

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:16-cv-00118-H-KSC	1/19/16	San Diego, CA
PLAINTIFF		DEFENDANT
Carucel Investments, L.P.		Novatel Wireless Inc. et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 7,221,904	6.	11.
2. 7,848,701	7.	12.
3. 7,979,023	8.	13.
4. 8,463,177	9.	14.
5. 8,718,543	10.	15.

In the above-entitled case, the following patents(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT
Judgment - Pursuant to jury verdict, Court enters judgment in favor of Defendants and against Plaintiff.

CLERK	(BY) DEPUTY CLERK	DATE
John Morrill	s/ J. Diaz	4/28/2017

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:16-cv-00118-LAB-BLM	1/19/16	San Diego, CA
PLAINTIFF		DEFENDANT
Carucel Investments, L.P.		Novatel Wireless Inc, et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 7,221,904	6.	11.
2. 7,848,701	7.	12.
3. 7,979,023	8.	13.
4. 8,463,177	9.	14.
5. 8,718,543	10.	15.

In the above-entitled case, the following patents(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK John Morrill	(BY) DEPUTY CLERK	DATE

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Southern District of Florida (Fort Lauderdale) on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 15-cv-61116-BB	DATE FILED 5/27/2015	U.S. DISTRICT COURT Southern District of Florida (Fort Lauderdale)
PLAINTIFF Carucel Investments, L.P.		DEFENDANT Novatel Wireless, Inc. AT&T Mobility LLC Verizon Communications, Inc. et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,221,904	5/22/2007	
2 7,848,701	12/7/2010	
3 7,979,023	7/12/2011	
4 8,463,177	6/11/2013	
5 8,718,543	5/6/2014	

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,849,191	9/30/2014	
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT	Case transferred to the Southern District of California

CLERK Steven M. Larimore	(BY) DEPUTY CLERK S. Reid	DATE 5/27/2015

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

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AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Southern District of Florida (Fort Lauderdale) on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 15-cv-61116-BB	DATE FILED 5/27/2015	U.S. DISTRICT COURT Southern District of Florida (Fort Lauderdale)
PLAINTIFF Carucel Investments, L.P.		DEFENDANT Novatel Wireless, Inc. AT&T Mobility LLC Verizon Communications, Inc. et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,221,904	5/22/2007	
2 7,848,701	12/7/2010	
3 7,979,023	7/12/2011	
4 8,463,177	6/11/2013	
5 8,718,543	5/6/2014	

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,849,191	9/30/2014	
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK Steven M. Larimore	(BY) DEPUTY CLERK S. Reid	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

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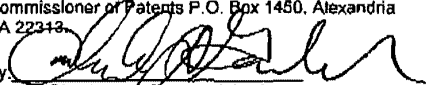
Reset

Patent
Attorney Docket No. CAR100C2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	MAIL STOP: MF Branch
Application No.: 09/401,584	)	Group Art Unit: 2617
Patent No.: 7,221,904	)	Examiner: CONTEE, JOY KIMBERLY
Filing Date: September 22, 1999	)	Confirmation No.: 4845
For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION	)	Certificate of Fax

I hereby certify that this correspondence is being faxed
to the United States Patent & Trademark Office on
September 17, 2014 via FAX addressed to
Commissioner of Patents P.O. Box 1450, Alexandria
VA 22313.

By: 
Charles D. Gavrilovich, Jr.

REQUEST FOR CORRECTION IN ENTITY STATUS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is a request to change entity status from Large to Small Entity. Small Entity Status was asserted upon paying the Issue Fee on April 9, 2007 for the above-identified application in good faith. The above-identified application/patent was and still is subject to Small Entity Fees. Accordingly, please correct the Entity Status to Small Entity so the maintenance fee can be paid.

Respectfully submitted,
CHARLES D. GAVRILOVICH, JR.

Date:

Sept 17, 2014

By:



Charles D. Gavrilovich, Jr.
Reg. No. 41,031
Attorney for Patentee

Charles D. Gavrilovich, Jr.
Gavrilovich, Dodd & Lindsey, LLP
985 Paseo La Cresta, Suite B
Chula Vista, CA 91910
Phone: 619 271 0382
FAX: 619 271 0383

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
filed in the U.S. District Court Southern District of Florida on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 14-cv-60363-RSR	DATE FILED 2/13/2014	U.S. DISTRICT COURT Southern District of Florida
PLAINTIFF Carucel Investments, L.P.		DEFENDANT Gogo, Inc. et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 7,221,904 B1	5/22/2007	
2 7,848,701 B2	12/7/2010	
3 7,979,023 B2	7/12/2011	
4 8,463,177 B2	6/11/2013	
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK Steven M. Larimore	(BY) DEPUTY CLERK Valerie Kemp	DATE 2/14/2014

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	05/22/2007	7221904	GAVRILOVICH-	4845

35083 7590 05/02/2007
CHARLES D. GAVRILOVICH, JR.,
GAVRILOVICH, DODD & LINDSEY, LLP
985 PASEO LA CRESTA, SUITE B
CHULA VISTA, CA 91910-6729

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Extension under 35 U.S.C. 154 (b) (application filed after June 7, 1995 but prior to May 29, 2000)

The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Extension is the filing date of the most recent CPA.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

CHARLES D. GAVRILOVICH, NAPERVILLE, IL;

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

35083 7590 01/25/2007

CHARLES D. GAVRILOVICH, JR.,
GAVRILOVICH, DODD & LINDSEY, LLP
985 PASEO LA CRESTA, SUITE B
CHULA VISTA, CA 91910-6729

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

TITLE OF INVENTION: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$0	\$0	\$1400	04/25/2007

EXAMINER	ART UNIT	CLASS-SUBCLASS
CONTEE, JOY KIMBERLY	2617	455-517000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

- 1 Gavrilovich, Dodd & Lindsey, LLP
2 Charles D. Gavrilovich, Jr.
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Carucel Investments, L.P.

Park Ridge, Illinois

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

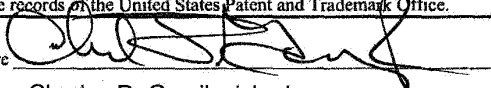
- ☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached. On-Line Payment via EFS Web
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☒ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature



Date

April 09, 2007

Typed or printed name Charles D. Gavrilovich, Jr.

Registration No.

41,031

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal				
Application Number:		09401584		
Filing Date:		22-Sep-1999		
Title of Invention:		MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION		
First Named Inventor/Applicant Name:		CHARLES D. GAVRILOVICH		
Filer:		Charles Dan Gavrilovich		
Attorney Docket Number:		GAVRILOVICH-		
Filed as Small Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	700	700
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				700

Electronic Acknowledgement Receipt	
EFS ID:	1667120
Application Number:	09401584
International Application Number:	
Confirmation Number:	4845
Title of Invention:	MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION
First Named Inventor/Applicant Name:	CHARLES D. GAVRILOVICH
Customer Number:	35083
Filer:	Charles Dan Gavrilovich
Filer Authorized By:	
Attorney Docket Number:	GAVRILOVICH-
Receipt Date:	13-APR-2007
Filing Date:	22-SEP-1999
Time Stamp:	11:48:37
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$700
RAM confirmation Number	1675
Deposit Account	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)

1	Issue Fee Payment (PTO-85B)	PTO85PartBgavrilovich.pdf	1558944	no	1
Warnings:					
Information:					
2	Fee Worksheet (PTO-06)	fee-info.pdf	8155	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1567099		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	Examiner: Joy K. Contee
Charles D. Gavrilovich	)	
	)	
Serial No.: 09/401,584	)	Group No.: 2681
	)	
Filed: September 22, 1999	)	Docket No. Gavrilovich P1US2
	)	
For: MOBILE COMMUNICATION SYSTEM	)	
WITH MOVING BASE STATION	)	

Via Electronic Filing

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following amendment to the specification is submitted after Notice of Allowance but before the payment of the Issue Fee.

The amendment to the specification begins on page 2.

IN THE SPECIFICATION:

Please amend the specification as follows.

Please insert the following paragraph after page 3, line 27 and before the Summary:

--BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram representation of a roadway structure with fixed base stations, moving base stations, and fixed radio ports.

FIG. 2 is a block diagram representation of a fixed radio port of FIG. 1.

FIG. 3 is a block diagram representation of a fixed base station of FIG. 1.

FIG. 4 is a block diagram representation of a moving base station of FIG. 1.

FIG. 5 is a block diagram representation of a gateway telephone office shown in FIG. 1.

FIG. 6 is a tabular representation of channel allocation.

FIG. 7 is a representation of selected channels of FIG. 6.

FIG. 8 illustrates signal transmission among the various system entities.

FIG. 9 is a block diagram representation of moving base stations operating in separate loops.--

Conclusion

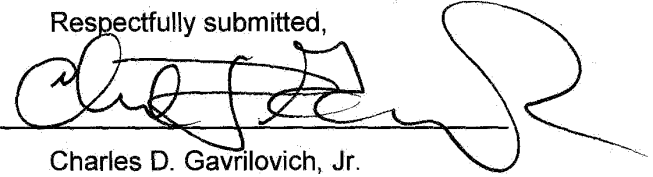
Applicant has added the Brief Description of the Drawings section in this amendment.

Date:

March 05, 2007

By:

Respectfully submitted,



Charles D. Gavrilovich, Jr.
Reg. No. 41,031

Charles D. Gavrilovich, Jr.
A Professional Corporation
985 Paseo La Cresta, Suite A
Chula Vista, CA 91910
Phone: 619 271 0382
FAX: 619 271 0383

Electronic Acknowledgement Receipt

EFS ID:	1566584
Application Number:	09401584
International Application Number:	
Confirmation Number:	4845
Title of Invention:	MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION
First Named Inventor/Applicant Name:	CHARLES D. GAVRILOVICH
Customer Number:	35083
Filer:	Charles Dan Gavrilovich
Filer Authorized By:	
Attorney Docket Number:	GAVRILOVICH-
Receipt Date:	05-MAR-2007
Filing Date:	22-SEP-1999
Time Stamp:	23:12:01
Application Type:	Utility

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	GavrilovichP1US2-3-05-07-rev2.pdf	399120	no	3

Warnings:

Information:	
Total Files Size (in bytes):	399120
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

35083 7590 01/25/2007

CHARLES D. GAVRILOVICH, JR.,
GAVRILOVICH, DODD & LINDSEY, LLP
985 PASEO LA CRESTA, SUITE B
CHULA VISTA, CA 91910-6729

EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT

PAPER NUMBER

2617

DATE MAILED: 01/25/2007

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

TITLE OF INVENTION: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$0	\$0	\$1400	04/25/2007

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

35083 7590 01/25/2007

CHARLES D. GAVRILOVICH, JR.,
GAVRILOVICH, DODD & LINDSEY, LLP
985 PASEO LA CRESTA, SUITE B
CHULA VISTA, CA 91910-6729

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

TITLE OF INVENTION: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$0	\$0	\$1400	04/25/2007

EXAMINER	ART UNIT	CLASS-SUBCLASS
CONTEE, JOY KIMBERLY	2617	455-517000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1	_____
2	_____
3	_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
35083	7590	01/25/2007	EXAMINER	
CHARLES D. GAVRILOVICH, JR., GAVRILOVICH, DODD & LINDSEY, LLP 985 PASEO LA CRESTA, SUITE B CHULA VISTA, CA 91910-6729			CONTEE, JOY KIMBERLY	
			ART UNIT	PAPER NUMBER
			2617	
DATE MAILED: 01/25/2007				

Determination of Patent Term Extension under 35 U.S.C. 154 (b)
(application filed after June 7, 1995 but prior to May 29, 2000)

The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Extension is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	09/401,584	GAVRILOVICH	
	Examiner	Art Unit	
	Joy K. Contee	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to communication filed on 5/15/06.
2. ☒ The allowed claim(s) is/are 30-36, 49-82, 89-117, 119-123, renumbered 1-69.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ 7. ☐ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____

Joy K. Contee
JOY K. CONTEE
SENIOR EXAMINER
 5712727A06

Temica M. Beamer
TEMICA BEAMER
PRIMARY EXAMINER

Examiner's Reasons for Allowance

1. The following is an examiner's statement of reasons for allowance:

The application is allowable for the reasons set forth on pages 8-10 of the of Appellant's brief, the claimed invention requires wirelessly communication between transmitter and receiver (or interpreted between a fixed base station and moving base station) whereas the closest prior art requires a wireline connection between a fixed base station and moving base station and wherein both base stations communicate wireless with a mobile station which does not teach or suggest the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

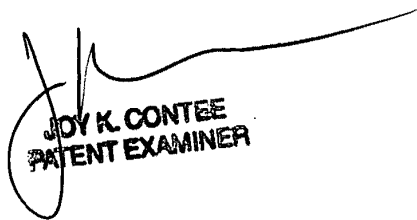
Conclusion

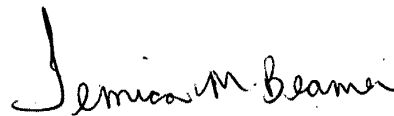
2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K. Contee whose telephone number is 571.272.7906. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571.272.7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JC


JOY K. CONTEE
PATENT EXAMINER


TEMICA BEAMER
PRIMARY EXAMINER



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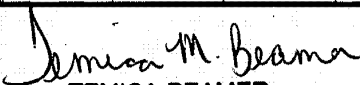
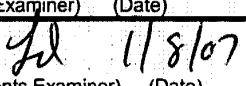


Bib Data Sheet

CONFIRMATION NO. 4845

SERIAL NUMBER 09/401,584	FILING OR 371(c) DATE 09/22/1999 RULE	CLASS 455	GROUP ART UNIT 2617	ATTORNEY DOCKET NO. GAVRILOVICH-
APPLICANTS CHARLES D. GAVRILOVICH, NAPERVILLE, IL;				
** CONTINUING DATA ***** This application is a CON of 08/953,962 10/20/1997 PAT 6,026,277 which is a CON of 08/687,722 07/26/1996 PAT 5,729,826 which is a 371 of PCT/US95/07037 06/02/1995 <i>OK, R</i>				
** FOREIGN APPLICATIONS ***** <i>none, R</i>				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 10/14/1999				
Foreign Priority claimed 35 USC 119 (a-d) conditions met Verified and Acknowledged	☐ yes ☒ no ☐ yes ☒ no ☐ Met after Allowance Examiner's Signature <i>[Signature]</i> Initials	STATE OR COUNTRY IL	SHEETS DRAWING 5	TOTAL CLAIMS 83
INDEPENDENT CLAIMS 24				
ADDRESS 35083				
TITLE MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION				
FILING FEE RECEIVED 1766	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit	

Issue Classification 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	09/401,584	GAVRILOVICH	
	Examiner	Art Unit	
	Joy K. Contee	2617	

ISSUE CLASSIFICATION											
ORIGINAL					CROSS REFERENCE(S)						
CLASS	SUBCLASS				CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
455	11.1				455	436	426.2				
INTERNATIONAL CLASSIFICATION											
H	0	4	B	7/15							
				/							
				/							
				/							
				/							
Joy Contee 1/7/07 (Assistant Examiner) (Date)					 TEMICA BEAMER PRIMARY EXAMINER 1/8/07 (Priamry Examiner) (Date)					Total Claims Allowed: 69	
 (Legal Instruments Examiner) (Date)										O.G. Print Claim(s) 1	
										O.G. Print Fig. 1	

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☒ T.D.				☐ R.1.47			
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original		
	1	2	31	20	61	44	91	67	121		151		181		
	2	3	32	21	62	45	92	68	122		152		182		
	3	4	33	22	63	46	93	69	123		153		183		
	4	5	34	23	64	47	94		124		154		184		
	5	6	35	24	65	48	95		125		155		185		
	6	7	36	25	66	49	96		126		156		186		
	7		37	26	67	50	97		127		157		187		
	8		38	27	68	51	98		128		158		188		
	9		39	28	69	52	99		129		159		189		
	10		40	29	70	53	100		130		160		190		
	11		41	30	71	54	101		131		161		191		
	12		42	31	72	55	102		132		162		192		
	13		43	32	73	56	103		133		163		193		
	14		44	33	74	57	104		134		164		194		
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	16		46	35	76	59	106		136		166		196		
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	22	11	52	41	82		112		142		172		202		
	23	12	53		83	60	113		143		173		203		
	24	13	54		84	61	114		144		174		204		
	25	14	55		85	62	115		145		175		205		
	26	15	56		86	63	116		146		176		206		
	27	16	57		87	64	117		147		177		207		
	28	17	58		88		118		148		178		208		
	29	18	59	42	89	65	119		149		179		209		
1	30	19	60	43	90	66	120		150		180		210		

Search Notes

Application/Control No.

09/401,584

Examiner

Joy K. Contee

Applicant(s)/Patent under
Reexamination

GAVRILOVICH

Art Unit

2617

SEARCHED

Class	Subclass	Date	Examiner
updated	subs	1/7/2007	JC

INTERFERENCE SEARCHED

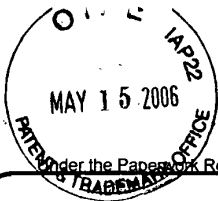
Class	Subclass	Date	Examiner
see search report		1/7/07	JC

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
EAST: PGPUB, USPAT, JPO, EPO, Derwent	1/7/2007	JC

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	12496	((movable or moving or mobile) near10 ("base station" or repeater or transmitter)).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:54
L2	7193	l1 and "455"/\$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:55
L3	312	l2 and @rlad<="19950602"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:56
L4	56	"predetermined path" and l1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:56
L5	19	"predetermined path" and l2	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:56
L6	0	"predetermined path" and l3	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2007/01/08 06:56



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Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/401,584
	Filing Date	September 22, 1999
	First Named Inventor	Gavrilovich, Charles D.
	Art Unit	2686
	Examiner Name	Joy K. Contee
	Attorney Docket Number	Gavrilovich-P1US2
Total Number of Pages in This Submission		100

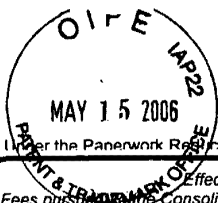
ENCLOSURES (Check all that apply)		
☒ Fee Transmittal Form ☒ Fee Attached ☒ Amendment/Reply ☒ After Final ☐ Affidavits/declaration(s) ☐ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Reply to Missing Parts/Incomplete Application ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation ☐ Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____ ☐ Landscape Table on CD	☐ After Allowance Communication to TC ☐ Appeal Communication to Board of Appeals and Interferences ☒ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☒ Other Enclosure(s) (please identify below): Itemized Postcard Credit Card Payment Form Final Office Action dated 1/3/2005 Patent No. 5282239 Application as Filed
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	Gavrilovich, Dodd, and Lindsey, LLP		
Signature			
Printed name	Charles D. Gavrilovich, Jr.		
Date	May 12, 2006	Reg. No.	41,031

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:	
Signature	
Typed or printed name	Charles D. Gavrilovich, Jr.
Date	May 12, 2006

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL For FY 2005

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 250.00

Complete if Known

Application Number	09/401,584
Filing Date	September 22, 1999
First Named Inventor	Gavrilovich, Charles D.
Examiner Name	Joy K. Contee
Art Unit	2686
Attorney Docket No.	Gavrilovich-P1US2

METHOD OF PAYMENT (check all that apply)

☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____
☒ Deposit Account Deposit Account Number: 502484 Deposit Account Name: _____
For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)
☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee
☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25

Each independent claim over 3 (including Reissues)

200	100

Multiple dependent claims

360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)

____ - 20 or HP = ____ x ____ = ____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)

____ - 3 or HP = ____ x ____ = ____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
____ - 100 = ____	____	____ / 50 = ____ (round up to a whole number) x ____	____	____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Appeal Brief

250.00

SUBMITTED BY

Signature

Name (Print/Type) Charles D. Gavrilovich, Jr.

Registration No. 41,031
(Attorney/Agent)

Telephone 619 271 0382

Date 9 May 12, 2006

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Examiner:	Joy K. Contee
Charles D. Gavrilovich	)		
Serial No.:	)	Group No.:	2681
09/401,584	)		
Filed:	)	Docket No.	Gavrilovich P1US2
September 22, 1999	)		
For:	)		
MOBILE COMMUNICATION SYSTEM	)		
WITH MOVING BASE STATION	)		

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date May 12, 2006, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

May 12, 2006 [Signature]
Date Signature
By: Charles D. Gavrilovich, Jr.

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Sir:

APPELLANT'S APPEAL BRIEF UNDER 37 CFR §41.37

In accordance with the Notice of Appeal to the Board of Patent Appeals and Interferences mailed March 27, 2006 and received on April 04, 2006, in the above-identified U.S. Patent application, Appellant hereby presents the Appellant's Appeal Brief under 37 CFR §41.37. The APPELLANT'S APPEAL BRIEF is submitted with copies of each reference discussed and a copy of the Final Office Action as well as the appropriate fees.

REAL PARTY IN INTEREST

Carucel Investments Limited Partnership of Park Ridge, Illinois is the real party in interest as the assignee of the above-identified application.

RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known which will be affected by this appeal.

STATUS OF CLAIMS

In the Final Office Action dated October 03, 2005, the Examiner has provided the following status of the claims. Claims 63-82 and 97-102 are allowed. Claims 50-53, 55-60, 90-92, 94-96, 104-106, are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 118 is objected to because of informalities. Claims 30-36, 49, 54-62, 89-96, 93, 103-106 and 113-123 are rejected. Appellant is concurrently filing an amendment canceling claim 118. Accordingly, the application under appeal includes pending claims 30-36, 49-82, 89-106 and 113-123. The claims involved in the appeal include claims 30-36, 49, 54-62, 89-96, 93, 103-106 and 113-123.

Claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, 113-123 stand rejected under 35 USC §102(b) as being anticipated by Yokoi et al. (US 5,282,239) ("Yokoi").

STATUS OF AMENDMENTS

Amendments submitted March 25, 2005 have been entered. Appellant is submitting an amendment concurrently with this appeal canceling claim 118.

SUMMARY OF THE CLAIMED SUBJECT MATTER

In accordance with 37 CFR § 41.37(v), Appellant provides a brief summary of each independent claim involved in the appeal and each dependent claim argued separately, where each summary refers to the specification by page and line number and to the drawings by reference number. Appellant notes that this "Summary of claimed subject matter" is provided only to assist the Board in identifying portions of the specification related to the particular claims. In the interest of brevity, each claim summary does not necessarily include all references to all relevant portions of the specification and drawings. Accordingly, omission of

any reference to the specification or to the drawings should not be construed in any way as an intent to relinquishment claim scope or term, or as an implication or statement regarding the conformance with 35 U.S.C. §112. Appellant respectfully submits that the claims should not be construed as being limited to the embodiments described or referenced in any claim summary and other embodiments, as well as the Doctrine of Equivalents, may apply in determining claim scope.

Claim 30

The subject matter of claim 30 is directed to an apparatus comprising a receiver configured to wirelessly receive a received signal and a transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit 20. The transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit. The actual motion of the mobile unit 20 is independent of the motion of the transmitter. The specification describes a moving base station 30 having a radio interface 132 for communicating with the mobile unit 20 and a radio interface 132 for communicating with a fixed radio port 50. The receiver of claim 30 is part of the radio interface 132 that communicates with the fixed radio port 50 of moving base station 30. The transmitter is part of the radio interface 132 of the moving base station 30 that communicates with the mobile unit 20. (Application, page 8, line 25 to page 9, line 15 and FIG. 4). FIG. 1 illustrates an example where a moving base station 30 (including a transmitter) moves along a predetermined path (along a conveying device disposed along a roadway) and in accordance with an anticipated motion of the mobile unit 20 since the anticipated motion of the mobile unit is along the roadway. The application describes the example shown in FIG. 1 at page 5, line 5 through page 7, line 21.

Claim 31

Claim 31 depends from claim 30 and is further directed to an apparatus where the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit 20 is on the roadway 10, 15. (See FIG. 1 and page 5, lines 5-9.)

Claim 33

Claim 33 depends from claim 32 which depends from claim 31 and is further directed to an apparatus where the received signal is received from a fixed radio port 50. (See FIG. 2 and page 7, lines 22-23 and FIG. 1).

Claim 34

Claim 34 is directed to an apparatus comprising a receiver configured to receive a received signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit. The actual motion of the mobile unit is independent of the motion of the receiver. The apparatus also comprises a transmitter configured to wirelessly transmit a transmit signal corresponding to the received signal to at least one fixed port. The specification describes a moving base station 30 having a radio interface 132 for communicating with the mobile unit 20 and a radio interface 132 for communicating with a fixed radio port 50. The transmitter of claim 34 is part of the radio interface 132 that communicates with the fixed radio port 50. The receiver is part of the radio interface 132 of the moving base station 30 that communicates with the mobile unit 20. (Application, page 8, line 25 to page 9, line 15 and FIG. 4). FIG. 1 illustrates an example where a moving base station 30 (including a receiver) moves along a predetermined path (along a conveying device disposed along a roadway) and in accordance with an anticipated motion of the mobile unit 20 since the anticipated motion of the mobile unit is along the roadway. The application describes the example shown in FIG. 1 at page 5, line 5 through page 7, line 21.

Claim 35

Claim 35 depends from claim 34 and is further directed to an apparatus where the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit 20 is on the roadway 10, 15. (See FIG. 1 and page 5, lines 5-9.)

Claim 49

Claim 49 is directed to a movable base station 30 configured to establish a communication link between a fixed port 50 and mobile unit 20 while the movable base station 30 has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit 20. The communication link comprises a wireless communication link between the movable base station 30 and the fixed port 50. The actual motion of the mobile unit 20 is independent of the motion of the movable base station 30. (See FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 54

Claim 54 is directed to a movable base station 30 configured to have a motion relative to a fixed port 50 along a predetermined path and in accordance with an anticipated motion of a mobile unit 20. The movable base station 30 comprises a first radio interface 132 configured to establish a first wireless communication link between the movable base station 30 and the mobile unit 20 and a second radio interface 132 configured to establish a second wireless communication link between the movable base station 30 and the fixed port 50. The actual motion of the mobile unit 20 is independent of the motion of the movable base station 30. (See FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 61

Claim 61 depends from claim 54 and is further directed to a movable base station 30 where the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit 20 is on the roadway 10, 15. (See FIG. 1 and page 5, lines 5-9).

Claim 89

Claim 89 is directed to a method of transmitting a signal to a mobile unit 20 having an anticipated motion relative to Earth. The method comprises the steps of wirelessly receiving a received signal, controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, and transmitting a transmit signal corresponding to the received signal to the mobile unit. The motion of the mobile unit is independent of the motion of the transmitter. (See FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 93

Claim 93 is directed to a method of wirelessly transmitting a transmit signal corresponding to a received signal transmitted from a mobile unit 20 having an anticipated motion relative to Earth. The method comprises the steps of controlling a motion of a receiver (part of the radio interface 132 communicating with the mobile unit 20) along a predetermined path in accordance with the anticipated motion of the mobile unit 20, receiving the received signal at the receiver, and wirelessly transmitting the transmit signal from a transmitter (part of the radio interface 132 communicating with the fixed radio port 50) connected to the receiver. The motion of the mobile unit 20 is independent of the motion of the receiver (e.g. radio interface 132). (See generally FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 103

Claim 103 is directed to a method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports. The plurality of fixed ports are communicatively coupled to the communication network. The method comprises the steps of establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality of fixed ports. (See generally FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 113

Claim 113 is directed to a communication system comprising a first transceiver (e.g. the radio interface 132 communicating with the mobile unit 20) and a second transceiver (e.g. the radio interface 132 communicating with the fixed radio ports 50). The first transceiver is configured to provide a moving communication cell to a mobile unit 20 while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit 20. The second transceiver is connected to the first transceiver and is configured to wirelessly exchange signals, corresponding to the communication cell, with at least one fixed port 50. The actual motion of the mobile unit 20 is independent of the motion of the moving communication cell. The movable base station 30, therefore provides a moving communication cell in the exemplary embodiment presented in the application. (See generally FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 114

Claim 114 depends from claim 113 and is further directed to a communication system where the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway 10, 15. (See FIG. 1 and page 5, lines 5-9).

Claim 116

Claim 116 depends from claim 115 and is further directed to a communication system that further comprises a plurality of fixed ports 50 disposed along the anticipated path of the

mobile unit 20. The plurality of fixed ports 50 are in communication with the moving base station 30. (See generally FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 119

Claim 119 is directed to a method of providing communication services to a mobile unit 20. The method comprises providing a moving communication cell to a mobile unit 20 while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit 20 and wirelessly exchanging signals with at least one fixed port corresponding to the communication cell. The actual motion of the mobile unit 20 is independent of the motion of the cell. (See generally FIG. 1 and page 5, line 5 through page 6, line 21).

Claim 120

Claim 120 depends from claim 119 and is further directed to a method where the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway 10, 15. (See FIG. 1 and page 5, lines 5-9).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Appellant wishes the Board of Patent Appeals and Interferences to review the following issues on appeal:

1) Whether the rejection of any of claims 30-36, 49, 54-62, 89-96, 93, 103-106 and 113-123 under 35 U.S.C. §102(b) as being anticipated by Yokoi et al. (US 5,282,239) ("Yokoi") was proper.

ARGUMENT

Appellant respectfully submits that claims 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119 are allowable over the art cited by the Examiner. Each of the issues presented for review are addressed below.

102(b) Rejection - Yokoi

Claims 30-36, 49, 54-62, 89-96, 93, 103-106 and 113-123 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi et al (US 5,282,239) ("Yokoi"). Appellant respectfully submits that these claims are allowable over the art cited. The claims are argued separately as indicated by the headings

Applicants respectfully submit that the claims as presented are allowable over the art cited by the examiner. A rejection of a claim for anticipation requires that a single anticipating reference include, within its four corners, all of the elements, limitations, and relationships therebetween of the rejected claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants respectfully submit that each and every element recited in any one of the claims is not found in Yokoi.

Claim 30

Claim 30 as amended recites an apparatus comprising "a receiver configured to wirelessly receive a received signal" and a "transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Appellant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach an apparatus that comprises a receiver that wirelessly receives a received signal and transmits a corresponding transmit signal to a mobile unit. In Yokoi, "all of the base stations 4 are coupled by wires to a central switch 5". (Yokoi, Column 2, lines 59-60). Further, the "moving conveyance base station 10 is coupled to the central switch 5 by wires running parallel to the elevator cable that supports the elevator 1". (Yokoi, Column 4, lines 42-45). "The central switch 5 is coupled via wires to the moving conveyance base stations 20, 32, 35. It is also coupled via wires to fixed base stations . . ." (Yokoi, Column 6, lines 21-23). Any signals transmitted from the moving conveyance base station (10, 20, 32, or 35) in Yokoi do not correspond to wirelessly received signals. The moving base station in Yokoi transmits signals to a portable cordless telephone 19 where the transmitted signals correspond to signals received from the central switch 5 through wires and not received wirelessly.

In the last Office Action, the Examiner attempted to apply the components of the elevator embodiment of Yokoi to the elements of claim 30 for support that claim 30 was anticipated by Yokoi. Appellant respectfully submits that it is clear after careful examination that Yokoi does not show all of the elements of claim 30. As applied by the Examiner, the “receiver” of claim 30 is intended to read on the “fixed base station” of Yokoi and the “fixed port” of claim 30 is intended to read on the “central switch” of Yokoi. Therefore, in order for claim 30 to read on Yokoi, the fixed base station must “wirelessly receive a received signal” from the central switch 5. This is not the case in Yokoi. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Therefore, any signal received at the fixed base station **from the central switch 5** is received through a wire and not “wirelessly” as recited in claim 30. The Examiner cites to column 3, lines 55-65 and column 8, lines 5-15 for support that signals are wirelessly received at the central switch 5. At column 3, lines 55-66, Yokoi explains that the portable cordless telephone can communicate through a fixed based station connected to the central switch. Therefore, signals wirelessly received at the fixed base station are received **from the portable telephone 6** and **not** from the central switch 5. At column 8 lines 5-15, Yokoi discusses hand-offs of a portable cordless telephone from a moving–conveyance station to a fixed base station. There is nothing in this section of Yokoi to suggest that the moving conveyance station is transmitting signals that correspond to wirelessly received signals.

Appellant respectfully submits that Yokoi does not suggest to transmit signals from a moving base station that correspond to wirelessly received signals from a fixed port. Accordingly, Yokoi does not show or describe an apparatus comprising a “receiver configured to wirelessly receive a received signal” and “a transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter.” Therefore, Yokoi does not describe or show all of the elements of claim 30 and claim 30 is allowable.

Claims 31 and 32

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 31. In addition to the elements not shown in the base claim 30, claim 31 recites elements not described Yokoi. Claim 31 recites “an apparatus in accordance with claim 30 wherein the

predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway." Appellants submit that Yokoi does not describe this limitation. In the crane embodiment of Yokoi, several cranes move along parallel tracks in a factory. Moving-conveyance base stations are mounted on the cranes to provide communications to the portable telephones used by crane operators. Any anticipated motion of the portable telephone is along a track and not a roadway. Yokoi does not suggest that the factory system can be applied to a roadway. In expanding the description to more than elevators and cranes, Yokoi specifically states that the invention may be applied to any type of moving conveyance installed in a building. Accordingly, teaches away from applying the system to a roadway.

Claim 33

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 33. In addition to the elements not shown in the base claim 30, claim 33 recites elements not described Yokoi. Claim 33 recites "an apparatus in accordance with claim 32, wherein the received signal is received from a fixed radio port". Appellant submits Yokoi does not describe receiving the received signal form a fixed radio port. Signals transmitted by the moving conveyance base station correspond to signals received from the central switch 5. A central switch is not a fixed radio port. As described in the appellant's application at page 7, lines 22-23, fixed radio ports 50 include a radio interface circuit 154 providing an interface between the radio signals received through the antennas 110, 111 and a processor 150. The fixed radio ports, therefore, include a radio circuit. The central switch in Yokoi does not include radio circuitry. The central switch exchanges signals with the base stations using wires and not radios. An attempt to read "fixed radio ports" on to a fixed base station of Yokoi also fails since the moving conveyance stations do not exchange signals with the fixed base stations.

Claim 34

Appellant respectfully submits that Yokoi does not describe every element of claim 34. Claim 34 recites an apparatus comprising "a receiver configured to receive a received signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver; and a transmitter configured to wirelessly transmit a transmit signal corresponding to the received signal to at least one fixed port." Appellant respectfully submits that Yokoi does not teach all of the limitations of this claim.

Yokoi does not teach an apparatus that comprises a transmitter that wirelessly transmits a transmit signal corresponding to a received signal to at least one port. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). In Yokoi, signals transmitted from the moving-conveyance base station that correspond to signals received from the portable telephones are transmitted through wires to the central switch and are not "wirelessly" transmitted as claimed. The moving conveyance base station in Yokoi only wirelessly transmits signals to portable cordless telephones and not to fixed radio ports.

Claims 35 and 36

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 35. In addition to the elements not shown in the base claim 34, claim 35 recites elements not described Yokoi. Claim 35 recites "an apparatus in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway." Appellants submit that Yokoi does not describe this limitation. In the crane embodiment of Yokoi, several cranes move along parallel tracks in a factory. (Yokoi, Column 8, lines 16-35). Moving-conveyance base stations are mounted on the cranes to provide communications to the portable telephones used by crane operators. Any anticipated motion of the portable telephone is along a track and not a roadway. As discussed above, Yokoi does not suggest that the factory system can be applied to a roadway.

Claim 49

Appellant respectfully submits that Yokoi does not describe every element of claim 49. Claim 49 recites "a movable base station configured to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, the communication link comprising a wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station". Appellant respectfully submits that Yokoi does not describe a movable base station configured to establish a communication link between a fixed port and a mobile unit where the communication link comprises a wireless communication link. The moving conveyance base station in Yokoi communicates to a central switch through a wire. Accordingly, the communication link between the moving conveyance base station and the central switch

does not comprise a wireless communication link. In the Final Office Action, the Examiner proposed that “fixed port” in claim 49 reads on the fixed base station in Yokoi. (Final Office Action, Page 6, line 19.) There is no communication link between the moving conveyance base station and the fixed base station, however. In Yokoi, the portable telephones communicate with fixed base stations or with the moving conveyance base stations. The moving conveyance base stations, however, do not communicate with the fixed base station and are connected to the central switch through wires. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). At page 6, line 19 of the Final Office Action, the Examiner also cited to column 8, lines 5-15 of Yokoi. This section in Yokoi indicates that the portable telephone can be handed off between base stations. There is no suggestion, however, that the moving conveyance base stations can communicate with the fixed base stations. Accordingly, appellants respectfully submit that Yokoi does not disclose a wireless communication link between a moving base station and a fixed port and that claim 49 is allowable.

Claim 54

Appellants respectfully submit that Yokoi does not describe all of the limitations of claim 54. Claim 54 recites a movable base station configured to move relative to a fixed port and comprises “a second radio interface configured to establish a second wireless communication link between the movable base station and the fixed port”. Yokoi does not describe a movable base station with this element. The moving conveyance base station in Yokoi includes radio circuitry for communicating only with a portable telephone and not any fixed port. The moving conveyance base station is connected to the central switch with wires and does not use a wireless communication link to communicate with the central switch or the fixed base stations. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Accordingly, appellants respectfully submit that Yokoi does not describe all of the limitations of claim 54 and that claim 54 is allowable.

Claim 61 and 62

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 61. In addition to the elements not shown in the base claim 54, claim 61 recites elements not described in Yokoi. Claim 61 recites “a movable base station in accordance with claim 54

wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.” Appellants submit that Yokoi does not describe this limitation. In the crane embodiment of Yokoi, several cranes move along parallel tracks in a factory. Moving-conveyance base stations are mounted on the cranes to provide communications to the portable telephones used by crane operators. Any anticipated motion of the portable telephone is along a track and not a roadway. As discussed above, Yokoi does not suggest that the factory system can be applied to a roadway.

Claim 89

Appellant respectfully submits that Yokoi does not teach all of the steps of claim 89. Claim 89 as amended recites a method where a motion of a transmitter is controlled “along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter” and comprises the steps of:

“wirelessly receiving a received signal;
controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and
transmitting a transmit signal corresponding to the received signal to the mobile unit.”

Appellant respectfully submits that Yokoi does not teach these three steps. Yokoi does not teach “wirelessly receiving a received signal” and “transmitting a transmit signal corresponding to the received signal to the mobile unit”. Signals transmitted to the portable telephones in Yokoi correspond to signals received through wires at the moving conveyance base station and are not wirelessly received. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Any signals received from the base station in Yokoi do not correspond to wirelessly received signals. The moving conveyance base station in Yokoi transmits signals to a portable cordless telephone where the transmitted signals correspond to signals received from the central switch through wires and not received wirelessly.

Continuing with claim 89, appellants respectfully submit that Yokoi does not describe “controlling a motion of a transmitter along a predetermined path in accordance with the

anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter” as recited in claim 89. The moving conveyance base station in Yokoi moves in accordance with the user operating instructions within the elevator 31 and is not based on the anticipated motion of the portable telephone 19. In applying Yokoi, the Examiner references the moving conveyance base station 32 in an elevator 31 that provides service to a portable telephone 19 in an adjacent elevator 1. The moving conveyance base station 32 is controlled by users within the first elevator 31 and is not “in accordance with the anticipated motion” of the portable telephone 19 in the adjacent elevator 1. Since the moving conveyance station 32 is mounted in the elevator 31, its motion is controlled by the motion of the elevator. There is nothing in Yokoi to suggest that the elevator 31 is controlled to move based on the motion of the adjacent elevator 1 in which the portable telephone 19 is contained.

Claim 93

Appellant respectfully submits that Yokoi does not teach all of the steps of claim 93. Claim 93 recites a method of wirelessly transmitting a transmit signal corresponding to a received signal transmitted from a mobile unit where the method comprises the steps of:

“controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver”;

receiving the received signal at the receiver; and

wirelessly transmitting the transmit signal from a transmitter connected to the receiver”.

Appellant respectfully submits that Yokoi does not teach these three steps. Yokoi does not teach “wirelessly transmitting the transmit signal from a transmitter connected to the receiver” where the transmit signal corresponds to the received signal received from a mobile unit. Any signals wirelessly transmitted from the moving conveyance base station in Yokoi are transmitted to the portable telephones and do not correspond to signals received from the portable telephones. Signals corresponding to signals received from the portable telephones are sent through wires to the central switch and are not wirelessly transmitted. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Any signals wirelessly transmitted from the base station in Yokoi do not correspond to signals received from the portable telephones.

Continuing with claim 93, appellants respectfully submit that Yokoi does not describe "controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver" as recited in claim 93. The moving conveyance base station in Yokoi moves in accordance with the user operating instructions within the elevator 31 and is not based on the anticipated motion of the portable telephone 19. In applying Yokoi, the Examiner references the moving conveyance base station 32 in an elevator 31 that provides service to a portable telephone 19 in an adjacent elevator 1. The moving conveyance base station 32 is controlled by users with the first elevator 31 and is not "in accordance with the anticipated motion" of the portable telephone 19 in the adjacent elevator 1. Since the moving conveyance station 32 is mounted in the elevator 31, its motion is controlled by the motion of the elevator 31. There is nothing in Yokoi to suggest that the elevator 31 is controlled to move based on the motion of the adjacent elevator 1 in which the portable telephone 19 is contained.

Claim 103

Appellant respectfully submits that Yokoi does not teach all of the steps of claim 103. Claim 103 recites a method comprising the step of "establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units." Appellant respectfully submits that Yokoi does not teach this limitation. The moving conveyance base station in Yokoi is connected to a central switch and does not communicate with a fixed port. A central switch is not a fixed radio port. As described in the appellant's application, fixed radio ports 50 include a radio interface circuit 154 providing an interface between the radio signals received through the antennas 110 111 and a processor 150. (Application, page 7, lines 22-23). The fixed radio port, therefore, includes a radio circuit. The central switch in Yokoi does not include radio circuitry. The central switch exchanges signals with the base stations using wires and not radios. Further, the fixed base station can not be interpreted as a fixed port since the moving conveyance base station does not communicate with the fixed base station.

Further, claim 103 recites the step of "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality of ports." Appellant respectfully submits that Yokoi does not teach this step. Nowhere in Yokoi is a showing that a plurality of mobile units are handed off simultaneously. Each portable cordless telephone in Yokoi is handed off individually based on the quality of its communication link. (Yokoi, Col. 7, lines 57-61). Each portable cordless telephone can be handed off between the fixed base station 4 and moving-conveyance

base station 10, between two moving conveyance base stations 10, or between two fixed base stations 4. In claim 103, the moving base station establishes wireless communication links between the mobile units and the moving base station and between the moving base station and a fixed port. The moving base station of claim 103 simultaneously hands off the plurality of mobile stations from one fixed port to another by establishing a communication link with the other fixed port. In contrast, several mobile units in Yokoi can not be handed off from one fixed port to another, simultaneously. As presented above, the portable cordless telephones do not communicate to a fixed port through a moving base station. The moving conveyance stations do not communicate with the fixed base stations in Yokoi. Appellants respectfully submit that Yokoi does not show all of the elements of claim 103 and that that this claim is allowable.

Claims 113 and 117

Claim 113 recites a communication system comprising a first transceiver configured to provide a communication cell and "a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell." Appellant respectfully submits that Yokoi does not teach this limitation. The moving-conveyance station is connected to the central switch through wires. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Appellant respectfully submits that Yokoi does not show all of the elements of claim 113 and that this claim is allowable.

Claims 114 and 115

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 114. In addition to the elements not shown in the base claim 113, claim 114 recites elements not described Yokoi. Claim 114 recites "a communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway." Appellants submit that Yokoi does not describe this limitation. In the crane embodiment of Yokoi, several cranes move along parallel tracks in a factory. Moving-conveyance base stations are mounted on the cranes to provide communications to the portable telephones used by crane operators. Any anticipated motion of the portable telephone is along a track and not a roadway. As discussed above, Yokoi does not suggest that the factory system can be applied to a roadway.

Claims 116 and 117

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 116. In addition to the elements not shown in the base claim 113, claim 116 recites elements not described Yokoi. Claim 116 recites "a communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station". Yokoi does not suggest that a plurality of fixed ports are disposed along the anticipated path of a mobile unit. There is no suggestion in Yokoi that either the fixed base stations or a plurality of central switches are placed along the tracks of the crane embodiment or along the elevator shafts in the elevator embodiment. Only a single central switch is discussed and there is no discussion regarding its position relative to the tracks or elevator shafts. Further, there is no discussion of the position of the fixed base stations relative to the tracks or the elevator shafts. In addition, the fixed ports can not be interpreted to be fixed ports since the moving conveyance stations do not communicate with the fixed base stations as presented above.

Claim 119

Appellant respectfully submits that Yokoi does not teach all of the steps of claim 119. Claim 119 recites a method where "wirelessly exchanging signals with at least one fixed port corresponding to the communication cell." Appellant respectfully submits that Yokoi does not teach this limitation of this claim. The moving conveyance station in Yokoi is connected to the central switch through wires. As explained above, Yokoi explicitly states that the moving conveyance base stations and the fixed base stations are connected to the central switch 5 by wires. (Column 2, lines 59-60, Column 4, lines 42-45 and Column 6, lines 21-23). Further, Yokoi does not discuss communicating with the fixed base stations to provide a moving communication cell. Appellant respectfully submits that Yokoi does not show all of the elements of claim 119 and that this claim is allowable.

Claims 120, 121, 122 and 123

Appellant respectfully submits that Yokoi does not describe all of the elements of claim 120. In addition to the steps not shown in the base claim 119, claim 120 recites limitations not described Yokoi. Claim 120 recites "a method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway." Appellants submit that Yokoi does not describe this limitation. In the crane embodiment of Yokoi, several cranes move along

parallel tracks in a factory. Moving-conveyance base stations are mounted on the cranes to provide communications to the portable telephones used by crane operators. Any anticipated motion of the portable telephone is along a track and not a roadway. Yokoi does not suggest that the factory system can be applied to a roadway.

Conclusion

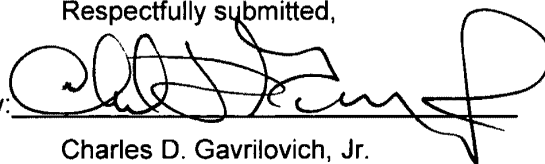
Appellant respectfully submits that the pending claims are allowable, that the case is in a condition for allowance, and that the grounds of rejection should be reversed.

Date:

May 12, 2006

Respectfully submitted,

By:



Charles D. Gavrilovich, Jr.
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APPENDIX

Claims At Issue On Appeal

30. An apparatus comprising:
a receiver configured to wirelessly receive a received signal; and
a transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter.

31. An apparatus in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. An apparatus in accordance with claim 31, wherein the transmitter is further configured to travel on a conveyor device along the predetermined path.

33. An apparatus in accordance with claim 32, wherein the received signal is received from a fixed radio port.

34. An apparatus comprising:
a receiver configured to receive a received signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver; and
a transmitter configured to wirelessly transmit a transmit signal corresponding to the received signal to at least one fixed port.

35. An apparatus in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. An apparatus in accordance with claim 35, wherein the receiver is further configured to travel on a conveyor device along the predetermined path.

49. A movable base station configured to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, the communication link comprising a wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

54. A movable base station configured to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:
a first radio interface configured to establish a first wireless communication link between the movable base station and the mobile unit; and
a second radio interface configured to establish a second wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

61. A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

89. A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:
wirelessly receiving a received signal;
controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and
transmitting a transmit signal corresponding to the received signal to the mobile unit.

93. A method of wirelessly transmitting a transmit signal corresponding to a received signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver;

receiving the received signal at the receiver; and

wirelessly transmitting the transmit signal from a transmitter connected to the receiver.

103. A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

113. A communication system comprising:

a first transceiver configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell; and

a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell.

114. A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

117. A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

119. A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell; and

wirelessly exchanging signals with at least one fixed port corresponding to the communication cell.

120. A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

121. A method in accordance with claim 120, wherein the providing the moving communication cell comprises:

providing the moving communication cell from a moving base station.

122. A method in accordance with claim 121, wherein the providing the moving communication cell comprises:

exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:

exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.



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09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
35083	7590	10/03/2005	EXAMINER	
CHARLES D. GAVRILOVICH, JR., GAVRILOVICH, DODD & LINDSEY, LLP 985 PASEO LA CRESTA, SUITE B CHULA VISTA, CA 91910-6729			CONTEE, JOY KIMBERLY	
			ART UNIT	PAPER NUMBER
			2686	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/401,584	Applicant(s) GAVRILOVICH, CHARLES D.	
	Examiner Joy K Contee	Art Unit 2686	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-36, 49-82, 89-106 and 113-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-82 and 97-102 is/are allowed.
- 6) ☒ Claim(s) 30-36, 49-62, 89-96, 103-106 and 113-123 is/are rejected.
- 7) ☒ Claim(s) 118 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	5) ☐ Notice of Informal Patent Application (PTO-152)
Paper No(s)/Mail Date _____	6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/28/2005 have been fully considered but they are not persuasive.

Applicant argues that Yokoi et al., US Patent No. 5,282,239 does not teach an apparatus that comprises a receiver that wirelessly receives a received signal and transmits a corresponding transmit signal to a mobile unit. Applicant also suggests that Yokoi et al. does not disclose wherein the communication link comprising a wireless communication link between the movable base station and fixed port. Applicant has added similar limitations to claims 30,34,49,54,89 and 93. As discussed below, Yokoi et al. further anticipates a fixed base station for wirelessly transmitting and receiving with a mobile unit and movable base station (see col. 3,lines 55-59 and col. 8,lines 5-16).

Applicant also argues that Yokoi et al. fails to disclose "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality of ports" and that Yokoi et al. cordless phone does not communicate to a fixed port through a moving base station. Examiner disagrees. Yokoi et al. teaches that hand-off request signals can also be used to hand-off calls from a moving conveyance base station to a fixed base station when the person using the portable cordless phone leaves the elevator (see col. 8,lines 5-15 and see Fig. 11. Further Yokoi et al. teaches that calls can be made simultaneously in all three elevators without mutual interference or crosstalk, thus given the example in Fig. 12, as long as the adjacent elevators remain together handoff will occur simultaneously amongst the three elevators.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 118 recites "a moving base station comprising the first transceiver and the second transceiver". This limitation is not found in the disclosure.

Claim Objections

3. Claim 118 is objected to because of the following informalities: "a moving base station comprising the first transceiver and the second transceiver" is not found in the specification. Appropriate correction is required. This portion of the limitation has not been treated on the merits.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103 and 113-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi (US 5,282,239), previously used, different embodiment.

Regarding claims 30, 113 and 119, Yokoi teaches an apparatus comprising:

a receiver (*i.e., reads on fixed base station*) configured to wirelessly receive a receive signal (and a second transceiver (*reads on movable base station*) connected to a first transceiver (*reads on fixed base station*) and configured to wirelessly exchange signals with at least one fixed port (*i.e., reads on central switch*) corresponding to the communication cell) (col. 3, lines 55-65 and col. 8, lines 5-15); and

a transmitter/ moving communication cell (*i.e., reads on moving base station 32, see Fig. 12*) (and method of providing a moving communication cell to a mobile unit) adapted to transmit a signal to a mobile unit (*i.e., reads on portable cordless telephone 19, see Fig. 12*) while the transmitter/moving communication cell (*i.e., moving base station 32*) has a motion relative to Earth along a predetermined path (*i.e., moving base station 32 is coupled to an elevator 31, see Fig. 12, which moves relative to earth along the elevator shaft in a vertical direction, i.e., upward and downward*) and in accordance with an anticipated motion of the mobile unit (*i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth*), wherein an actual motion of the mobile unit (*i.e., reads on portable cordless telephone 19*) is independent of the motion (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads*

on "anticipated motion" of mobile) of the transmitter/moving communication cell (i.e., reads on moving base station 32) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above.

Regarding claims 31, 114 and 120, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 8, lines 5-15).

Regarding claim 34, Yokoi teaches a receiver (*i.e., within moving base station 32*) adapted to receive a signal from a mobile unit (*i.e., portable cordless telephone 19*) while the receiver (*i.e., moving base station 32*) has a motion relative to Earth along a predetermined path (*i.e., moving base station 32 is coupled to elevator 31, which moves relative to earth*) and in accordance with an anticipated motion of the mobile unit (*i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth*), wherein an actual motion of the mobile unit (*i.e., with and within elevator 1*) is independent (*i.e., portable cordless telephone is free from elevator 31*) of the

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motion of the receiver (***moving base station 32***) (col. 7, lines 39-52 and col. 8, lines 5-15); and transmitter (***reads on movable base station***) configured to wirelessly exchange signals with at least one fixed port (***i.e., reads on central switch***) corresponding to the communication cell) (col. 3, lines 55-65 and col. 8, lines 5-15);

Regarding claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above.

Regarding claim 35, Yokoi teaches wherein the predetermined path (*i.e., parallel track is the path*) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (20 or 32) adapted to establish a communication link between a fixed port and mobile unit (19) while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit (***i.e., reads on a person using the portable cordless telephone leaves the elevator 1***), the communication link comprising a wireless communication link between the movable base station and the fixed port (***i.e., reads on fixed base station***) (col. 8, lines 5-15) wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (***i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless***

telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claims 54, 115-118, 121-123, Yokoi teaches a movable base station (or moving communication cell) (32) adapted to have a motion relative to a fixed port (fixed base) along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising: a first radio interface (or gateway) adapted to establish wirelessly a first communication link between the movable base station and the mobile unit (col. 7, lines 39-52); and a second radio interface adapted to establish wirelessly a second communication link between the movable base station and the fixed port wherein an actual motion of the mobile unit independent of the motion of the movable base station (***i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile)***) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 61, dependent on claim 54, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, dependent on claim 61, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (i.e., reads on 20,32 and 35, see Fig. 11) having a motion relative to a plurality of fixed ports (such as fixed base 4), wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units (i.e., reads on moving base stations 20,32 and 35, see Fig. 11) and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units station (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile*); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 8, line5-15).

Allowable Subject Matter

6. Claims 63-82 and 97-102 are allowed.
7. Claims 50-53,55-60,90-92, 94-96 and 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K Contee whose telephone number is 571-272-7906. The examiner can normally be reached on Monday thru Friday, 5:30 am. until 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone

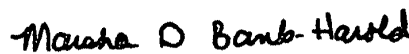
Art Unit: 2686

number for the organization where this application or proceeding is assigned is 571-273-8300

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MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

BACKGROUND OF THE INVENTION

Related Applications

This application is a continuation of U.S. Application Serial No. 08/953,962, filed
5 October 20, 1997, which is a continuation of U.S. Application Serial No. 08/687,722, filed
July 26, 1996, now U.S. Patent 5,729,826, which is a national phase application of
PCT/US95/07037, filed June 2, 1995.

Field of the Invention

The invention relates to cellular telephone systems in which a mobile unit
10 communicates by wireless communication to a base station connected to the wire telephone
network and more particularly to cellular telephone systems adapted for use with fast-moving
mobile units.

Background Art

In a typical cellular telephone system, an area is divided into a plurality of cells
15 with each cell having a centrally located cell site. A mobile unit moving in such a cellular
network communicates by radio with a nearest cell site. The cell sites are each connected by
cable or point-to-point microwave to a telephone network interface. The network interface
typically provides communication among cell sites and between the cell sites and the so-called
wire line telephone network. The functions of a typical network interface are described in The
20 Bell System Technical Journal, January 1979, Volume 58, No. 1. One of the functions to be
performed by the telephone network interface is the so-called "handoff" function. As a mobile
unit moves through a cellular network, it will move away from one cell site and toward another
cell site. Each cell site monitors signal quality of the signal received from the mobile unit and
passes information to the telephone network interface and determines when a call in progress is
25 to be transferred from one cell site to another. This procedure is known as "handoff". The
handoff process involves several operations including selecting a cell site trunk between the
MTSO and the new cell site, sending a message to the mobile unit transmitter/receiver to tune

from its present voice channel to a voice channel in the new cell site corresponding to the newly selected trunk, setting up a talking path in the MTSO from the cell site trunk to the trunk of the telephone network presently in use in the call, and idling the talking path in the switching network in the MTSO between the old cell trunk and the telephone network trunk assigned to the call.

A problem with existing mobile telephone systems is the considerable time required in handoffs. This becomes a particular problem in urban areas which are highly congested. A basic principle of cellular telephone systems is the concept of frequency reuse. It can be shown that traffic capacity of a cellular system is increased by a factor N^2 as the size of the cell, i.e., its diameter, is decreased by a factor of N . This is due to the fact that, at least in principle, all frequencies in the mobile telephone spectrum are available for use in each independent cell. Thus, as the number of cells is increased, the total number of calls that can concurrently exist in an area is increased. A drawback, however, to decreasing the size of the cells is that a mobile unit tends to cross cell boundaries more often, requiring a larger number of handoffs which will tend to overload the mobile telephone switching office (MTSO) to the point where existing calls may be interrupted or dropped.

Personal communication service (PCS) functions in substantially the same manner as the mobile cellular system. In PCS, the user may be in a building or walking in a street or riding a vehicle and using a handset which communicates with a base station in the same manner that the mobile unit communicates with the base station or cell site in the cellular network. It is envisioned that PCS, by implementing very small cells, could provide service to a very large number of users, for example in a densely populated urban area. The difficulty with PCS is the same as in the cellular system in that handoffs become the bottleneck.

Modern cellular systems use what is known as code division multiple access (CDMA) spread-spectrum communications. In direct-sequence coding CDMA (DS-CDMA), the energy of the user signal is distributed uniformly over the system bandwidth through the spreading process providing separation between users of the same frequency in adjacent cells. A requirement of DS-CDMA is that no interfering signal received may be significantly stronger

than the desired signal since it would jam the weaker signal. This type of coding is used in what is sometimes referred to as hierarchal cell structures. The most commonly referenced hierarchal structure is a macro/umbrella cell overlaying a number of micro cells. A fast-moving mobile unit, for example, may be served by the macro cell to avoid an extreme number of handovers.

5 Slow-moving users are allocated to micro cells to save capacity for the macro cells. Using the DS-CDMA concept, micro cells and macro cells share the same frequency. To avoid strong interference at a micro cell from mobile unit in communication with a macro base station, the output power of the mobile unit in the micro cell is increased to overpower the interfering signal. The use of hierarchal cell structure to provide high-quality speech, data communication at rates
10 up to 2 megabits per second and video communication with mobile units travelling at rates in excess of 100 miles per hour and accommodating PCS are seen as needed to meet future mobile telecommunication demands.

In the hierarchal cell structure, the low tier, small cells, e.g., on the order of 100 feet in diameter, accommodate low speeds. The low speed is mostly pedestrian traffic and other
15 traffic moving at speeds below 30 miles per hour. The advantages of small cells is low power, simple, inexpensive and light-weight terminals. What is desirable is an infra structure which allows use of such terminals in all applications, whether in the home or office as a cordless phone, on streets, in shopping malls, airports, etc., and in cars on expressways at highway speeds. Additionally, high-spectrum reuse is needed to provide low-cost, high-quality service which
20 requires a large bandwidth for each subscriber.

To provide wire line toll, quality-voice service, a 32-kilobit per second bit rate is required with ADPCM coders. As wireless data services emerge, even more spectrum bandwidth will be required. In the future, it may be possible to utilize the spectrum in the 60 gigahertz range providing very large amounts of bandwidth. However, the radio wave characteristics at
25 that frequency dictate a very short range, line of site propagation, requiring very small cells. However, as noted, small cells and fast-moving mobile units are incompatible due to the time required for handoff.

SUMMARY OF THE INVENTION

These and other problems of the prior art are overcome in accordance with this invention by means of a moving base station which is interposed between a moving mobile telephone unit and a fixed base station. In accordance with this invention, a movable base station
5 moves with the traffic at a rate of speed which is comparable to the speed of the traffic and communicates with a moving mobile telephone unit via standard mobile radio transmission. The movable base station further communicates by radio signals with a plurality of fixed antennas spaced along the path of travel of the mobile base station. The several fixed antennas are connected to a telephone wire line network via a telephone gateway office in a standard fashion.
10 In accordance with this invention, the fixed radio ports are synchronized and the interface between the moving base station and the fixed radio ports is a time division multiplexed (TDM) - direct-sequence, spread-spectrum CDMA.

In one particular embodiment, a number of fixed base stations are provided in addition to moving base stations allowing slower moving traffic, such as pedestrian traffic or
15 rush hour mobile traffic to communicate via the fixed base stations.

In a specific embodiment of the invention, the moving base stations are provided with highly directional antennas directed to moving traffic and highly directional antennas directed to the radio ports. Communications from the fixed radio ports to the movable base stations are at a relatively low power level and from the movable base stations to the mobile units
20 are at a relatively higher power level. Due to the characteristics of the direct-sequence, spread-spectrum CDMA, the higher power level signal will overpower the lower level signal such that the mobile unit does not receive communications from the fixed radio port but only from the movable base station. In the reverse direction, a low level of signal is transmitted from the mobile units to the movable base station and a high-level signal is transmitted from the base
25 station to the fixed radio ports, thereby eliminating any direct communication from the mobile unit to the fixed radio port.

In one embodiment of the invention, the movable base stations are supported on a series of closed loops and ends of adjacent loops overlap to facilitate transfer of telephone cells between adjacent loops.

DETAILED DESCRIPTION

5 FIG. 1 is a diagrammatic representation of a mobile telecommunication system incorporating principles of the invention. FIG. 1 represents, for example, a divided highway with mobile units 20 traveling on a first roadway 10 in one direction and a plurality of mobile units 25 traveling along a second roadway 15, in the opposite direction. A plurality of moving base stations 30 are disposed along one side of the roadway 10. The base stations are spaced apart by
10 a selected distance equivalent to the diameter of the cell served by the moving base station. The moving base stations 30 may be moved by means of a rail 35, or other suitable conveying device which may include an automotive vehicle travelling on the roadway, in the same direction as the traffic flow on the roadway 10, as indicated by the arrow 12. In a similar fashion, a plurality of moving base stations 40 are disposed adjacent the roadway 15 moving in the direction of the
15 traffic as indicated by the arrow 17. The moving base stations 40 are moved along a rail 45. The moving base stations 30, 40 may be supported on any suitable conveying device such as rails 35, 45. The conveying device may be at ground level or overhead, depending on the terrain and available space for the device. The moving base stations are preferably disposed for optimum radio communication with the mobile units on the roadways.

20 Disposed between the moving base stations moving along the rails 35, 45 are a plurality of fixed radio ports 50 which are connected by means of a fiber optic ring 55 or a similar signal transmitting device to a telephone office connected to the wire line telephone network and referred to as a gateway office. The gateway office 60 forms the interface between the mobile telecommunication system and the wire line telephone network. The gateway office
25 is a well-known equipment. It is part of the telephone network and is responsible for call processing in conjunction with the base stations. As described further later herein, the gateway office will include certain processor hardware and software to detect a best signal quality indication and to selectively transmit information with a best signal quality indicator to the

telephone network. A plurality of fixed base stations 70 are disposed in the vicinity of the roadway 10 and are connected to the gateway office 60 by means of a fiber optic ring 75 or similar signal transmission device.

In operation, the moving base stations 30 may move in the direction of the flow of the traffic at a rate of, for example, 60 miles per hour, which may be faster than some traffic and slower than other traffic. The moving base station preferably handles telecommunications with mobile units which travel at a rate of not more than 30 miles per hour faster or slower than the moving base station. For example, the moving base stations 30, 40 may be traveling at the rate of 60 miles per hour to accommodate traffic moving in the range of 30 to 90 miles per hour. In the arrangement of FIG. 1, fixed base stations 70 would accommodate communications with mobile units traveling at a speed of less than 30 miles per hour including pedestrian traffic and stationary units. It will be readily apparent that instead of having fixed and moving base stations as depicted in FIG. 1, slowly moving and rapidly moving units may be used as well. A particular moving base station is effective when the mobile units are moving in the same direction as a base station. FIG. 1 shows two roadways traveling in opposite directions with the moving base stations disposed between moving in the direction of the traffic. The base stations may also be placed on opposite sides of the same roadway with two-way traffic with the moving base stations moving in opposite directions on the opposite sides of the roadway.

In the typical cellular telephone system, the base station, also referred to as a cell site, forms an interface between the mobile unit and the gateway office. As such, the base stations may perform a number of functions, including functions such as locating a particular mobile unit, as well as voice processing and functions associated with call setup, call supervision, and call termination. Additionally, the base stations perform the function of handing off and receiving an existing call involving a mobile unit which has moved into or out of the normal service area of a base station. All of these are well-known base station functions. In some proposed mobile telephone systems, the base stations are primarily only radio interface units and a base station controller, connected to a plurality of base stations performs call-handling functions for the plurality of base stations. The system in accordance with the

invention differs from the prior art primarily in that the base stations 30, 40 are moving with the traffic and communicate with the gateway office 60 via fixed radio ports 50. Furthermore, the various call-handling functions, including handoff, are performed by the moving base station. Advantageously, because of movement of the base station in the same direction as the traveling mobile unit, the number of handoffs is greatly reduced.

Each of the moving base stations 30, 40 is provided with antennas 100, 101. The antennas 100, 101, preferably high gain, directional antennas for use in mobile communication, are well known and commercially available. The fixed base stations 70 are provided with four separate antennas 110 extending in four different directions. The antennas 100 on the base stations 30, 40 are used to communicate with the mobile units 20, 25 whereas the antennas 101 on the moving base stations 30, 40 are used to communicate with the fixed radio ports 50. The fixed base stations 70 are preferably each provided with four antennas 102-105. Fewer than four antennas may also be used. In that case, at least one omni-directional antenna is used. In the configuration of FIG. 1, the antennas 102 are arranged to communicate with the mobile units 20 and the antennas 103-105 are arranged to communicate with other mobile telephone communications from slow moving traffic or stationary subscribers. The fixed radio ports 50, in the configuration of FIG. 1, are each provided with a pair of directional antennas 110, 111 of the same general type as the directional antennas 100-105. As the moving base stations 30, 40 move relative to the fixed radio ports 50, data representing voice signals and call related information is transmitted between the antennas 101 on the moving base stations 30, 40 and the antennas 110, 111 on the fixed radio ports 50.

FIG. 2 is a diagrammatic representation of the fixed radio ports 50. The unit includes a standard microprocessor 150 as well as a radio interface circuit 154 providing an interface between the radio signals received on the antennas 110, 111 and the processor 150. The circuits are of a type typically used in fixed base stations and are well known in the art. Additionally, each radio port 50 includes a processor 150 connected to an add/drop multiplexer (ADM) 152. The ADM 152 interfaces with the fiber optic cable 55 and is able to add data from the processor 150 to the data stream on the fiber optic cable 55. Additionally, the ADM 152

recognizes a data stream accompanied by an address identifying the processor 150 and transfers such data from the data stream of the fiber optic cable 55 to the processor 150. As will be described further later herein, the processor 150 computes a signal quality indicator for the information received from the radio interface circuits 154, based primarily on radio signal strength intensity, in a well-known fashion. Processor 150 controls the transfer information between the fiber optic cable 55 and the various moving base stations via the antennas 110, 111.

FIG. 3 is a block diagram representation of one of the fixed base stations 70. The fixed base stations 70 perform the functions of a standard prior art fixed base station. The base stations 70 are connected to the fiber optic ring 75 and include an add/drop multiplexer (ADM) 162 which provides an interface between the processor 160 and the fiber optic ring 75.

As mentioned earlier, both the optical ring 55 and optical ring 75 are connected to the gateway office 60. The primary function of the gateway office is to provide the interface to a wired telephone network. It distributes the telecommunications traffic between the network and the moving base stations via the fixed radio ports. The fiber optic rings 55, 75 are preferably continuous rings with an add/drop multiplexer for each ring in the gateway office. Data transmission on the fiber optic rings 55, 75 is preferably in accordance with one of the well-known SONET or synchronous digital hierarchy (SDH) transmission protocols.

The directional antennas 100-105, 110, 111 may be of a sectorized architecture or may be phased array antennas with highly directional radio frequency beams. Such antennas are preferably used to decrease interference between the mobile base stations and the fixed radio ports, allowing greater spectrum reuse. Antenna diversity can be provided with two spatially separated radio beams separated in time with a predefined time-delay offset for easier separation at reception. Various techniques for obtaining high antenna diversity are well known in the art and antennas employing such techniques are commercially available.

FIG. 4 is a block diagram representation of the moving base station 30. The station 30 includes a processor 130 connected via radio interfaces 132, 134 to the antennas 100, 101, respectively. The processor 130 may be a standard microprocessor and the radio interface circuits 132 may be standard radio interface circuits. The microprocessor is preferably

programmed to handle the call processing functions performed in a prior art system by a call site or by a shared base station controller. In this manner, the moving base station has greater autonomy and requires less communications with a shared base station controller or the like. The circuits 132, like the radio interface circuits 154 in the fixed radio port 50 and the radio interface circuits 164 in the fixed base station 70, are well known and commercially available circuits.

The radio interface between the mobile units 20, 25 and the moving base stations 30, 40 and the fixed base station 70 is a standard radio interface, well known in the art. The radio interface between the moving base stations 30, 40 and the fixed radio ports 50 is preferably a time division multiplexed, direct-sequence, spread-spectrum, code-division multiple-access interface (TDM/CDMA). Multiple channels between the base station and the fixed radio ports are time division multiplexed as time slots in a data stream. The data stream is spread with a pseudo-random code over the allocated spectrum. A pilot sequence is inserted in the transmitted signal for ease of synchronization in a well-known manner. The interface between the movable base station and the fixed radio port is preferably transparent to the overall system in spectrum use.

Frequency division or time division may be used for duplex communications. In the frequency division duplex (FDD) mode, data is simultaneously transmitted in both directions, each in a different spectrum band. In a typical system in the FDD mode, the TDM frame transmission duration will be approximately 500 microseconds making the interface substantially transparent to overall system delay.

The interface between the mobile unit and the movable base may be the standard IS-95-based PCS air interface standard. The channel capacity for the so-called "extended mode" (2.5 mhz) has been determined to be seven channels at 32 kilobits per second. The FCC allocated licensed spectrum for personal communications services (PCS) includes 10-mhz licenses and 30-mhz licenses. Each 10-mhz license provides two separated 5-mhz bands and each 30- mhz license provides two separated 15-mhz bands, for two-way communications. Two 5-mhz bands can support 14 duplex channels at 32 kilobits per second and two 15-mhz bands can support 42 duplex channels at 32 kilobits per second.

Voice signals between a mobile unit and the gateway office are encoded in a standard fashion using ADPCM voice encoding with a minimum bit rate of 32 kilobits per second in each channel. The interface between the moving base station and the fixed radio port is adapted to carry up to 19 channels of 32 kilobits per second each at 16 bits per time slot. The frame structure includes 16 bearer channels of 32 kilobits per second at 16 bits per time slot. The time division multiplexed frame rate between the movable base station and the fixed radio port is 608 kilobits per second. To achieve a processing gain of 9 decibels, the frame rate is multiplied by a factor of 8, yielding 4,864 kilobits per second, which fit into a single 5-mhz band. FIG. 6 is a tabular representation of the channel allocation showing 16 bearer channels plus 3 channels for signalling, control, and error code. FIG. 7 is a representation of channels 18 and 19 of FIG. 6.

The moving base stations are addressed using predefined code sequences derived in a known manner by the use of Walsh functions. U.S. Pat. 5,103,349 entitled "System and Method for Generating Signal Wave Forms in CDMA Cellular Telephone System" describes the use of Walsh functions for code generation. U.S. Pat. 5,103,349 is incorporated by reference herein. As described in that patent, by choosing a Walsh function of order 8 provides 8 orthogonal codes in the present embodiment using spread spectrum CDMA uses the all 0 Walsh sequence as a pilot carrier with the other 7 sequences available for moving base station communications. The code sequences may be repeated as ABCDEFG; ABCDEFG; . . . Although fewer codes could be used, preferably no less than 3 are used. Because of differing propagation times for signals between a particular moving base station and two or more different fixed radio ports, it is not possible to satisfy the condition of time alignment required for Walsh function orthogonality for 2 or more fixed radio ports at one time. For this purpose, two outer pseudonoise codes are used to provide discrimination between signals arriving at the moving base station from different fixed radio ports. The pseudonoise code rate is preferably 4,864 kilobits per second. The sequence length for the transmitted carrier signal is preferably 32,768 chips, as described in U.S. Pat. 5,103,459. The outer pseudonoise codes modulate the signal in quadrature phase shift keying.

The pilot signal will be transmitted in both directions, from the moving base stations to the fixed radio ports and vice, versa. This is made possible by the line of site fading characterized as Rician.

5 The pilot sequence will be long enough that a number of different sequences can be generated by shifts in the basic sequence. The separation will be great enough to ensure that there is no interference between pilot signals. Each moving base stations will use a different offset from a neighboring moving base station to provide signal separation. Similarly, each fixed radio port will use a different offset from a neighboring fixed radio port.

10 The FCC has allocated a 20 mhz of unlicensed spectrum, including a 10 mhz band for voice products and a 10-mhz band for data products. Thus, one continuous 10-megahertz channel is available and time division multiplex transmission is preferably used. The bit rate for both directions of transmission will be twice the frequency division duplex rate, introducing an overall delay of 500 microseconds and a processing gain of 9 decibels. In the time division duplex mode, the transmission times and direction, forward and reverse between the mobile unit and the moving base station and between the moving base station and the fixed radio ports, are aligned. In one half of the time division, duplex cycle signals are transmitted from the mobile unit to the moving base station and, from there, to the fixed radio port. In the other half-cycle, signals are transmitted from the fixed radio port to the moving base station and then to the mobile unit.

20 The two 15-mhz licensed spectrum bands (30 mhz) are preferably divided into three 5-megahertz channels in each direction, utilizing the same architecture as described earlier herein with respect to the 5-megahertz licensed spectrum. In the 15-mhz licensed spectrum, each of the 5-megahertz channels will support 14 traffic channels, for a total of 42 traffic channels in each 15-mhz band. The air interface between the moving base station and the fixed radio port, as well as the signal structure, can be modified and adapted to a variety of allocations of spectrum and air interface standards.

25 In the present embodiment, as described earlier herein, 7 orthogonal codes are available for communication between the fixed radio ports 50 and the moving base stations 30,

40. As described earlier herein and depicted in FIGS. 6 and 7, one 16 bit communication channel, channel 19, is set aside for control and identification bits. As depicted in FIG. 7, channel 19 may comprise 7 control bits and 9 identification bits. The 9 identification bits provide 512 unique identification numbers. Using 7 orthogonal codes and 512 identification numbers, 3,854 moving base stations can be uniquely identified. When the moving base stations are separated by a spacing of 200 feet, the total distance of coverage using the 3,854 moving base stations is approximately 135 miles. FIG. 1 shows a portion of the system with moving base stations moving in opposite directions along oppositely directed roadways and fixed radio ports with dual antennas. Vehicular traffic moving in opposite directions on the same roadway are preferably served by moving base stations on opposite sides of the roadway. Where each roadway has only one-way traffic, the system is preferably disposed between the roadways. In one embodiment of the invention, depicted in FIG. 9, two separate loops 200, 205 are disposed between two separate roadways 206, 208 with the traffic on the roadways indicated by the arrows 207 and 209. The loops 200 and 205 comprise moving base stations 210 and 250, respectively. The base stations, in this embodiment, are moving in the direction indicated by the arrows 201 and 202. Since, as a practical matter, the loops 200, 205 are not of indefinite length, a plurality of loops may be required to cover a desired area. To avoid interruption in communications, the ends of the loops are preferably sufficiently close together, or overlapping, to provide an overlapping area of coverage for mobile units traveling in the area of the loop ends. This will allow one of the mobile stations nearing the end of the loop of which it is a part to hand off the call to a mobile station of the adjacent loop.

Each loop preferably has a single gateway for connection to the wire telephone network. One advantage of that arrangement is that it eliminates the need for registration of moving base stations, which is required where a moving base station moves between gateways. FIG. 9 shows a pair of gateways 215 associated with the loop 200 and a pair of gateways 255 associated with the loop 205. The two gateways of a loop are both connected to the fixed radio ports of the loop at all times and may be operated in a load sharing mode with each capable of

handling the total telecommunication's traffic for the loop in the event of a failure in one of the gateways.

To avoid interrupting communications with a mobile unit traveling along the roadway in the area where two adjacent loops end, any existing calls are handed off from the moving base station near the terminating end of its loop to a moving base station of the next loop. The handoff process is essentially the same as a handoff between moving base stations on the same loop, except that the handed off call will be routed to the wire network to a different gateway. This procedure is equivalent to a handoff between cell sites of different cells in the existing cellular network in a manner which is well known in the art. The loops 200 and 205 may physically overlap to assure proper overlap of communications between moving base stations of the two loops and to avoid loss of communication with a mobile unit handed off from one loop to another.

The timing and synchronization between the moving base station and a fixed radio port with which the moving base station communicates is phase-locked to the pilot signals received from the fixed radio port with which the moving base station communicates. For synchronization purposes, the moving base station will receive a Global Positioning Satellite (GPS) Coordinated Universal Time (UCT) timing signal once each second.

CDMA Technology is well-known for sensitivity to power control. Specifically, the more powerful signals tend to "mask out" less powerful signals at the receiver. Typically, elaborate power control schemes are implemented to ensure that all signals arrive at the receiver at the same level. In accordance with the system of this invention, however, the sensitivity to power level of CDMA is used to advantage. The principles of signal transmission employed in the system of the invention is illustrated in FIG. 8. Two power levels of radio transmission, high (H) and low (L), are defined. Referring to FIG. 1, high-power level signals are transmitted from the moving base station 30 to the mobile unit 20 and from the base station 30 to the fixed radio port 50. Low power level signals are transmitted from the fixed radio port 50 to the moving base station 30. Similarly, low power signals are transmitted from the mobile unit 20 to the moving base station 30. Since the moving base station receives a low power level signal from the fixed

radio port and transmits a high level power signal toward terminals, the high power level received at the mobile unit 20 will mask out any signals of the low power signal transmitted from the fixed radio port to the moving base station. In a similar fashion, any low signal transmitted from the mobile unit 20 reaching the fixed radio port 50 will be masked by the high power level signal transmitted from the moving base station to the fixed radio port. As stated earlier, the antennas 100-105, 110, 111 are preferably highly directional antennas with very little feedback from the transmit signal to the receive signal. Feedback due to reflections and other extraneous sources can be readily eliminated at the moving base station using well-known noise cancellation techniques.

When a mobile unit set is first powered up or first enters a service area, the mobile unit must register in the manner described earlier, by transmitting its unique address in the new service area. The address will be received by the closest moving base station 30 and transmitted via a fixed radio port and the gateway switch 60 to the telephone network. This registration procedure is required so that an incoming call for the mobile unit can be appropriately directed.

The spacing of mobile based stations 20 and the fixed radio ports 50 of FIG. 1, together with the strength of the signal transmitted between the moving base stations and the fixed radio ports, determines the number of fixed radio ports with which a moving base station can communicate at any point in time. The spacing and signal strength is preferably such that each fixed radio port receives signals from three moving base stations. When a fixed radio port receives data, accompanied by the identification number of the moving base station, the processor 150 (FIG. 2) computes a signal quality indication on the received signal. The signal quality indication is a figure of merit preferably computed as a function of signal strength and signal-to-noise ratio. It is added to the received data and added to the fiber optic ring 55 via the ADM 152. The gateway 60 preferably receives the same data from several different ones of the fixed radio ports 50 and stores the data in an internal memory in the gateway 60 in association with the moving base station identification number and Walsh function spreading code. The address of the fixed radio port from which the data has been received is stored in the memory of processor 64 as well. Accordingly, multiple copies of the same data transmitted by a single

moving base station are stored in the memory of the processor 64 in the gateway. The signal quality indications computed by the processors 150 in each of several fixed radio ports are compared to a predefined signal quality indication threshold, and the data corresponding to a signal quality indication below the threshold value is discarded. Otherwise, the data is retained.

5 A cyclic redundancy code transmitted with the data is used to detect any TDM frame errors. The best data, i.e., associated with the best signal quality indication is transferred from the gateway 60 to the telephone network. Data received from the telephone network at the gateway 60 and intended for a registered mobile unit is stored in the memory of the processor 150 in a register particularly associated with the moving base station currently serving the mobile unit. This data
10 will be sent via the optical ring 55 to all fixed radio ports that are identified in the memory of the processor 65 as fixed radio ports with an acceptable signal quality indication. The received data will be transmitted from each of the fixed radio ports which received the data together with the identification code and Walsh function code of the moving base station to which the data is directed. The transmission of data from different fixed radio ports will be staggered, delayed by
15 different amounts, so that they can be received and separated at the moving base stations. The delays can be precisely controlled by means of synchronous distribution via the optical ring 55, in the SONET or SDH format. The receiving moving base station, by means of its processor 130, compares the multiple copies of the received data signals, aligns them and combines them for the best reception.

20 Each of the moving base stations will have one of N assigned codes, where N may be any number, but preferably is at least 3 or more. Seven Walsh function codes are preferably used. The codes may be repeated in sequence, as for example, ABCDEFGABCDEFG. The codes are assigned in sequence to the various moving base stations so that two moving base stations having the same code will be physically separated by a sufficient distance to prevent
25 interference in the communications between fixed radio ports and moving base stations having the same identity code. The operation of the fixed base stations 70 is essentially the same as that of a standard fixed base station. In congested traffic areas, a mobile unit which is stopped or slowly moving, e.g., less than 30 miles per hour, will preferably be serviced by one of the fixed

base stations 70. As the speed of travel of the mobile unit 20 increases, a handoff will occur between the fixed base station and a moving base station. The procedures for determining whether a mobile unit is to be served by a fixed base station or a moving base station are the same procedures as described earlier herein in determining which moving base station is selected to serve a mobile unit, i.e., based on signal strength and error rate. Thus, when a call involving a mobile unit is initiated or when it is determined that a handoff should occur, the mobile unit may be handed from a moving station to a fixed station, or vice versa. Each mobile unit monitors pilot signals from fixed and moving base stations and synchronizes to the base station providing the best signal. The mobile unit may "connect" with three fixed or moving base stations while searching for a fourth in what is known as the "soft" hand-off mode. As the speed of the vehicle increases, fixed or slow moving base stations will be dropped. In more congested areas where traffic speed will vary between 0 and 60 miles per hour, base stations speed may, for example, be set to move at 30 mph. The moving base station should then be able to accommodate all traffic in the 0-60 mph range.

It will be understood that the above-described arrangement is merely illustrative of the application of the principles of the invention and that other arrangements may be devised by those skilled in the art without departing from the scope of the invention as defined by the appended claims.

CLAIMS

WHAT WE CLAIM IS:

1. Interface apparatus for establishing signal connections between a telephone office connected to a telephone network and mobile telephone units transmitting radio signals and moving in a specified direction, the interface apparatus comprising:

a stationary interface unit connected to the telephone office via a signal transmission connection;

a plurality of spaced apart movable base stations, each of the base stations uniquely associated with the telephone office and supported on a conveying device for limited

movement in the specified direction within an area defined relative to the stationary interface, the movable base stations each responsive to radio signals transmitted by the mobile telephone units to transmit corresponding radio signals to the stationary interface unit and the stationary interface unit responsive to the radio signals transmitted from the movable units to transmit signals corresponding to the signals transmitted from the movable units to the telephone office via the signal transmission connection.

2. The interface apparatus in accordance with claim 1 wherein the mobile telephone unit moves along a roadbed and the movable interface unit is movably supported on conveying apparatus disposed along path extending parallel to the roadbed.

3. The interface apparatus in accordance with claim 2 wherein the conveying apparatus comprises a rail movably supporting the movable interface unit.

4. The interface apparatus in accordance with claim 2 wherein the stationary interface unit is disposed on one side of the conveying apparatus opposite the roadbed.

5. The interface apparatus in accordance with claim 1 wherein the movable interface unit comprises signal processing circuitry and a first radio antenna directed toward the mobile telephone unit and a second radio antenna directed toward the stationary interface unit and wherein the stationary interface unit comprises signal processing circuitry and a radio antenna directed toward the movable interface unit, the movable interface unit responsive to radio signals received at the first antenna to transmit corresponding radio signals via the second antenna to the stationary interface unit and the stationary interface unit responsive to radio signals received via the radio antenna of the stationary interface unit to transmit corresponding signals to the telephone office via the signal transmission connection.

6. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to hand-off and receive existing calls to mobile units in an associated service area.

7. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform a plurality of functions including locating an identified mobile unit in an associated service area.

8. The interface apparatus in accordance with claim 1 wherein the radio signals transmitted between the movable interface unit and the stationary interface unit are transmitted in accordance with a code division multiple access, direct sequence, spread spectrum transmission signalling protocol.

9. The interface apparatus in accordance with claim 8 wherein signals transmitted from the mobile telephone unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the stationary interface unit are transmitted at a second power level higher than the first power level.

10. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a time division duplex manner.

11. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a frequency division duplex manner.

12. The interface apparatus in accordance with claim 8 wherein each movable interface unit is synchronized to a selected stationary unit by transmission of pilot signals to the selected unit.

13. The interface apparatus in accordance with claim 1 wherein the movable interface unit is responsive to radio signals received from the stationary interface unit to transmit corresponding radio signals to the mobile telephone unit and wherein signals transmitted from the stationary interface unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the mobile telephone unit are transmitted at a second power level higher than the first power level.

14. Interface apparatus for establishing signal connections between a telephone office and a plurality of mobile telephone units transmitting radio signals, certain of the mobile telephone units moving in a specified direction, the interface apparatus comprising:

a plurality of movable interface units uniquely associated with the telephone office; and

a plurality of stationary interface units connected to the telephone office via a signal transmission connection;

each of the movable interface units movable in the specified direction and within a limited area defined relative to the stationary interface units and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding radio signals in the direction of the stationary interface units, each of the stationary interface units responsive to radio signals transmitted from an adjacent movable unit to transmit signals corresponding to the signals transmitted from the adjacent movable unit to the telephone office via the signal transmission connection.

15. The interface apparatus in accordance with claim 14 wherein:

the movable interface units are movable along an interface unit path extending in a direction parallel to the predefined path and having a first side adjacent the predefined path;

the stationary interface units are spaced apart and disposed on a second side of the interface unit path opposite the first side of the interface unit path;

each of the movable interface units comprises signal processing circuitry and an associated first radio antenna directed toward the first side and an associated second radio antenna directed toward the second side;

each of the stationary interface units comprises signal processing circuitry and an associated radio antenna directed toward the interface unit path;

each of the movable interface units is responsive to radio signals received at the associated first antenna to transmit radio signals via the associated second antenna to the stationary interface unit; and

each of the stationary interface units is responsive to radio signals received via the associated radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

16. The interface apparatus in accordance with claim 14 wherein the movable units move along the interface unit path at a predefined speed.

17. The interface apparatus in accordance with claim 16 wherein the predefined speed is a function of an average speed of the plurality of mobile telephone units.

18. The interface apparatus in accordance with claim 14 and further comprising a plurality of mobile telephone units moving along another path in an opposite direction opposite the specified direction and a plurality of movable interface units movable in the opposite direction and wherein:

5 the plurality of mobile telephone units moving in the specified direction move along a first roadbed and the plurality of mobile telephone units moving in the opposite direction move along a second roadbed spaced apart from the first roadbed;

 the plurality of movable interface units movable in the specified direction are disposed along one side of the first roadbed adjacent the second roadbed;

10 the plurality of movable interface units movable in the opposite direction are disposed along one side of the second roadbed adjacent the first roadbed; and

 the plurality of stationary interface units are disposed between the plurality of movable interface units movable in the specified direction and the plurality of movable interface units movable in the opposite direction.

19. The interface apparatus in accordance with claim 14 and further comprising a plurality of stationary interface units connected to the telephone office via a signal transmission connection and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding signals to the telephone office.

20. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform hand-off and receiving functions relative to existing calls for mobile units within an associated service area.

21. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and is operative to perform a plurality of functions, including locating an identified mobile unit in an associated service area.

22. The interface apparatus in accordance with claim 14 wherein the telephone office is connected to a telephone network and wherein a plurality of stationary interface units are responsive to radio signals transmitted by an identified one of the movable interface units and

each stationary interface unit responsive to radio signals from the identified movable interface
5 unit is operative to compute a signal quality indication for data represented by the transmitted
radio signals and to transmit to the telephone office data signals corresponding to the transmitted
radio signals together with a corresponding signal quality indication, the telephone office
responsive to the receipt of the data signals and signal quality indication to transmit to the
telephone network data received from a selected one of the stationary interface units having a
10 preferred signal quality indication.

23. The interface apparatus in accordance with claim 14 wherein each of the
stationary units is responsive to a data message received from the telephone office to transmit a
corresponding radio message to selected ones of the movable interface units and wherein the
telephone office is operative to transmit a predetermined data message intended for a selected
5 one of the movable interface units to selected ones of the stationary interface units and each of
the selected ones of the stationary interface units is responsive to receipt of the predetermined
data message to transmit corresponding radio signals to the selected one of the movable interface
units.

24. The interface apparatus in accordance with claim 23 wherein the
predetermined data message is transmitted to each of the selected ones of the stationary interface
units in a timed sequence and the selected ones of the stationary interface units transmits the
corresponding radio signals in a corresponding timed sequence.

25. A mobile telephone system comprising:
a telephone office connected to a telephone network;
a stationary interface unit connected via a signal transmission connection to the
telephone office;

5 a movable interface unit uniquely associated with the telephone office and
movable at a predetermined speed along a first predefined path of travel and in a direction

defined by a direction of travel of a mobile telecommunication unit traveling along a second predetermined path defined within a limited area defined relative to the stationary interface;

the stationary interface unit comprising signal processing circuitry and a

10 stationary interface radio antenna directed toward the first predefined path of travel;

the moving interface unit comprising signal processing circuitry and a first radio antenna directed toward the second predefined path of travel and a second radio antenna directed toward the stationary interface unit;

15 the moving interface unit responsive to radio signals received at the first radio antenna to transmit corresponding radio signals via the second radio antenna to the stationary interface and the stationary interface responsive to radio signals received at the stationary interface radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

26. A mobile telephone system arranged for communication with mobile telephone units and comprising:

first and second telephone offices connected to a telephone network;

5 a first closed loop having opposite ends and a second closed loop having opposite ends, one of the opposite ends of the first loop disposed adjacent one of the opposite ends of the second loop, each of the loops movably supporting a plurality of movable base stations;

a plurality of stationary interface units disposed adjacent each of the loops, each connected to one of the telephone offices;

10 each movable base station communicating with a stationary interface unit and responsive to radio telephone signals transmitted by a mobile telephone unit to establish a telephone communication connection with one of the telephone offices via one of the stationary interface units;

15 the telephone offices operative to record position of each of the movable base stations on each loop and to transmit an alert signal via one of the stationary interface units to an identified movable base station approaching one of the opposite ends of one of the loops;

the identified movable base station responsive to the alert signal to indicate to mobile units communicating with the identified movable base station to establish a telephone communication connection to another base station.

27. The system in accordance with claim 26 wherein one of the opposite ends of one of the loops overlaps one of the opposite ends of another of the loops.

28. The apparatus in accordance with claim 1 wherein the movable interface unit is further responsive to radio signals received from the telephone office via the stationary interface unit to locate an identified mobile unit and to transmit to the identified mobile unit signals corresponding to radio signals received from the telephone office.

29. The apparatus in accordance with claim 1 and comprising a plurality of stationary interface units and wherein the area is defined relative to the plurality of interface units.

MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

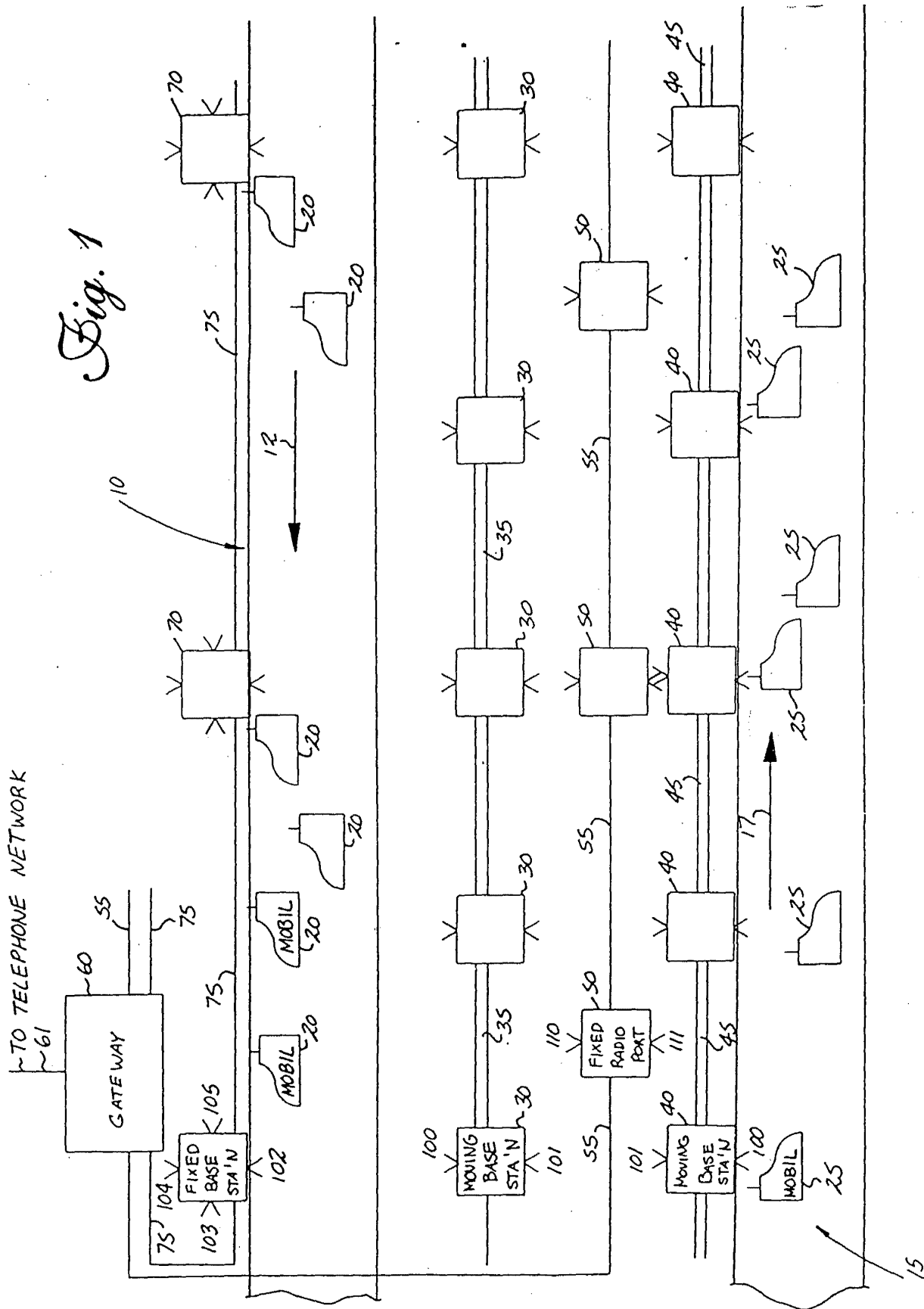
ABSTRACT

A mobile communication system employs moving base stations moving in the direction of flow of traffic moving along a roadway. The moving base station communicates with fixed radio ports connected to a gateway office. A plurality of moving base stations are spaced apart on a closed loop and move with the flow of traffic along one roadway on one leg of the loop and with a flow of traffic on another roadway in another leg of the loop. The moving base stations communicate with a plurality of fixed radio ports connected by a signal transmission link to a gateway office which, in turn, is connected to the wire line network. The moving base stations are each provided with a pair of directional antennas with one antenna directed toward the flow of traffic and another antenna directed to the fixed radio ports.

5
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TO TELEPHONE NETWORK

Fig. 1



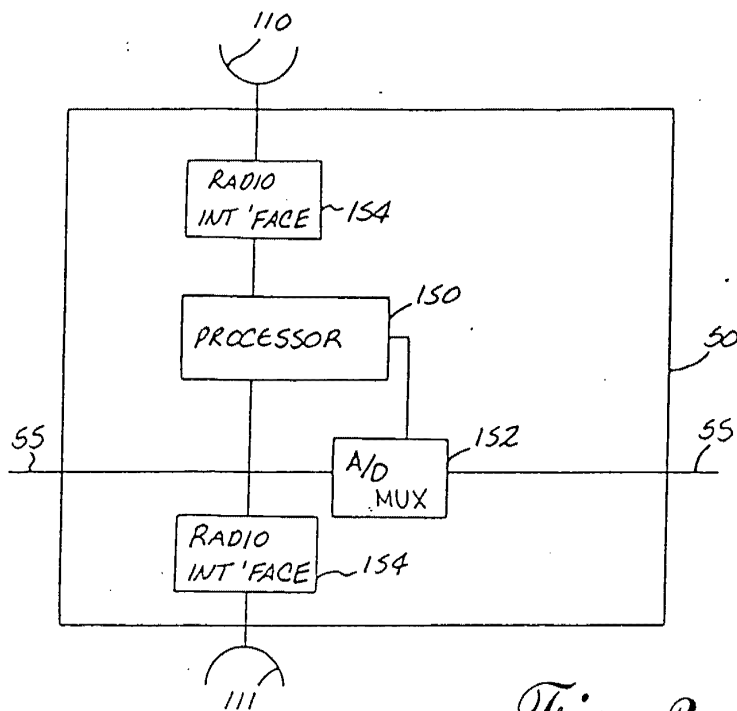


Fig. 2

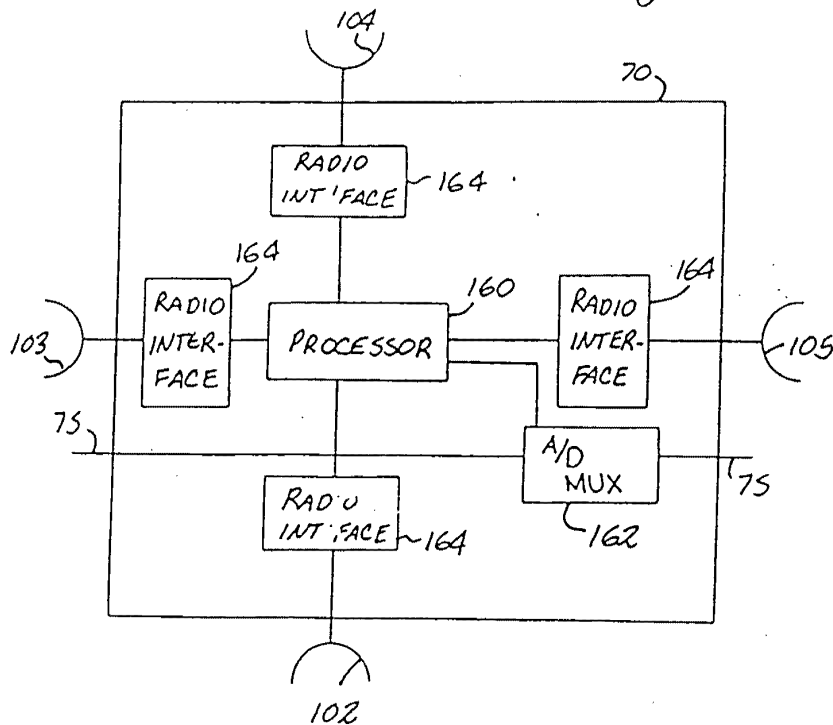


Fig. 3

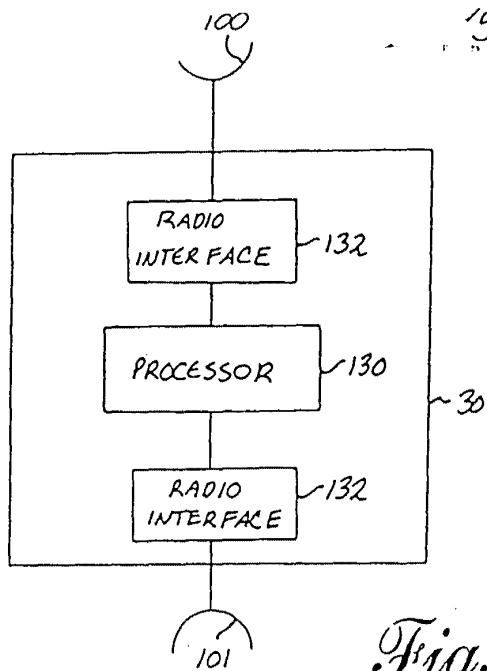


Fig. 4

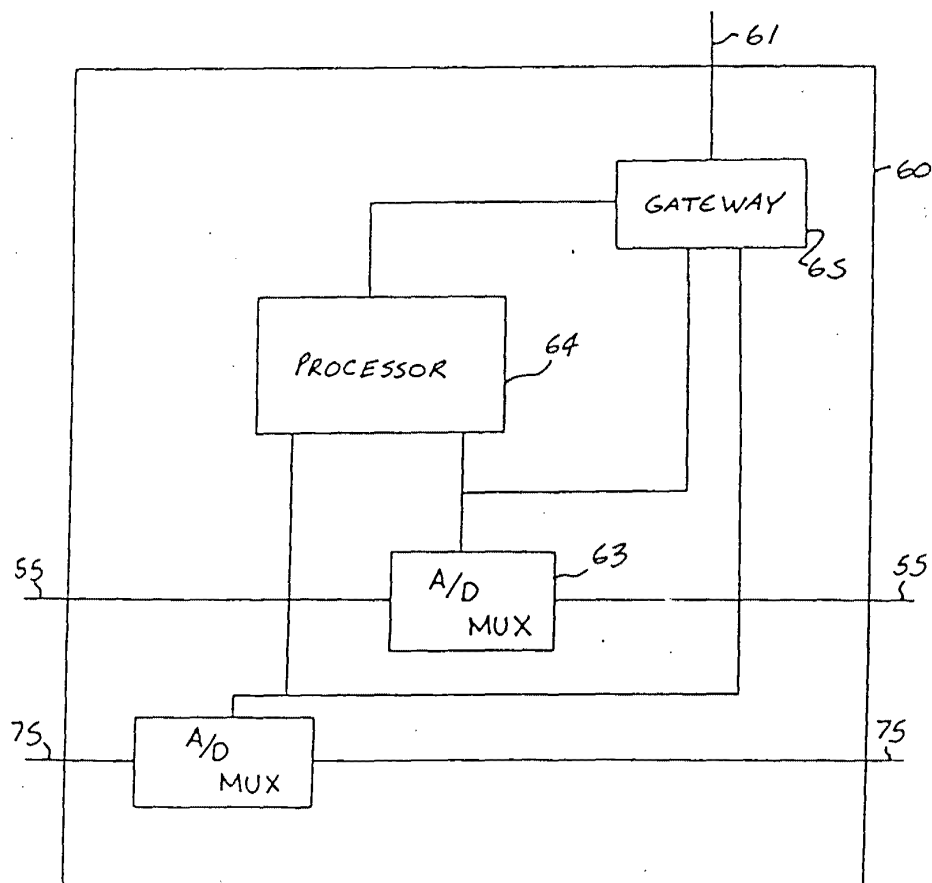


Fig. 5

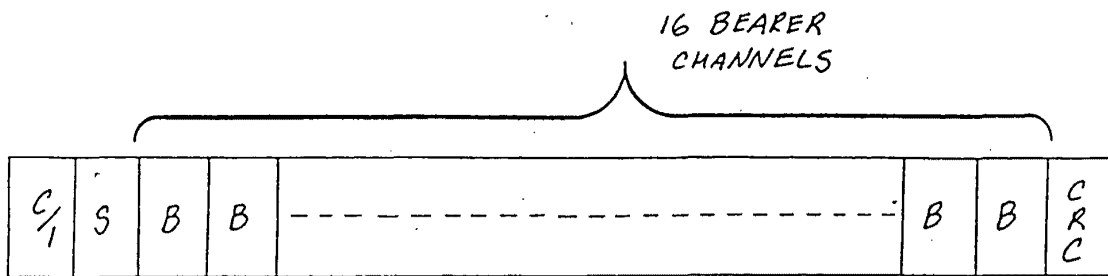


Fig. 6

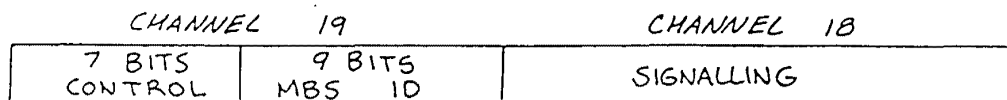


Fig. 7

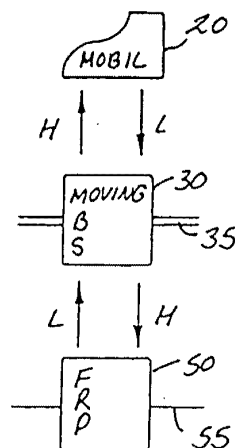


Fig. 8

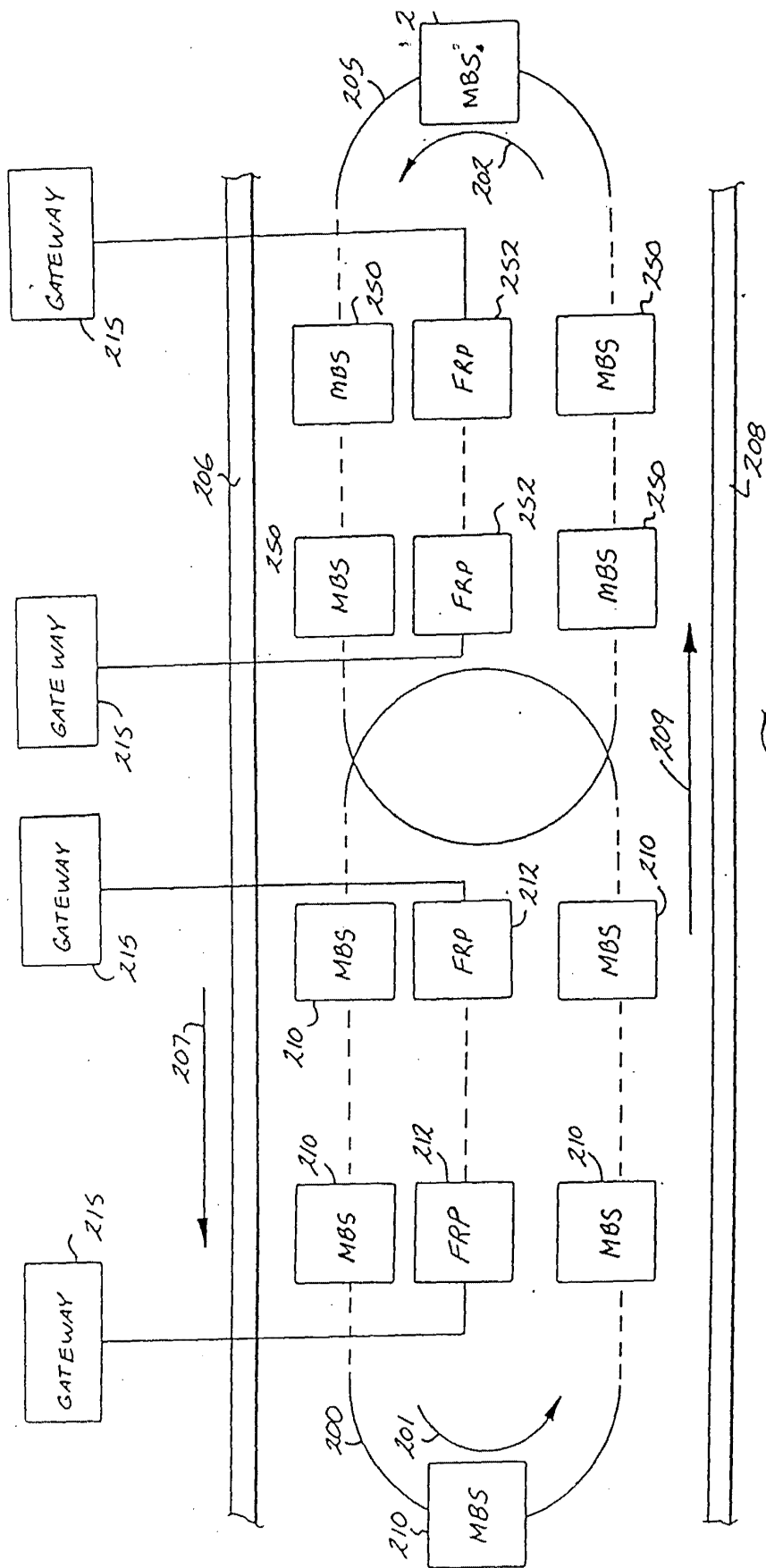


Fig. 9



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich	)	Group No.:	2681
Serial No.:	)	Examiner:	Joy Contee
09/401,584	)	Docket No.	Gavrilovich P1US2
Filed:	)		
September 22, 1999	)		
For:	)		
MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION			

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date May 12, 2006, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

May 12, 2006 [Signature]
Date Signature

Mail Stop No Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT UNDER 37 CFR 41.33

This amendment is being filed concurrently with an appeal brief. Please amend the above referenced application as indicated below.

IN THE CLAIMS

Please enter the following rewritten claims:

30. (Previously Amended) An apparatus comprising:
a receiver configured to wirelessly receive a received signal; and
a transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter.
31. (Previously Amended) An apparatus in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.
32. (Previously Amended) An apparatus in accordance with claim 31, wherein the transmitter is further configured to travel on a conveyor device along the predetermined path.
33. (Previously Amended) An apparatus in accordance with claim 32, wherein the received signal is received from a fixed radio port.
34. (Previously Amended) An apparatus comprising:
a receiver configured to receive a received signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver; and
a transmitter configured to wirelessly transmit a transmit signal corresponding to the received signal to at least one fixed port.
35. (Previously Amended) An apparatus in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.
36. (Previously Amended) An apparatus in accordance with claim 35, wherein the receiver is further configured to travel on a conveyor device along the predetermined path.

Claims 37 - 48 (Previously Cancelled).

49. (Previously Amended) A movable base station configured to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, the communication link comprising a wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

50. (Original) A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Previously Amended) A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of another mobile unit.

52. (Previously Amended) A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Previously Amended) A movable base station in accordance with claim 52, wherein the motion of the movable base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Previously Amended) A movable base station configured to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface configured to establish a first wireless communication link between the movable base station and the mobile unit; and

a second radio interface configured to establish a second wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

55. (Previously Amended): A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original): A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended) A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended) A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended) A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended) A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Previously Amended) A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original) A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Previously Amended) An apparatus adapted to move in accordance with a movement of a mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original) An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended) An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended) An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended) An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended) An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended) An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original) An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original) An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. (Original) An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. (Original) An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original) An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

a first wireless communication link between the at least one fixed radio port and the receiver; and

a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended) An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. (Original) An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended) An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended) An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended) An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended) An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Previously Amended) An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second fixed radio port of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original): An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83-88. (Previously Cancelled).

89. (Previously Amended) A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

- wirelessly receiving a received signal;
- controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and
- transmitting a transmit signal corresponding to the received signal to the mobile unit.

90. (Previously Amended) A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

- moving the transmitter along a conveying device deposited along the predetermined path; and
- adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original) A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

- observing a relative motion between the mobile unit and the transmitter;
- and
- adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original) A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the transmitter in accordance with the average speed.

93. (Previously Amended) A method of wirelessly transmitting a transmit signal corresponding to a received signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver;
receiving the received signal at the receiver; and
wirelessly transmitting the transmit signal from a transmitter connected to the receiver.

94. (Original) A method in accordance with claim 93, wherein the step of controlling comprises the steps of:

moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. (Original) A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original) A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:

- moving the receiver next to a roadway;
- calculating an average speed of a plurality of mobile units traveling along the roadway; and
- adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended) A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

- moving a movable base station in accordance with the motion of the mobile unit;

- receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

- transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

- maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. (Original) An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended) An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended) An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended) An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended) An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original): A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

- establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

- simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original) A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

- combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and
- transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original) A method in accordance with claim 104, wherein the step of combining comprises the steps of:

- determining a first quality of the first signal;
- determining a second quality of the second signal; and
- adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original) A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

Claims 107 – 112 (Previously Cancelled).

113. (Previously Amended) A communication system comprising:

a first transceiver configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell; and

a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell.

114. (Previously Added): A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. (Previously Added) A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. (Previously Added) A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

117. (Previously Added) A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

118. (Currently Cancelled)

119. (Previously Amended): A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell; and

wirelessly exchanging signals with at least one fixed port corresponding to the communication cell.

120. (Previously Added) A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

121. (Previously Added) A method in accordance with claim 120, wherein the providing the moving communication cell comprises:
providing the moving communication cell from a moving base station.

122. (Previously Added) A method in accordance with claim 121, wherein the providing the moving communication cell comprises:
exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. (Previously Added) A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:
exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.

REMARKS

Before this amendment, claims 30-36 and 49-82, 89-106, and 113-123 were pending in the present application. In order to limit issues on appeal applicant has cancelled claim 118 without prejudice. Claims 30-36, 49-82, 89-106, 113-117 and 119-123 are now pending. Applicant is submitting this amendment concurrently with an appeal brief and respectfully submits that cancellation of claim 118 does not affect the scope of any other pending claim under appeal.

Respectfully submitted,

CHARLES D. GAVRILOVICH

Date:

May 12, 2006

By:



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Reg. No. 41,031

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich	Group No.:	2686
Serial No.: 09/401,584	Examiner:	Joy Contee
Filed: September 22, 1999	Docket No.	Gavrilovich P1US2
For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION		

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date 03/27/2006, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

March 27, 2006
Date

[Signature]
Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

NOTICE OF APPEAL

In response to the Final Office Action dated October 03, 2005, applicant is filing a Notice of Appeal. This Notice of Appeal is being filed within six months of the mailing of the Final Office Action and a petition and a fee for three month extension of time are filed herewith. If, however, it is determined that additional fees are due, the Commissioner is hereby authorized to charge Deposit Account Number 502484.

Respectfully submitted,

Date: March 27, 2006

By: [Signature]

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PTO/SB/31 (04-05)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES		Docket Number (Optional) Gavrilovich-P1US2	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on <u>March 27, 2006</u> Signature <u>[Signature]</u> Typed or printed name <u>Charles D. Gavrilovich, Jr.</u>		In re Application of Charles D. Gavrilovich	
		Application Number <u>09/401,584</u>	Filed <u>September 22, 1999</u>
		For <u>Mobile Communication System With Moving Base Station</u>	
		Art Unit <u>2686</u>	Examiner <u>Joy K. Contee</u>
Applicant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the examiner.			
The fee for this Notice of Appeal is (37 CFR 41.20(b)(1))		\$ <u>500.00</u>	
☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is:		\$ <u>250.00</u>	
☐ A check in the amount of the fee is enclosed.			
☒ Payment by credit card. Form PTO-2038 is attached.			
☐ The Director has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.			
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. <u>502484</u> . I have enclosed a duplicate copy of this sheet.			
☒ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.			
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
I am the		<u>[Signature]</u> Signature	
☐ applicant/inventor.		<u>Charles D. Gavrilovich, Jr.</u> Typed or printed name	
☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)			
☒ attorney or agent of record. Registration number <u>41,031</u>		<u>619 271 0382</u> Telephone number	
☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____		<u>March 27, 2006</u> Date	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.			
☐ *Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/21 (09-04)
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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/401,584	
	Filing Date	September 22, 1999	
	First Named Inventor	Gavrilovich, Charles D.	
	Art Unit	2686	
	Examiner Name	Joy K. Contee	
Total Number of Pages in This Submission	6	Attorney Docket Number	Gavrilovich-P1US2

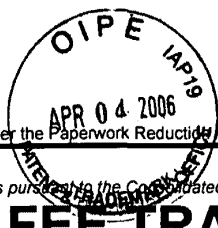
ENCLOSURES (Check all that apply)		
☒ Fee Transmittal Form	☐ Drawing(s)	☐ After Allowance Communication to TC
☒ Fee Attached	☐ Licensing-related Papers	☐ Appeal Communication to Board of Appeals and Interferences
☐ Amendment/Reply	☐ Petition	☒ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Power of Attorney, Revocation	☐ Status Letter
☒ Extension of Time Request	☐ Change of Correspondence Address	☐ Other Enclosure(s) (please identify below):
☐ Express Abandonment Request	☐ Terminal Disclaimer	Itemized Postcard
☐ Information Disclosure Statement	☐ Request for Refund	Credit Card Payment Form
☐ Certified Copy of Priority Document(s)	☐ CD, Number of CD(s) _____	
☐ Reply to Missing Parts/Incomplete Application	☐ Landscape Table on CD	
☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	Remarks	

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	Gavrilovich, Dodd, and Lindsey, LLP		
Signature			
Printed name	Charles D. Gavrilovich, Jr.		
Date	March 27, 2006	Reg. No.	41,031

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
Signature			
Typed or printed name	Charles D. Gavrilovich, Jr.	Date	March 27, 2006

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

For FY 2006

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 760.00

Complete if Known

Application Number	09/401,584
Filing Date	September, 22, 1999
First Named Inventor	Charles D. Gavrilovich
Examiner Name	Joy K. Contee
Art Unit	2686
Attorney Docket No.	Gavrilovich-P1US2

METHOD OF PAYMENT (check all that apply)

☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 502484 Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below

☐ Charge fee(s) indicated below, except for the filing fee

☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17

☒ Credit any overpayments

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FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Fee (\$)	Small Entity Fee (\$)
50	25

Each independent claim over 3 (including Reissues)

200	100

Multiple dependent claims

360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)

- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)

- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims

Fee (\$)	Fee Paid (\$)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)

Other (e.g., late filing surcharge): Notice of Appeal (250), 3 Month Extension (510)

760.00

SUBMITTED BY

Signature

Registration No.
(Attorney/Agent) 41,031

Telephone 619 271 0382

Name (Print/Type) Charles D. Gavrilovich, Jr.

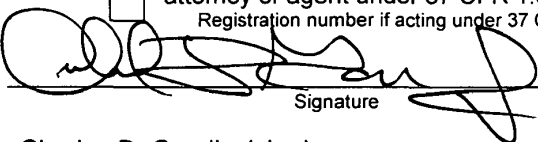
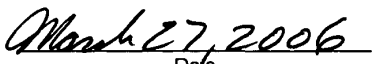
Date March 27, 2006

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2005 <i>(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)</i>		Docket Number (Optional) Gavrilovich-P1US2	
Application Number 09/401,584		Filed September 22, 1999	
For Mobile Communication System With Moving Base Station			
Art Unit 2686		Examiner Joy K. Contee	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
	<u>Fee</u>	<u>Small Entity Fee</u>	
☐ One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
☐ Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ _____
☒ Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ 510
☐ Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____
☒ Applicant claims small entity status. See 37 CFR 1.27.			
☐ A check in the amount of the fee is enclosed.			
☒ Payment by credit card. Form PTO-2038 is attached.			
☐ The Director has already been authorized to charge fees in this application to a Deposit Account.			
☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____ I have enclosed a duplicate copy of this sheet.			
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
I am the ☐ applicant/inventor.			
☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
☒ attorney or agent of record. Registration Number 41,031			
☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____			
 Signature		 Date	
Charles D. Gavrilovich, Jr. Typed or printed name		619-271-0382 Telephone Number	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
☐ Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
35083	7590	10/03/2005	EXAMINER	
CHARLES D. GAVRILOVICH, JR., GAVRILOVICH, DODD & LINDSEY, LLP 985 PASEO LA CRESTA, SUITE B CHULA VISTA, CA 91910-6729			CONTEE, JOY KIMBERLY	
			ART UNIT	PAPER NUMBER
			2686	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/401,584	GAVRILOVICH, CHARLES D.	
	Examiner	Art Unit	
	Joy K Contee	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-36, 49-82, 89-106 and 113-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-82 and 97-102 is/are allowed.
- 6) ☒ Claim(s) 30-36, 49-62, 89-96, 103-106 and 113-123 is/are rejected.
- 7) ☒ Claim(s) 118 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	5) ☐ Notice of Informal Patent Application (PTO-152)
Paper No(s)/Mail Date _____	6) ☐ Other: _____

By

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/28/2005 have been fully considered but they are not persuasive.

Applicant argues that Yokoi et al., US Patent No. 5,282,239 does not teach an apparatus that comprises a receiver that wirelessly receives a received signal and transmits a corresponding transmit signal to a mobile unit. Applicant also suggests that Yokoi et al. does not disclose wherein the communication link comprising a wireless communication link between the movable base station and fixed port. Applicant has added similar limitations to claims 30,34,49,54,89 and 93. As discussed below, Yokoi et al. further anticipates a fixed base station for wirelessly transmitting and receiving with a mobile unit and movable base station (see col. 3,lines 55-59 and col. 8,lines 5-16).

Applicant also argues that Yokoi et al. fails to disclose "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality of ports" and that Yokoi et al. cordless phone does not communicate to a fixed port through a moving base station. Examiner disagrees. Yokoi et al. teaches that hand-off request signals can also be used to hand-off calls from a moving conveyance base station to a fixed base station when the person using the portable cordless phone leaves the elevator (see col. 8,lines 5-15 and see Fig. 11. Further Yokoi et al. teaches that calls can be made simultaneously in all three elevators without mutual interference or crosstalk, thus given the example in Fig. 12, as long as the adjacent elevators remain together handoff will occur simultaneously amongst the three elevators.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 118 recites "a moving base station comprising the first transceiver and the second transceiver". This limitation is not found in the disclosure.

Claim Objections

3. Claim 118 is objected to because of the following informalities: "a moving base station comprising the first transceiver and the second transceiver" is not found in the specification. Appropriate correction is required. This portion of the limitation has not been treated on the merits.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103 and 113-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi (US 5,282,239), previously used, different embodiment.

Regarding claims 30, 113 and 119, Yokoi teaches an apparatus comprising:

a receiver (*i.e., reads on fixed base station*) configured to wirelessly receive a receive signal (and a second transceiver (**reads on movable base station**) connected to a first transceiver (**reads on fixed base station**) and configured to wirelessly exchange signals with at least one fixed port (*i.e., reads on central switch*) corresponding to the communication cell) (col. 3, lines 55-65 and col. 8, lines 5-15); and

a transmitter/ moving communication cell (*i.e., reads on moving base station 32, see Fig. 12*) (and method of providing a moving communication cell to a mobile unit) adapted to transmit a signal to a mobile unit (*i.e., reads on portable cordless telephone 19, see Fig. 12*) while the transmitter/moving communication cell (*i.e., moving base station 32*) has a motion relative to Earth along a predetermined path (*i.e., moving base station 32 is coupled to an elevator 31, see Fig. 12, which moves relative to earth along the elevator shaft in a vertical direction, i.e., upward and downward*) and in accordance with an anticipated motion of the mobile unit (*i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth*), wherein an actual motion of the mobile unit (*i.e., reads on portable cordless telephone 19*) is independent of the motion (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads*

on “anticipated motion” of mobile) of the transmitter/moving communication cell (i.e., reads on moving base station 32) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above.

Regarding claims 31, 114 and 120, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 8, lines 5-15).

Regarding claim 34, Yokoi teaches a receiver (**i.e., within moving base station 32**) adapted to receive a signal from a mobile unit (**i.e., portable cordless telephone 19**) while the receiver (**i.e., moving base station 32**) has a motion relative to Earth along a predetermined path (**i.e., moving base station 32 is coupled to elevator 31, which moves relative to earth**) and in accordance with an anticipated motion of the mobile unit (**i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth**), wherein an actual motion of the mobile unit (**i.e., with and within elevator 1**) is independent (**i.e., portable cordless telephone is free from elevator 31**) of the

motion of the receiver (***moving base station 32***) (col. 7, lines 39-52 and col. 8, lines 5-15); and transmitter (***reads on movable base station***) configured to wirelessly exchange signals with at least one fixed port (***i.e., reads on central switch***) corresponding to the communication cell) (col. 3, lines 55-65 and col. 8, lines 5-15);

Regarding claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above.

Regarding claim 35, Yokoi teaches wherein the predetermined path (***i.e., parallel track is the path***) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (20 or 32) adapted to establish a communication link between a fixed port and mobile unit (19) while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit (***i.e., reads on a person using the portable cordless telephone leaves the elevator 1***), the communication link comprising a wireless communication link between the movable base station and the fixed port (***i.e., reads on fixed base station***) (col. 8, lines 5-15) wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (***i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless***

telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claims 54, 115-118, 121-123, Yokoi teaches a movable base station (or moving communication cell) (32) adapted to have a motion relative to a fixed port (fixed base) along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising: a first radio interface (or gateway) adapted to establish wirelessly a first communication link between the movable base station and the mobile unit (col. 7, lines 39-52); and a second radio interface adapted to establish wirelessly a second communication link between the movable base station and the fixed port wherein an actual motion of the mobile unit independent of the motion of the movable base station (***i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile)*** (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 61, dependent on claim 54, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, dependent on claim 61, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (i.e., reads on 20,32 and 35, see Fig. 11) having a motion relative to a plurality of fixed ports (such as fixed base 4), wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units (i.e., reads on moving base stations 20,32 and 35, see Fig. 11) and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units station (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile*); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 8, line5-15).

Allowable Subject Matter

6. Claims 63-82 and 97-102 are allowed.
7. Claims 50-53,55-60,90-92, 94-96 and 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K Contee whose telephone number is 571-272-7906. The examiner can normally be reached on Monday thru Friday, 5:30 am. until 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone

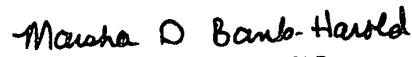
Art Unit: 2686

number for the organization where this application or proceeding is assigned is 571-273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JKC


JAY K. CONTEE
PATENT EXAMINER


MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Index of Claims 	Application No.		Applicant(s)	
	09/401,584		GAVRILOVICH, CHARLES D.	
	Examiner		Art Unit	
	Joy K Contee		2686	

✓	Rejected
=	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date	
Final	Original		
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Claim		Date	
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Claim		Date	
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150	✓		

Search Notes

Application No.

09/401,584

Examiner

Joy K Contee

Applicant(s)

GAVRILOVICH, CHARLES D.

Art Unit

2686

SEARCHED

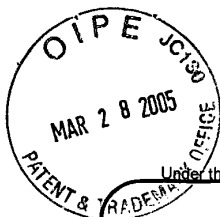
Class	Subclass	Date	Examiner
455	updated sb	9/18/03	DL
342	r	r	a

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR



PTO/SB/21 (09-04)
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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/401,584
	Filing Date	August 22, 1999
	First Named Inventor	Gavrilovich, Charles D.
	Art Unit	2686
	Examiner Name	Contee, Joy
	Attorney Docket Number	GAVRILOVICH-P1US2
Total Number of Pages in This Submission		

ENCLOSURES (Check all that apply)		
☐ Fee Transmittal Form	☐ Drawing(s)	☐ After Allowance Communication to TC
☐ Fee Attached	☐ Licensing-related Papers	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment/Reply	☐ Petition	☐ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Power of Attorney, Revocation	☐ Status Letter
☐ Extension of Time Request	☐ Change of Correspondence Address	☒ Other Enclosure(s) (please identify below):
☐ Express Abandonment Request	☐ Terminal Disclaimer	Itemized Postcard
☐ Information Disclosure Statement	☐ Request for Refund	
☐ Certified Copy of Priority Document(s)	☐ CD, Number of CD(s) _____	
☐ Reply to Missing Parts/Incomplete Application	☐ Landscape Table on CD	
☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	Remarks	

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	Gavrilovich, Dodd, and Lindsey, LLP	
Signature		
Printed name	Charles D. Gavrilovich, Jr.	
Date	March 25, 2005	Reg. No. 41,031

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:		
Signature		
Typed or printed name	Charles D. Gavrilovich, Jr.	Date March 25, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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2686
grw

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich

Serial No.: 09/401,584

Filed: September 22, 1999

Art Unit: 2686

Examiner: Joy Kimberly Contee

Docket No. GAVRILOVICH-P1US2

For: **MOBILE COMMUNICATION SYSTEM
WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date March 25, 2005, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

March 25, 2005
Date

[Signature]
Signature

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE TO NOTICE OF NON-COMPLIANT AMENDMENT

In response to the Notice of Non-Compliant Amendment dated March 17, 2005, the "In The Claims" section has been amended to comply with 37 CFR 1.121. Only the corrected section of the non-compliant amendment document is being resubmitted in its entirety.

The resubmitted "In The Claims" section begins on page 2.

IN THE CLAIMS

Please enter the following rewritten claims:

Claims 1-29 (Previously Cancelled).

30. (Currently Amended): An apparatus comprising:
a receiver configured to wirelessly receive a received signal; and
A a transmitter adapted configured to transmit a transmit signal corresponding
to the received signal to a mobile unit while the transmitter has a motion relative to Earth along
a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein
an actual motion of the mobile unit is independent of the motion of the transmitter.
31. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 30
wherein the predetermined path has a contour corresponding to a roadway contour and the
anticipated motion of the mobile unit is on the roadway.
32. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 31,
wherein the transmitter is further adapted configured to travel on a conveyor device along the
predetermined path.
33. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 32,
wherein the ~~signal corresponds to a~~ received signal is received from a fixed radio port ~~at a~~
~~receiver communicatively coupled to the transmitter.~~
34. (Currently Amended): An apparatus comprising:
A a receiver adapted configured to receive a received signal from a mobile unit
while the receiver has a motion relative to Earth along a predetermined path and in accordance
with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is
independent of the motion of the receiver; and
a transmitter configured to wirelessly transmit a transmit signal corresponding to
the received signal to at least one fixed port.

35. (Currently Amended): ~~A receiver~~ An apparatus in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. (Currently Amended): ~~A receiver~~ An apparatus in accordance with claim 35, wherein the receiver is further ~~adapted~~ configured to travel on a conveyor device along the predetermined path.

Claims 37 - 48 (Previously Cancelled).

49. (Currently Amended): A movable base station ~~adapted~~ configured to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, the communication link comprising a wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

50. (Original): A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of another mobile unit.

52. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Previously Amended): A movable base station in accordance with claim 52, wherein the motion of the movable base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Currently Amended): A movable base station adapted configured to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted configured to establish a first wireless communication link between the movable base station and the mobile unit; and

a second radio interface adapted configured to establish a second wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

55. (Previously Amended): A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original): A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Previously Amended): A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original): A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Previously Amended): An apparatus adapted to move in accordance with a movement of a mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original): An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended): An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original): An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original): An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. (Original): An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. (Original): An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original): An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

a first wireless communication link between the at least one fixed radio port and the receiver; and

a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended): An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. (Original): An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Previously Amended): An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second fixed radio port of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original): An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83-88. (Previously Cancelled).

89. (Currently Amended): A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

wirelessly receiving a received signal;

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and

transmitting ~~the~~ a transmit signal corresponding to the received signal to the mobile unit.

90. (Previously Amended): A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original): A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;
and

adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original): A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the transmitter in accordance with the average speed.

93. (Currently Amended): A method of wirelessly transmitting a transmit signal corresponding to a received signal ~~receiving a signal~~ transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver; ~~and~~
receiving the received signal at the receiver; and
wirelessly transmitting the transmit signal from a transmitter connected to the receiver.

94. (Original): A method in accordance with claim 93, wherein the step of controlling comprises the steps of:

moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. (Original): A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original): A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:

- moving the receiver next to a roadway;
- calculating an average speed of a plurality of mobile units traveling along the roadway; and
- adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended): A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

- moving a movable base station in accordance with the motion of the mobile unit;

- receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

- transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

- maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. (Original): An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original): A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original): A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and
transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original): A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original): A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

Claims 107 – 112. (Previously Cancelled).

113. (Currently Amended): A communication system comprising:
a first transceiver configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell; and
a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell.

114. (Previously Added): A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. (Previously Added): A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. (Previously Added): A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

117. (Previously Added): A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

118. (Currently Amended): A communication system in accordance with claim 113, the communication system comprising:

a moving base station comprising the first transceiver and the second transceiver and configured to exchange mobile unit signals with a plurality of mobile units within a moving geographical area defined by the moving communication cell; and

a plurality of fixed ports configured to exchange fixed port signals with the moving base station, the fixed port signals corresponding to the mobile units signals.

119. (Currently Amended): A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell; and

wirelessly exchanging signals with at least one fixed port corresponding to the communication cell.

120. (Previously Added): A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

121. (Previously Added): A method in accordance with claim 120, wherein the providing the moving communication cell comprises:

providing the moving communication cell from a moving base station.

122. (Previously Added): A method in accordance with claim 121, wherein the providing the moving communication cell comprises:

exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. (Previously Added): A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:

exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.

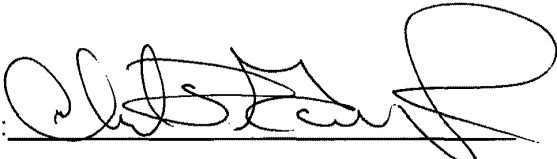
Conclusion

Applicant has resubmitted the "Amendment to the claims" section with the correction indicating claims 1-20 had been previously cancelled. Applicant respectfully submits that the amendment as now presented complies with 37 CFR 1.121 and that claims 21-40 are allowable over the art cited.

Respectfully submitted,

CHARLES D. GAVRILOVICH

Date: March 25, 2005

By: 

Charles D. Gavrilovich, Jr.
Reg. No. 41,031

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PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number

09/40/584

CLAIMS AS FILED - PART I

(Column 1) (Column 2)

TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 82	Minus	** 83	=
Independent	* 25	Minus	*** 24	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE		RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	94.00
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 70	Minus	** 83	=
Independent	* 13	Minus	*** 24	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 70	Minus	** 83	=
Independent	* 12	Minus	*** 24	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
35083	7590	03/17/2005		
CHARLES D. GAVRILOVICH, JR., A PROFESSIONAL CORPORATION 985 PASEO LA CRESTA, SUITE A CHULA VISTA, CA 91910-6729				
EXAMINER				
CONTEE, JOY KIMBERLY				
ART UNIT		PAPER NUMBER		
2686				

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

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Notice of Non-Compliant Amendment (37 CFR 1.121)

The amendment document filed on 1-10-05 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121. In order for the amendment document to be compliant, correction of the following item(s) is required. Only the corrected section of the non-compliant amendment document must be resubmitted (in its entirety), e.g., the entire "Amendments to the claims" section of applicant's amendment document must be re-submitted. 37 CFR 1.121(h).

THE FOLLOWING CHECKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____
- ☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____
- ☐ 3. Amendments to the drawings: _____
- ☐ 4. Amendments to the claims:
- ☒ A. A complete listing of all of the claims is not present.
 - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
 - ☐ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following 7 status identifiers: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New) and (Not entered).
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☐ E. Other: _____

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP Sec. 714 and the USPTO website at <http://www.uspto.gov/web/offices/pac/dapp/opa/preognotice/office1ver.pdf>.

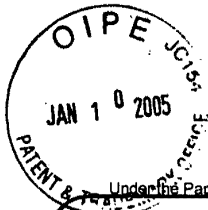
If the non-compliant amendment is a **PRELIMINARY AMENDMENT**, applicant is given ONE MONTH from the mail date of this letter to supply the corrected section which complies with 37 CFR 1.121. Failure to comply with 37 CFR 1.121 will result in non-entry of the preliminary amendment and examination on the merits will commence without consideration of the proposed changes in the preliminary amendment(s). This notice is not an action under 35 U.S.C. 132, and this ONE MONTH time limit is not extendable.

If the non-compliant amendment is a reply to a **NON-FINAL OFFICE ACTION** (including a submission for an RCE), and since the amendment appears to be a *bona fide* attempt to be a reply (37 CFR 1.135(c)), applicant is given a TIME PERIOD of ONE MONTH from the mailing of this notice within which to re-submit the corrected section which complies with 37 CFR 1.121 in order to avoid abandonment. **EXTENSIONS OF THIS TIME PERIOD ARE AVAILABLE UNDER 37 CFR 1.136(a).**

If the amendment is a reply to a **FINAL REJECTION**, this form may be an attachment to an Advisory Action. The period for response to a final rejection continues to run from the date set in the final rejection, and is not affected by the non-compliant status of the amendment.

Shirley L. Stanley
Legal Instruments Examiner (LIE)

571-272-1625
Telephone No.

2582
RFWPTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

19

Application Number	09/401,584
Filing Date	September 22, 1999
First Named Inventor	Gavrilovich
Art Unit	2682
Examiner Name	Joy Kimberly Contee
Attorney Docket Number	GAVRILOVICH-P1US2

ENCLOSURES (Check all that apply)

☐ Fee Transmittal Form ☐ Fee Attached ☒ Amendment/Reply ☐ After Final ☐ Affidavits/declaration(s) ☐ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Reply to Missing Parts/ Incomplete Application ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____ ☐ Landscape Table on CD	☐ After Allowance Communication to TC ☐ Appeal Communication to Board of Appeals and Interferences ☐ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☐ Other Enclosure(s) (please identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Charles D. Gavrilovich, Jr., A Professional Corporation		
Signature			
Printed name	Charles D. Gavrilovich, Jr.		
Date	January 07, 2005	Reg. No.	41,031

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Charles D. Gavrilovich, Jr.	Date	January 07, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich

Serial No.: 09/401,584

Filed: September 22, 1999

For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

Group No.: 2681

Examiner: Joy Contee

Docket No. Gavrilovich P1US2

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date January 07, 2005, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

January 07, 2005 [Signature]
Date Signature

Mail Stop No Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE TO NON-FINAL OFFICE ACTION

In response to the Office Action dated October 07, 2004, please amend the claims as indicated on the following pages. The "Remarks" begin on page 14. No fees are due with this response. If, however, it is determined that fees are due, the Commissioner is hereby authorized to charge Deposit Account Number 502484.

IN THE CLAIMS

Please enter the following rewritten claims:

30. (Currently Amended): An apparatus comprising:
a receiver configured to wirelessly receive a received signal; and
A a transmitter adapted configured to transmit a transmit signal corresponding
to the received signal to a mobile unit while the transmitter has a motion relative to Earth along
a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein
an actual motion of the mobile unit is independent of the motion of the transmitter.
31. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 30
wherein the predetermined path has a contour corresponding to a roadway contour and the
anticipated motion of the mobile unit is on the roadway.
32. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 31,
wherein the transmitter is further ~~adapted~~ configured to travel on a conveyor device along the
predetermined path.
33. (Currently Amended): ~~A transmitter~~ An apparatus in accordance with claim 32,
wherein the ~~signal corresponds to a received signal~~ is received from a fixed radio port at a
~~receiver communicatively coupled to the transmitter.~~
34. (Currently Amended): An apparatus comprising:
A a receiver adapted configured to receive a received signal from a mobile unit
while the receiver has a motion relative to Earth along a predetermined path and in accordance
with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is
independent of the motion of the receiver; and
a transmitter configured to wirelessly transmit a transmit signal corresponding to
the received signal to at least one fixed port.
35. (Currently Amended): ~~A receiver~~ An apparatus in accordance with claim 34
wherein the predetermined path has a contour corresponding to a roadway contour and the
anticipated motion of the mobile unit is on the roadway.

36. (Currently Amended): ~~A receiver~~ An apparatus in accordance with claim 35, wherein the receiver is further ~~adapted~~ configured to travel on a conveyor device along the predetermined path.

Claims 37 - 48 (Previously Cancelled).

49. (Currently Amended): A movable base station ~~adapted~~ configured to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, the communication link comprising a wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

50. (Original): A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of another mobile unit.

52. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Previously Amended): A movable base station in accordance with claim 52, wherein the motion of the movable base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Currently Amended): A movable base station ~~adapted~~ configured to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface ~~adapted~~ configured to establish a first wireless communication link between the movable base station and the mobile unit; and

a second radio interface ~~adapted~~ configured to establish a second wireless communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

55. (Previously Amended): A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original): A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Previously Amended): A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original): A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Previously Amended): An apparatus adapted to move in accordance with a movement of a mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original): An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended): An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original): An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original): An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. (Original): An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. (Original): An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original): An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

a first wireless communication link between the at least one fixed radio port and the receiver; and

a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended): An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. (Original): An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Previously Amended): An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second fixed radio port of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original): An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83-88. (Previously Cancelled).

89. (Currently Amended): A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

wirelessly receiving a received signal;

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and

transmitting the a transmit signal corresponding to the received signal to the mobile unit.

90. (Previously Amended): A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original): A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;

and

adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original): A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the transmitter in accordance with the average speed.

93. (Currently Amended): A method of wirelessly transmitting a transmit signal corresponding to a received signal ~~receiving a signal~~ transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver; ~~and~~
receiving the received signal at the receiver; and
wirelessly transmitting the transmit signal from a transmitter connected to the receiver.

94. (Original): A method in accordance with claim 93, wherein the step of controlling comprises the steps of:

moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. (Original): A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original): A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:

- moving the receiver next to a roadway;
- calculating an average speed of a plurality of mobile units traveling along the roadway; and
- adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended): A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

- moving a movable base station in accordance with the motion of the mobile unit;

- receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

- transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

- maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. (Original): An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original): A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original): A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and
transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original): A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original): A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

Claims 107 – 112. (Previously Cancelled).

113. (Currently Amended): A communication system comprising:
a first transceiver configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell; and
a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell.

114. (Previously Added): A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. (Previously Added): A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. (Previously Added): A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

117. (Previously Added): A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

118. (Currently Amended): A communication system in accordance with claim 113, the communication system comprising:

a moving base station comprising the first transceiver and the second transceiver and configured to exchange mobile unit signals with a plurality of mobile units within a moving geographical area defined by the moving communication cell; and

a plurality of fixed ports configured to exchange fixed port signals with the moving base station, the fixed port signals corresponding to the mobile units signals.

119. (Currently Amended): A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell; and

wirelessly exchanging signals with at least one fixed port corresponding to the communication cell.

120. (Previously Added): A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

121. (Previously Added): A method in accordance with claim 120, wherein the providing the moving communication cell comprises:

providing the moving communication cell from a moving base station.

122. (Previously Added): A method in accordance with claim 121, wherein the providing the moving communication cell comprises:

exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. (Previously Added): A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:

exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.

REMARKS

This paper is responsive to an Office Action dated October 07, 2004 which re-opened prosecution after an appeal brief was submitted by applicant. Claims 30-36 and 49-82, 89-106, and 113-123 are pending in the present application. The Examiner has allowed claims 63-82 and 97-102. Applicant has amended claims 30-36, 49, 54, 89, 93, 113, 118 and 119 in this response. No claims have been added or cancelled. Claims 30-36, 49-82, 89-106 and 113-123 are now pending. Applicant respectfully submits that the pending claims as amended are allowable.

The Examiner rejected claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, and 113-123 under 35 USC 102(b) as being anticipated by Yokoi et al (US 5,282,239) ("Yokoi"). Applicants respectfully submit that these claims as amended are allowable over the art cited.

Claim 30 as amended recites an apparatus comprising "a receiver configured to wirelessly receive a received signal" and a "transmitter configured to transmit a transmit signal corresponding to the received signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach an apparatus that comprises a receiver that wirelessly receives a received signal and transmits a corresponding transmit signal to a mobile unit. In Yokoi, "all of the base stations are coupled to by wires to a central switch". (Column 2, lines 59-60). Any signals transmitted from the base station in Yokoi do not correspond to wirelessly received signals. Accordingly, applicants respectfully submit that Yokoi does not show all of the limitations of claim 30 and that claim 30 is allowable.

Regarding claims 31-33, these claims depend from claim 30 which applicant respectfully submits is allowable. Accordingly, claims 31-33 are at least allowable as depending from an allowable base claim.

Further regarding claim 31, this claim recites that "the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway". Applicant respectfully submits that this limitation is not shown or discussed in Yokoi.

The paths of the base stations in Yokoi are along elevator shafts in one embodiment and along rails in another embodiment. Nowhere in Yokoi is a discussion or showing that the base stations travel along a predetermined path that has a contour corresponding to a roadway contour.

Claim 34 recites "a receiver configured to receive a received signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver" and "a transmitter configured to wirelessly transmit a transmit signal corresponding to the received signal to at least one fixed port". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the base station wirelessly transmits a signal to a fixed port. As explained above, all of the base stations in Yokoi are connected to the central switch. Applicant respectfully submits that Yokoi does not show all of the elements of claim 34 and that this claim is allowable.

Claims 35 and 36 depend from claim 34 which applicant respectfully submits is allowable. Accordingly, claims 35 and 36 are at least allowable as depending from an allowable base claim.

Further regarding claim 35, this claim recites that "the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway." As explained above, the base stations in Yokoi travel along elevator shaft and along rails and do not travel along a path having a contour corresponding to a roadway contour.

As amended, claim 49 recites that the moving station is configured to establish a communication link between the mobile station and a fixed port, where the communication link comprises "a wireless communication link between the movable base station and the fixed port." Applicant respectfully submits that this limitation is not shown in Yokoi. As discussed above, the base stations in Yokoi are connected to the central switch through wires. No wireless communication link exists between the movable base station and a fixed port in Yokoi. Accordingly, applicant respectfully submits that Yokoi does not show all of the elements of claim 49 and that claim 49 is allowable.

As amended, claim 54 recites a movable base station that comprises a "second wireless interface configured to establish a second wireless communication link between the movable base station and the fixed port." Applicant respectfully submits that this limitation is not shown in Yokoi. As discussed above, the base stations in Yokoi are connected to the central switch through wires. Accordingly, applicant respectfully submits that Yokoi does not show all of the elements of claim 54 and that claim 54 is allowable.

Regarding claim 61 and 62, these claims depend from claim 54 which applicant submits is allowable. Accordingly, claims 61 and 62 are at least allowable as depending from an allowable base claim. Further, claim 61 recites that the "predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway." As discussed above with reference to claims 31 and 35, Yokoi does not show this limitation.

Claim 89 as amended recites a method where a motion of a transmitter is controlled "along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter" and comprises the steps of "wirelessly receiving a received signal." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "wirelessly receiving a received signal". As explained above with reference to claims 30, 34, and 49, the base stations are connected to the central switch through wires.

As amended, claim 93 recites a method of wirelessly transmitting a transmit signal corresponding to a received signal comprising the steps of "receiving the received signal at the receiver" and wirelessly transmitting the transmit signal from a transmitter connected to the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach "wirelessly transmitting the transmit signal". As discussed above, the Yokoi teaches to connect the base stations to the central switch using wires. Applicant respectfully submits that Yokoi does not show all of the elements of claim 93 and that this claim is allowable.

Claim 103 recites a method comprising the step of "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality of ports." Applicant respectfully submits that Yokoi does not teach this limitation. Nowhere in Yokoi is a showing that a plurality

of mobile units are handed off simultaneously. Each portable cordless phone in Yokoi is handed off individually based on the quality of its communication link. (Col. 7, lines 57-61). Each portable cordless phone can be handed off between the fixed base station and moving-conveyance base station 10, between moving conveyance base stations 10 or between fixed base stations. In applicant's claim, the moving base station establishes wireless communication links between the mobile units and the moving base station and between the moving base station and a fixed port. The moving base station can simultaneously handoff the plurality of mobile stations from one fixed port to another by establishing a communication link with the other fixed port. In contrast, in Yokoi, several mobile units can not be handed off from one fixed port to another simultaneously. The portable cordless phones do not communicate to a fixed port through a moving base station. Applicants respectfully submit that Yokoi does not show all of the elements of claim 103 and that that this claim is allowable.

Claim 113 as amended recites a communication system comprising a first transceiver configured to provide a communication cell and "a second transceiver connected to the first transceiver and configured to wirelessly exchange signals with at least one fixed port corresponding to the communication cell." Applicant respectfully submits that Yokoi does not teach this limitation of this claim. As explained above, the moving-conveyance station is connected to the central switch through wires. Applicant respectfully submits that Yokoi does not show all of the elements of claim 113 and that this claim is allowable.

Claims 114-118 depend from claim 113 which applicant respectfully submits is allowable. Accordingly, claims 114-118 are at least allowable as depending from an allowable base claim.

Claim 119 recites a method where "wirelessly exchanging signals with at least one fixed port corresponding to the communication cell." Applicant respectfully submits that Yokoi does not teach this limitation of this claim. As explained above, the moving conveyance station is connected to the central switch through wires. Applicant respectfully submits that Yokoi does not show all of the elements of claim 119 and that this claim is allowable.

Claims 120-123 depend from claim 119 which applicant respectfully submits is allowable. Accordingly, claims 120-123 are at least allowable as depending from an allowable base claim.

Conclusion

Claims 30-36 and 49-82, 89-106, and 113-123 are pending in the present application. The Examiner has allowed claims 63-82 and 97-102. Applicant has amended claims 30-36, 49, 54, 89, 93, 113, 118 and 119 in this response. No claims have been added or cancelled. Claims 30-36, 49-82, 89-106 and 113-123 are now pending. Applicant respectfully submits that the pending claims are allowable and that the case is in a condition for allowance.

Respectfully submitted,
CHARLES D. GAVRILOVICH

Date: _____

By: _____

Charles D. Gavrilovich, Jr.
Reg. No. 41,031

Charles D. Gavrilovich, Jr.
A Professional Corporation
985 Paseo La Cresta, Suite A
Chula Vista, CA 91910
Phone: 619 271 0382
FAX: 619 271 0383

Index of Claims



Application No.

09/401,584

Examiner

Joy K Contee

Applicant(s)

GAVRILOVICH, CHARLES D.

Art Unit

2686

✓ Rejected
= Allowed

- (Through numeral)
Cancelled
+ Restricted

N Non-Elected
I Interference

A Appeal
O Objected

Claim	Date
Final	
Original	10/1/04
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Claim	Date
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PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number

09/40/584

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	* 82	Minus	** 83 =
	Independent	* 25	Minus	*** 24 = 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	* 70	Minus	** 83 =
	Independent	* 13	Minus	*** 24 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

	(Column 1)		(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	* 40	Minus	** 83 = -
	Independent	* 12	Minus	*** 24 = -
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY
TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE		RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	

SMALL ENTITY

OR OTHER THAN SMALL ENTITY

RATE	ADDI-TIONAL FEE		RATE	ADDI-TIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	94.00
+140=		OR	+280=	
TOTAL		OR	TOTAL	

RATE	ADDI-TIONAL FEE		RATE	ADDI-TIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	

RATE	ADDI-TIONAL FEE		RATE	ADDI-TIONAL FEE
X\$ 9=		OR	X\$18=	30
X42=		OR	X84=	20
+140=		OR	+280=	360
TOTAL		OR	TOTAL	



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
09/401,584		2686	06B0

Change of Address/Power of Attorney

The following fields have been set to Customer Number 35083 on

- Correspondence Address
- Power of Attorney
- Maintenance Fee Address

The address of record for Customer Number 35083 is:

CHARLES D. GAVRILOVICH, JR.,
A PROFESSIONAL CORPORATION
985 PASEO LA CRESTA, SUITE A
CHULA VISTA, CA 91910-6729

The Practitioners of record for Customer Number 35083 are:

PTO INSTRUCTIONS:

Please take the following action when the correspondence address has been changed to a customer number:

- 1) Add 'ADDRESS CHANGE TO CUSTOMER NUMBER' on the next available content line of the File Jacket.**
- 2) Put a line through the old address on the File Jacket and enter the Customer Number as the new address.**
- 3) File this Notice in the File Jacket.**

Please take the following action when the correspondence address has NOT been changed:

- 1) File this Notice in the File Jacket**



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
35083	7590	10/07/2004	EXAMINER	
CHARLES D. GAVRILOVICH, JR., A PROFESSIONAL CORPORATION 985 PASEO LA CRESTA, SUITE A CHULA VISTA, CA 91910-6729			CONTEE, JOY KIMBERLY	
			ART UNIT	PAPER NUMBER
			2686	

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/401,584	Applicant(s) GAVRILOVICH, CHARLES D.	
	Examiner Joy K Contee	Art Unit 2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-36, 49-82, 89-106 and 113-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-82 and 97-102 is/are allowed.
- 6) ☒ Claim(s) 30-36, 49, 54, 61, 62, 89, 93, 103 and 113-123 is/are rejected.
- 7) ☒ Claim(s) 50-53, 55-60, 90-92, 94-96 and 104-106 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. In view of the Appellant's Appeal Brief under 7 CFR §1.192 filed on July 2, 2004, PROSECUTION IS HEREBY REOPENED. With respect to claims 30-36,49,54,58,61,62,89,93,103, 113,118 and 119, a new ground of rejection using a different embodiment (see Fig. 12) described in Yokoi et al. (Yokoi), U.S. Patent No. 5,282,239 is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 30-36,49, 54, 58, 61, 62, 89, 93,103 and 113-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi (US 5,282,239), previously used, different embodiment.

Regarding claims 30,113 and 119, Yokoi teaches a transmitter/ moving communication cell (*i.e., reads on moving base station 32, see Fig. 12*) (and method of providing a moving communication cell to a mobile unit) adapted to transmit a signal to a mobile unit (*i.e., reads on portable cordless telephone 19, see Fig. 12*) while the transmitter/moving communication cell (*i.e., moving base station 32*) has a motion relative to Earth along a predetermined path (*i.e., moving base station 32 is coupled to an elevator 31, see Fig. 12, which moves relative to earth along the elevator shaft in a vertical direction, i.e., upward and downward*) and in accordance with an anticipated motion of the mobile unit (*i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth*), wherein an actual motion of the mobile unit (*i.e., reads on portable cordless telephone 19*) is independent of the motion (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile*) of the transmitter/moving communication cell (*i.e., reads on moving base station 32*) (col. 7,lines 39-52 and col. 8,lines 5-15).

Regarding claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above.

Regarding claims 31, 114 and 120, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 8, lines 5-15).

Regarding claim 34, Yokoi teaches a receiver (*i.e., within moving base station 32*) adapted to receive a signal from a mobile unit (*i.e., portable cordless telephone 19*) while the receiver (*i.e., moving base station 32*) has a motion relative to Earth along a predetermined path (*i.e., moving base station 32 is coupled to elevator 31, which moves relative to earth*) and in accordance with an anticipated motion of the mobile unit (*i.e., reads on a person carries the portable cordless telephone 19 and moves relative to both moving base stations 20 and 32, see Fig. 12 and the earth*), wherein an actual motion of the mobile unit (*i.e., with and within elevator 1*) is independent (*i.e., portable cordless telephone is free from elevator 31*) of the motion of the receiver (*moving base station 32*) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above.

Regarding claim 35, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (20 or 32) adapted to establish a communication link between a fixed port and mobile unit (19) while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit (***i.e., reads on a person using the portable cordless telephone leaves the elevator 1***), wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (***i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile***) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claims 54, 115-118, 121-123, Yokoi teaches a movable base station (or moving communication cell) (32) adapted to have a motion relative to a fixed port (fixed

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base or central switch) along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising: a first radio interface (or gateway) adapted to establish a first communication link between the movable base station and the mobile unit (col. 7, lines 39-52); and a second radio interface adapted to establish a second communication link between the movable base station and the fixed port wherein an actual motion of the mobile unit independent of the motion of the movable base station (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile*) (col. 7, lines 39-52 and col. 8, lines 5-15).

Regarding claim 61, dependent on claim 54, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, dependent on claim 61, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (*i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55*).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (*i.e., reads on 20, 32 and 35, see Fig. 11*) having a motion relative to a plurality of fixed ports (such as fixed base 4), wherein the plurality of fixed ports are communicatively coupled to the

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communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units (i.e., reads on moving base stations 20,32 and 35, see Fig. 11) and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units station (*i.e., portable cordless telephone 19 moves within and with moving base station 20 coupled to the elevator 1, however, said portable cordless telephone moves free, i.e., said cordless telephone's motion is not due to the motion of elevator 31, which is adapted to transmit a signal to said cordless telephone when elevators 1 and 31 are moving side by side, i.e., reads on "anticipated motion" of mobile*); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 8, line5-15).

Allowable Subject Matter

4. Claims 63-82 and 97-102 are allowed.
5. Claims 50-53,55-60,90-92, 94-96 and 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K Contee whose telephone number is 703-308-

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0149. The examiner can normally be reached on M (alternating), T & Th, 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 703-305-4379. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMK
JMK
PATENT EXAMINER

JKC

October 1, 2004

Marsha D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Index of Claims



Application No.

09/401,584

Examiner

Joy K Contee

Applicant(s)

GAVRILOVICH, CHARLES D.

Art Unit

2686

√	Rejected
=	Allowed

—	(Through numeral) Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim	Date
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Search Notes

Application No.

09/401,584

Examiner

Joy K Contee

Applicant(s)

GAVRILOVICH, CHARLES D.

Art Unit

2686

SEARCHED

Class	Subclass	Date	Examiner
455	11.1,422.1 436,456.1	9/30/2004	JC
342	.106,109	9/30/2004	JC
455	updated	9/30/2004	JC
342	updated	9/30/2004	JC

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
Appeal Conference with Marsha Banks-Harold & Ed Urban	10/1/2004	JC



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DIVISION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

2004 JUL -9 PM 2: 25

In re Application of:

Charles D. Gavrilovich

Serial No.: 09/401,584

Filed: September 22, 1999

For: **MOBILE COMMUNICATION SYSTEM
WITH MOVING BASE STATION**

Examiner: Joy K. Contee

Group No.: 2681

Docket No. Gavrilovich P1US2

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date July 1, 2004, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

July 1, 2004
Date

[Signature]
Signature

By: Charles D. Gavrilovich, Jr.

REQUEST FOR REFUND UNDER 37 CFR 1.26

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I hereby request a refund of \$345.00, for extension fees, plus the \$25.00 surcharge incorrectly charged to my Deposit Account No. 502484 for the above-referenced patent application.

Fees in the amount of \$320.00, were incorrectly charged to my deposit account for a three month time of extension fee for a Notice of Appeal filed after an Advisory Action. As stated in MPEP 714.13, when an applicant replies within two months from the date of mailing of any final rejection setting a three month shortened statutory period for reply and the Office does not mail an advisory action until after the end of 3-month period, the period of reply for purposes of determining the amount of any extension fee will be the date on which the Office mails the advisory action. In this case, a final rejection was mailed November 12, 2003, applicant filed a response after final on January 10, 2004, an advisory action was mailed April 05, 2004 and applicant filed the Notice of Appeal on May 3, 2004. Accordingly, the \$55 submitted for the one month extension of time with the Notice of Appeal was the correct fee. A fee of 320.00 was charged to my account on May 12, 2004 indicating fee code 2253 and referencing the above-

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Application No: 0940584
Filed: 9/22/1999

PATENT MAINTENANCE
DIVISION

referenced application. Further, a \$25 service charge was charged to my deposit account on May 18, 2004. I have enclosed a copy of my monthly Statement of Deposit Account, a copy of the Notice of Appeal; and a copy of the postcard indicating the date of receipt of ~~the~~ Notice of Appeal. PM 2: 25

Applicant respectfully requests a credit of \$345.00 to Deposit Account No. 502484, which is the amount charged for the extension of time fees charged in error plus the \$25.00 service charge imposed on my Deposit Account. A duplicate copy of this request is enclosed for accounting purposes.

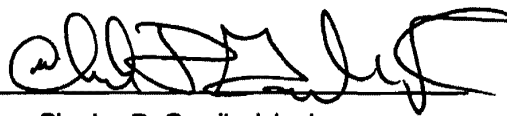
If a telephone conference would be useful, please contact the undersigned at the number listed below.

Respectfully submitted,

Date:

July 1, 2004

By:

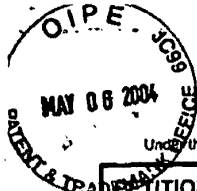


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Reg. No. 41,031

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2004 JUL -9 PM 2:25

PATENT MAINTENANCE
DIVISION



#17
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PTO/SB/22 (08-03)
Approved for use through 7/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional)	
In re Application of Charles D. Gavrilovich			
Application Number 09/401,584		Filed Sept. 22, 1999	
For MOBILE COMMUNICATION SYSTEM WITH MOVING			
Art Unit 2686		Examiner Joy K. Contee	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

☒ One month (37 CFR 1.17(a)(1))	\$ <u>110.00</u>
☐ Two months (37 CFR 1.17(a)(2))	\$ _____
☐ Three months (37 CFR 1.17(a)(3))	\$ _____
☐ Four months (37 CFR 1.17(a)(4))	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$ _____

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: \$ 55.00.

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 502484.

I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ 24 attorney/agent of record. Registration Number 41,031

☐ attorney or agent under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a) _____

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

May 03, 2004 Date

Charles D. Gavrilovich, Jr. Signature

619 271 0382 Telephone Number

Charles D. Gavrilovich, Jr. Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

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Adjustment date: 08/30/2004 EEKUBAY1
05/12/2004 LBADIE 00000003 502484 09401584
01 FC:2253 320.00 CR



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich

Serial No.: 09/401,584

Filed: September 22, 1999

For: **MOBILE COMMUNICATION SYSTEM
WITH MOVING BASE STATION**

Examiner: Joy K. Contee

Group No.: 2681

Docket No. Gavrilovich P1US2

RECEIVED

JUL 09 2004

CERTIFICATION UNDER 37 CFR § 1.8

Technology Center 2600

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date June 30, 2004, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Date

June 30, 2004

Signature

By: Charles D. Gavrilovich, Jr.

Mail Stop Appeal Briefs – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPELLANT'S APPEAL BRIEF UNDER 37 CFR §1.192

In accordance with the Notice of Appeal to the Board of Patent Appeals and Interferences mailed May 3, 2004 and received on May 6, 2004, in the above-identified U.S. Patent application, Appellant hereby presents the Appellant's Appeal Brief under 37 CFR §1.192 (b). The APPELLANT'S APPEAL BRIEF is submitted in triplicate along with three copies of each reference discussed, three copies of the Final Office Action and three copies of the Advisory Action as well as the appropriate fees.

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Appeal_06-30-04

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REAL PARTY IN INTEREST

Carucel Investments Limited Partnership of Naperville, Illinois, is the real party in interest as the assignee of the above-identified application.

RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known which will be affected by this appeal.

STATUS OF CLAIMS

The application under appeal includes pending claims 30-36, 49-82, 89-111 and 113-123. In the Advisory Action, the Examiner has provided the following status of the claims. Claims 63-82 and 97-102 are allowed. Claims 50-53, 90-92, 94-96, 104-106, 114-117, and 120-123 are objected to. Claims 30-36-49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119 are rejected.

Claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, 113, 118, and 119 stand rejected under 35 USC §102(b) as being anticipated by Yokoi et al. (US 5,282,239).

Claims 55 and 56 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Charas et al (5,404,570).

Claim 57 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Ishikawa et al. (US 5,969,614).

Claims 59-60 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Barkats (US 5,615,407).

STATUS OF AMENDMENTS

In the Advisory Action mailed April 05, 2004, the Examiner has indicated that the latest amendments submitted in the "Response After Final Rejection" mailed January 10, 2003 have been entered.

SUMMARY OF THE INVENTION

The present invention is directed to methods and devices for providing communication services to moving mobile units such as telephones, radio modems, or other types of radios. In the exemplary embodiment discussed in the specification, a movable base station travels along a predetermined path and in accordance with an anticipated motion of one or more mobile units. The mobile units may be located within vehicles traveling along a roadway and the movable

base stations may be guided along a rail or other conveying device next to the roadway. By receiving and/or transmitting signals while moving next to the roadway, the movable base station provides a moving communication cell to one or more mobile units traveling on the roadway. In the exemplary embodiment, the movable base stations also communicate with fixed ports that are distributed along the predetermined path and connected to other communication infrastructure. The movable base station, therefore, exchanges signals with the fixed ports that correspond to the signals exchanged with the mobile units.

In accordance with certain features of the exemplary embodiment, the speed of the movable base stations may be adjusted to more closely follow the general flow of roadway traffic and the motion of one or more mobile units. In some embodiments, the movable base stations maintain a constant speed that is selected based on the expected speed of mobile units.

In some embodiments, the movable base stations are located within designated vehicles traveling along the roadway in the same general direction as the mobile units. In other embodiments, the movable base stations are guided along railway that follows the contour of the roadway. The movable base stations, therefore, are moved along path that follows the anticipated motion of the mobile units. The actual motion of the mobile unit, however, is independent to the motion of the movable base station. For example, a vehicle containing a mobile unit may speed up, slow down, turn, or otherwise move independently to the motion of the movable base station.

The exemplary embodiments overcome the problems of conventional communication systems where, due to tradeoffs between mobile unit speed, base station capacity, and available bandwidth to a user, truly broadband communication links are not available to mobile units traveling at speeds greater than 30 mile per hour. Typical methods for providing more bandwidth to a user require smaller communication cells to take advantage of frequency reuse. As the size of the cells is reduced, however, the mobile unit tends to cross cell boundaries more often, requiring a large number of handoffs to the point that the calls will be dropped if the mobile units are traveling at high vehicular speeds. As the speed of the user increases, the processing and resources required to complete handoffs in a small cell system becomes prohibitive to communications. The exemplary embodiments of the invention, however, overcome this problem by providing a relatively smaller communication cell that tracks the expected motion of the mobile unit. The numbers of handoffs in the exemplary embodiments are minimized since the mobile units stay within moving cells. Among other benefits, therefore, the

present invention allows the exploitation of the advantages of a small cell architecture and frequency reuse with minimal consequences.

ISSUES

Appellant wishes the Board of Patent Appeals and Interferences to review the following issues on appeal:

1) Whether the rejection of any of claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, 113, 118, and 119 under 35 U.S.C. §102(b) as being anticipated by Yokoi et al. (US 5,282,239) was proper.

2) Whether the rejection of any of claims 55 and 56 under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Charas et al (5,404,570) was proper.

3) Whether the rejection of any of claims 59-60 under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Barkats (US 5,615,407) was proper.

GROUPING OF CLAIMS

It is applicant's position that claims 30-36, 49, 54, 61, 62, 89, 93, 103, and 113, 118, and 119 (Group1) stand or fall together, claims 55-57 (Group 2) stand and fall together, claims 59-60 (Group 3) stand or fall together and that claim 58 is separately patentable.

CITED REFERENCES

Yokoi

Yokoi et al. (US 5,282,239) ("Yokoi") describes a cordless telephone system where portable coreless telephones 2 within an elevator car 1 communicate with a moving-conveyance base station 10 mounted on the elevator car 1. The moving-conveyance base station 10 is coupled to a central switch 5 by wires running parallel to the elevator cable that supports the elevator 1.

Charas

Charas et al. (US 5,404,570) ("Charas") describes a repeater system 100 that provides communications links to mobile units 102 in a closed environment 104, such as a tunnel, that is substantially closed off to high frequency communication between the mobile unit 102 and a

Base Transceiver Station (BTS) 106. The BTS 106 is connected to a first two-way frequency converter 108 that provides an interface between the high frequency signals used by the BTS 106 and low frequency signals that are transmitted and received in the tunnel 104 through a radiating transmission cable 110. A second two-way frequency converter 116 mounted on a vehicle 114, such a train car, provides an interface between the low frequency signals exchanged with the radiating transmission cable 110 and high frequency signals used by the mobile unit 102 within the vehicle 114. Accordingly, the frequency band used for communicating between the second frequency converter 116 and the BTS 104 (through the first frequency converter 108) is different than the frequency band used for communicating between the second frequency converter 116 and the mobile unit 102. Charas teaches to use low frequency communications between the second frequency converter 116 and the cable 110 where the "low frequency" is "in the range of 30 to 300 megahertz." Column 3, lines 17-18. Further, Charas points out that "it should be readily apparent that a typical mobile unit is not capable of operating in this frequency range, and cannot directly take advantage of such a signal." (Column 3, lines 61-65).

Barkats

Barkats (US 5,615,407) ("Barkats") describes a geostationary satellite system where signals are transmitted "laterally" between geostationary satellites 2 and 3 at one frequency and other signals are transmitted to earth stations 1 at another frequency. Barkats explicitly suggests to use frequencies between 30 GHz and 50 GHz for the lateral transmissions between satellites 2 and 3.

ARGUMENT

Applicant respectfully submits that claims 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119 are allowable over the art cited by the Examiner. Each of the issues presented for review are addressed below.

102(b) Rejection - Yokoi

Claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, 113, 118, and 119 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi. Applicant respectfully submits that these claims are allowable over the art cited. Claims 30-36, 49, 54, 61, 62, 89, 93, 103, 113, 118, and 119 (Group 1) are addressed immediately below followed by arguments regarding claim 58.

Applicants respectfully submit that the claims as presented are allowable over the art cited by the examiner. A rejection of a claim for anticipation requires that a single anticipating reference include, within its four corners, all of the elements, limitations, and relationships therebetween of the rejected claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants respectfully submit that each and every element recited in any one of the claims of Group 1 is not found in Yokoi.

Each of the claims in Group 1 refer either to a receiver, a transmitter, a movable base station, or a moving communication cell that "has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the" receiver, transmitter, movable base station or moving communication cell. Referring to claim 30 as a representative claim of the claims of Group 1, claim 30 recites a "transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not describe all of the limitations of this claim. For example, Yokoi does not disclose that the "actual motion of a mobile unit is independent of the motion of the transmitter". In Yokoi, the motion of a portable cordless phone depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Although the portable cordless phone may be moved within the elevator relative to the motion of the moving-conveyance base station, the motion of the portable cordless phone is dependent on the motion of the elevator and, therefore, also dependent on the motion of the moving-conveyance base station. **If the elevator moves, at least a component of the motion of the portable cordless phone will be due to the motion of the elevator.** If the user of the portable cordless phone is moving within the elevator and the elevator is going down, for example, the motion of the portable cordless phone will also have a motion with a downward component. Accordingly, Yokoi does not show that an actual motion of a mobile unit is "independent" of the motion of a transmitter as claimed.

In addressing applicant's response to the Final Rejection, the Examiner maintained that the "actual motion" of the mobile unit is independent of the motion of the transmitter and stated that "the transmitter does not control the 'actual motion' of the mobile unit, e.g., within the elevator the mobile unit is free to move." See Advisory Action page 2 (Continuation Sheet). Applicant has never maintained that the transmitter in Yokoi "controls" the motion of the mobile unit. Applicant respectfully submits that, in Yokoi, the motion of the cordless portable phone is not **independent** to the motion of the elevator since any motion of the elevator is conveyed to the cordless portable phone. The fact that the user may move within the elevator, does not make the "actual motion" of the portable phone independent to the motion of the elevator. As explained above, if the elevator moves, the cordless portable phone also moves.

Therefore, Yokoi does not show a transmitter, receiver, movable base station, or moving communication cell that has "a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Accordingly, applicant respectfully submits that all of the limitations of each of the claims in Group 1 are not found in Yokoi and that the rejection under 35 U.S.C. §102(b) was not proper.

Rejection of claim 58 under 35 U.S.C. §102(b) – Yokoi

Claim 58 depends from claim 55 that depends from claim 54 which applicant respectfully submits is allowable. Accordingly, claim 58 is allowable as depending from an allowable base claim if claim 54 is found to be allowable. Claim 58 recites the additional limitation that the frequency band used for the first and second communication links is a millimeter wave frequency band. In rejecting claim 58 under 35 U.S.C §102(b), the Examiner cites to column 3, lines 61-63, column 4, lines 32-33 of Yokoi. (See Office Action mailed November 12, 2003, page 7, lines 13-14). Careful review of this section in Yokoi reveals no discussion of millimeter waves or any other frequencies. Nowhere, in Yokoi is a discussion of millimeter wave frequency bands. Accordingly, applicant respectfully submits that all of the limitations of claim 58 are not found in Yokoi and the rejection under 35 U.S.C. §102(b) was improper.

Rejection under 35 U.S.C. §103(a) - Yokoi in view of Charas

Claims 55, 56, 75, 76, 78, 81, and 82 were rejected in the Final Rejection mailed November 12, 2003. In the Advisory Action, the Examiner indicated that claims 75-82 are allowed. Accordingly, claims 55 and 56 stand rejected under 35 U.S.C. 103(a) as being

unpatentable over Yokoi in view of Charas. Further, claim 57 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoi in view of Ishikawa et al. (US 5,969,614).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Applicant respectfully submits that neither Yokoi, nor Charas, nor a combination of the two, teaches every element of either claim 55 or claim 56.

Claim 55 recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz". Nowhere in either reference is there a suggestion to use a single frequency band having a lower limit greater than 300 megahertz for a first communication link and for a second communication link where the first communication link is between the movable base station and the mobile unit and the second communication link is between the movable base station and the fixed port.

The Examiner admits that Yokoi does not teach that the first communication link and second communication link are established within a frequency band having a lower limit greater than 300 MHz. (See Final Office Action mailed November 12, 2003, Page 8, Item 8, lines 1-2).

Applicant submits that Charas does not teach or suggest a first communication link and a second communication that are established within a frequency band having a lower limit greater than 300 megahertz. On the contrary, Charas teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . . in the range of 30 to 300 megahertz." (column 3, lines 17-18). (Also see column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment and teaches to convert the signals to low frequency signals that can propagate through the closed environment. In Charas, the frequency band used for communicating between the mobile units and the moving two-way frequency converter is different than the frequency band used for communicating between the moving two-way frequency converter and the base station. Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55. The signals are transmitted at 200 MHz

to the moving two-way frequency converter, converted to 1500 megahertz and transmitted to the mobile units. (See column 4 lines 32-41). Applicant respectfully submits that neither Yokoi, nor Charas, nor a combination of the two, teach or suggest a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz" and that claim 55 is allowable.

Regarding claim 56, applicant respectfully submits neither Yokoi, nor Charas, nor a combination of the two, teaches or suggests a frequency band having a lower limit of 300 megahertz. For support that this limitation is shown in Charas, the Examiner cites to column 3, lines 61-63. This section states:

"Propagation of the signal within the second, closed environment can be accomplished by propagating a low radio frequency signal, preferably in the range 30-300 MHz, through either a coaxial or a bifilar conductor located within the closed environment."

In Charas, therefore, 300 MHz is an upper limit, not a lower limit, of a frequency band used for communication with the stationary frequency converter. Accordingly, applicant respectfully submits that neither Charas, nor Yokoi, nor a combination of the two, teach or suggest a movable base station in accordance with claim 56, wherein "the frequency band has a lower limit of 300 megahertz" and that claim 56 is allowable.

Regarding claim 57, this claim depends from claim 55, which applicant submits is allowable. Accordingly, applicant respectfully submits that claim 57 is allowable as depending from an allowable base claim.

Rejection under 35 U.S.C. §103(a) - Yokoi in view of Barkats

In the Final Office Action, the Examiner rejected claims 59, 60, 79 and 80 under 35 U.S.C. §103(a) as unpatentable over Yokoi in view of Barkats. In the Advisory Action the Examiner has indicated that claims 63-82 and 97-102 are allowed. Accordingly, claims 59 and 60 stand rejected under 35 U.S.C. §103(a).

Regarding claims 59 and 60, applicant respectfully submits that neither Yokoi, nor Barkats, nor a combination, of the two teach or suggest every element of each of these claims. As admitted by the Examiner, Yokoi does not teach or suggest the use of frequency spectrum comprising a frequency spectrum from 50 gigahertz to 70 gigahertz. (See Final Office Action

mailed November 12, 2003, Page 10, lines 12-14). Barkats teaches the use of the frequency band between 30 GHZ to 50 GHZ and does not teach or suggest using a frequency spectrum from 50 gigahertz to 70 gigahertz. The Examiner stated that "[i]nherently a greater range would be available, e.g. 50 GHZ to 70GHZ." Applicant submits that the frequency spectrum from 50 gigahertz to 70 gigahertz is not a greater range of the frequency band from 30 GHz to 50 GHz. The frequency spectrum from 50 gigahertz to 70 gigahertz includes the frequencies from 50 GHZ to 70 GHZ and is a distinct, non-overlapping, frequency spectrum as compared to the frequency band from 30 GHZ to 50 GHZ.

Therefore, neither Barkats, nor Yokoi, nor a combination of the two teach or suggest using the frequency spectrum from 50 to 70 gigahertz. Applicant respectfully submits that the rejection of claims 59 and 60 was improper.

Conclusion

Claims 30-36, 49-82, 89-111 and 113-123 are now pending in the application. Applicant respectfully submits that the pending-claims are allowable and that the case is in a condition for allowance.

Date:

June 30, 2004

Respectfully submitted,

By:



Charles D. Gavrilovich, Jr.
Reg. No. 41,031

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APPENDIX

30. A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter.

31. A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received from a fixed radio port at a receiver communicatively coupled to the transmitter.

34. A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver.

35. A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

49. A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

54. A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:
a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and
a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

55. A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

89. A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and

transmitting the signal to the mobile unit.

93. A method of receiving a signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver, and

receiving the signal at the receiver.

103. A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

113. A communication system configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell.

118. A communication system in accordance with claim 113, the communication system comprising:



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

7590

04/05/2004

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985 PASEO LA CRESTA
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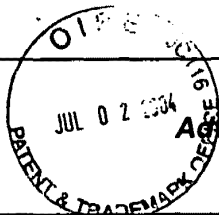
EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT	PAPER NUMBER
2686	/6

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



Advisory Action

Application No. 09/401,584	Applicant(s) Gavrilovich	
Examiner Joy K Contee	Art Unit 2686	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 13 November 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
- b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) ☐ they raise the issue of new matter (see Note below);
 - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____

3. ☐ Applicant's reply has overcome the following rejection(s): _____.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: 63-82 and 97-102.

Claim(s) objected to: 50-53, 90-92, 94-96, 104-106, 114-117 and 120-123.

Claim(s) rejected: 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119.

Claim(s) withdrawn from consideration: _____.

8. ☐ The drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.
10. ☐ Other: _____

Marsha D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Continuation of 5. does NOT place the application in condition for allowance because: after careful reconsideration, with respect to Yokio et al., 5,282,239, Examiner maintains that the "actual motion" of the mobile unit is independent of the motion of the transmitter. Hence the transmitter does not control the "actual motion" of the mobile unit, e.g., with in the elevator the mobile unit is free to move. Further, Applicant argues that "at least a component of the motion....will be due to the motion of the elevator. However, this limitation is not in the claims.


JOY K. CONTEE
PATENT EXAMINER
7/30/01 41

Interview Summary

09/401,584

Gavrilovich

Examiner

Art Unit

Joy K Contee

2686

All participants (applicant, applicant's representative, PTO personnel):

(1) Joy K Contee. (3) _____(2) Mr. Charles Gavrilovich, Jr.. (4) _____Date of Interview: 09 February 2004.Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal (copy given to: 1) ☐ applicant 2) ☐ applicant's representative)Exhibit shown or demonstration conducted: d) ☐ Yes e) ☐ No.
If Yes, brief description: _____

Claim(s) discussed: _____

Identification of prior art discussed: _____

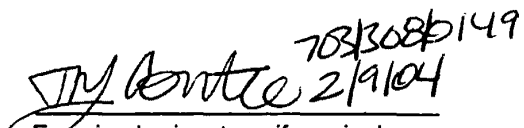
Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Examiner informed Mr. Gavrilovich, Jr. that claims 89 and 93 did not contain the limitation "actual motion". Examiner informed Mr. Gavrilovich that a new nonfinal action or a notice of allowance would be forwarded shortly.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

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2/9/04
Examiner's signature, if required



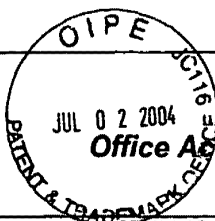
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845
7590	11/12/2003			
LAW OFFICE OF CHARLES D. GAVRILOVICH, JR. 985 PASEO LA CRESTA SUITE A CHULA VISTA, CA 91910-6729			EXAMINER CONTEE, JOY KIMBERLY	
			ART UNIT 2686	PAPER NUMBER

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



Office Action Summary	Application No. 09/401,584	Applicant(s) GAVRILOVICH, CHARLES D.	
	Examiner Joy K Contee	Art Unit 2686	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☒ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-36 and 49-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-82 and 97-102 is/are allowed.
- 6) ☒ Claim(s) 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) ☐ Other: _____

DETAILED ACTION

1. This is in response to the Applicant's amendments and arguments received August 6, 2003 in which claims 113-123 have been added. Claims 30-36 and 49-123 are currently pending.

Response to Arguments

2. Applicant's arguments filed August 6, 2003 have been fully considered but they are not persuasive. Regarding claims 30-36, 49,83-88 and 107-112, Examiner maintains the rejection applied by Examiner Gelin in the May 15, 2003 detailed office action.

With respect to Applicant's arguments against the rejections under 35 USC 112, Examiner asserts that it is not found in the background of the disclosure, reference to a numerical quantity or range associated with number of mobile users per square kilometers. Regardless of what is "well known", for example, Applicant argues that "the number of users per cell site to increase the bandwidth per channel" is well known, a exact number is not inherent and can not be assumed from specification.

In light of the amendments to claims 30-36 and 49, filed August 6, 2003, Examiner can not find a clear distinction between an "actual motion" and the "anticipated motion" of the mobile unit. If the "anticipated motion" is along the predetermined path, what is the "actual motion"? Is it not the user carrying the mobile unit around within the space of the elevator or outside of the elevator in Yokoi? Examiner asserts that this "carrying" movement or motion of the mobile unit is independent of that motion.

Regarding claims 55 and 56 Examiner maintains that Charas teaches a base station having a frequency converter that transmits and receives RF information in the 1500 MHZ which is greater than 300 MHZ (col. 4, lines 6-11, col. 5, lines 24-34). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the technique of Charas within the system of Yokoi in order to transmit and receive the high RF signal to a communication unit inside a vehicle, and synchronize the output frequencies of the high RF signal and low RF signal and avoid interference if two or more vehicles are close to each other and are receiving signals from the same base station.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 83-88 and 107-112 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

After reading the specification, the Examiner does not find a specific passage that corresponds to limitations of claims 83-85. For instance, claim 83 recites a communication system adapted to simultaneously provide a communication channel

having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer. This limitation is nowhere to be found in the specification.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

----- A person shall be entitled to a patent unless-----

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 30-36, and 49, 54, 58, 61, 62, 89, 93, and 103,113-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi et al (US 5,282,239).

Regarding claims 30,113 and 119, Yokoi teaches a transmitter and (method of) moving communication cell (i.e., within moving base station 10 or 20) adapted to transmit a signal to a mobile unit (i.e., portable telephone 2 or 19) while the transmitter and moving communication cell (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the transmitter and moving communication cell is controlled (i.e.,

typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above."

Regarding claims 31, 114 and 120, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 34, Yokoi teaches a receiver (i.e., within moving base station 10 or 20) adapted to receive a signal to a mobile unit (i.e., portable telephone 2 or 19) while the receiver (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the receiver is

controlled (i.e., typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above."

Regarding claim 35, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (10, 20) adapted to establish a communication link between a fixed port (4) and mobile unit (2) while the movable base station has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claims 54, 115-118, 121-123, Yokoi teaches a movable base station (or moving communication cell) (10 or 20) adapted to have a motion relative to a fixed port (fixed base or central switch) along a predetermined path and in accordance with an anticipated motion of a mobile unit (col. 4, lines 37-59), comprising: a first radio interface (or gateway) adapted to establish a first communication link between the movable base station and the mobile unit (i.e., moving base in communication with the portable telephone 2, col. 4, lines 44-47); and a second radio interface adapted to establish a second communication link between the movable base station and the fixed port (typically user of the mobile can move the base station by the press of a button in the conveyance, and col. 4, lines 40-44), wherein the motion of the movable base station is independently controllable to the motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claim 58, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

Regarding claim 61, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (such as

portable telephone 2) having a motion relative to a plurality of fixed ports (such as fixed base 4), wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units (col. 4, lines 37-59); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 7, line 21 to col. 8, line 15).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 55, 56, 75, 76, 78, 81, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570).

Regarding claim 55, Yokoi teaches all the limitations above except wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

However, the preceding limitation is known in the art of communications. Charas teaches a base station having a frequency converter that transmits and receives RF information in the 1500 MHZ which is greater than 300 MHZ (col. 4, lines 6-11, col. 5, lines 24-34). Therefore, it would have been obvious to one of ordinary skill in the art, at

the time the invention was made, to implement the technique of Charas within the system of Yokoi in order to transmit and receive the high RF signal to a communication unit inside a vehicle, and synchronize the output frequencies of the high RF signal and low RF signal and avoid interference if two or more vehicles are close to each other and are receiving signals from the same base station.

Regarding claim 56, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claims 75, 81, and 82, Yokoi in view of Charas teaches all the limitations above. Yokoi further teaches a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports (col. 5, lines 47-62, col. 7, lines 21-38).

Regarding claim 76, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claim 78, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

9. Claims 57, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Ishikawa.

Regarding claims 57, 77, Yokoi teaches all the limitations except wherein the frequency band is an optical frequency band.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Ishikawa teaches an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include operation using optical frequency band for the purpose of using signal light waves of some sort in order to transmit from the transmitter to the repeater and to the receiver in a situation where a line of sight communication path is available.

10. Claims 59-60, 79, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Barkats.

Regarding claims 59, 60, 79, and 80, Yokoi teaches all the limitations except wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats teaches a satellite (i.e., repeaters) communication using a range of available frequencies from 30 GHZ to 50 GHZ (col. 4, lines 15-20).

Inherently a grater range would be available, e.g., 50 GHZ to 70 GHZ. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Yokoi to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

Allowable Subject Matter

11. Claims 63-74, and 97-102 are allowed.
12. Claims 50-53, 90-92, 94-96, 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

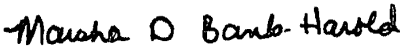
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy Contee whose telephone number is 703.308.0149. The examiner can normally be reached on 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-306-0377.


Joy Contee
November 5, 2003


MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600



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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	09/401,584	
	Filing Date	Sep 22, 1999	
	First Named Inventor	Gavrilovich, Charles D.	
	Art Unit	2681	
	Examiner Name	Joy Contee	
Total Number of Pages in This Submission	206	Attorney Docket Number	Gavrilovich-P1US2

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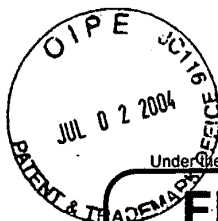
ENCLOSURES (check all that apply)		
☒ Fee Transmittal Form	☐ Drawing(s)	☐ After Allowance communication to Group
☒ Fee Attached	☐ Licensing-related Papers	☐ Appeal Communication to Board of Appeals and Interferences
☐ Amendment / Reply	☐ Petition	☒ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Power of Attorney, Revocation Change of Correspondence Address	☐ Status Letter
☐ Extension of Time Request	☐ Terminal Disclaimer	☒ Other Enclosure(s) (please identify below):
☐ Express Abandonment Request	☐ Request for Refund	Itemized postcard; 3 copies of each of 3 references; 3 copies Final Office Action; 3 copies Advisory Action
☐ Information Disclosure Statement	☐ CD, Number of CD(s) _____	
☐ Certified Copy of Priority Document(s)	Remarks	
☐ Response to Missing Parts/ Incomplete Application		
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Charles D. Gavrilovich, Jr., A Professional Corporation
Signature	
Date	June 30, 2004

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.		
Type or printed name	Charles D. Gavrilovich, Jr.	
Signature		Date
		June 30, 2004

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 165.00)

Complete if Known

Application Number 09/401,584
Filing Date Sept 22, 1999
First Named Inventor Gavrilovich, Charles D.
Examiner Name Joy K. Contee
Art Unit 2681
Attorney Docket No. Gavrilovich-P1US2

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METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number 502484
Deposit Account Name

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	165.00
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 165.00)

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$ 0)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent Claims	-3** =	X	

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ 0)

**or number previously paid, if greater; For Reissues, see above

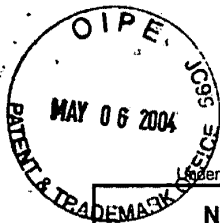
SUBMITTED BY

Name (Print/Type) Charles D. Gavrilovich, Jr. Registration No. 41,031 Telephone 619 271 0382
Signature [Signature] (Attorney/Agent) Date June 30, 2004

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This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**NOTICE OF APPEAL FROM THE EXAMINER TO
THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Docket Number (Optional)
Gavrilovich-P1US2

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450"

on May 03, 2004
Signature [Signature]

Typed or printed name Charles D. Gavrilovich, Jr.

In re Application of
Charles D. Gavrilovich

Application Number
09/401,584

Filed
9/22/1999

For Mobile Communication System With Moving Base Station

Art Unit
2681

Examiner
Joy Contee

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 1.17(b))

\$ 330.00

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is:

\$ 165.00

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge any fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 502484. I have enclosed a duplicate copy of this sheet.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 41031

☐ attorney or agent acting under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a): _____

[Signature]
Signature

Charles D. Gavrilovich, Jr.
Typed or printed name

619 271 0382
Telephone number

May 03, 2004
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.191. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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01 FC-2401



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich

Group No.: 2681

Serial No.: 09/401,584

Examiner: Joy Contee

Filed: September 22, 1999

Docket No. Gavrilovich P1US2

For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date May 03, 2004, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Date

Signature

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Commissioner for Patents
P.O. Box 1450
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Sir:

NOTICE OF APPEAL

In response to the Advisory Action dated April 05, 2004, applicant is filing a Notice of Appeal. This Notice of Appeal is being filed within one month of the mailing of the Advisory Action and a petition and a fee for one month extension of time are filed herewith. If, however, it is determined that additional fees are due, the Commissioner is hereby authorized to charge Deposit Account Number 502484.

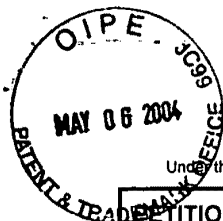
Respectfully submitted,

Date:

By:

Charles D. Gavrilovich, Jr.
Reg. No. 41,031

Charles D. Gavrilovich, Jr.
A Professional Corporation
985 Paseo La Cresta, Suite A
Chula Vista, CA 91910
Phone: 619 271 0382
FAX: 619 271 0383



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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional)										
In re Application of Charles D. Gavrilovich												
Application Number 09/401,584		Filed Sept. 22, 1999										
For MOBILE COMMUNICATION SYSTEM WITH MOVING												
Art Unit 2686		Examiner Joy K. Contee										
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application. The requested extension and appropriate non-small-entity fee are as follows (check time period desired): <table><tr><td>☒ One month (37 CFR 1.17(a)(1))</td><td>\$ 110.00</td></tr><tr><td>☐ Two months (37 CFR 1.17(a)(2))</td><td>\$</td></tr><tr><td>☐ Three months (37 CFR 1.17(a)(3))</td><td>\$</td></tr><tr><td>☐ Four months (37 CFR 1.17(a)(4))</td><td>\$</td></tr><tr><td>☐ Five months (37 CFR 1.17(a)(5))</td><td>\$</td></tr></table> ☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: \$ 55.00 ☒ A check in the amount of the fee is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 502484 I have enclosed a duplicate copy of this sheet. I am the ☐ applicant/inventor. ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96). 05/12/2004 LBADIE 00000003 ☒ 24 attorney/agent of record. Registration Number 41,031 01 FC:2253 320.00 DA ☐ attorney or agent under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a) WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. <u>May 03, 2004</u> Date <u>[Signature]</u> Signature 619 271 0382 Telephone Number Charles D. Gavrilovich, Jr. Typed or printed name NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below. ☐ Total of forms are submitted.			☒ One month (37 CFR 1.17(a)(1))	\$ 110.00	☐ Two months (37 CFR 1.17(a)(2))	\$	☐ Three months (37 CFR 1.17(a)(3))	\$	☐ Four months (37 CFR 1.17(a)(4))	\$	☐ Five months (37 CFR 1.17(a)(5))	\$
☒ One month (37 CFR 1.17(a)(1))	\$ 110.00											
☐ Two months (37 CFR 1.17(a)(2))	\$											
☐ Three months (37 CFR 1.17(a)(3))	\$											
☐ Four months (37 CFR 1.17(a)(4))	\$											
☐ Five months (37 CFR 1.17(a)(5))	\$											

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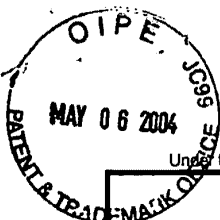
This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/401,584	
	Filing Date	Sep 22, 1999	
	First Named Inventor	Gavrilovich, Charles D.	
	Art Unit	2681	
	Examiner Name	Joy Contee	
Total Number of Pages in This Submission	5	Attorney Docket Number	CARU3000

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ENCLOSURES (check all that apply)		
☒ Fee Transmittal Form ☒ Fee Attached ☐ Amendment / Reply ☐ After Final ☐ Affidavits/declaration(s) ☒ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Response to Missing Parts/Incomplete Application ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53	☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____	☐ After Allowance communication to Group ☐ Appeal Communication to Board of Appeals and Interferences ☒ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☒ Other Enclosure(s) (please identify below): Itemized postcard
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Charles D. Gavrilovich, Jr., A Professional Corporation		
Signature			
Date	May 03, 2004		

CERTIFICATE OF TRANSMISSION/MAILING

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Type or printed name	Charles D. Gavrilovich, Jr.		
Signature		Date	May 03, 2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

7590

04/05/2004

LAW OFFICE OF CHARLES D. GAVRILOVICH, JR.
985 PASEO LA CRESTA
SUITE A
CHULA VISTA, CA 91910-6729

EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT	PAPER NUMBER

2686

16

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action	Application No. 09/401,584	Applicant(s) Gavrilovich	
	Examiner Joy K Contee	Art Unit 2686	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 13 November 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
- b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
 - (b) ☐ they raise the issue of new matter (see Note below);
 - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____

3. ☐ Applicant's reply has overcome the following rejection(s): _____.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: 63-82 and 97-102.

Claim(s) objected to: 50-53, 90-92, 94-96, 104-106, 114-117 and 120-123.

Claim(s) rejected: 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119.

Claim(s) withdrawn from consideration: _____.

8. ☐ The drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.
10. ☐ Other: _____

MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Continuation of 5. does NOT place the application in condition for allowance because: after careful reconsideration, with respect to Yokio et al., 5,282,239, Examiner maintains that the "actual motion" of the mobile unit is independent of the motion of the transmitter. Hence the transmitter does not control the "actual motion" of the mobile unit, e.g., with in the elevator the mobile unit is free to move. Further, Applicant argues that "at least a component of the motion....will be due to the motion of the elevator. However, this limitation is not in the claims.

J. K. Contee
JOY K. CONTEE
PATENT EXAMINER
7/308-0149

Interview Summary	Application No.		Applicant(s)	
	09/401,584		Gavrilovich	
	Examiner		Art Unit	
	Joy K Contee		2686	

All participants (applicant, applicant's representative, PTO personnel):

(1) Joy K Contee. (3) _____.

(2) Mr. Charles Gavrilovich, Jr. (4) _____.

Date of Interview: 09 February 2004.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☐ No.

If Yes, brief description: _____.

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Examiner informed Mr. Gavrilovich, Jr. that claims 89 and 93 did not contain the limitation "actual motion". Examiner informed Mr. Gavrilovich that a new nonfinal action or a notice of allowance would be forwarded shortly.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

785/08249
2/9/04
J. Contee
Examiner's signature, if required



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Charles D. Gavrilovich

Group No.: 2681

Serial No.: 09/401,584

Examiner: Joy Contee

Filed: September 22, 1999

Docket No. Gavrilovich P1US2

For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date January 10, 2004, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

January 10, 2004
Date

[Signature]
Signature

RECEIVED

JAN 15 2004

Technology Center 2600

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT AFTER FINAL REJECTION

In response to the Final Office Action dated November 12, 2003, please amend the claims as indicated on the following pages. The amendments will place the application in better form for appeal. The "Remarks" begin on page 14. No fees are due with this response. If, however, it is determined that fees are due, the Commissioner is hereby authorized to charge Deposit Account Number 502484.

PLEASE ENTER

IN THE CLAIMS

Please enter the following rewritten claims:

CANCEL CLAIMS 1-29

30. (Previously Amended): A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter.

31. (Original): A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

E1 32. (Original): A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. (Previously Amended): A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received from a fixed radio port at a receiver communicatively coupled to the transmitter.

34. (Previously Amended): A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver.

35. (Original): A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. (Original): A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

37 - 48 (Previously Cancelled)

49. (Previously Amended): A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

50. (Original): A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

E1 52. (Previously Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Previously Amended): A movable base station in accordance with claim 52, wherein the motion of the movable base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Previously Amended): A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station.

55. (Previously Amended): A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original): A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Previously Amended): A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original): A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Previously Amended): An apparatus adapted to move in accordance with a movement of a mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original): An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended): An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original): An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original): An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

E1 72. (Original): An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. (Original): An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original): An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

a first wireless communication link between the at least one fixed radio port and the receiver; and

a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended): An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

E1

76. (Original): An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Previously Amended): An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second fixed radio port of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original): An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83-88. (Cancelled).

89. (Previously Amended): A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter; and

transmitting the signal to the mobile unit.

E I

90. (Previously Amended): A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original): A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;

and

adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original): A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;

calculating an average speed of a plurality of mobile units traveling along the roadway; and

adjusting the speed of the transmitter in accordance with the average speed.

93. (Previously Amended): A method of receiving a signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:
controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the receiver, and
receiving the signal at the receiver.

94. (Original): A method in accordance with claim 93, wherein the step of controlling comprises the steps of:
moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. (Original): A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:
observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original): A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:
moving the receiver next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended): A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

moving a movable base station in accordance with the motion of the mobile unit;

receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

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98. (Original): An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original): A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original): A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original): A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original): A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

107 – 112. Cancelled.

113. (Previously Added): A communication system configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell.

114. (Previously Added): A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. (Previously Added): A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. (Previously Added): A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

117. (Previously Added): A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

118. (Previously Added): A communication system in accordance with claim 113, the communication system comprising:

a moving base station configured to exchange mobile unit signals with a plurality of mobile units within a moving geographical area defined by the moving communication cell;
and

a plurality of fixed ports configured to exchange fixed port signals with the moving base station, the fixed port signals corresponding to the mobile units signals.

119. (Previously Added): A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell.

120. (Previously Added): A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

ET 121. (Previously Added): A method in accordance with claim 120, wherein the providing the moving communication cell comprises:

providing the moving communication cell from a moving base station.

122. (Previously Added): A method in accordance with claim 121, wherein the providing the moving communication cell comprises:

exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. (Previously Added): A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:

exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.

REMARKS

This paper is responsive to an Office Action dated November 12, 2003. Before this response, claims 30-36 and 49-123 were pending. The Examiner has allowed claims 63-82 and 97-102. Applicant has cancelled claims 83-88 and 107-112 in this response. Claims 30-36, 49-82, 89-111 and 113-123 are now pending. Applicant respectfully submits that the pending claims are allowable.

The Examiner rejected claims 83-88 and 107-112 under 35 U.S.C. 112, first paragraph. Applicants have cancelled claim 83-88 and 107-112.

The Examiner rejected claims 30-36, 49, 54, 58, 61, 62, 89, 93, 103, and 113-123 under 35 USC 102(b) as being anticipated by Yokoi et al (US 5,282,239) ("Yokoi"). Applicants respectfully maintain that these claims are allowable over the art cited.

Claim 30 recites a "transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the transmitter". In Yokoi, the motion of a portable cordless phone depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Although the portable cordless phone may be moved within the elevator independently to the motion of the moving-conveyance base station, the motion of the portable cordless phone is dependent on the motion of the elevator and, therefore, the motion of the moving-conveyance base station. **If the elevator moves, at least a component of the motion of the portable cordless phone will be due to the motion of the elevator.** If the user of the portable cordless phone is moving within the elevator and the elevator is going down, for example, the motion of the portable cordless phone will also have a motion with a downward component. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 30 and that this claim is allowable.

Regarding claims 31-33, these claims depend from claim 30 which applicant respectfully submits is allowable. Accordingly, claims 31-33 are at least allowable as depending from an allowable base claim.

Claim 34 recites "a receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the receiver". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 34 and that this claim is allowable.

Claims 35 and 36 depend from claim 34 which applicant respectfully submits is allowable. Accordingly, claims 35 and 36 are at least allowable as depending from an allowable base claim.

Regarding claims 49 and 54, applicant respectfully submits that Yokoi does not teach all of the limitations of either of these claims. Claims 49 and 50 recite a movable base station "wherein an actual motion of the mobile unit is independent of the motion of the movable base station". Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the movable base station". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a movable base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 49 or claim 50 and that these claims are allowable.

Claims 50-53 depend from claim 49 which applicant respectfully submits is allowable. Accordingly, claims 50-53 are at least allowable as depending from an allowable base claim.

Claims 55-62 depend from claim 54 which applicant respectfully submits is allowable. Accordingly, claims 55-62 are at least allowable as depending from an allowable base claim.

Claim 89 recites a method where a motion of a transmitter is controlled "along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "motion of a mobile unit is independent of the motion of the transmitter". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 89 and that this claim is allowable.

Claim 93 recites a method wherein "an actual motion of the mobile unit is independent of the motion of the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the receiver". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 93 and that this claim is allowable.

Claim 103 recites a method comprising the step of "establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units." Applicant respectfully submits that Yokoi does not teach this limitation. In Yokoi, the portable cordless phone within the elevator communicates with a moving-conveyance base station 10 either through a leaky coaxial cable or through an antenna when the moving-conveyance base station 10 is mounted in the elevator. In both descriptions, the moving-conveyance base station 10 is connected to the central switch through wires and not through a moving base station. (See column 3, lines 8-9 and column 4, lines 41-44). The examiner

analogized the moving base station recited in claim 103 to the fixed base 4 in Yokoi. After careful examination, however, it is clear that the communication link between the fixed base 4 and the portable cordless phones does not include a moving base station. The cordless portable phones either communicate with the fixed base 4 or with a moving conveyance base station 10. When communicating through the moving conveyance base station 10, the fixed base 4 is not used. Accordingly, the step of establishing communication link through a movable base station is not shown in Yokoi.

Claim 103 further recites "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports". Applicant respectfully submits that this step is not shown in Yokoi. As explained above, the fixed port cannot be analogized to the fixed base 4 since the moving-conveyance base station 10 does not communicate with the fixed base 4. Nowhere in Yokoi is a description of a simultaneous hand off of a plurality of mobile units from one fixed port to another where the plurality of mobile units communicates with the fixed ports through a moving base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 103 and that this claim is allowable.

Claim 113 recites a communication system where "an actual motion of the mobile unit is independent of the motion of the moving communication cell". Applicant respectfully submits that Yokoi does not teach this limitation of this claim. As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a moving communication cell. Applicant respectfully submits that Yokoi does not show all of the elements of claim 113 and that this claim is allowable.

Claims 114-118 depend from claim 113 which applicant respectfully submits is allowable. Accordingly, claims 114-118 are at least allowable as depending from an allowable base claim.

Claim 119 recites a method where "an actual motion of the mobile unit is independent of the motion of the cell". Applicant respectfully submits that Yokoi does not teach this limitation of this claim. As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is

attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a cell. Applicant respectfully submits that Yokoi does not show all of the elements of claim 119 and that this claim is allowable.

Claims 120-123 depend from claim 119 which applicant respectfully submits is allowable. Accordingly, claims 120-123 are at least allowable as depending from an allowable base claim.

The Examiner rejected claims 55, 56, 75, 76, 78, 81, and 82 under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570) ("Charas").

Regarding claim 55, this claim depends from claim 54 which applicant respectfully submits is allowable. Accordingly, claim 55 is at least allowable as depending from an allowable base claim. Further, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two, teaches or suggests every element of this claim. Claims 55 recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz". Nowhere in either reference is there a suggestion to use a single frequency band having a lower limit greater than 300 megahertz for a first communication link and for a second communication link where the first communication link is between the movable base station and the mobile unit and the second communication link is between the movable base station and the fixed port.

Applicant submits that Charas does not teach or suggest a first communication link and a second communication that are established within a frequency band having a lower limit greater than 300 megahertz. On the contrary, Charas teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . . in the range of 30 to 300 megahertz." Column 3, lines 17-18. (Also see Column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment and teaches to convert the signals to low frequency signals that can propagate through the closed environment. In Charas, the frequency band used for communicating between the mobile units and the moving two-way frequency converter is different than the frequency band used for communicating between the moving two-way frequency converter and the base station.

Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55. The signals are transmitted at 200 MHz to the moving two-way frequency converter, converted to 1500 megahertz and transmitted to the mobile units. (See column 4 lines 32-41). Applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz" and that claim 55 is allowable.

Regarding claim 56, applicant respectfully submits neither Yokoi, Charas, nor a combination of the two, teaches or suggests a frequency band having a lower limit of 300 megahertz. For support that this limitation is shown in Charas, the Examiner cites to column 3, lines 61-63. This section states:

"Propagation of the signal within the second, closed environment can be accomplished by propagating a low radio frequency signal, preferably in the range 30-300 MHz, through either a coaxial or a bifilar conductor located within the closed environment."

In Charas, therefore, 300 MHz is an upper limit, not a lower limit, of a frequency band used for communication with the non-moving base station. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest a movable base station in accordance with claim 55, wherein "the frequency band has a lower limit of 300 megahertz" and that claim 56 is allowable.

Regarding claims 75, 81, and 82, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims.

Claim 75 recites an apparatus having "a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports". Nowhere within either reference is a teaching or a suggestion to establish a communication link from a moving base station to a plurality of mobile units based on signal quality indicators corresponding to each of a plurality of signals transmitted from fixed ports. As explained above, the moving-conveyance base stations in Yokoi are connected with wires to the central station and do not directly communicate with the fixed base. Therefore, no

communication link is established between a plurality of mobile units and a fixed port based on signal quality indicators transmitted from a plurality of fixed ports. The moving-conveyance base stations are permanently connected to the same central switch. The Examiner cites to column 5, lines 47-62 and column 7 lines 21-38 for support that this element is shown. The text at column 5, lines 47-62 describes power control for a transmitter and does not suggest establishing a link between a plurality of mobile units and at least one of a plurality of fixed ports based on quality indicators transmitted corresponding to transmitted signals from the fixed ports. The text at column 7, lines 21-38 describes a method of generating a hand off request at the portable cordless unit based on a received field strength at the portable cordless phone. The text does not teach or suggest the use of a processor in an apparatus adapted to move in accordance with the movement of plurality of mobile units to establish a communication link with a fixed port based on quality indicators corresponding to signals transmitted from a plurality of fixed ports.

Charas teaches to use a coaxial cable within a closed environment for communicating with two-way frequency converters mounted on train cars and does not teach or suggest a processor within an apparatus adapted to move in accordance with the movement of plurality of mobile units that establishes a communication link with a fixed port. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 75 and that claim 75 is allowable.

Claim 81 recites an apparatus wherein the "processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators". As explained above, neither reference teaches or suggests establishing a communication link with fixed ports using a processor within an apparatus adapted to move in accordance with a movement of a plurality of mobile units. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 81 and that claim 81 is allowable.

Regarding claim 82, this claim is at least allowable as depending from an allowable base claim.

Regarding claim 76, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of this claim. Claim 76 recites "an apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300

megahertz". As explained above, Charas teaches to use a lower frequency band having an upper limit of 300 MHz for communication with the two-way frequency converters mounted in the train car. Claim 76 recites a single frequency band having a lower limit of 300 megahertz for communication between the plurality of mobile units and the apparatus and for communication between the apparatus and the fixed ports. Yokoi does not teach or suggest the use of a frequency band having lower limit of 300 megahertz. Nor does Yokoi teach or suggest communication between a moving apparatus and a plurality of mobile units and communication between the moving apparatus and a fixed port in the same frequency band. As explained above, in Yokoi, a moving-conveyance base station that is moving on an elevator does not communicate with a fixed port and is connected to the central switch with wires. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 76 and that claim 76 is allowable.

Regarding claim 78, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest the use of a millimeter wave frequency band for communication between an apparatus and a plurality of mobile units and for communication between the apparatus and a fixed port. The Examiner cites to column 4, lines 32-33 for support that this element is suggested in Yokoi. This section suggests the use of leaky wave guide for communicating with the portable cordless phones. There is no suggestion that an apparatus communicate with a fixed port using a millimeter wave frequency band. Accordingly, applicant submits that all of the elements of claim 78 are not taught or suggested in either reference and that claim 78 is allowable.

Regarding claim 77, this claim depends from claim 75 which applicant submits is allowable. Accordingly, claim 77 is at least allowable as depending from an allowable base claim.

Regarding claims 59-60, 79, and 80, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims. Yokoi does not teach or suggest the use of frequency spectrum comprising a frequency spectrum from 50 gigahertz to 70 gigahertz. Barkats teaches the use of the frequency band between 30 GHz to 50 GHz and does not teach or suggest using a frequency spectrum from 50 gigahertz to 70 gigahertz. The Examiner stated that "[i]nherently a greater range would be available, e.g. 50 GHz to 70GHz." Applicant submits that the frequency spectrum from 50

gigahertz to 70 gigahertz is not a greater range of the frequency band from 30 GHz to 50 GHz. The frequency spectrum from 50 gigahertz to 70 gigahertz includes the frequencies from 50 GHz to 70 GHz and is a distinct, non-overlapping frequency spectrum as compared to the frequency band from 30 GHz to 50 GHz.

Conclusion

Applicant has cancelled claims 83-88 and 107-112 in this response. Claims 30-36, 49-82, 89-111 and 113-123 are now pending in the application. Applicant respectfully submits that the pending claims are allowable and that the case is in a condition for allowance.

Respectfully submitted,
CHARLES D. GAVRILOVICH

Date:

January 10, 2004

By:



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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	09/401,584	
	Filing Date	Sep 22, 1999	
	First Named Inventor	Gavrilovich, Charles D.	
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	Examiner Name	Joy Contee	
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ENCLOSURES (check all that apply)		
☐ Fee Transmittal Form ☐ Fee Attached ☒ Amendment / Reply (22 pages) ☒ After Final ☐ Affidavits/declaration(s) ☐ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Response to Missing Parts/ Incomplete Application ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53	☐ Assignment Papers (for an Application) ☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) Remarks	☐ After Allowance Communication to Group ☐ Appeal Communication to Board of Appeals and Interferences ☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☐ Other Enclosure(s) (please identify below): RECEIVED JAN 15 2004 Technology Center 2600

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Charles D. Gavrilovich, Jr., A Professional Corporation
Signature	
Date	January 10, 2004

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EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT	PAPER NUMBER

2686

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/401,584		GAVRILOVICH, CHARLES D.	
	Examiner		Art Unit	
	Joy K Contee		2686	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on 06 August 2003.

2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 30-36 and 49-123 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) 63-82 and 97-102 is/are allowed.

6) ☒ Claim(s) 30-36, 49, 54-62, 83-89, 93, 103, 107, 113, 118 and 119 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892) 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.	4) ☐ Interview Summary (PTO-413) Paper No(s). _____. 5) ☐ Notice of Informal Patent Application (PTO-152) 6) ☐ Other: _____

DETAILED ACTION

1. This is in response to the Applicant's amendments and arguments received August 6, 2003 in which claims 113-123 have been added. Claims 30-36 and 49-123 are currently pending.

Response to Arguments

2. Applicant's arguments filed August 6, 2003 have been fully considered but they are not persuasive. Regarding claims 30-36, 49,83-88 and 107-112, Examiner maintains the rejection applied by Examiner Gelin in the May 15, 2003 detailed office action.

With respect to Applicant's arguments against the rejections under 35 USC 112, Examiner asserts that it is not found in the background of the disclosure, reference to a numerical quantity or range associated with number of mobile users per square kilometers. Regardless of what is "well known", for example, Applicant argues that "the number of users per cell site to increase the bandwidth per channel" is well known, a exact number is not inherent and can not be assumed from specification.

In light of the amendments to claims 30-36 and 49, filed August 6, 2003, Examiner can not find a clear distinction between an "actual motion" and the "anticipated motion" of the mobile unit. If the "anticipated motion" is along the predetermined path, what is the "actual motion"? Is it not the user carrying the mobile unit around within the space of the elevator or outside of the elevator in Yokoi? Examiner asserts that this "carrying" movement or motion of the mobile unit is independent of that motion.

Regarding claims 55 and 56 Examiner maintains that Charas teaches a base station having a frequency converter that transmits and receives RF information in the 1500 MHZ which is greater than 300 MHZ (col. 4, lines 6-11, col. 5, lines 24-34). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the technique of Charas within the system of Yokoi in order to transmit and receive the high RF signal to a communication unit inside a vehicle, and synchronize the output frequencies of the high RF signal and low RF signal and avoid interference if two or more vehicles are close to each other and are receiving signals from the same base station.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 83-88 and 107-112 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

After reading the specification, the Examiner does not find a specific passage that corresponds to limitations of claims 83-85. For instance, claim 83 recites a communication system adapted to simultaneously provide a communication channel

having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer. This limitation is nowhere to be found in the specification.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 30-36, and 49, 54, 58, 61, 62, 89, 93, and 103, 113-123 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi et al (US 5,282,239).

Regarding claims 30, 113 and 119, Yokoi teaches a transmitter and (method of) moving communication cell (i.e., within moving base station 10 or 20) adapted to transmit a signal to a mobile unit (i.e., portable telephone 2 or 19) while the transmitter and moving communication cell (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the transmitter and moving communication cell is controlled (i.e.,

typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above."

Regarding claims 31, 114 and 120, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 34, Yokoi teaches a receiver (i.e., within moving base station 10 or 20) adapted to receive a signal to a mobile unit (i.e., portable telephone 2 or 19) while the receiver (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the receiver is

controlled (i.e., typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above."

Regarding claim 35, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (10, 20) adapted to establish a communication link between a fixed port (4) and mobile unit (2) while the movable base station has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claims 54, 115-118, 121-123, Yokoi teaches a movable base station (or moving communication cell) (10 or 20) adapted to have a motion relative to a fixed port (fixed base or central switch) along a predetermined path and in accordance with an anticipated motion of a mobile unit (col. 4, lines 37-59), comprising: a first radio interface (or gateway) adapted to establish a first communication link between the movable base station and the mobile unit (i.e., moving base in communication with the portable telephone 2, col. 4, lines 44-47); and a second radio interface adapted to establish a second communication link between the movable base station and the fixed port (typically user of the mobile can move the base station by the press of a button in the conveyance, and col. 4, lines 40-44), wherein the motion of the movable base station is independently controllable to the motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claim 58, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

Regarding claim 61, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (such as

portable telephone 2) having a motion relative to a plurality of fixed ports (such as fixed base 4), wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units (col. 4, lines 37-59); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 7, line 21 to col. 8, line 15).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 55, 56, 75, 76, 78, 81, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570).

Regarding claim 55, Yokoi teaches all the limitations above except wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

However, the preceding limitation is known in the art of communications. Charas teaches a base station having a frequency converter that transmits and receives RF information in the 1500 MHZ which is greater than 300 MHZ (col. 4, lines 6-11, col. 5, lines 24-34). Therefore, it would have been obvious to one of ordinary skill in the art, at

the time the invention was made, to implement the technique of Charas within the system of Yokoi in order to transmit and receive the high RF signal to a communication unit inside a vehicle, and synchronize the output frequencies of the high RF signal and low RF signal and avoid interference if two or more vehicles are close to each other and are receiving signals from the same base station.

Regarding claim 56, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claims 75, 81, and 82, Yokoi in view of Charas teaches all the limitations above. Yokoi further teaches a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports (col. 5, lines 47-62, col. 7, lines 21-38).

Regarding claim 76, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claim 78, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

9. Claims 57, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Ishikawa.

Regarding claims 57, 77, Yokoi teaches all the limitations except wherein the frequency band is an optical frequency band.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Ishikawa teaches an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include operation using optical frequency band for the purpose of using signal light waves of some sort in order to transmit from the transmitter to the repeater and to the receiver in a situation where a line of sight communication path is available.

10. Claims 59-60, 79, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Barkats.

Regarding claims 59, 60, 79, and 80, Yokoi teaches all the limitations except wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats teaches a satellite (i.e., repeaters) communication using a range of available frequencies from 30 GHZ to 50 GHZ (col. 4, lines 15-20).

Inherently a grater range would be available, e.g., 50 GHZ to 70 GHZ. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Yokoi to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

Allowable Subject Matter

11. Claims 63-74, and 97-102 are allowed.
12. Claims 50-53, 90-92, 94-96, 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Application/Control Number: 09/401,584
Art Unit: 2681

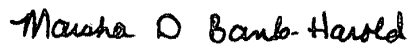
Page 12

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy Contee whose telephone number is 703.308.0149. The examiner can normally be reached on 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.


Joy Contee
November 5, 2003


MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Technology Center 2600

In re Application of:

Charles D. Gavrilovich

Group No.: 2681

Serial No.: 09/401,584

Examiner: Jean Alland Gelin

Filed: September 22, 1999

Docket No. Gavrilovich P1US2

For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date August 4, 2003, in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

August 4, 2003
Date

[Signature]
Signature

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT AND REQUEST FOR RECONSIDERATION

In response to the Office Action dated May 15, 2003, please amend the claims as indicated on the following pages. The "Remarks" begin on page 16. No fees are due with this response. If, however, it is determined that fees are due, the Commissioner is hereby authorized to charge Deposit Account Number 502484.

IN THE CLAIMS

Please enter the following rewritten claims:

30. (Currently Amended): A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter ~~is controlled independently to the anticipated motion of the mobile unit.~~

31. (Original): A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. (Original): A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. (Currently Amended): A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received ~~at the transmitter~~ from a fixed radio port at a receiver communicatively coupled to the transmitter.

34. (Currently Amended): A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver ~~is controlled independently to the anticipated motion of the mobile unit.~~

35. (Original): A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. (Original): A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

37 - 48 (Previously Cancelled)

49. (Currently Amended): A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the movable base station ~~is controlled independently to the anticipated motion of the mobile unit.~~

50. (Original): A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Currently Amended): A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

52. (Currently Amended): A movable base station in accordance with claim 51 50, wherein the motion of the ~~mobile~~ movable base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Currently Amended): A movable base station in accordance with claim 52, wherein the motion of the ~~mobile~~ movable base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Currently Amended): A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein an actual motion of the mobile unit is independent of the motion of the movable base station ~~is independently controllable to the motion of the mobile unit.~~

55. (Previously Amended): A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original): A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended): A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended): A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Currently Amended): A movable base station in accordance with claim 54, wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original): A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Currently Amended): An apparatus adapted to move in accordance with a movement of a mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original): An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended): An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended): An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended): An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original): An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original): An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. (Original): An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. (Original): An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original): An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

a first wireless communication link between the at least one fixed radio port and the receiver; and

a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended): An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. (Original): An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended): An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended): An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Currently Amended): An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second fixed radio port of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original): An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83. (Original): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

84. (Previously Amended): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

85. (Original): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

86. (Original): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

87. (Original): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

88. (Original): A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

89. (Currently Amended): A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is ~~controlled independently to~~ independent of the motion of the transmitter; and transmitting the signal to the mobile unit.

SCB
EI
90. (Currently Amended): A method in accordance with claim ~~97~~ 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

D1
adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original): A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;

and

adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original): A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;

calculating an average speed of a plurality of mobile units traveling along the roadway; and

adjusting the speed of the transmitter in accordance with the average speed.

93. (Currently Amended): A method of receiving a signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:
controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is ~~controlled independently to~~ independent of the motion of the receiver, and receiving the signal at the receiver.

54B
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94. (Original): A method in accordance with claim 93, wherein the step of controlling comprises the steps of:

moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

D 1
95. (Original): A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original): A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:

moving the receiver next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended): A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

moving a movable base station in accordance with the motion of the mobile unit;

receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. (Original): An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended): An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original): A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original): A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original): A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original): A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

107. (Original): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

108. (Previously Amended): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

109. (Original): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

110. (Original): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

111. (Original): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. (Original): A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

113. (New): A communication system configured to provide a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the moving communication cell.

114. (New): A communication system in accordance with claim 113 wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

115. (New): A communication system in accordance with claim 114, comprising a moving base station adapted to provide the moving communication cell.

116. (New): A communication system in accordance with claim 115, further comprising a plurality of fixed ports disposed along the anticipated path of the mobile unit, the plurality of fixed ports in communication with the moving base station.

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117. (New): A communication system in accordance with claim 116, further comprising a gateway connected to the plurality of fixed ports.

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118. (New): A communication system in accordance with claim 113, the communication system comprising:

a moving base station configured to exchange mobile unit signals with a plurality of mobile units within a moving geographical area defined by the moving communication cell;
and

a plurality of fixed ports configured to exchange fixed port signals with the moving base station, the fixed port signals corresponding to the mobile units signals.

119. (New): A method of providing communication services to a mobile unit, the method comprising:

providing a moving communication cell to a mobile unit while the moving communication cell has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the cell.

120. (New): A method in accordance with claim 119, wherein the predetermined path has a contour corresponding to a roadway contour of a roadway and the anticipated motion of the mobile unit is along the roadway.

121. (New): A method in accordance with claim 120, wherein the providing the moving communication cell comprises:

providing the moving communication cell from a moving base station.

122. (New): A method in accordance with claim 121, wherein the providing the moving communication cell comprises:

exchanging fixed port signals between the moving base station and at least one fixed port of a plurality of fixed ports disposed along the anticipated path of the mobile unit.

123. (New): A method in accordance with claim 122, wherein the providing the moving communication cell further comprises:

exchanging mobile unit signals between the moving base station and the mobile unit, the fixed port signals corresponding to the mobile unit signals.

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REMARKS

This paper is responsive to an Office Action dated May 15, 2003. Before this response, claims 30-36 and 49-112 were pending. The Examiner has allowed claims 63-74 and 97-102. Applicant has amended claims 30, 33, 34, 49, 51-54, 61, 63, 81, 89, 90, and 93 and added new claims 113-123. Claims 30-36 and 49-123 are now pending. Applicant respectfully submits that the pending claims are allowable. In the previous office action submitted by Examiner Contee, claims 30-36 and 49-112 were allowed. Applicant respectfully submits that full faith and credit should be given to the search and action of a previous examiner unless there is a clear error in the previous action or knowledge of other prior art. See MPEP 706.04

The Examiner rejected claims 30-36, 49, 54, 58, 61, 89, 93, and 103 under 35 USC 102(b) as being anticipated by Yokoi et al (US 5,282,239) ("Yokoi"). Applicants respectfully submit that these claims as now presented are allowable over the art cited.

As amended, claim 30 recites a "transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the transmitter". In Yokoi, the motion of a portable cordless phone depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Although the portable cordless phone may be moved within the elevator independently to the motion of the moving-conveyance base station, the motion of the portable cordless phone is dependent on the motion of the elevator and, therefore, the motion of the moving-conveyance base station. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 30 and that this claim is allowable.

Regarding claims 31-33, these claims depend from claim 30 which applicant respectfully submits is allowable. Accordingly, claims 31-33 are at least allowable as depending from an allowable base claim.

Claim 34 as amended recites "a receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein an actual motion of the mobile unit is independent of the motion of the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the receiver". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 34 and that this claim is allowable.

Claims 35 and 36 depend from claim 34 which applicant respectfully submits is allowable. Accordingly, claims 35 and 36 are at least allowable as depending from an allowable base claim.

Regarding claims 49 and 50, applicant respectfully submits that Yokoi does not teach all of the limitations of either of these claims. Claims 49 and 50 as amended recite a movable base station "wherein an actual motion of the mobile unit is independent of the motion of the movable base station". Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the movable base station". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a movable base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 49 or claim 50 and that these claims are allowable.

Claims 50-53 depend from claim 49 which applicant respectfully submits is allowable. Accordingly, claims 50-53 are at least allowable as depending from an allowable base claim.

Claims 55-62 depend from claim 54 which applicant respectfully submits is allowable. Accordingly, claims 55-62 are at least allowable as depending from an allowable base claim.

Claim 89 as amended recites a method where a motion of a transmitter is controlled "along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is independent of the motion of the transmitter." Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "motion of a mobile unit is independent of the motion of the transmitter". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a transmitter. Applicant respectfully submits that Yokoi does not show all of the elements of claim 89 and that this claim is allowable.

Claim 93 as amended recites a method wherein "an actual motion of the mobile unit is independent of the motion of the receiver". Applicant respectfully submits that Yokoi does not teach all of the limitations of this claim. For example, Yokoi does not teach that the "actual motion of a mobile unit is independent of the motion of the receiver". As explained above, the motion of a portable cordless phone in Yokoi depends on the motion of the moving-conveyance base station since the moving-conveyance base station is attached to the elevator that is carrying the portable cordless phone. Accordingly, Yokoi does not show that an actual motion of a mobile unit is independent of the motion of a receiver. Applicant respectfully submits that Yokoi does not show all of the elements of claim 93 and that this claim is allowable.

Claim 103 recites a method comprising the step of "establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units." Applicant respectfully submits that Yokoi does not teach this limitation. In Yokoi, the portable cordless phone within the elevator communicates with a moving-conveyance base station 10 either through a leaky coaxial cable or through an antenna when the moving-conveyance base station 10 is mounted in the elevator. In both descriptions, the moving-conveyance base station 10 is connected to the central switch through wires and not through a moving base station. (See column 3, lines 8-9 and column 4, lines 41-44). The examiner analogized the moving base station recited in claim 103 to the fixed base 4 in Yokoi. After careful examination, however, it is clear that the communication link between the fixed base 4 and the portable cordless phones does not include a moving base station. The cordless portable

phones either communicate with the fixed base 4 or with a moving conveyance base station 10. When communicating through the moving conveyance base station 10, the fixed base 4 is not used. Accordingly, the step of establishing communication link through a movable base station is not shown in Yokoi.

Claim 103 further recites "simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports". Applicant respectfully submits that this step is not shown in Yokoi. As explained above, the fixed port cannot be analogized to the fixed base 4 since the moving-conveyance base station 10 does not communicate with the fixed base 4. Nowhere in Yokoi is a description of a simultaneous hand off of a plurality of mobile units from one fixed port to another where the plurality of mobile units communicates with the fixed ports through a moving base station. Applicant respectfully submits that Yokoi does not show all of the elements of claim 103 and that this claim is allowable.

The Examiner rejected claims 55, 56, 75, 76, 78, 81, and 82 under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570) ("Charas").

Regarding claim 55, this claim depends from claim 54 which applicant respectfully submits is allowable. Accordingly, claim 55 is at least allowable as depending from an allowable base claim. Further, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two, teaches or suggests every element of this claim. Claims 55 recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz". Nowhere in either reference is there a suggestion to use a single frequency band having a lower limit greater than 300 megahertz for a first communication link and for a second communication link where the first communication link is between the movable base station and the mobile unit and the second communication link is between the movable base station and the fixed port.

Applicant submits that Charas does not teach or suggest a first communication link and a second communication that are established within a frequency band having a lower limit greater than 300 megahertz. On the contrary, Charas teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . . in the range of 30 to 300 megahertz." Column 3, lines 17-18. (Also see Column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment and teaches to convert the signals to low frequency signals that can propagate through the closed

environment. In Charas, the frequency band used for communicating between the mobile units and the moving two-way frequency converter is different than the frequency band used for communicating between the moving two-way frequency converter and the base station. Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55. The signals are transmitted at 200 MHz to the moving two-way frequency converter, converted to 1500 megahertz and transmitted to the mobile units. (See column 4 lines 32-41). Applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz" and that claim 55 is allowable.

Regarding claim 56, applicant respectfully submits neither Yokoi, Charas, nor a combination of the two, teaches or suggests a frequency band having a lower limit of 300 megahertz. For support that this limitation is shown in Charas, the Examiner cites to column 3, lines 61-63. This section states:

"Propagation of the signal within the second, closed environment can be accomplished by propagating a low radio frequency signal, preferably in the range 30-300 MHz, through either a coaxial or a bifilar conductor located within the closed environment."

In Charas, therefore, 300 MHz is an upper limit, not a lower limit, of a frequency band used for communication with the non-moving base station. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest a movable base station in accordance with claim 55, wherein "the frequency band has a lower limit of 300 megahertz" and that claim 56 is allowable.

Regarding claims 75, 81, and 82, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims.

Claim 75 recites an apparatus having "a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports". Nowhere within either reference is a teaching or a suggestion to establish a communication link from a moving base station to a plurality of mobile units based on signal

quality indicators corresponding to each of a plurality of signals transmitted from fixed ports. As explained above, the moving-conveyance base stations in Yokoi are connected with wires to the central station and do not directly communicate with the fixed base. Therefore, no communication link is established between a plurality of mobile units and a fixed port based on signal quality indicators transmitted from a plurality of fixed ports. The moving-conveyance base stations are permanently connected to the same central switch. The Examiner cites to column 5, lines 47-62 and column 7 lines 21-38 for support that this element is shown. The text at column 5, lines 47-62 describes power control for a transmitter and does not suggest establishing a link between a plurality of mobile units and at least one of a plurality of fixed ports based on quality indicators transmitted corresponding to transmitted signals from the fixed ports. The text at column 7, lines 21-38 describes a method of generating a hand off request at the portable cordless unit based on a received field strength at the portable cordless phone. The text does not teach or suggest the use of a processor in an apparatus adapted to move in accordance with the movement of plurality of mobile units to establish a communication link with a fixed port based on quality indicators corresponding to signals transmitted from a plurality of fixed ports.

Charas teaches to use a coaxial cable within a closed environment for communicating with two-way frequency converters mounted on train cars and does not teach or suggest a processor within an apparatus adapted to move in accordance with the movement of plurality of mobile units that establishes a communication link with a fixed port. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 75 and that claim 75 is allowable.

Claim 81 recites an apparatus wherein the "processor is further adapted to establish a second communication link between the plurality of mobile units and at least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators". As explained above, neither reference teaches or suggests establishing a communication link with fixed ports using a processor within an apparatus adapted to move in accordance with a movement of a plurality of mobile units. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 81 and that claim 81 is allowable.

Regarding claim 82, this claim is at least allowable as depending from an allowable base claim.

Regarding claim 76, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of this claim. Claim 76 recites "an apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz". As explained above, Charas teaches to use a lower frequency band having an upper limit of 300 MHz for communication with the two-way frequency converters mounted in the train car. Claim 76 recites a single frequency band having a lower limit of 300 megahertz for communication between the plurality of mobile units and the apparatus and for communication between the apparatus and the fixed ports. Yokoi does not teach or suggest the use of a frequency band having lower limit of 300 megahertz. Nor does Yokoi teach or suggest communication between a moving apparatus and a plurality of mobile units and communication between the moving apparatus and a fixed port in the same frequency band. As explained above, in Yokoi, a moving-conveyance base station that is moving on an elevator does not communicate with a fixed port and is connected to the central switch with wires. Accordingly, applicant respectfully submits that neither Charas, Yokoi, nor a combination of the two teach or suggest every element of claim 76 and that claim 76 is allowable.

Regarding claim 78, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest the use of a millimeter wave frequency band for communication between an apparatus and a plurality of mobile units and for communication between the apparatus and a fixed port. The Examiner cites to column 4, lines 32-33 for support that this element is suggested in Yokoi. This section suggests the use of leaky wave guide for communicating with the portable cordless phones. There is no suggestion that an apparatus communicate with a fixed port using a millimeter wave frequency band. Accordingly, applicant submits that all of the elements of claim 78 are not taught or suggested in either reference and that claim 78 is allowable.

Regarding claim 77, this claim depends from claim 75 which applicant submits is allowable. Accordingly, claim 77 is at least allowable as depending from an allowable base claim.

Regarding claims 59-60, 79, and 80, applicant respectfully submits that neither Yokoi, Charas, nor a combination of the two teach or suggest every element of each of these claims. Yokoi does not teach or suggest the use of frequency spectrum comprising a frequency spectrum from 50 gigahertz to 70 gigahertz. Barkats teaches the use of the frequency band

between 30 GHZ to 50 GHZ and does not teach or suggest using a frequency spectrum from 50 gigahertz to 70 gigahertz. The Examiner stated that "[i]nherently a greater range would be available, e.g. 50 GHZ to 70GHZ." Applicant submits that the frequency spectrum from 50 gigahertz to 70 gigahertz is not a greater range of the frequency band from 30 GHz to 50 GHz. The frequency spectrum from 50 gigahertz to 70 gigahertz includes the frequencies from 50 GHZ to 70 GHZ and is a distinct, non-overlapping frequency spectrum as compared to the frequency band from 30 GHZ to 50 GHZ.

The Examiner rejected claims 83-88 and 107-112 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

35 U.S.C. 112, First paragraph reads:

"The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention".

Applicant respectfully submits that claims 83-88 and 107-112 meet the requirements of 35 USC 112, first paragraph. Each of these claims recites features of the exemplary embodiment described in the specification. The "Background" of the application specifically identifies a key limitation of conventional systems by describing the problems due to mobile speed, cell size and handoff times required in conventional systems. See column 2, lines 37-48 for example. In addition, it was well known at the time filing that conventional systems were limited in performance based on the bandwidth provided to mobile units, the density of mobile units per cell, cell size, and speed of the mobile units. As explained in the background, conventional systems were limited to speeds less than 30 miles per hour due to the times required to perform a hand off. Conventional systems sacrificed one or more of the parameters to achieve increased performance in other parameters. For example, conventional systems sacrificed maximum speed of the mobile unit to increase the bandwidth per channel to each user. Further, it was well known at the time of the filing of the application that conventional systems sacrificed the number of users per cell site to increase the bandwidth per channel while supporting mobile speeds greater than 30 miles per hour. The limitations recited in claims 83-88 and 107-112 include performance parameters that could not be achieved with conventional

systems at the time of filing. Further, it was well known by those skilled in the art that the achievable performance parameters by these conventional systems fell short of the limitations claimed. Claims 83-88 and 107-112 highlight the performance features of the exemplary embodiment that can easily achieve the limitations of these claims. The description, therefore, includes such full, clear, concise and exact terms as to enable any person skilled in the art of mobile wireless communication systems to make and use the invention as claimed in claims 83-88 and 107-112. Accordingly, applicant respectfully submits that claims 83-88 and 107-112 meet the requirements of 35 U.S.C. 112 and are allowable.

The Examiner rejected claim 33 under 35 U.S.C. 112, second paragraph as being indefinite for failing to particular point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claim 33 and respectfully submits that claim 33 as amended is allowable.

Conclusion

Applicant has amended claims 30, 33, 34, 49, 51-54, 61, 63, 81, 89, 90, and 93 and added new claims 13-122. Claims 30-36 and 49-123 are now pending in the application. Applicant respectfully submits that the pending claims are allowable and that the case is in a condition for allowance.

Respectfully submitted,

CHARLES D. GAVRILOVICH

Date: August 4, 2003

By: 

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	First Named Inventor	Gavrilovich, Charles D.	
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ENCLOSURES (check all that apply)		
☐ Fee Transmittal Form	☐ Assignment Papers (for an Application)	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment / Reply (24 pages)	☐ Licensing-related Papers	☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Charles D. Gavrilovich, Jr., A Professional Corporation
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Date	August 4, 2003

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EXAMINER

GELIN, JEAN ALLAND

ART UNIT

PAPER NUMBER

2681

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/401,584	Applicant(s) GAVRILOVICH, CHARLES D.	
	Examiner Jean A Gelin	Art Unit 2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-36 and 49-112 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-74 and 97-102 is/are allowed.
- 6) ☒ Claim(s) 30-36, 49, 54-62, 75-89, 93, 103 and 107-112 is/are rejected.
- 7) ☒ Claim(s) 50-53, 90-92, 94-96 and 104-106 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) ☐ Other: _____

DETAILED ACTION

1. This is in response to the Applicant's amendments and arguments received April 27, 2003 in which claims 37-48 have been canceled. Claims 30-36 and 49-112 are currently pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 83-88 and 107-112 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

After reading the specification, the Examiner does not find a specific passage that corresponds to limitations of claims 83-85. For instance, claim 83 recites a communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer. This limitation is nowhere to be found in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to claim 33, the phrase "wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port" is not clear. How does a transmitter receive a signal?

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 30-36, and 49, 54, 58, 61, 62, 89, 93, and 103 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoi et al (US 5,282,239).

Regarding claim 30, Yokoi teaches a transmitter (i.e., within moving base station 10 or 20) adapted to transmit a signal to a mobile unit (i.e., portable telephone 2 or 19) while the transmitter (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the transmitter .

is controlled (i.e., typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 89, the claim is rejected as being anticipated by Yokoi for the same reason as claim 30 above."

Regarding claim 31, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 32, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 33, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 34, Yokoi teaches a receiver (i.e., within moving base station 10 or 20) adapted to receive a signal to a mobile unit (i.e., portable telephone 2 or 19) while the receiver (i.e., moving base station 10 or 20) has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the receiver is

controlled (i.e., typically a person presses a floor number for the elevator to move, then the portable telephone in communication via the moving base hands off the call to another base station) independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

"With respect to claim 93, the claim is rejected as being anticipated by Yokoi for the same reason as claim 34 above."

Regarding claim 35, Yokoi teaches wherein the predetermined path (i.e., parallel track is the path) has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (col. 8, lines 24-34).

Regarding claim 36, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 49, Yokoi teaches a movable base station (10, 20) adapted to establish a communication link between a fixed port (4) and mobile unit (2) while the movable base station has a motion relative to Earth along a predetermined path (i.e., moving base station 10 or 20 is coupled to an elevator, which has the capability to move relative to earth) and in accordance with an anticipated motion of the mobile unit (i.e., a person carries the portable telephone, and moves relative to the moving base station and the earth), wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claim 54, Yokoi teaches a movable base station (10 or 20) adapted to have a motion relative to a fixed port (fixed base or central switch) along a predetermined path and in accordance with an anticipated motion of a mobile unit (col. 4, lines 37-59), comprising: a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit (i.e., moving base in communication with the portable telephone 2, col. 4, lines 44-47); and a second radio interface adapted to establish a second communication link between the movable base station and the fixed port (typically user of the mobile can move the base station by the press of a button in the conveyance, and col. 4, lines 40-44), wherein the motion of the movable base station is independently controllable to the motion of the mobile unit (see, col. 4, lines 37-64, col. 5, line 38-67, col. 7, lines 11-63, and col. 8, lines 5).

Regarding claim 58, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

Regarding claim 61, Yokoi teaches a wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path (col. 7, lines 21-38, col. 8, lines 24-34).

Regarding claim 62, Yokoi teaches wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port (i.e., sending a call via the moving base, col. 4, lines 6, lines 46-55).

Regarding claim 103, Yokoi teaches a method of providing a communication connection between a communication network and a plurality of mobile units (such as portable telephone 2) having a motion relative to a plurality of fixed ports (such as fixed

base 4), wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units (col. 4, lines 37-59); and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports (col. 7, line 21 to col. 8, line 15).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 55, 56, 75, 76, 78, 81, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Charas et al. (US 5,404,570).

Regarding claim 55, Yokoi teaches all the limitations above except wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

However, the preceding limitation is known in the art of communications. Charas teaches a base station having a frequency converter that transmits and receives RF information in the 1500 MHZ which is greater than 300 MHZ (col. 4, lines 6-11, col. 5, lines 24-34). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to implement the technique of Charas within the

system of Yokoi in order to transmit and receive the high RF signal to a communication unit inside a vehicle, and synchronize the output frequencies of the high RF signal and low RF signal and avoid interference if two or more vehicles are close to each other and are receiving signals from the same base station.

Regarding claim 56, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claims 75, 81, and 82, Yokoi in view of Charas teaches all the limitations above. Yokoi further teaches a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports (col. 5, lines 47-62, col. 7, lines 21-38).

Regarding claim 76, Yokoi in view of Charas teaches all the limitations above. Charas further teaches wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 61-63).

Regarding claim 78, Yokoi teaches wherein the frequency band is a millimeter wave frequency band (i.e., low frequency band, col. 3, lines 61-63, col. 4, lines 32-33).

10. Claims 57, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Ishikawa.

Regarding claims 57, 77, Yokoi teaches all the limitations except wherein the frequency band is an optical frequency band.

However, the preceding limitation is known in the art of communications. In the same field of endeavor, Ishikawa teaches an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include operation using optical frequency band for the purpose of using signal light waves of some sort in order to transmit from the transmitter to the repeater and to the receiver in a situation where a line of sight communication path is available.

11. Claims 59-60, 79, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoi in view of Barkats.

Regarding claims 59, 60, 79, and 80, Yokoi teaches all the limitations except wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats teaches a satellite (i.e., repeaters) communication using a range of available frequencies from 30 GHZ to 50 GHZ (col. 4, lines 15-20). Inherently a greater range would be available, e.g., 50 GHZ to 70 GHZ. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Yokoi to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

Allowable Subject Matter

12. Claims 63-74, and 97-102 are allowed.

13. Claims 50-53, 90-92, 94-96, and 104-106 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is an examiner's statement of reasons for allowance: the prior art teaches a movable base station to establish communication link between a portable terminal and a fixed base station.

As per claims 50-53 on the other hand, the Applicant specifically teaches wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit. This limitation, in conjunction with all limitations of the independent claims, has not been disclosed, taught, or made obvious over the prior art of record.

As per claims 63-74, 97-102, the Applicant teaches an apparatus adapted to move in accordance with a movement of mobile unit moving comprising: a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports. These limitations, in conjunction with all limitations of the independent claims, have not been disclosed, taught, or made obvious over the prior art of record.

As per claims 90-92 and 94-96, the Applicant teaches adjusting a speed of the transmitter/receiver in accordance with the motion of the mobile unit. This limitation, in conjunction with all limitations of the independent claims, has not been disclosed, taught, or made obvious over the prior art of record.

As per claims 104-106, the Applicant teaches wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of: combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and transmitting the resultant signal to the plurality of mobile units from the movable base station. These limitations, in conjunction with all limitations of the independent claims, have not been disclosed, taught, or made obvious over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

15. Applicant's arguments with respect to claims 30-36 and 49-112 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean A Gelin whose telephone number is (703) 305-4847. The examiner can normally be reached on 9:00 AM to 6:30 PM.

Application/Control Number: 09/401,584

Page 12

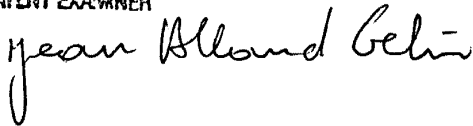
Art Unit: 2681

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (703) 305-4778. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

JGelin
May 14, 2003

JEAN GELIN
PATENT EXAMINER

A handwritten signature in cursive script that reads "jean Almond Gelin". The signature is written in black ink and is positioned below the printed name and title.

	Type	Hits	Search Text
1	BRS	18	transmitter with motion with earth
2	BRS	72	"moving base" near2 (station terminal)
3	BRS	855	"mobile base" near2 (station terminal)
4	BRS	922	("moving base" near2 (station terminal)) or ("mobile base" near2 (station terminal))
5	BRS	2248	fast near3 (vehicle car mobile)
6	BRS	25	((("moving base" near2 (station terminal)) or ("mobile base" near2 (station terminal))) and (fast near3 (vehicle car mobile)))
7	BRS	16	power near2 level and (((("moving base" near2 (station terminal)) or ("mobile base" near2 (station terminal))) and (fast near3 (vehicle car mobile))))
8	BRS	1562	mov\$3 near3 "base station" near2 (station terminal)
9	BRS	2418	antenna same (roadway route)
10	BRS	377	antenna same base same (roadway route)
11	BRS	18	(mov\$3 near3 "base station" near2 (station terminal)) and (antenna same base same (roadway route))
12	BRS	62	"moving base" near1 (station terminal)
13	BRS	3	"moving base" near1 (station terminal) same motion
14	BRS	26	satellite same broadcast\$3 same airplane
15	BRS	2	satellite same broadcast\$3 same airplane same rotation
16	BRS	136	satellite same equator\$3 same rotation
17	BRS	90799	motion with relative
18	BRS	407	motion with relative with earth
19	BRS	8	motion with relative with earth with transmitter
20	BRS	384	(motion with relative) and (motion with relative with earth)

	Type	Hits	Search Text
21	BRS	9	motion with relative with earth and (satellite same equator\$3 same rotation)
22	BRS	1078	communication with channel with "data rate"
23	BRS	562	density near4 mobile
24	BRS	5	(communication with channel with "data rate") and (density near4 mobile)
25	BRS	5	"communication channel" with "data rate" with megabit
26	BRS	378	"communication channel" near3 simultaneously
27	BRS	4	(density near4 mobile) and ("communication channel" near3 simultaneously)
28	BRS	2	"communication channel" with (mobile terminal) with square
29	BRS	97	density with (mobile terminal) with square
30	BRS	9	455\$.ccls. and (density with (mobile terminal) with square)

L Number	Hits	Search Text	D%	Time stamp
1	40	5729826.uref. or 5404570.uref. or 5282239.uref.	USPAT	2003/04/02 17:34



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#10P
LB
3/27/03

In re Application of:

Charles D. Gavrilovich

Group No.: 2681

Serial No.: 09/401,584

Examiner: Joy K. Contee

Filed: September 22, 1999

Docket No. Gavrilovich P1US2

For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date March 18, 2003, in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231

March 18, 2003

Date

[Signature]

Signature

Box Non-Fee Amendment
Commissioner for Patents
Washington, D.C. 20231

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Technology Center 2600

Sir:

AMENDMENT AND REQUEST FOR RECONSIDERATION

In response to the Office Action dated December 31, 2002 please amend the claims as indicated on the following pages in the format set forth in OG Notice dated February 25, 2003.

IN THE CLAIMS

Please enter the following rewritten claims:

30. (Original) : A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit.

31. (Original) : A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. (Original) : A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. (Original) : A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port.

34. (Original) : A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the receiver is controlled independently to the anticipated motion of the mobile unit.

35. (Original) : A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. (Original) : A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

37 - 48 (Cancelled)

49. (Original) : A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit.

C/ 50. (Original) : A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. (Original) : A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

SCD
DI 52. (Original) : A movable base station in accordance with claim 51, wherein the motion of the mobile base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. (Original) : A movable base station in accordance with claim 52, wherein the motion of the mobile base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. (Original) : A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein the motion of the movable base station is independently controllable to the motion of the mobile unit.

55. (Previously Amended) : A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than 300 megahertz.

56. (Original) : A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Previously Amended) : A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

58. (Previously Amended) : A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

59. (Previously Amended) : A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Previously Amended) : A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. (Original) : A movable base station in accordance with claim 54 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. (Original) : A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. (Previously Amended) : An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and
a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. (Original) : An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. (Previously Amended) : An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Previously Amended) : An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

67. (Previously Amended) : An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Previously Amended) : An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Previously Amended) : An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. (Original) : An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. (Original) : An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. (Original) : An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

C1
73. (Original) : An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. (Original) : An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:
SUB D1
a first wireless communication link between the at least one fixed radio port and the receiver; and
a second wireless communication link between the transmitter and the mobile unit.

75. (Previously Amended) : An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:
a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;
a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than 300 megahertz; and
a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. (Original) : An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Previously Amended) : An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Previously Amended) : An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Previously Amended) : An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Previously Amended) : An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. (Original) : An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and a least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. (Original) : An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83. (Original) : A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

84. (Previously Amended) A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

85. (Original) : A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

C/ 86. (Original) : A communication system adapted to simultaneously provide a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

SCB DI 87. (Original) : A communication system adapted to simultaneously provide a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

88. (Original) : A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

89. (Original) : A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:
controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the transmitter; and
transmitting the signal to the mobile unit.

90. (Original) : A method in accordance with claim 97, wherein the step of controlling comprises the steps of:
moving the transmitter along a conveying device deposited along the predetermined path; and
adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. (Original) : A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;

and

adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. (Original) : A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;

calculating an average speed of a plurality of mobile units traveling along the roadway; and

adjusting the speed of the transmitter in accordance with the average

speed.

93. (Original) : A method of receiving a signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in

accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the receiver, and

receiving the signal at the receiver.

94. (Original) : A method in accordance with claim 93, wherein the step of controlling comprises the steps of:

moving the receiver along a conveying device deposited along the predetermined path; and

adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. (Original) : A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and

adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. (Original) : A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:

- moving the receiver next to a roadway;
- calculating an average speed of a plurality of mobile units traveling along the roadway; and
- adjusting the speed of the receiver in accordance with the average speed.

97. (Previously Amended) : A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

moving a movable base station in accordance with the motion of the mobile unit;

receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than 300 megahertz;

transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. (Original) : An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. (Previously Amended) : An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

100. (Previously Amended) : An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Previously Amended) : An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Previously Amended) : An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. (Original) : A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:
establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and
simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. (Original) : A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:
combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and
transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. (Original) : A method in accordance with claim 104, wherein the step of combining comprises the steps of:
determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. (Original) : A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

107. (Original) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

108. (Previously Amended) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

109. (Original) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

110. (Original) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

111. (Original) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. (Original) : A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.



REMARKS

This paper is responsive to an Office Action dated December 31, 2002. Before this response, claims 30 -112 were pending. Applicant has cancelled claims 37-48. Claims 30-36 and 49-112 are now pending. The Examiner has allowed claims 30-36 and 49-112. Accordingly, all the claims now pending are allowed and applicant respectfully submits that the case is in a condition for allowance.

Respectfully submitted,
CHARLES D. GAVRILOVICH

Date:

March 18, 2003

By:

Charles D. Gavrilovich, Jr.
Reg. No. 41,031

Law Office of Charles D. Gavrilovich, Jr.
985 Paseo La Cresta, Suite A
Chula Vista, CA 91910
Phone: 619 271 0382
FAX: 619 271 0383

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PTO/SB/21 (08-00)
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TRANSMITTAL FORM (to be used for all correspondence after initial filing)		Application Number	09/401,584
		Filing Date	September 22, 1999
		First Named Inventor	Charles D. Gavrilovich
		Group Art Unit	2681
		Examiner Name	Contee, Joy Kimberly
Total Number of Pages in This Submission	31	Attorney Docket Number	Gavrilovich-P1US2

ENCLOSURES (check all that apply)		
☐ Fee Transmittal Form ☐ Fee Attached ☒ Amendment / Reply ☐ After Final ☐ Affidavits/declaration(s) ☐ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Response to Missing Parts/Incomplete Application ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53	☐ Assignment Papers (for an Application) ☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____	☐ After Allowance Communication to Group ☐ Appeal Communication to Board of Appeals and Interferences ☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☒ Other Enclosure(s) (please identify below): - Itemized Postcard
Remarks		RECEIVED MAR 25 2003 Technology Center 2600

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Charles D. Gavrilovich, Jr. Reg. No. 41,031
Signature	
Date	March 18, 2003

CERTIFICATE OF MAILING		
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: <u>March 18, 2003</u>		
Typed or printed name	Charles D. Gavrilovich, Jr.	
Signature		Date <u>March 18, 2003</u>

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

7590 12/31/2002
LAW OFFICE OF CHARLES D. GAVRILOVICH, JR.
985 PASEO LA CRESTA
SUITE A
CHULA VISTA, CA 91910-6729

EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT	PAPER NUMBER

2681

DATE MAILED: 12/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/401,584

Applicant(s)

Gavrilovich

Examiner

Joy Contee

Art Unit

2681

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Oct 15, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-112 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30-36 and 49-112 is/are allowed.
- 6) ☒ Claim(s) 37-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

Art Unit: 2681

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed October 15, 2002 have been fully considered but they are not persuasive.

In response to applicant's arguments, the recitation "an apparatus adapted to move in accordance with a motion of a mobile unit" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2681

3. Claims 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears et al. ("Mears"), U.S. Patent No. 4,539,706, in view of Charas et al. ("Charas"), U.S. Patent No. 5,404,570, both previously used.

Regarding claim 37, Mears discloses an a mobile vehicular repeater apparatus comprising:

a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band (i.e., F1) inherently higher than a low frequency radio frequency band (col. 4, lines 40-57); and

a transmitter adapted to transmit a resultant signal within [the] frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port (col. 4, lines 40-57).

Mears does not explicitly disclose wherein the frequency band has a lower limit greater than or equal to 300 megahertz.

In a similar field of endeavor, Charas discloses in a repeater system a lower frequency is in the range of 30 to 300 megahertz (col. 3, lines 15-18).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Mears to include a low frequency port for mobile vehicular repeating for the purpose of providing a signal transmitted from the fixed port to a mobile.

Regarding claim 43, Mears discloses an apparatus comprising:

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a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band inherently higher than a low frequency radio frequency band (col. 4, lines 40-57); and

a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit (col. 4, lines 40-57).

Mears does not explicitly disclose wherein the frequency band has a lower limit greater than or equal to 300 megahertz.

In a similar field of endeavor, Charas discloses in a repeater system a lower frequency is in the range of 30 to 300 megahertz (col. 3, lines 15-18).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Mears to include a low frequency port for mobile vehicular repeating for the purpose of providing a signal transmitted from the fixed port to a mobile.

4. Claims 38,40,44 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears and Charas, in view of Briskman et al. ("Briskman"), U.S. Patent No. 5,485,485, previously used.

Regarding claims 38,40,44 and 46, Mears and Charas disclose the limitations of claims 37 and 43. Mears does not explicitly disclose an apparatus according to claims 37 and 43, wherein the frequency band has a lower limit of 300 megahertz (i.e., millimeter wave frequency band having a wavelength from 1 mm to 0.1 mm (300 GHz to 3000GHz).

In a similar field of endeavor, Briskman discloses an apparatus according to claims 37 and 43, wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 34-47).

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At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified Mears to include operation in a system of two or more satellites (i.e., repeaters) using UHF frequencies including the range from 300 to 3,000 MHZ for the purpose of broadcasting signals to receivers at or near the earth's surface (col. 3, lines 21-27).

5. Claims 39 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears, Charas and Briskman, in view of Ishikawa et al. ("Ishikawa"), U.S. Patent No. 5,696,61, previously used.

Regarding claims 39 and 45, Mears, Charas and Briskman disclose the limitations of claims 38 and 44. The combination does not disclose wherein the frequency band is an optical frequency band.

In a similar field of endeavor, Ishikawa discloses an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44)

At the time of the invention it would have been obvious to one ordinary skill in the art to have included operation using an optical frequency band for the purpose of using signal light waves of some sort in order to transmit from the transmitter to the repeater to the receiver in a situation where a line of sight communication path is available.

6. Claims 41,42, 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears, Charas and Briskman, in view of Barkats, U.S. Patent No. 5,615,407, previously used.

Art Unit: 2681

Regarding claims 41, 42, 47 and 48, Mears, Charas and Briskman disclose the limitations of claims 40 and 46. The combination does not explicitly disclose a frequency spectrum from 50 Ghz to 70 GHz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats discloses a satellite (i.e., repeaters) communication using a range of available frequencies from 30GHz to 50GHz, for example (col. 4, lines 15-20). Inherently a greater range would be available, e.g., 50 GHz to 70 Ghz.

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified the combination of Mears, Charas and Briskman to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

Allowable Subject Matter

7. Claims 30-36 and 49-112 are allowed.
8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 30-36, 49-62, prior art of record fails to disclose an apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, wherein the motion of the moveable base station is independently controllable to the motion of the mobile unit.

Regarding claims 63-82 and 97-102, prior art of record fails to disclose an apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising: a transmitter adapted to transmit, within the

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frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

Regarding claims 83-88 and 107-112, prior art fails to disclose the detailed description involving the following: a communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour (=28 miles per hour), wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

Regarding claims 90-92 and 94-96, prior art fails to disclose the combination of the moveable base station including adjusting the speed of the transmitter in accordance with the motion of the mobile unit.

Regarding claims 103-106, prior art fails to disclose a method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with

Art Unit: 2681

the motion of the mobile units; and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

These distinct features render the claims allowable.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K. Contee whose telephone number is (703) 308-0149. The Examiner can normally be reached between 5:30 a.m. and 2:00 p.m., Monday- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost, can be reached on (703)305-4778.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)306-0377

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry)

Or:

(703) 872-9314, (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

Application/Control Number: 09/401,584

Page 9

Art Unit: 2681

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).



Joy K. Contee

December 29, 2002



NAY MAUNG
PRIMARY EXAMINER

Commissioner for Patents
Washington, DC 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-

CONFIRMATION NO. 4845

LAW OFFICE OF CHARLES D. GAVRILOVICH, JR.
985 PASEO LA CRESTA
SUITE A
CHULA VISTA, CA 91910-6729



OC000000009262037

Date Mailed: 12/18/2002

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/02/2002.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

LINDA W BADIE
2600 (703) 306-2931

OFFICE COPY

Commissioner for Patents
Washington, DC 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-

CONFIRMATION NO. 4845

VARNUM RIDDERING SCHMIDT & HOWLETT LLP
BRIDGEWATER PLACE
POST OFFICE BOX 352
GRAND RAPIDS, MI 49501

OC000000009261994

Date Mailed: 12/18/2002

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

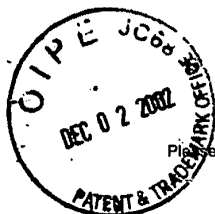
This is in response to the Power of Attorney filed 12/02/2002.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

A handwritten signature in cursive script, reading "Linda W Badie".

LINDA W BADIE
2600 (703) 306-2931

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Please type a plus sign (+) inside this box → ☐

PTO/SB/82 (10-00)

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REVOCATION OF POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	09/401,584
Filing Date	September 22, 1999
First Named Inventor	Charles D. Gavrilovich
Group Art Unit	2681
Examiner Name	Contee, Joy Kimberly
Attorney Docket Number	Gavrilovich-P1US2

I hereby revoke all previous powers of attorney or authorizations of agent given in the above identified application:

☒ A Power of Attorney or Authorization of Agent is submitted herewith **Technology Center 2600**

OR

☐ Please change the correspondence address for the above-identified application to:

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Place Customer
Number Bar Code
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OR

☐ Firm or
Individual Name

Address

Address

City

Country

State

ZIP

Telephone

Fax

I am the:

☐ Applicant/Inventor.

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Name

Charles D. Gavrilovich

Signature

Charles D. Gavrilovich

Date

11-18-02

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

Burden Hour Statement: This form is estimated to take 3 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



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RECEIVED POWER OF ATTORNEY OR AUTHORIZATION OF AGENT Technology Center 2600	Application Number	09/401,584
	Filing Date	September 22, 1999
	First Named Inventor	Charles D. Gavrilovich
	Title	Mobile Communication System With Moving Base Station
	Group Art Unit	2681
	Examiner Name	Contee, Joy Kimberly
	Attorney Docket Number	Gavrilovich-P1US2

I hereby appoint:

☐ Practitioners at Customer Number

OR

☒ Practitioner(s) named below:

Name	Registration Number
Charles D. Gavrilovich, Jr.	41,031

Place Customer
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as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please change the correspondence address for the above-identified application to:

☐ The above-mentioned Customer Number.

OR

☐ Practitioners at Customer Number

OR

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Number Bar Code
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☒ Firm or Individual Name	Law Office of Charles D. Gavrilovich, Jr.				
Address	985 Paseo La Cresta, Suite A				
Address					
City	Chula Vista	State	California	Zip	91910-6729
Country	USA				
Telephone	619 271 0382	Fax	619 271 0383		

I am the:

☐ Applicant/Inventor.

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	Charles D. Gavrilovich
Signature	
Date	11-18-02

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: Carucel Investments, LPApplication No./Patent No.: 09/401,584 Filed/Issue Date: September 22, 1999Entitled: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATIONCarucel Investments, a Limited Partnership

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

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RECEIVED

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or2. ☐ an assignee of less than the entire right, title and interest.

The extent (by, percentage) of its ownership interest is _____%

in the patent application/patent identified above by virtue of either:

DEC 06 2002

Technology Center 2600

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.☐ Copies of assignments or other documents in the chain of title are attached.**[NOTE:** A separate copy (*i.e.*, the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

11-18-02

Date

Carucel, LLC by Charles D. Gavrilovich, Member

Typed or printed name

Signature

General Partner

Title

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



EXHIBIT B

ASSIGNMENT

This Assignment is made this 03 day of AUGUST, 2000, by Charles D. Gavrilovich ("Assignor"), having an address of 1745 Pavilion Way, Park Ridge, Illinois 60068, to Carucel Investments L.P., ("Assignee"), a Delaware limited partnership having a principal place of business at 3 Plainfield Road, Naperville, Illinois 60540.

DEC 06 2002

Technology Center 2000

RECITALS

WHEREAS, Assignor is the sole owner of certain new and useful inventions described in the patents and patent applications ("Patents") listed below in Definition Section I.

WHEREAS, Assignee desires to acquire from the Assignor, and the Assignor is willing to transfer to Assignee, the patents and patent applications ("Patents") and rights derived therefrom under the terms and conditions set forth in the this Patent Assignment;

NOW, THEREFORE, for good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, it is agreed as follows:

I. DEFINITION.

The term "Patents" means the patents and patent applications listed below and any other United States or foreign patents granted or issued covering the inventions in the Patents or that derive a right of priority from the Patents (including, without limitation, all divisional, continuation, continuation-in-part and continued prosecution applications thereof, and all revivals, reissues, and re-examinations thereof, and all foreign counterparts thereof).

PATENTS

<u>Country</u>	<u>Patent/Application No.</u>	<u>Status</u>
Argentina	P 96 01 02857	Pending
Australia	704764	Issued
Brazil	PI9510605-7	Pending
Canada	2,218,546	Pending
Chile	741-96	Pending
China	95197867.5	Pending
European Patent Convention (Belgium, Germany, Denmark, Spain, France, Great Britain, Ireland, Italy, Netherlands, and Sweden)	95922951.9	Pending
Federation of Russia	98101109	Issued
Finland	974375	Pending
Hong Kong	981114550.3	Pending

<u>Country</u>	<u>Patent/Application No.</u>	<u>Status</u>
Hungry	P 98 01174	Issued
India	892CAL96	Pending
Israel	118492	Pending
Japan	536423/1996	Pending
Mexico	97,9258	Pending
New Zealand	288432	Pending
Norway	97,5533	Pending
Philippines	1-58734	Pending
Poland	P 323 682	Issued
Singapore	9705221-1	Pending
South Korea	97-708711	Pending
Taiwan	85105724	Issued
Thailand	031671	Published
United States	5,729,826	Issued
United States	6,026,277	Issued
United States	09/401,584	Pending
Venezuela	0908-96	Pending
Vietnam	S19971259	Pending
WIPO	PCT/US95/07037	Published

II. ASSIGNMENT

1. Assignor does and will sell, assign, and transfer to Assignee, the Assignor's entire right, title, and interest in and to each of the Patents, including, without limitation, the right to file foreign applications directly in the name of the Assignee and to claim for any such foreign applications any priority rights to which such applications are entitled under international conventions, treaties, or otherwise.

2. Assignor agrees that, upon request and without further compensation, but at no expense to Assignor, Assignor and its legal representatives and assigns will do all lawful acts, including the execution of papers and the giving of testimony, that may be necessary or desirable for obtaining, sustaining, reissuing, or enforcing each of the Patents in the United States and throughout the world. In the event that Assignee is unable for any reason to secure the Assignor's signature to any document that may be necessary or desirable for obtaining, sustaining, reissuing or enforcing each of the Invention Patents in the United States and throughout the world, the Assignor hereby irrevocably designates and appoints Assignee and Assignee's duly authorized officers and agents as the Assignor's agents and attorneys-in-fact to act for and on the Assignor's behalf and instead of the Assignor to execute such document, all with the same legal force and effect as if executed by the Assignor.

3. Assignor represents and warrants that it has not granted and will not grant to others (i) any rights, title or interest in and to any of the Patents, or (ii) any rights inconsistent with the rights granted herein.

IN WITNESS WHEREOF, Assignor has executed this Assignment effective as of the date first set forth above.

Assignor:

Charles D. Gavrilovich

Charles D. Gavrilovich

Signature

August 3, 2000

Date

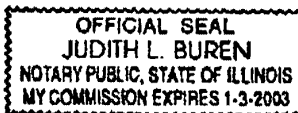
STATE OF Illinois)

COUNTY OF Cook)

On Aug 3, 2000, before me, Judith L. Buren a Notary Public, personally appeared Charles D. Gavrilovich personally known to me - OR - X proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS by hand and official seal.

Judith L. Buren
(Signature of Notary)





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**CHANGE OF
CORRESPONDENCE ADDRESS
Application**Address to:
Assistant Commissioner for Patents
Washington, D.C. 20231

Application Number	09/401,584
Filing Date	September 22, 1999
First Named Inventor	Charles D. Gavrilovich
Art Unit	2681
Examiner Name	Contee, Joy Kimberly
Attorney Docket Number	Gavrilovich-P1US2

Please change the Correspondence Address for the above-identified application to:

☐ Customer Number
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DEC 06 2002Place Customer
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Label here

☒ Firm or Individual Name	Law Office of Charles D. Gavrilovich, Jr.				
Address	985 Paseo La Cresta, Suite A				
Address					
City	Chula Vista	State	California	ZIP	91910-6729
Country	USA				
Telephone	619 271 0382	Fax	619 271 0383		

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the :

- ☐ Applicant/Inventor.
- ☒ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).
- ☐ Attorney or Agent of record.
- ☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number _____

Typed or Printed
Name

Charles D. Gavrilovich

Signature

Date

11-18-02

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

Burden Hour Statement: This form is estimated to take 3 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



2681

Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (08-00)

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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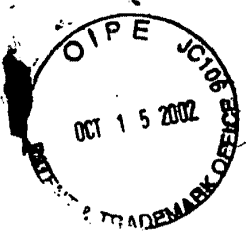
TRANSMITTAL FORM RECEIVED (to be used for initial filing) DEC 06 2002 Technology Center 2600	Application Number	09/401,584	
	Filing Date	Sep 22, 1999	
	First Named Inventor	Gavrilovich, Charles D.	
	Group Art Unit	2681	
	Examiner Name	Contee, Joy Kimberly	
Total Number of Pages in This Submission	8+Postcard	Attorney Docket Number	Gavrilovich-P1US2

ENCLOSURES (check all that apply)		
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Charles D. Gavrilovich) Group No.: 2681
Serial No.: 09/401,584) Examiner: Joy K. Contee
Filed: September 22, 1999) Docket No. Gavrilovich P1US2
For: **MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION**

CERTIFICATION UNDER 37 CFR § 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date Oct 10, 2002, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

October 10, 2002 [Signature]
Date Signature

BOX FEE AMEND
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

AMENDMENT AND REQUEST FOR RECONSIDERATION

In response to the Office Action dated September 13, 2002 please amend the application as follows:

IN THE CLAIMS

Please enter the following rewritten claims:

30. A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit.

31. A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port.

34. A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the receiver is controlled independently to the anticipated motion of the mobile unit.

35. A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

37. (Amended) An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

543
B1 a receiver adapted to receive a signal transmitted from the fixed
radio port within a frequency band having a lower limit greater than or equal to 300 megahertz;
and

a transmitter adapted to transmit a resultant signal within the frequency
band to the mobile unit in accordance with the signal transmitted from the fixed radio port.

38. An apparatus in accordance with claim 37, wherein the frequency band
has a lower limit of 300 megahertz.

39. (Amended) An apparatus in accordance with claim 37, wherein the
frequency band is an optical frequency band.

B2 40. (Amended) An apparatus in accordance with claim 37, wherein the
frequency band is a millimeter wave frequency band.

543
C1 41. (Amended) An apparatus in accordance with claim 40, wherein the
frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

42. (Amended) An apparatus in accordance with claim 40, wherein the
frequency band is an oxygen absorption frequency band.

43. (Amended) An apparatus adapted to move in accordance with a motion of
a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:
a receiver adapted to receive a signal transmitted from the mobile unit within a
frequency band having a lower limit greater than or equal to 300 megahertz; and
a transmitter adapted to transmit a resultant signal within the frequency band to
the fixed radio port in accordance with the signal transmitted from the mobile unit.

44. An apparatus in accordance with claim 43, wherein the frequency band
has a lower limit of 300 megahertz.

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C1 45. (Amended) An apparatus in accordance with claim 43, wherein the
frequency band is an optical frequency band.

46. (Amended) An apparatus in accordance with claim 43, wherein the frequency band is a millimeter wave frequency band.

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47. (Amended) An apparatus in accordance with claim 46, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

48. (Amended) An apparatus in accordance with claim 46, wherein the frequency band is an oxygen absorption frequency band.

49. A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit.

50. A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

52. A movable base station in accordance with claim 51, wherein the motion of the mobile base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

53. A movable base station in accordance with claim 52, wherein the motion of the mobile base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

54. A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein the motion of the movable base station is independently controllable to the motion of the mobile unit.

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55. (Amended) A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than or equal to 300 megahertz.

56. A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

57. (Amended) A movable base station in accordance with claim 55, wherein the frequency band is an optical frequency band.

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58. (Amended) A movable base station in accordance with claim 55, wherein the frequency band is a millimeter wave frequency band.

SEP
59. (Amended) A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

60. (Amended) A movable base station in accordance with claim 58, wherein the frequency band is an oxygen absorption frequency band.

61. A movable base station in accordance with claim 54 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

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63. (Amended) An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:
a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than or equal to 300 megahertz;
a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and
a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

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65. (Amended) An apparatus in accordance with claim 63, wherein the frequency band is an optical frequency band.

66. (Amended) An apparatus in accordance with claim 63, wherein the frequency band is a millimeter wave frequency band.

S43
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67. (Amended) An apparatus in accordance with claim 66, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

68. (Amended) An apparatus in accordance with claim 66, wherein the frequency band is an oxygen absorption frequency band.

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69. (Amended) An apparatus in accordance with claim 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:

- a first wireless communication link between the at least one fixed radio port and the receiver; and
- a second wireless communication link between the transmitter and the mobile unit.

75. (Amended) An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency having a lower limit greater than or equal to 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

76. An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. (Amended) An apparatus in accordance with claim 75, wherein the frequency band is an optical frequency band.

78. (Amended) An apparatus in accordance with claim 75, wherein the frequency band is a millimeter wave frequency band.

79. (Amended) An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

80. (Amended) An apparatus in accordance with claim 78, wherein the frequency band is an oxygen absorption frequency band.

81. An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and a least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

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84. (Amended) A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

85. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

86. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

87. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

88. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

89. A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the transmitter; and
transmitting the signal to the mobile unit.

90. A method in accordance with claim 97, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and
adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter; and
adjusting the speed of the transmitter to minimize the relative motion between the mobile unit and the transmitter.

92. A method in accordance with claim 91, wherein the step of moving the transmitter comprises the steps of:

moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the transmitter in accordance with the average speed.

93. A method of receiving a signal transmitted from a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a receiver along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the receiver, and
receiving the signal at the receiver.

94. A method in accordance with claim 93, wherein the step of controlling comprises the steps of:
moving the receiver along a conveying device deposited along the predetermined path; and
adjusting a speed of the receiver in accordance with the motion of the mobile unit.

95. A method in accordance with claim 94, wherein the step of adjusting comprises the steps of:
observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion between the mobile unit and the receiver.

96. A method in accordance with claim 95, wherein the step of moving the receiver comprises the steps of:
moving the receiver next to a roadway;
calculating an average speed of a plurality of mobile units traveling along the roadway; and
adjusting the speed of the receiver in accordance with the average speed.

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97. (Amended) A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:
moving a movable base station in accordance with the motion of the mobile unit;
receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band having a lower limit greater than or equal to 300 megahertz;
transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and
maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

312 99. (Amended) An apparatus in accordance with claim 97, wherein the frequency band is an optical frequency band.

910 100. (Amended) An apparatus in accordance with claim 97, wherein the frequency band is a millimeter wave frequency band.

101. (Amended) An apparatus in accordance with claim 97, wherein the frequency band comprises a frequency spectrum from 50 gigahertz to 70 gigahertz.

102. (Amended) An apparatus in accordance with claim 97, wherein the frequency band is an oxygen absorption frequency band.

103. A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;
determining a second quality of the second signal; and
adding the first signal to the second signal in accordance with the first quality and the second quality.

106. A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

107. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

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108. (Amended) A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

109. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

110. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

111. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

REMARKS

This paper is responsive to an Office Action dated September 13, 2002. Claims 30 -112 are pending. Claims 63-88 and 97-112 are allowed. Applicant has amended claims 37, 39-43, 45-48, 55, 57-60, 63, 65-69, 75, 77-80, 84, 97, 99-102 and 108.

The Examiner objected to claims 84 and 108 because of informalities. Applicant has amended claims 84 and 108 in accordance with the Examiners suggestions and respectfully submits that the claims are allowable.

The Examiner rejected claims 37 and 43 under 35 U.S.C. 112 second paragraph as being indefinite for failing to particularly and distinctly claim the subject matter which the applicant regards as the invention. Applicant has amended claims 37 and 43 to more clearly define the invention and respectfully submits claims 37 and 43 meet the requirements of 35 U.S.C. 112, second paragraph.

The Examiner rejected claims 37 and 43 under 35 USC 102(b) as being anticipated by Mears et al. ("Mears"), US patent No. 4,539,706

A rejection of a claim for anticipation requires that a single anticipating reference include, within its four corners, all of the elements, limitations, and relationships therebetween of the

rejected claim. Applicant respectfully submits that Mears does not teach each and every element recited in each of claims 37 and 43.

Claims 37 and 43 each recite an "apparatus adapted to move in accordance with a motion of a mobile unit". Applicant respectfully submits that Mears does not teach this element. The mobile vehicular radio repeater in Mears is not adapted to move in accordance with the motion of the portable radio. Mears discusses mobile vehicular radio repeaters which can be located in a police car or fire truck that repeat communications from a portable radio held by a person on foot to a central station such as police or fire station. Column 1, lines 19-30. Nowhere in Mears is there a discussion of mobile vehicular radio repeaters that "move in accordance with a motion of a mobile unit". Mears, on the contrary, suggests that the mobile vehicular radio repeater does not move in accordance with the motion of any portable radio. Mears solves the problem of the lack of acknowledgement of a successful transmission from a portable radio. In providing an example of a situation that may arise where the operator of portable radio may not be aware of a successful transmission, Mears states (at Column 2, Lines 14-16): "For example, during the message transmission he may have inadvertently moved out of range of the vehicular repeater." This statement suggests that the mobile vehicular radio repeater does not move in accordance with the motion of the portable radio. Accordingly, Mears does not teach each and every element of either claim 37 or claim 43 and applicant respectfully submits that these claims are allowable.

Regarding claims 38-42, these claims depend from claim 37 which applicant respectfully submits is allowable. Accordingly, claims 38-42 are allowable as depending from an allowable base claim.

Regarding claims 43-48, these claims depend from claim 42 which applicant respectfully submits is allowable. Accordingly, claims 43-48 are allowable as depending from an allowable base claim.

The Examiner rejected claims 54-56 and 58 under 35 USC 102(b) as being anticipated by Charas et al. US Patent No. 5,404,570 ("Charas"). Applicant respectfully submits that Charas does not disclose every element of any one of claims 54-56 or 58 and that these claims are allowable over the art cited.

Claims 54-56, and 58 recite a movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit "wherein the motion of the movable base station is independently controllable to the motion of the mobile unit". Applicant submits Charas does not teach this element. Charas describes repeater systems for providing radio coverage in closed environments where a mobile base station is located within a moving vehicle such as train car traveling through a tunnel. Mobile units within the train car can communicate with an external base station with use of the repeater system. The mobile base station in Charas, however, does not have a motion that is independently controllable to the motion of the mobile units. Any change in speed or motion of the mobile base station results in a change in speed or motion of the mobile units within the vehicle. Therefore, the motion of the mobile base station can not be controlled independently from the motion of the mobile units. Accordingly, applicant respectfully submits that Charas does not describe every limitation of any of claims 54-56 or 58 and that these claims are allowable.

As amended, claim 55 further recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than or equal to 300 megahertz". Applicant submits that Charas does not show this element and, on the contrary, teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . . in the range of 30 to 300 megahertz." Column 3, lines 17-18. (Also see Column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment, Charas teaches to convert the signals to low frequency signals that can propagate through the closed environment. Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55.

Claim 56 further recites a movable base station "wherein the frequency band has a lower limit of 300 megahertz." Applicant respectfully submits that Charas does not teach this element. As explained above in reference to claim 55, Charas teaches to use a range of 30 to 300 megahertz for communication between the movable base station and the cable. The lower

limit taught by Charas, therefore, is well below the 300 megahertz recited in claim 56. Accordingly, applicant respectfully submits that Charas does not teach every element of claim 56 and that claim 56 is allowable.

As amended, claim 58 recites a movable base station "wherein the frequency band is a millimeter wave frequency band". Applicant submits that Charas does not teach this element. It is well known in the art that the millimeter wave frequency band is the frequency spectrum from 30 GHz to 300 GHz. Charas specifically teaches to use the 30-300 megahertz frequency band. Accordingly, the millimeter wave frequency band recited in claim 58 is orders of magnitude higher in frequency than the 30 to 300 megahertz spectrum taught by Charas. Applicant respectfully submits that Charas does not teach all of the elements of claim 56 and that claim 56 is allowable.

Regarding claims 57, 59, and 60, these claim depend from claim 54 which applicant respectfully submits is allowable. Accordingly, claims 57, 59, and 60 are at least allowable as depending from an allowable base claim.

The Examiner has rejected claims 30-36,49-54,61,62,89 and 93 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,2,5,6 and 8 of US Patent No. 6,026,277. The Examiner also rejected claims 30-36,49-54,61,62,89 and 93 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 11 of US Patent No. 5,729,826. A terminal disclaimer for each of the patents is submitted with this response. Applicant respectfully submits that the double patenting rejections have been overcome.

Conclusion

In this response, applicant has amended claims 37, 39-43, 45-48, 55, 57-60, 63, 65-69, 75, 77-80, 84, 97, 99-102 and 108. No claims have been cancelled or added. Accordingly, claims 30 -112 remain pending in the application. The applicant is submitting a terminal disclaimer for US Patent No. 6,026,277 and a terminal disclaimer for US Patent No. 5,729,826 with this response.

Respectfully submitted,

CHARLES D. GAVRILOVICH

Date:

October 10, 2002

By:



Charles D. Gavrilovich, Jr., Reg. No. 41,031

Law Office of Charles D. Gavrilovich, Jr.
985 Paseo La Cresta
Chula Vista, CA 91910

VERSION WITH MARKINGS TO SHOW CHANGES MADE

37. (Amended) An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a transmitter adapted to transmit a resultant signal within the frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port.

39. (Amended) An apparatus in accordance with claim [38] 37, wherein the frequency band is an optical frequency band.

40. (Amended) An apparatus in accordance with claim [38] 37, wherein the frequency band is a millimeter wave frequency band.

41. (Amended) An apparatus in accordance with claim 40, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

42. (Amended) An apparatus in accordance with claim [41] 40, wherein the frequency band is an oxygen absorption frequency band.

43. (Amended) An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit.

45. (Amended) An apparatus in accordance with claim [44] 43, wherein the frequency band is an optical frequency band.

46. (Amended) An apparatus in accordance with claim [44] 43, wherein the frequency band is a millimeter wave frequency band.

47. (Amended) An apparatus in accordance with claim 46, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

48. (Amended) An apparatus in accordance with claim [47] 46, wherein the frequency band is an oxygen absorption frequency band.

55. (Amended) A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz.

57. (Amended) A movable base station in accordance with claim [56] 55, wherein the frequency band is an optical frequency band.

58. (Amended) A movable base station in accordance with claim [56] 55, wherein the frequency band is a millimeter wave frequency band.

60. (Amended) A movable base station in accordance with claim [59] 58, wherein the frequency band is an oxygen absorption frequency band.

59. (Amended) A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

63. (Amended) An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band [higher than a

low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

65. (Amended) An apparatus in accordance with claim [64] 63, wherein the frequency band is an optical frequency band.

66. (Amended) An apparatus in accordance with claim [64] 63, wherein the frequency band is a millimeter wave frequency band.

67. (Amended) An apparatus in accordance with claim [65] 66, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

68. (Amended) An apparatus in accordance with claim [67] 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Amended) An apparatus in accordance with claim [73] 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

75. (Amended) An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

77. (Amended) An apparatus in accordance with claim [76] 75, wherein the frequency band is an optical frequency band.

78. An apparatus in accordance with claim [76] 75, wherein the frequency band is a millimeter wave frequency band.

79. (Amended) An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

80. (Amended) An apparatus in accordance with claim [79] 78, wherein the frequency band is an oxygen absorption frequency band.

84. (Amended) A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

97. (Amended) A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

moving a movable base station in accordance with the motion of the mobile unit;

receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency [bandwidth higher than a low frequency radio frequency bandwidth] band having a lower limit greater than or equal to 300 megahertz;

transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

99. (Amended) An apparatus in accordance with claim [98] 97, wherein the frequency band is an optical frequency band.

100. (Amended) An apparatus in accordance with claim [98] 97, wherein the frequency band is a millimeter wave frequency band.

101. (Amended) An apparatus in accordance with claim [99] 97, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

102. (Amended) An apparatus in accordance with claim [101] 97, wherein the frequency band is an oxygen absorption frequency band.

108. (Amended) A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.



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**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A PRIOR PATENT**

Docket Number (Optional)
Gavrilovich P1US2

In re Application of: Charles D. Gavrilovich

Application No.: 09/401,584

Filed: September 22, 1999

For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

The owner*, Carucel Investments, LP, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 5,729,826. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

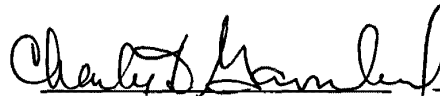
In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173 of the prior patent, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☒ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☐ The undersigned is an attorney or agent of record.

 10-7-02
Signature Date

Charles D. Gavrilovich
Typed or printed name

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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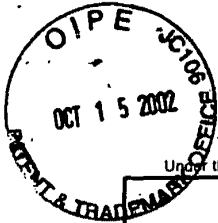
*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

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10/17/2002 TGEDAMU1 00000030 09401584

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**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A PRIOR PATENT**

Docket Number (Optional)

Gavrilovich P1US2

In re Application of: Charles D. Gavrilovich

Application No.: 09/401,584

Filed: September 22, 1999

For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

The owner*, Carucel Investments, LP, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 6,026,277. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173 of the prior patent, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☒ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☐ The undersigned is an attorney or agent of record.

 10-7-02
Signature Date

Charles D. Gavrilovich

Typed or printed name

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.



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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Carucel Investments, LP

Application No./Patent No.: 09/401,584 Filed/Issue Date: September 22, 1999

Entitled: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

Carucel Investments, a Limited Partnership

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by, percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

- ☐ Copies of assignments or other documents in the chain of title are attached.
[NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

10-7-02
Date

Carucel, LLC by Charles D. Gavrilovich, Member

Charles D. Gavrilovich
Typed or printed name
Signature

General Partner

Title

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EXHIBIT B

ASSIGNMENT

This Assignment is made this 03 day of AUGUST, 2000, by Charles D. Gavrilovich ("Assignor"), having an address of 1745 Pavilion Way, Park Ridge, Illinois 60068, to Carucel Investments L.P., ("Assignee"), a Delaware limited partnership having a principal place of business at 7 S 533 Plainfield Road, Naperville, Illinois 60540.

RECITALS

WHEREAS, Assignor is the sole owner of certain new and useful inventions described in the patents and patent applications ("Patents") listed below in Definition Section I.

WHEREAS, Assignee desires to acquire from the Assignor, and the Assignor is willing to transfer to Assignee, the patents and patent applications ("Patents") and rights derived therefrom under the terms and conditions set forth in the this Patent Assignment;

NOW, THEREFORE, for good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, it is agreed as follows:

I. DEFINITION.

The term "Patents" means the patents and patent applications listed below and any other United States or foreign patents granted or issued covering the inventions in the Patents or that derive a right of priority from the Patents (including, without limitation, all divisional, continuation, continuation-in-part and continued prosecution applications thereof, and all revivals, reissues, and re-examinations thereof, and all foreign counterparts thereof).

PATENTS

<u>Country</u>	<u>Patent/Application No.</u>	<u>Status</u>
Argentina	P 96 01 02857	Pending
Australia	704764	Issued
Brazil	PI9510605-7	Pending
Canada	2,218,546	Pending
Chile	741-96	Pending
China	95197867.5	Pending
European Patent Convention (Belgium, Germany, Denmark, Spain, France, Great Britain, Ireland, Italy, Netherlands, and Sweden)	95922951.9	Pending
Federation of Russia	98101109	Issued
Finland	974375	Pending
Hong Kong	981114550.3	Pending

<u>Country</u>	<u>Patent/Application No.</u>	<u>Status</u>
Hungry	P 98 01174	Issued
India	892CAL96	Pending
Israel	118492	Pending
Japan	536423/1996	Pending
Mexico	97,9258	Pending
New Zealand	288432	Pending
Norway	97,5533	Pending
Philippines	1-58734	Pending
Poland	P 323 682	Issued
Singapore	9705221-1	Pending
South Korea	97-708711	Pending
Taiwan	85105724	Issued
Thailand	031671	Published
United States	5,729,826	Issued
United States	6,026,277	Issued
United States	09/401,584	Pending
Venezuela	0908-96	Pending
Vietnam	S19971259	Pending
WIPO	PCT/US95/07037	Published

II. ASSIGNMENT

1. Assignor does and will sell, assign, and transfer to Assignee, the Assignor's entire right, title, and interest in and to each of the Patents, including, without limitation, the right to file foreign applications directly in the name of the Assignee and to claim for any such foreign applications any priority rights to which such applications are entitled under international conventions, treaties, or otherwise.

2. Assignor agrees that, upon request and without further compensation, but at no expense to Assignor, Assignor and its legal representatives and assigns will do all lawful acts, including the execution of papers and the giving of testimony, that may be necessary or desirable for obtaining, sustaining, reissuing, or enforcing each of the Patents in the United States and throughout the world. In the event that Assignee is unable for any reason to secure the Assignor's signature to any document that may be necessary or desirable for obtaining, sustaining, reissuing or enforcing each of the Invention Patents in the United States and throughout the world, the Assignor hereby irrevocably designates and appoints Assignee and Assignee's duly authorized officers and agents as the Assignor's agents and attorneys-in-fact to act for and on the Assignor's behalf and instead of the Assignor to execute such document, all with the same legal force and effect as if executed by the Assignor.

3. Assignor represents and warrants that it has not granted and will not grant to others (i) any rights, title or interest in and to any of the Patents, or (ii) any rights inconsistent with the rights granted herein.

IN WITNESS WHEREOF, Assignor has executed this Assignment effective as of the date first set forth above.

Assignor:

Charles D. Gavrilovich

Charles D. Gavrilovich

Signature

August 3, 2000

Date

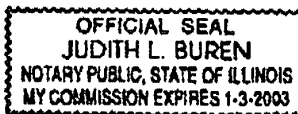
STATE OF Illinois)

COUNTY OF Cook)

On Aug 3, 2000, before me, Judith L. Buren a Notary Public, personally appeared Charles D. Gavrilovich personally known to me - OR - X proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS by hand and official seal.

Judith L. Buren
(Signature of Notary)





2681
/\$

Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (08-00)
Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/401,584	
	Filing Date	September 22, 1999	
	First Named Inventor	Charles D. Gavrilovich	
	Group Art Unit	2681	
	Examiner Name	Contee, Joy Kimberly	
Total Number of Pages in This Submission	31	Attorney Docket Number	Gavrilovich-P1US2

RECEIVED

OCT 21 2002

Technology Center 2600

ENCLOSURES (check all that apply)		
☒ Fee Transmittal Form	☒ Assignment Papers (for an Application)	☐ After Allowance Communication to Group
☒ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment / Reply	☐ Licensing-related Papers	☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Petition to Convert to a Provisional Application	☐ Status Letter
☐ Extension of Time Request	☐ Power of Attorney, Revocation Change of Correspondence Address	☒ Other Enclosure(s) (please identify below):
☐ Express Abandonment Request	☒ Terminal Disclaimer	- Statement Under 37 CFR 3.73(b)
☐ Information Disclosure Statement	☐ Request for Refund	- Second Terminal Disclaimer
☐ Certified Copy of Priority Document(s)	☐ CD, Number of CD(s) _____	- Itemized Postcard
☐ Response to Missing Parts/Incomplete Application	Remarks	
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53	Assignment papers are submitted for purposes of 37 CFR 3.73(b) and are not submitted with a cover sheet for recording at this time.	

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Charles D. Gavrilovich, Jr. Reg. No. 41,031
Signature	
Date	October 10, 2002

CERTIFICATE OF MAILING	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: <u>Oct 10, 2002</u>	
Typed or printed name	Charles D. Gavrilovich, Jr.
Signature	
Date	October 10, 2002

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FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 110.00

Complete if Known

Application Number 09/401,584
Filing Date September 22, 1999
First Named Inventor Charles D. Gavrilovich
Examiner Name Contee, Joy Kimberly
Group Art Unit 2681
Attorney Docket No. Gavrilovich-P1US2

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number
Deposit Account Name

The Commissioner is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Credit any overpayments
☐ Charge any additional fee(s) during the pendency of this application
☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) (\$) 0.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Extra Claims Fee from below Fee Paid
Total Claims 83 - 83 = 0 x 9 = 0
Independent Claims 24 - 24 = 0 x 42 = 0
Multiple Dependent 0 = 0

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
103	18	203	9	Claims in excess of 20	
102	84	202	42	Independent claims in excess of 3	
104	280	204	140	Multiple dependent claim, if not paid	
109	84	209	42	** Reissue independent claims over original patent	
110	18	210	9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) (\$) 0.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for <i>ex parte</i> reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,280	241	640	Petition to revive - unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17(q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	
Other fee (specify) _____ Terminal Disclaimer fees (2 X \$55 term Disc.)					110.00

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 110.00

SUBMITTED BY

Name (Print/Type) Charles D. Gavrilovich, Jr.
Signature

Registration No. 41,031
(Attorney/Agent)

Complete (if applicable)

Telephone 619 271 0382

Date Oct 10, 2002

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,584	09/22/1999	CHARLES D. GAVRILOVICH	GAVRILOVICH-	4845

7590

09/13/2002

VARNUM RIDDERING SCHMIDT & HOWLETT LLP
BRIDGEWATER PLACE
POST OFFICE BOX 352
GRAND RAPIDS, MI 49501

EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT

PAPER NUMBER

2681

DATE MAILED: 09/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

74

Office Action Summary

Application No.
09/401,584

Applicant(s)
Gavrlovich

Examiner
Joy K. Contee

Art Unit
2681



– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Sep 22, 1999
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-112 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-88 and 97-112 is/are allowed.
- 6) ☒ Claim(s) 30-62, 89, and 93 is/are rejected.
- 7) ☒ Claim(s) 90-92 and 94-96 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 6) ☐ Other: _____

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DETAILED ACTION

Claim Objections

1. Claims 84 and 108 are objected to because of the following informalities: there appears to be a typographical error in the aforementioned claims. Each claim references "a speed greater than 45 kilometers within...". The correct unit of speed appears to be inadvertently omitted, i.e., it should read "45 kilometers per hour". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 37 and 43 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 37 and 43 recite the limitation "the frequency band" in lines 5-6 . It is unclear as to which frequency band this limitations refers to (i.e., a frequency band higher or a frequency band lower).

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 37 and 43 rejected under 35 U.S.C. 102(b) as being anticipated by Mears et al. ("Mears"), U.S. Patent No. 4,539,706.

Regarding claim 37, Mears discloses an apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band (i.e., F1) inherently higher than a low frequency radio frequency band (col. 4, lines 40-57); and

a transmitter adapted to transmit a resultant signal within [the] frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port (col. 4, lines 40-57).

Regarding claim 43, Mears discloses an apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

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a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band inherently higher than a low frequency radio frequency band (col. 4, lines 40-57); and

a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit (col. 4, lines 40-57).

7. Claims 54-56 and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by Charas et al. ("Charas"), U.S. Patent No.5,404,570.

Regarding claim 54, Charas discloses a movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit (col. 1, lines 56-62); and

a second radio interface adapted to establish a second communication link between the moveable base station and the fixed port wherein the motion of the movable base station is independently controllable to the motion of the mobile unit (col. 1, lines 62-67 to col. 2, lines 1-15).

Regarding claim 55, Charas discloses a moveable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band higher than a low frequency band (col. 3, lines 15-18).

Regarding claim 56, Charas discloses a moveable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 15-18).

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Regarding claim 58, Charas discloses a movable base station in accordance with claim 56, wherein the frequency band is a millimeter wave frequency band (i.e., 30 to 300 megahertz range) (col. 3, lines 15-18).

Regarding claim 61, Charas discloses a movable base station in accordance with claim 54 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway (i.e., tunnel or train track path) (col. 2, lines 24-41).

Regarding claim 62, Charas discloses a movable base station in accordance with claim 61, wherein the mobile base station is further adapted to travel on a conveyor device along the predetermined path (col. 2, lines 29-41).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 38, 40, 44 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears, in view of Briskman et al. ("Briskman"), U.S. Patent No. 5,485,485.

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Regarding claims 38,40,44 and 46, Mears discloses the limitations of claims 37 and 43. Mears does not explicitly disclose an apparatus according to claims 37 and 43, wherein the frequency band has a lower limit of 300 megahertz (i.e., millimeter wave frequency band having a wavelength from 1 mm to 0.1 mm (300 GHz to 3000GHz).

In a similar field of endeavor, Briskman discloses an apparatus according to claims 37 and 43, wherein the frequency band has a lower limit of 300 megahertz (col. 3, lines 34-47).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified Mears to include operation in a system of two or more satellites (i.e., repeaters) using UHF frequencies including the range from 300 to 3,000 MHZ for the purpose of broadcasting signals to receivers at or near the earth's surface (col. 3, lines 21-27).

10. Claims 39 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears and Briskman, in view of Ishikawa et al. ("Ishikawa"), U.S. Patent No. 5,696,614.

Regarding claims 39 and 45, Mears and Briskman disclose the limitations of claims 38 and 44. The combination does not disclose wherein the frequency band is an optical frequency band.

In a similar field of endeavor, Ishikawa discloses an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44)

At the time of the invention it would have been obvious to one ordinary skill in the art to have included operation using an optical frequency band for the purpose of using signal light

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waves of some sort in order to transmit from the transmitter to the repeater to the receiver in a situation where a line of sight communication path is available.

11. Claims 41,42 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mears and Briskman, in view of Barkats, U.S. Patent No. 5,615,407.

Regarding claims 41, 42,47 and 48, Mears and Briskman disclose the limitations of claims 40 and 46. The combination does not explicitly disclose a frequency spectrum from 50 Ghz to 70 GHz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats discloses a satellite (i.e., repeaters) communication using a range of available frequencies from 30GHz to 50GHz, for example (col. 4, lines 15-20). Inherently a greater range would be available,e.g., 50 GHz to 70 Ghz.

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified the combination of Mears and Briskman to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

12. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Charas, in view of Ishikawa.

Regarding claims 39 and 45, Charas discloses the limitations of claim 56. Charas does not disclose wherein the frequency band is an optical frequency band.

In a similar field of endeavor, Ishikawa discloses an optical wavelength multiplex transmission method and optical dispersion compensation method (col. 7, lines 18-44)

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At the time of the invention it would have been obvious to one ordinary skill in the art to have included operation using an optical frequency band for the purpose of using signal light waves of some sort in order to transmit from the transmitter to the repeater to the receiver in a situation where a line of sight communication path is available.

13. Claims 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Charas, in view of Barkats.

Regarding claims 59 and 60, Charas disclose the limitations of claim 58. Charas does not explicitly disclose a frequency spectrum from 50 Ghz to 70 GHz (i.e., an oxygen absorption frequency band).

In a similar field of endeavor, Barkats discloses a satellite (i.e., repeaters) communication using a range of available frequencies from 30GHz to 50GHz, for example (col. 4, lines 15-20). Inherently a greater range would be available, e.g., 50 GHz to 70 Ghz.

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Charas to include a higher frequency for communication for the purpose of utilizing a range in which there is not a shortage.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

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harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CAR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CAR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CAR 3.73(b).

15. Claims 30-36,49-54,61,62,89 and 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,2,5,6 and 8 of U.S. Patent No. 6,026,277. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1,2,5,6 and 8 of U.S. Patent No. 6,026,277, encompass the scope of claims 30-36,49-54,61,62,89 and 93 of the instant application.

Regarding claims 30-36,49-54,61,62,89 and 93, the instant application claims the transmitter has a motion relative to Earth along a predetermined path, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit. U.S. Patent

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No. 6,026,277 describes a moveable base station, moving a specified direction and supported by a conveyor, which instant application even claims in dependent claims (i.e., 32,36 and 62).

Omission of element and its function in combination is obvious expedient if remaining elements perform same functions as before. In re KARLSON (CCPA) 136 USPQ 184 (1963)

16. Claims 30-36,49-54,61,62,89 and 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 11 of U.S. Patent No. 5,729,826. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in 5,729,826, encompass the aforementioned claims of the instant application.

Regarding claims 30-36,49-54,61,62,89 and 93, the instant application claims the transmitter has a motion relative to Earth along a predetermined path, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit. U.S. Patent No. 5,729,826 describes, *inter alia*, a stationary interface unit connected to the telephone office via a signal transmission connection; a plurality of spaced apart moveable base stations, each of the base stations uniquely associated with the telephone office and supported on a conveying device for limited movement in the specified direction within an area defined relative to the stationary interface, which is analogous to the predetermined path claimed in the instant application.

Omission of element and its function in combination is obvious expedient if remaining elements perform same functions as before. In re KARLSON (CCPA) 136 USPQ 184 (1963)

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Allowable Subject Matter

17. Claims 63-88 and 97-112 are allowed.

18. Claims 90-92,94-96 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 63-82 and 97-102, prior art of record fails to disclose an apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising: a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

Regarding claims 83-88 and 107-112, prior art fails to disclose the detailed description involving the following: a communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour (=28 miles per hour), wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

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Regarding claims 90-92 and 94-96, prior art fails to disclose the combination of the moveable base station including adjusting the speed of the transmitter in accordance with the motion of the mobile unit.

Regarding claims 103-106, prior art fails to disclose a method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of: establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

These distinct features render the claims allowable.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Charas et al., U.S. Patent No. 5,404,570, discloses radio coverage in closed environment.

Mears et al., U.S. Patent No. 4,539,706, discloses a mobile vehicular repeater system.

Ishii et al., U.S. Patent No. 5,058,201, discloses a mobile telecommunications system which has multiple base stations each defining a miniature service zone and capable of communicating with mobile stations present in the service zone over a radio link.

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Alvesalo, U.S. Patent No. 5,384,824, discloses a method for carrying out location updating from a mobile cellular radiophone system to another cellular radiophone system.

Yokoi et al., U.S. Patent No. 5,282,239, discloses a cordless telephone system for moving conveyances.

Kamura, U.S. Patent No. 5,640,443, discloses a mobile telephone communication system.

Gilhousen et al., U.S. Patent No. 5,109,390, discloses a diversity receiver in a CDMA cellular telephone system.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K. Contee whose telephone number is (703) 308-0149. The Examiner can normally be reached between 5:30 a.m. and 2:00 p.m., Monday- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost, can be reached on (703)305-4778.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)306-0377

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

Art Unit: 2681

(703) 872-9314, (for formal communications intended for entry)

Or:

(703) 872-9314, (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).



Joy K. Contee

September 7, 2002



DWAYNE BOST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

9-9-02

Notice of References CitedApplication/Control No.
09/401,584Applicant(s)/Patent Under Reexam
GavrilovichExaminer
Joy K. ConteeArt Unit
2681

Page 1 of 1

U.S. PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Name	Classification²	
A	5,404,570	4/1995	Charas et al.	455	22
B	5,058,201	10/1991	Ishii et al.	455	33
C	4,539,706	9/1985	Mears et al.	455	11
D	5,729,826	3/1998	Gavrilovich	455	11.1
E	5,384,824	1/1995	Alvesalo	379	59
F	6,026,277	2/2000	Gavrilovich	455	11.1
G	5,640,443	6/1997	Kamura	455	433
H	5,282,239	1/1994	Yokoi et al.	455	465
I	5,109,390	4/1992	Gilhousen et al.	370	335
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Country	Name	Classification²	
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

	Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages
U	
V	
W	
X	

¹ A copy of this reference is not being furnished with this Office action. See MPEP § 707.05(a).¹ Dates in MM-YYYY format are publication dates.² Classifications may be U.S. or foreign.

09/4015211

NOTICE OF DRAFTSPERSON'S
PATENT DRAWING REVIEWThe drawing(s) filed (insert date) 9/12/99 are:A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be submitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color. Color drawings are not acceptable until petition is granted. Fig(s) _____ Pencil and non black ink not permitted. Fig(s) _____ 2. PHOTOGRAPHS. 37 CFR 1.84(b) 1 full-tone set is required. Fig(s) _____ Photographs not properly mounted (must use bristol board or photographic double-weight paper). Fig(s) _____ Poor quality (half-tone). Fig(s) _____ 3. TYPE OF PAPER. 37 CFR 1.84(e) Paper not flexible, strong, white, and durable. Fig(s) _____ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) _____ Mylar, velum paper is not acceptable (too thin). Fig(s) _____ 4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes: 21.0 cm by 29.7 cm (DIN size A4) 21.6 cm by 27.9 cm (8 1/2 x 11 inches) All drawing sheets not the same size. Sheet(s) _____ Drawings sheets not an acceptable size. Fig(s) _____ 5. MARGINS. 37 CFR 1.84(g): Acceptable margins: Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: 8 1/2 x 11 Margins not acceptable. Fig(s) <u>9</u> Top (T) _____ Left (L) _____ Right (R) _____ Bottom (B) _____ 6. VIEWS. 37 CFR 1.84(h) REMINDER: Specification may require revision to correspond to drawing changes. Partial views. 37 CFR 1.84(h)(2) Brackets needed to show figure as one entity. Fig(s) _____ Views not labeled separately or properly. Fig(s) _____ Enlarged view not labeled separately or properly. Fig(s) _____ 7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3) Hatching not indicated for sectional portions of an object. Fig(s) _____ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____	8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i) Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____ 9. SCALE. 37 CFR 1.84(k) Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____ 10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(i) Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) <u>1-9</u> 11. SHADING. 37 CFR 1.84(m) Solid black areas pale. Fig(s) _____ Solid black shading not permitted. Fig(s) _____ Shade lines, pale, rough and blurred. Fig(s) _____ 12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p) Numbers and reference characters not plain and legible. Fig(s) _____ Figure legends are poor. Fig(s) _____ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____ English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) _____ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) _____ 13. LEAD LINES. 37 CFR 1.84(q) Lead lines cross each other. Fig(s) _____ Lead lines missing. Fig(s) _____ 14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t) Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) _____ 15. NUMBERING OF VIEWS. 37 CFR 1.84(u) Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____ 16. CORRECTIONS. 37 CFR 1.84(w) Corrections not made from prior PTO-948 dated _____ 17. DESIGN DRAWINGS. 37 CFR 1.152 Surface shading shown not appropriate. Fig(s) _____ Solid black shading not used for color contrast. Fig(s) _____

COMMENTS

REVIEWER

A.D.

DATE

11/17/99

TELEPHONE NO.

ATTACHMENT TO PAPER NO.

4

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes **incorporated** therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.

06/01/01

L Number	Hits	Search Text	DB	Time stamp
1	1	((movable or move\$ or non-fix\$) adj2 repeater) same mobile same base	USPAT	2002/09/03 11:45
2	36	((movable or move\$ or non-fix\$) adj2 repeater)	USPAT	2002/09/03 12:01
3	369	((movable or move\$ or non-fix\$) adj2 (base adj2 station))	USPAT	2002/09/03 12:02
4	249	455/\$.cccls. and (((movable or move\$ or non-fix\$) adj2 (base adj2 station)))	USPAT	2002/09/03 12:02
5	138	repeat\$ and (455/\$.cccls. and (((movable or move\$ or non-fix\$) adj2 (base adj2 station))))	USPAT	2002/09/03 12:12
6	3261	(movable or mobile or portable) adj2 (base adj2 station)	USPAT	2002/09/03 12:15
7	217	(portable) adj2 (base adj2 station)	USPAT	2002/09/03 13:00
8	0	((movable or move\$ or non-fix\$) adj2 repeater)) adj2 (megabits or Mbps)	USPAT	2002/09/03 13:04
9	0	WCDMA and ((portable) adj2 (base adj2 station))	USPAT	2002/09/03 13:04
11	1	("5103459").PN.	USPAT	2002/09/03 13:11
12	1	("5103349").PN.	USPAT	2002/09/03 13:11
10	21	WCDMA and ((movable or mobile or portable) adj2 (base adj2 station))	USPAT	2002/09/03 13:28
13	0	(pico adj2 cell) same train	USPAT	2002/09/03 13:29
14	1	(pico adj2 cell) and train	USPAT	2002/09/03 13:30
15	1	("5594782").PN.	USPAT	2002/09/03 13:30

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PTO/SB/05 (4/98)
Approved for use through 09/30/2000. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR § 1.53(b))

Attorney Docket No.	Gavrilovich P1US2
First Inventor or Application Identifier	GAVRILOVICH, Charles D.
Title	CELLULAR NETWORK
Express Mail Label No.	EL 122 464 935 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ *Fee Transmittal Form (e.g. PTO/SB/17)
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification [Total Pages 25]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix

- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claims (s)
- Abstract of the Disclosure

3. ☒ Drawings (35 U.S.C. 113) [Total Sheets 5]

4. Oath or Declaration [Total Pages 1]

- a. ☐ Newly executed (original or copy)
b. ☒ Copy from prior application (37 CFR § 1.63(d))
(for continuation/divisional with Box 16 completed)
i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 CFR 1.63(d)(2) and 1.33(b).

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY
SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED
(37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS
RELIED UPON (37 C.F.R. § 1.28).

5. ☐ Microfiche Computer Program (Appendix)

6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)

- a. ☐ Computer Readable Copy
b. ☐ Paper Copy (identical to computer copy)
c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))

8. ☐ 37 CFR § 3.73(b) Statement [] Power of Attorney
(when there is an assignee)

9. ☐ English Translation Document (if applicable)

10. ☐ Information Disclosure [] Copies of IDS
Statement (IDS)/PTO-1449 Citations

11. ☒ Preliminary Amendment

12. ☒ Return Receipt Postcard (MPEP 503)
(should be specifically itemized)

13. ☐ *Small Entity Stmt(s) [X] Statement filed in prior
application Status still proper and desired
(PTO/SB/09-12)

14. ☐ Certified copy of Priority Document(s)
(if foreign priority is claimed)

15. ☒ Other: Check for \$1,766.00

16. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

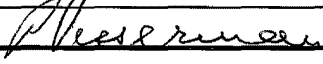
☒ Continuation [] Divisional [] Continuation-in-part(CIP) of prior application no. 08 / 953,962 filed 10/20/97

Prior application information: -Examiner: REDMON, J. Group/Art Unit: 2744

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

[] Customer Number or Bar Code Label or [X] Correspondence address below
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Signature				Date	9/23/98

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): CHARLES D. GAVRILOVICH

For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

Continuation of Serial No.: 08/953,962

Examiner: Redmon, J.

Filed: October 20, 1997

Group Art Unit: 2744

Docket No.: Gavrilovich P1US2

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the application, please amend the application as follows:

In the Claims:

Please delete claims 1-29 and add the following claims 30-112 as follows:

30. A transmitter adapted to transmit a signal to a mobile unit while the transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit.

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31. A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port.

34. A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the receiver is controlled independently to the anticipated motion of the mobile unit.

35. A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

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37. An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band higher than a low frequency radio frequency band; and

5 a transmitter adapted to transmit a resultant signal within the frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port.

38. An apparatus in accordance with claim 37, wherein the frequency band has a lower limit of 300 megahertz.

39. An apparatus in accordance with claim 38, wherein the frequency band is an optical frequency band.

40. An apparatus in accordance with claim 38, wherein the frequency band is a millimeter wave frequency band.

41. An apparatus in accordance with claim 40, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

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42. An apparatus in accordance with claim 41, wherein the frequency band is an oxygen absorption frequency band.

43. An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band higher than a low frequency radio frequency band; and

a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit.

44. An apparatus in accordance with claim 43, wherein the frequency band has a lower limit of 300 megahertz.

45. An apparatus in accordance with claim 44, wherein the frequency band is an optical frequency band.

46. An apparatus in accordance with claim 44, wherein the frequency band is a millimeter wave frequency band.

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47. An apparatus in accordance with claim 46, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

48. An apparatus in accordance with claim 47, wherein the frequency band is an oxygen absorption frequency band.

49. A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit.

50. A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

52. A movable base station in accordance with claim 51, wherein the motion of the mobile base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

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53. A movable base station in accordance with claim 52, wherein the motion of the mobile base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

20 54. A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein the motion of the movable base station is independently controllable to the motion of the mobile unit.

55. A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band higher than a low frequency radio frequency band.

56. A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

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57. A movable base station in accordance with claim 56, wherein the frequency band is an optical frequency band.

58. A movable base station in accordance with claim 56, wherein the frequency band is a millimeter wave frequency band.

59. A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

60. A movable base station in accordance with claim 59, wherein the frequency band is an oxygen absorption frequency band.

61. A movable base station in accordance with claim 54 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

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a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band higher than a low frequency radio frequency band;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. An apparatus in accordance with claim 64, wherein the frequency band is an optical frequency band.

66. An apparatus in accordance with claim 64, wherein the frequency band is a millimeter wave frequency band.

67. An apparatus in accordance with claim 65, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

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68. An apparatus in accordance with claim 67, wherein the frequency band is an oxygen absorption frequency band.

69. An apparatus in accordance with claim 73, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in

accordance with the quality of each of the plurality of synchronized signals to produce the
 5 resultant signal.

73. An apparatus in accordance with claim 63, wherein the amount of
 information transferred to the mobile unit is maximized by transmitting the information through
 at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a
 greatest quality communication link between the at least one fixed radio port and the mobile unit
 5 in relation to other communication links between other fixed radio ports of the plurality of fixed
 radio ports and the mobile unit.

74. An apparatus in accordance with claim 73, wherein the greatest quality
 communication link comprises:

a first wireless communication link between the at least one fixed radio
 port and the receiver; and

a second wireless communication link between the transmitter and the
 mobile unit.

75. An apparatus adapted to move in accordance with a movement of a
 plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater
 than a relative velocity of movement between each of the mobile units of the plurality of mobile
 units, the apparatus comprising:

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79. An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

80. An apparatus in accordance with claim 79, wherein the frequency band is an oxygen absorption frequency band.

81. An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and a least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

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84. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers within a geographic area less than 1800 square meters.

85. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

86. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

87. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

88. A communication system adapted to simultaneously provide a

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communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

89. A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the transmitter; and transmitting the signal to the mobile unit.

90. A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

observing a relative motion between the mobile unit and the transmitter;
and adjusting the speed of the transmitter to minimize the relative motion between the
mobile unit and the transmitter.

92. A method in accordance with claim 91, wherein the step of moving
the transmitter comprises the steps of:
moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along
the roadway; and
adjusting the speed of the transmitter in accordance with the average
speed.

93. A method of receiving a signal transmitted from a mobile unit having an
anticipated motion relative to Earth, the method comprising the steps of:
controlling a motion of a receiver along a predetermined path in
accordance with the anticipated motion of the mobile unit, wherein the motion of the
mobile unit is controlled independently to the motion of the receiver; and
receiving the signal at the receiver.

94. A method in accordance with claim 93, wherein the step of controlling
comprises the steps of:

moving the receiver along a conveying device deposited along the
predetermined path; and

5 adjusting a speed of the receiver in accordance with the motion of the
mobile unit.

95. A method in accordance with claim 94, wherein the step of adjusting
comprises the steps of:

observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion
between the mobile unit and the receiver.

96. A method in accordance with claim 95, wherein the step of moving
the receiver comprises the steps of:

moving the receiver next to a roadway;
calculating an average speed of a plurality of mobile units traveling along
5 the roadway; and

adjusting the speed of the receiver in accordance with the average speed.

97. A method of providing a communication link between a communication
network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the

plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

- 5 moving a movable base station in accordance with the motion of the mobile unit;
- receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency bandwidth higher than a low frequency radio frequency bandwidth;
- 10 transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and
- maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. An apparatus in accordance with claim 98, wherein the frequency band is an optical frequency band.

100. An apparatus in accordance with claim 98, wherein the frequency band is a millimeter wave frequency band.

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101. An apparatus in accordance with claim 99, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

102. An apparatus in accordance with claim 101, wherein the frequency band is an oxygen absorption frequency band.

103. A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and

transmitting the resultant signal to the plurality of mobile units from the movable base station.

105. A method in accordance with claim 104, wherein the step of combining comprises the steps of:

determining a first quality of the first signal;

determining a second quality of the second signal; and

adding the first signal to the second signal in accordance with the first quality and the second quality.

106. A method in accordance with claim 105, wherein the step of adding comprises the step of minimizing a contribution of the first signal to the resultant signal by ignoring the first signal.

107. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

108. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12

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mobile units traveling at a speed greater than 45 kilometers within a geographic area less than 1800 square meters.

109. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

110. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

111. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile

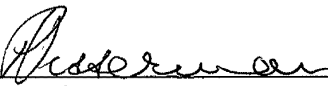
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units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

Respectfully submitted,

CHARLES D. GAVRILOVICH

Date 9/22/99

By 
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MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

BACKGROUND OF THE INVENTION

Related Applications

This application is a continuation of U.S. Application Serial No. 08/953,962, filed October 20, 1997, which is a continuation of U.S. Application Serial No. 08/687,722, filed July 26, 1996, now U.S. Patent 5,729,826, which is a national phase application of PCT/US95/07037, filed June 2, 1995.

Field of the Invention

The invention relates to cellular telephone systems in which a mobile unit communicates by wireless communication to a base station connected to the wire telephone network and more particularly to cellular telephone systems adapted for use with fast-moving mobile units.

Background Art

In a typical cellular telephone system, an area is divided into a plurality of cells with each cell having a centrally located cell site. A mobile unit moving in such a cellular network communicates by radio with a nearest cell site. The cell sites are each connected by cable or point-to-point microwave to a telephone network interface. The network interface typically provides communication among cell sites and between the cell sites and the so-called wire line telephone network. The functions of a typical network interface are described in The Bell System Technical Journal, January 1979, Volume 58, No. 1. One of the functions to be performed by the telephone network interface is the so-called "handoff" function. As a mobile unit moves through a cellular network, it will move away from one cell site and toward another cell site. Each cell site monitors signal quality of the signal received from the mobile unit and passes information to the telephone network interface and determines when a call in progress is to be transferred from one cell site to another. This procedure is known as "handoff". The handoff process involves several operations including selecting a cell site trunk between the MTSO and the new cell site, sending a message to the mobile unit transmitter/receiver to tune

from its present voice channel to a voice channel in the new cell site corresponding to the newly selected trunk, setting up a talking path in the MTSO from the cell site trunk to the trunk of the telephone network presently in use in the call, and idling the talking path in the switching network in the MTSO between the old cell trunk and the telephone network trunk assigned to the call.

A problem with existing mobile telephone systems is the considerable time required in handoffs. This becomes a particular problem in urban areas which are highly congested. A basic principle of cellular telephone systems is the concept of frequency reuse. It can be shown that traffic capacity of a cellular system is increased by a factor N^2 as the size of the cell, i.e., its diameter, is decreased by a factor of N . This is due to the fact that, at least in principle, all frequencies in the mobile telephone spectrum are available for use in each independent cell. Thus, as the number of cells is increased, the total number of calls that can concurrently exist in an area is increased. A drawback, however, to decreasing the size of the cells is that a mobile unit tends to cross cell boundaries more often, requiring a larger number of handoffs which will tend to overload the mobile telephone switching office (MTSO) to the point where existing calls may be interrupted or dropped.

Personal communication service (PCS) functions in substantially the same manner as the mobile cellular system. In PCS, the user may be in a building or walking in a street or riding a vehicle and using a handset which communicates with a base station in the same manner that the mobile unit communicates with the base station or cell site in the cellular network. It is envisioned that PCS, by implementing very small cells, could provide service to a very large number of users, for example in a densely populated urban area. The difficulty with PCS is the same as in the cellular system in that handoffs become the bottleneck.

Modern cellular systems use what is known as code division multiple access (CDMA) spread-spectrum communications. In direct-sequence coding CDMA (DS-CDMA), the energy of the user signal is distributed uniformly over the system bandwidth through the spreading process providing separation between users of the same frequency in adjacent cells. A requirement of DS-CDMA is that no interfering signal received may be significantly stronger

than the desired signal since it would jam the weaker signal. This type of coding is used in what is sometimes referred to as hierarchal cell structures. The most commonly referenced hierarchal structure is a macro/umbrella cell overlaying a number of micro cells. A fast-moving mobile unit, for example, may be served by the macro cell to avoid an extreme number of handovers.

5 Slow-moving users are allocated to micro cells to save capacity for the macro cells. Using the DS-CDMA concept, micro cells and macro cells share the same frequency. To avoid strong interference at a micro cell from mobile unit in communication with a macro base station, the output power of the mobile unit in the micro cell is increased to overpower the interfering signal. The use of hierarchal cell structure to provide high-quality speech, data communication at rates
10 up to 2 megabits per second and video communication with mobile units travelling at rates in excess of 100 miles per hour and accommodating PCS are seen as needed to meet future mobile telecommunication demands.

In the hierarchal cell structure, the low tier, small cells, e.g., on the order of 100 feet in diameter, accommodate low speeds. The low speed is mostly pedestrian traffic and other traffic moving at speeds below 30 miles per hour. The advantages of small cells is low power, simple, inexpensive and light-weight terminals. What is desirable is an infra structure which allows use of such terminals in all applications, whether in the home or office as a cordless phone, on streets, in shopping malls, airports, etc., and in cars on expressways at highway speeds. Additionally, high-spectrum reuse is needed to provide low-cost, high-quality service which
20 requires a large bandwidth for each subscriber.

To provide wire line toll, quality-voice service, a 32-kilobit per second bit rate is required with ADPCM coders. As wireless data services emerge, even more spectrum bandwidth will be required. In the future, it may be possible to utilize the spectrum in the 60 gigahertz range providing very large amounts of bandwidth. However, the radio wave characteristics at
25 that frequency dictate a very short range, line of site propagation, requiring very small cells. However, as noted, small cells and fast-moving mobile units are incompatible due to the time required for handoff.

SUMMARY OF THE INVENTION

These and other problems of the prior art are overcome in accordance with this invention by means of a moving base station which is interposed between a moving mobile telephone unit and a fixed base station. In accordance with this invention, a movable base station
5 moves with the traffic at a rate of speed which is comparable to the speed of the traffic and communicates with a moving mobile telephone unit via standard mobile radio transmission. The movable base station further communicates by radio signals with a plurality of fixed antennas spaced along the path of travel of the mobile base station. The several fixed antennas are connected to a telephone wire line network via a telephone gateway office in a standard fashion.
10 In accordance with this invention, the fixed radio ports are synchronized and the interface between the moving base station and the fixed radio ports is a time division multiplexed (TDM) - direct-sequence, spread-spectrum CDMA.

In one particular embodiment, a number of fixed base stations are provided in addition to moving base stations allowing slower moving traffic, such as pedestrian traffic or rush hour mobile traffic to communicate via the fixed base stations.

In a specific embodiment of the invention, the moving base stations are provided with highly directional antennas directed to moving traffic and highly directional antennas directed to the radio ports. Communications from the fixed radio ports to the movable base stations are at a relatively low power level and from the movable base stations to the mobile units are at a relatively higher power level. Due to the characteristics of the direct-sequence, spread-spectrum CDMA, the higher power level signal will overpower the lower level signal such that the mobile unit does not receive communications from the fixed radio port but only from the movable base station. In the reverse direction, a low level of signal is transmitted from the mobile units to the movable base station and a high-level signal is transmitted from the base
25 station to the fixed radio ports, thereby eliminating any direct communication from the mobile unit to the fixed radio port.

In one embodiment of the invention, the movable base stations are supported on a series of closed loops and ends of adjacent loops overlap to facilitate transfer of telephone cells between adjacent loops.

DETAILED DESCRIPTION

FIG. 1 is a diagrammatic representation of a mobile telecommunication system incorporating principles of the invention. FIG. 1 represents, for example, a divided highway with mobile units 20 traveling on a first roadway 10 in one direction and a plurality of mobile units 25 traveling along a second roadway 15, in the opposite direction. A plurality of moving base stations 30 are disposed along one side of the roadway 10. The base stations are spaced apart by a selected distance equivalent to the diameter of the cell served by the moving base station. The moving base stations 30 may be moved by means of a rail 35, or other suitable conveying device which may include an automotive vehicle travelling on the roadway, in the same direction as the traffic flow on the roadway 10, as indicated by the arrow 12. In a similar fashion, a plurality of moving base stations 40 are disposed adjacent the roadway 15 moving in the direction of the traffic as indicated by the arrow 17. The moving base stations 40 are moved along a rail 45. The moving base stations 30, 40 may be supported on any suitable conveying device such as rails 35, 45. The conveying device may be at ground level or overhead, depending on the terrain and available space for the device. The moving base stations are preferably disposed for optimum radio communication with the mobile units on the roadways.

Disposed between the moving base stations moving along the rails 35, 45 are a plurality of fixed radio ports 50 which are connected by means of a fiber optic ring 55 or a similar signal transmitting device to a telephone office connected to the wire line telephone network and referred to as a gateway office. The gateway office 60 forms the interface between the mobile telecommunication system and the wire line telephone network. The gateway office is a well-known equipment. It is part of the telephone network and is responsible for call processing in conjunction with the base stations. As described further later herein, the gateway office will include certain processor hardware and software to detect a best signal quality indication and to selectively transmit information with a best signal quality indicator to the

telephone network. A plurality of fixed base stations 70 are disposed in the vicinity of the roadway 10 and are connected to the gateway office 60 by means of a fiber optic ring 75 or similar signal transmission device.

In operation, the moving base stations 30 may move in the direction of the flow of the traffic at a rate of, for example, 60 miles per hour, which may be faster than some traffic and slower than other traffic. The moving base station preferably handles telecommunications with mobile units which travel at a rate of not more than 30 miles per hour faster or slower than the moving base station. For example, the moving base stations 30, 40 may be traveling at the rate of 60 miles per hour to accommodate traffic moving in the range of 30 to 90 miles per hour. In the arrangement of FIG. 1, fixed base stations 70 would accommodate communications with mobile units traveling at a speed of less than 30 miles per hour including pedestrian traffic and stationary units. It will be readily apparent that instead of having fixed and moving base stations as depicted in FIG. 1, slowly moving and rapidly moving units may be used as well. A particular moving base station is effective when the mobile units are moving in the same direction as a base station. FIG. 1 shows two roadways traveling in opposite directions with the moving base stations disposed between moving in the direction of the traffic. The base stations may also be placed on opposite sides of the same roadway with two-way traffic with the moving base stations moving in opposite directions on the opposite sides of the roadway.

In the typical cellular telephone system, the base station, also referred to as a cell site, forms an interface between the mobile unit and the gateway office. As such, the base stations may perform a number of functions, including functions such as locating a particular mobile unit, as well as voice processing and functions associated with call setup, call supervision, and call termination. Additionally, the base stations perform the function of handing off and receiving an existing call involving a mobile unit which has moved into or out of the normal service area of a base station. All of these are well-known base station functions. In some proposed mobile telephone systems, the base stations are primarily only radio interface units and a base station controller, connected to a plurality of base stations performs call-handling functions for the plurality of base stations. The system in accordance with the

invention differs from the prior art primarily in that the base stations 30, 40 are moving with the traffic and communicate with the gateway office 60 via fixed radio ports 50. Furthermore, the various call-handling functions, including handoff, are performed by the moving base station. Advantageously, because of movement of the base station in the same direction as the traveling mobile unit, the number of handoffs is greatly reduced.

Each of the moving base stations 30, 40 is provided with antennas 100, 101. The antennas 100, 101, preferably high gain, directional antennas for use in mobile communication, are well know and commercially available. The fixed base stations 70 are provided with four separate antennas 110 extending in four different directions. The antennas 100 on the base stations 30, 40 are used to communicate with the mobile units 20, 25 whereas the antennas 101 on the moving base stations 30, 40 are used to communicate with the fixed radio ports 50. The fixed base stations 70 are preferably each provided with four antennas 102-105. Fewer than four antennas may also be used. In that case, at least one omni-directional antenna is used. In the configuration of FIG. 1, the antennas 102 are arranged to communicate with the mobile units 20 and the antennas 103-105 are arranged to communicate with other mobile telephone communications from slow moving traffic or stationary subscribers. The fixed radio ports 50, in the configuration of FIG. 1, are each provided with a pair of directional antennas 110, 111 of the same general type as the directional antennas 100-105. As the moving base stations 30, 40 move relative to the fixed radio ports 50, data representing voice signals and call related information is transmitted between the antennas 101 on the moving base stations 30, 40 and the antennas 110, 111 on the fixed radio ports 50.

FIG. 2 is a diagrammatic representation of the fixed radio ports 50. The unit includes a standard microprocessor 150 as well as a radio interface circuit 154 providing an interface between the radio signals received on the antennas 110, 111 and the processor 150. The circuits are of a type typically used in fixed base stations and are well known in the art. Additionally, each radio port 50 includes a processor 150 connected to an add/drop multiplexer (ADM) 152. The ADM 152 interfaces with the fiber optic cable 55 and is able to add data from the processor 150 to the data stream on the fiber optic cable 55. Additionally, the ADM 152

recognizes a data stream accompanied by an address identifying the processor 150 and transfers such data from the data stream of the fiber optic cable 55 to the processor 150. As will be described further later herein, the processor 150 computes a signal quality indicator for the information received from the radio interface circuits 154, based primarily on radio signal strength intensity, in a well-known fashion. Processor 150 controls the transfer information between the fiber optic cable 55 and the various moving base stations via the antennas 110, 111.

FIG. 3 is a block diagram representation of one of the fixed base stations 70. The fixed base stations 70 perform the functions of a standard prior art fixed base station. The base stations 70 are connected to the fiber optic ring 75 and include an add/drop multiplexer (ADM) 162 which provides an interface between the processor 160 and the fiber optic ring 75.

As mentioned earlier, both the optical ring 55 and optical ring 75 are connected to the gateway office 60. The primary function of the gateway office is to provide the interface to a wired telephone network. It distributes the telecommunications traffic between the network and the moving base stations via the fixed radio ports. The fiber optic rings 55, 75 are preferably continuous rings with an add/drop multiplexer for each ring in the gateway office. Data transmission on the fiber optic rings 55, 75 is preferably in accordance with one of the well-known SONET or synchronous digital hierarchy (SDH) transmission protocols.

The directional antennas 100-105, 110, 111 may be of a sectorized architecture or may be phased array antennas with highly directional radio frequency beams. Such antennas are preferably used to decrease interference between the mobile base stations and the fixed radio ports, allowing greater spectrum reuse. Antenna diversity can be provided with two spatially separated radio beams separated in time with a predefined time-delay offset for easier separation at reception. Various techniques for obtaining high antenna diversity are well known in the art and antennas employing such techniques are commercially available.

FIG. 4 is a block diagram representation of the moving base station 30. The station 30 includes a processor 130 connected via radio interfaces 132, 134 to the antennas 100, 101, respectively. The processor 130 may be a standard microprocessor and the radio interface circuits 132 may be standard radio interface circuits. The microprocessor is preferably

programmed to handle the call processing functions performed in a prior art system by a call site or by a shared base station controller. In this manner, the moving base station has greater autonomy and requires less communications with a shared base station controller or the like. The circuits 132, like the radio interface circuits 154 in the fixed radio port 50 and the radio interface circuits 164 in the fixed base station 70, are well known and commercially available circuits.

The radio interface between the mobile units 20, 25 and the moving base stations 30, 40 and the fixed base station 70 is a standard radio interface, well known in the art. The radio interface between the moving base stations 30, 40 and the fixed radio ports 50 is preferably a time division multiplexed, direct-sequence, spread-spectrum, code-division multiple-access interface (TDM/CDMA). Multiple channels between the base station and the fixed radio ports are time division multiplexed as time slots in a data stream. The data stream is spread with a pseudo-random code over the allocated spectrum. A pilot sequence is inserted in the transmitted signal for ease of synchronization in a well-known manner. The interface between the movable base station and the fixed radio port is preferably transparent to the overall system in spectrum use.

Frequency division or time division may be used for duplex communications. In the frequency division duplex (FDD) mode, data is simultaneously transmitted in both directions, each in a different spectrum band. In a typical system in the FDD mode, the TDM frame transmission duration will be approximately 500 microseconds making the interface substantially transparent to overall system delay.

The interface between the mobile unit and the movable base may be the standard IS-95-based PCS air interface standard. The channel capacity for the so-called "extended mode" (2.5 mhz) has been determined to be seven channels at 32 kilobits per second. The FCC allocated licensed spectrum for personal communications services (PCS) includes 10-mhz licenses and 30-mhz licenses. Each 10-mhz license provides two separated 5-mhz bands and each 30- mhz license provides two separated 15-mhz bands, for two-way communications. Two 5-mhz bands can support 14 duplex channels at 32 kilobits per second and two 15-mhz bands can support 42 duplex channels at 32 kilobits per second.

Voice signals between a mobile unit and the gateway office are encoded in a standard fashion using ADPCM voice encoding with a minimum bit rate of 32 kilobits per second in each channel. The interface between the moving base station and the fixed radio port is adapted to carry up to 19 channels of 32 kilobits per second each at 16 bits per time slot. The frame structure includes 16 bearer channels of 32 kilobits per second at 16 bits per time slot. The time division multiplexed frame rate between the movable base station and the fixed radio port is 608 kilobits per second. To achieve a processing gain of 9 decibels, the frame rate is multiplied by a factor of 8, yielding 4,864 kilobits per second, which fit into a single 5-mhz band. FIG. 6 is a tabular representation of the channel allocation showing 16 bearer channels plus 3 channels for signalling, control, and error code. FIG. 7 is a representation of channels 18 and 19 of FIG. 6.

The moving base stations are addressed using predefined code sequences derived in a known manner by the use of Walsh functions. U.S. Pat. 5,103,349 entitled "System and Method for Generating Signal Wave Forms in CDMA Cellular Telephone System" describes the use of Walsh functions for code generation. U.S. Pat. 5,103,349 is incorporated by reference herein. As described in that patent, by choosing a Walsh function of order 8 provides 8 orthogonal codes in the present embodiment using spread spectrum CDMA uses the all 0 Walsh sequence as a pilot carrier with the other 7 sequences available for moving base station communications. The code sequences may be repeated as ABCDEFG; ABCDEFG; . . . Although fewer codes could be used, preferably no less than 3 are used. Because of differing propagation times for signals between a particular moving base station and two or more different fixed radio ports, it is not possible to satisfy the condition of time alignment required for Walsh function orthogonality for 2 or more fixed radio ports at one time. For this purpose, two outer pseudonoise codes are used to provide discrimination between signals arriving at the moving base station from different fixed radio ports. The pseudonoise code rate is preferably 4,864 kilobits per second. The sequence length for the transmitted carrier signal is preferably 32,768 chips, as described in U.S. Pat. 5,103,459. The outer pseudonoise codes modulate the signal in quadrature phase shift keying.

The pilot signal will be transmitted in both directions, from the moving base stations to the fixed radio ports and vice, versa. This is made possible by the line of site fading characterized as Rician.

The pilot sequence will be long enough that a number of different sequences can be generated by shifts in the basic sequence. The separation will be great enough to ensure that there is no interference between pilot signals. Each moving base stations will use a different offset from a neighboring moving base station to provide signal separation. Similarly, each fixed radio port will use a different offset from a neighboring fixed radio port.

The FCC has allocated a 20 mhz of unlicensed spectrum, including a 10 mhz band for voice products and a 10-mhz band for data products. Thus, one continuous 10-megahertz channel is available and time division multiplex transmission is preferably used. The bit rate for both directions of transmission will be twice the frequency division duplex rate, introducing an overall delay of 500 microseconds and a processing gain of 9 decibels. In the time division duplex mode, the transmission times and direction, forward and reverse between the mobile unit and the moving base station and between the moving base station and the fixed radio ports, are aligned. In one half of the time division, duplex cycle signals are transmitted from the mobile unit to the moving base station and, from there, to the fixed radio port. In the other half-cycle, signals are transmitted from the fixed radio port to the moving base station and then to the mobile unit.

The two 15-mhz licensed spectrum bands (30 mhz) are preferably divided into three 5-megahertz channels in each direction, utilizing the same architecture as described earlier herein with respect to the 5-megahertz licensed spectrum. In the 15-mhz licensed spectrum, each of the 5-megahertz channels will support 14 traffic channels, for a total of 42 traffic channels in each 15-mhz band. The air interface between the moving base station and the fixed radio port, as well as the signal structure, can be modified and adapted to a variety of allocations of spectrum and air interface standards.

In the present embodiment, as described earlier herein, 7 orthogonal codes are available for communication between the fixed radio ports 50 and the moving base stations 30,

40. As described earlier herein and depicted in FIGS. 6 and 7, one 16 bit communication channel, channel 19, is set aside for control and identification bits. As depicted in FIG. 7, channel 19 may comprise 7 control bits and 9 identification bits. The 9 identification bits provide 512 unique identification numbers. Using 7 orthogonal codes and 512 identification numbers, 3,854 moving base stations can be uniquely identified. When the moving base stations are separated by a spacing of 200 feet, the total distance of coverage using the 3,854 moving base stations is approximately 135 miles. FIG. 1 shows a portion of the system with moving base stations moving in opposite directions along oppositely directed roadways and fixed radio ports with dual antennas. Vehicular traffic moving in opposite directions on the same roadway are preferably served by moving base stations on opposite sides of the roadway. Where each roadway has only one-way traffic, the system is preferably disposed between the roadways. In one embodiment of the invention, depicted in FIG. 9, two separate loops 200, 205 are disposed between two separate roadways 206, 208 with the traffic on the roadways indicated by the arrows 207 and 209. The loops 200 and 205 comprise moving base stations 210 and 250, respectively. The base stations, in this embodiment, are moving in the direction indicated by the arrows 201 and 202. Since, as a practical matter, the loops 200, 205 are not of indefinite length, a plurality of loops may be required to cover a desired area. To avoid interruption in communications, the ends of the loops are preferably sufficiently close together, or overlapping, to provide an overlapping area of coverage for mobile units traveling in the area of the loop ends. This will allow one of the mobile stations nearing the end of the loop of which it is a part to hand off the call to a mobile station of the adjacent loop.

Each loop preferably has a single gateway for connection to the wire telephone network. One advantage of that arrangement is that it eliminates the need for registration of moving base stations, which is required where a moving base station moves between gateways. FIG. 9 shows a pair of gateways 215 associated with the loop 200 and a pair of gateways 255 associated with the loop 205. The two gateways of a loop are both connected to the fixed radio ports of the loop at all times and may be operated in a load sharing mode with each capable of

handling the total telecommunication's traffic for the loop in the event of a failure in one of the gateways.

To avoid interrupting communications with a mobile unit traveling along the roadway in the area where two adjacent loops end, any existing calls are handed off from the moving base station near the terminating end of its loop to a moving base station of the next loop. The handoff process is essentially the same as a handoff between moving base stations on the same loop, except that the handed off call will be routed to the wire network to a different gateway. This procedure is equivalent to a handoff between cell sites of different cells in the existing cellular network in a manner which is well known in the art. The loops 200 and 205 may physically overlap to assure proper overlap of communications between moving base stations of the two loops and to avoid loss of communication with a mobile unit handed off from one loop to another.

The timing and synchronization between the moving base station and a fixed radio port with which the moving base station communicates is phase-locked to the pilot signals received from the fixed radio port with which the moving base station communicates. For synchronization purposes, the moving base station will receive a Global Positioning Satellite (GPS) Coordinated Universal Time (UCT) timing signal once each second.

CDMA Technology is well-known for sensitivity to power control. Specifically, the more powerful signals tend to "mask out" less powerful signals at the receiver. Typically, elaborate power control schemes are implemented to ensure that all signals arrive at the receiver at the same level. In accordance with the system of this invention, however, the sensitivity to power level of CDMA is used to advantage. The principles of signal transmission employed in the system of the invention is illustrated in FIG. 8. Two power levels of radio transmission, high (H) and low (L), are defined. Referring to FIG. 1, high-power level signals are transmitted from the moving base station 30 to the mobile unit 20 and from the base station 30 to the fixed radio port 50. Low power level signals are transmitted from the fixed radio port 50 to the moving base station 30. Similarly, low power signals are transmitted from the mobile unit 20 to the moving base station 30. Since the moving base station receives a low power level signal from the fixed

radio port and transmits a high level power signal toward terminals, the high power level received at the mobile unit 20 will mask out any signals of the low power signal transmitted from the fixed radio port to the moving base station. In a similar fashion, any low signal transmitted from the mobile unit 20 reaching the fixed radio port 50 will be masked by the high power level signal transmitted from the moving base station to the fixed radio port. As stated earlier, the antennas 100-105, 110, 111 are preferably highly directional antennas with very little feedback from the transmit signal to the receive signal. Feedback due to reflections and other extraneous sources can be readily eliminated at the moving base station using well-known noise cancellation techniques.

When a mobile unit set is first powered up or first enters a service area, the mobile unit must register in the manner described earlier, by transmitting its unique address in the new service area. The address will be received by the closest moving base station 30 and transmitted via a fixed radio port and the gateway switch 60 to the telephone network. This registration procedure is required so that an incoming call for the mobile unit can be appropriately directed.

The spacing of mobile based stations 20 and the fixed radio ports 50 of FIG. 1, together with the strength of the signal transmitted between the moving base stations and the fixed radio ports, determines the number of fixed radio ports with which a moving base station can communicate at any point in time. The spacing and signal strength is preferably such that each fixed radio port receives signals from three moving base stations. When a fixed radio port receives data, accompanied by the identification number of the moving base station, the processor 150 (FIG. 2) computes a signal quality indication on the received signal. The signal quality indication is a figure of merit preferably computed as a function of signal strength and signal-to-noise ratio. It is added to the received data and added to the fiber optic ring 55 via the ADM 152. The gateway 60 preferably receives the same data from several different ones of the fixed radio ports 50 and stores the data in an internal memory in the gateway 60 in association with the moving base station identification number and Walsh function spreading code. The address of the fixed radio port from which the data has been received is stored in the memory of processor 64 as well. Accordingly, multiple copies of the same data transmitted by a single

moving base station are stored in the memory of the processor 64 in the gateway. The signal quality indications computed by the processors 150 in each of several fixed radio ports are compared to a predefined signal quality indication threshold, and the data corresponding to a signal quality indication below the threshold value is discarded. Otherwise, the data is retained.

5 A cyclic redundancy code transmitted with the data is used to detect any TDM frame errors. The best data, i.e., associated with the best signal quality indication is transferred from the gateway 60 to the telephone network. Data received from the telephone network at the gateway 60 and intended for a registered mobile unit is stored in the memory of the processor 150 in a register particularly associated with the moving base station currently serving the mobile unit. This data
10 will be sent via the optical ring 55 to all fixed radio ports that are identified in the memory of the processor 65 as fixed radio ports with an acceptable signal quality indication. The received data will be transmitted from each of the fixed radio ports which received the data together with the identification code and Walsh function code of the moving base station to which the data is directed. The transmission of data from different fixed radio ports will be staggered, delayed by different amounts, so that they can be received and separated at the moving base stations. The delays can be precisely controlled by means of synchronous distribution via the optical ring 55, in the SONET or SDH format. The receiving moving base station, by means of its processor 130, compares the multiple copies of the received data signals, aligns them and combines them for the best reception.

20 Each of the moving base stations will have one of N assigned codes, where N may be any number, but preferably is at least 3 or more. Seven Walsh function codes are preferably used. The codes may be repeated in sequence, as for example, ABCDEFGABCDEFG. The codes are assigned in sequence to the various moving base stations so that two moving base stations having the same code will be physically separated by a sufficient distance to prevent
25 interference in the communications between fixed radio ports and moving base stations having the same identity code. The operation of the fixed base stations 70 is essentially the same as that of a standard fixed base station. In congested traffic areas, a mobile unit which is stopped or slowly moving, e.g., less than 30 miles per hour, will preferably be serviced by one of the fixed

base stations 70. As the speed of travel of the mobile unit 20 increases, a handoff will occur between the fixed base station and a moving base station. The procedures for determining whether a mobile unit is to be served by a fixed base station or a moving base station are the same procedures as described earlier herein in determining which moving base station is selected to serve a mobile unit, i.e., based on signal strength and error rate. Thus, when a call involving a mobile unit is initiated or when it is determined that a handoff should occur, the mobile unit may be handed from a moving station to a fixed station, or vice versa. Each mobile unit monitors pilot signals from fixed and moving base stations and synchronizes to the base station providing the best signal. The mobile unit may "connect" with three fixed or moving base stations while searching for a fourth in what is known as the "soft" hand-off mode. As the speed of the vehicle increases, fixed or slow moving base stations will be dropped. In more congested areas where traffic speed will vary between 0 and 60 miles per hour, base stations speed may, for example, be set to move at 30 mph. The moving base station should then be able to accommodate all traffic in the 0-60 mph range.

It will be understood that the above-described arrangement is merely illustrative of the application of the principles of the invention and that other arrangements may be devised by those skilled in the art without departing from the scope of the invention as defined by the appended claims.

CLAIMS

WHAT WE CLAIM IS:

1. Interface apparatus for establishing signal connections between a telephone office connected to a telephone network and mobile telephone units transmitting radio signals and moving in a specified direction, the interface apparatus comprising:

a stationary interface unit connected to the telephone office via a signal transmission connection;

a plurality of spaced apart movable base stations, each of the base stations uniquely associated with the telephone office and supported on a conveying device for limited

movement in the specified direction within an area defined relative to the stationary interface, the movable base stations each responsive to radio signals transmitted by the mobile telephone units to transmit corresponding radio signals to the stationary interface unit and the stationary interface unit responsive to the radio signals transmitted from the movable units to transmit signals corresponding to the signals transmitted from the movable units to the telephone office via the signal transmission connection.

2. The interface apparatus in accordance with claim 1 wherein the mobile telephone unit moves along a roadbed and the movable interface unit is movably supported on conveying apparatus disposed along path extending parallel to the roadbed.

3. The interface apparatus in accordance with claim 2 wherein the conveying apparatus comprises a rail movably supporting the movable interface unit.

4. The interface apparatus in accordance with claim 2 wherein the stationary interface unit is disposed on one side of the conveying apparatus opposite the roadbed.

5. The interface apparatus in accordance with claim 1 wherein the movable interface unit comprises signal processing circuitry and a first radio antenna directed toward the mobile telephone unit and a second radio antenna directed toward the stationary interface unit and wherein the stationary interface unit comprises signal processing circuitry and a radio antenna directed toward the movable interface unit, the movable interface unit responsive to radio signals received at the first antenna to transmit corresponding radio signals via the second antenna to the stationary interface unit and the stationary interface unit responsive to radio signals received via the radio antenna of the stationary interface unit to transmit corresponding signals to the telephone office via the signal transmission connection.

6. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to hand-off and receive existing calls to mobile units in an associated service area.

7. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform a plurality of functions including locating an identified mobile unit in an associated service area.

8. The interface apparatus in accordance with claim 1 wherein the radio signals transmitted between the movable interface unit and the stationary interface unit are transmitted in accordance with a code division multiple access, direct sequence, spread spectrum transmission signalling protocol.

9. The interface apparatus in accordance with claim 8 wherein signals transmitted from the mobile telephone unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the stationary interface unit are transmitted at a second power level higher than the first power level.

10. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a time division duplex manner.

11. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a frequency division duplex manner.

12. The interface apparatus in accordance with claim 8 wherein each movable interface unit is synchronized to a selected stationary unit by transmission of pilot signals to the selected unit.

13. The interface apparatus in accordance with claim 1 wherein the movable interface unit is responsive to radio signals received from the stationary interface unit to transmit corresponding radio signals to the mobile telephone unit and wherein signals transmitted from the stationary interface unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the mobile telephone unit are transmitted at a second power level higher than the first power level.

14. Interface apparatus for establishing signal connections between a telephone office and a plurality of mobile telephone units transmitting radio signals, certain of the mobile telephone units moving in a specified direction, the interface apparatus comprising:
a plurality of movable interface units uniquely associated with the telephone office; and

a plurality of stationary interface units connected to the telephone office via a signal transmission connection;

each of the movable interface units movable in the specified direction and within a limited area defined relative to the stationary interface units and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding radio signals in the direction of the stationary interface units, each of the stationary interface units responsive to radio signals transmitted from an adjacent movable unit to transmit signals corresponding to the signals transmitted from the adjacent movable unit to the telephone office via the signal transmission connection.

15. The interface apparatus in accordance with claim 14 wherein:

the movable interface units are movable along an interface unit path extending in a direction parallel to the predefined path and having a first side adjacent the predefined path;

the stationary interface units are spaced apart and disposed on a second side of the interface unit path opposite the first side of the interface unit path;

each of the movable interface units comprises signal processing circuitry and an associated first radio antenna directed toward the first side and an associated second radio antenna directed toward the second side;

each of the stationary interface units comprises signal processing circuitry and an associated radio antenna directed toward the interface unit path;

each of the movable interface units is responsive to radio signals received at the associated first antenna to transmit radio signals via the associated second antenna to the stationary interface unit; and

each of the stationary interface units is responsive to radio signals received via the associated radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

16. The interface apparatus in accordance with claim 14 wherein the movable units move along the interface unit path at a predefined speed.

17. The interface apparatus in accordance with claim 16 wherein the predefined speed is a function of an average speed of the plurality of mobile telephone units.

18. The interface apparatus in accordance with claim 14 and further comprising a plurality of mobile telephone units moving along another path in an opposite direction opposite the specified direction and a plurality of movable interface units movable in the opposite direction and wherein:

5 the plurality of mobile telephone units moving in the specified direction move along a first roadbed and the plurality of mobile telephone units moving in the opposite direction move along a second roadbed spaced apart from the first roadbed;

the plurality of movable interface units movable in the specified direction are disposed along one side of the first roadbed adjacent the second roadbed;

10 the plurality of movable interface units movable in the opposite direction are disposed along one side of the second roadbed adjacent the first roadbed; and

the plurality of stationary interface units are disposed between the plurality of movable interface units movable in the specified direction and the plurality of movable interface units movable in the opposite direction.

19. The interface apparatus in accordance with claim 14 and further comprising a plurality of stationary interface units connected to the telephone office via a signal transmission connection and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding signals to the telephone office.

20. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform hand-off and receiving functions relative to existing calls for mobile units within an associated service area.

21. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and is operative to perform a plurality of functions, including locating an identified mobile unit in an associated service area.

22. The interface apparatus in accordance with claim 14 wherein the telephone office is connected to a telephone network and wherein a plurality of stationary interface units are responsive to radio signals transmitted by an identified one of the movable interface units and

each stationary interface unit responsive to radio signals from the identified movable interface unit is operative to compute a signal quality indication for data represented by the transmitted radio signals and to transmit to the telephone office data signals corresponding to the transmitted radio signals together with a corresponding signal quality indication, the telephone office responsive to the receipt of the data signals and signal quality indication to transmit to the telephone network data received from a selected one of the stationary interface units having a preferred signal quality indication.

23. The interface apparatus in accordance with claim 14 wherein each of the stationary units is responsive to a data message received from the telephone office to transmit a corresponding radio message to selected ones of the movable interface units and wherein the telephone office is operative to transmit a predetermined data message intended for a selected one of the movable interface units to selected ones of the stationary interface units and each of the selected ones of the stationary interface units is responsive to receipt of the predetermined data message to transmit corresponding radio signals to the selected one of the movable interface units.

24. The interface apparatus in accordance with claim 23 wherein the predetermined data message is transmitted to each of the selected ones of the stationary interface units in a timed sequence and the selected ones of the stationary interface units transmits the corresponding radio signals in a corresponding timed sequence.

25. A mobile telephone system comprising:
a telephone office connected to a telephone network;
a stationary interface unit connected via a signal transmission connection to the telephone office;

a movable interface unit uniquely associated with the telephone office and movable at a predetermined speed along a first predefined path of travel and in a direction

defined by a direction of travel of a mobile telecommunication unit traveling along a second predetermined path defined within a limited area defined relative to the stationary interface;

the stationary interface unit comprising signal processing circuitry and a

10 stationary interface radio antenna directed toward the first predefined path of travel;

the moving interface unit comprising signal processing circuitry and a first radio antenna directed toward the second predefined path of travel and a second radio antenna directed toward the stationary interface unit;

15 the moving interface unit responsive to radio signals received at the first radio antenna to transmit corresponding radio signals via the second radio antenna to the stationary interface and the stationary interface responsive to radio signals received at the stationary interface radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

26. A mobile telephone system arranged for communication with mobile telephone units and comprising:

first and second telephone offices connected to a telephone network;

a first closed loop having opposite ends and a second closed loop having opposite ends, one of the opposite ends of the first loop disposed adjacent one of the opposite ends of the second loop, each of the loops movably supporting a plurality of movable base stations;

a plurality of stationary interface units disposed adjacent each of the loops, each connected to one of the telephone offices;

10 each movable base station communicating with a stationary interface unit and responsive to radio telephone signals transmitted by a mobile telephone unit to establish a telephone communication connection with one of the telephone offices via one of the stationary interface units;

15 the telephone offices operative to record position of each of the movable base stations on each loop and to transmit an alert signal via one of the stationary interface units to an identified movable base station approaching one of the opposite ends of one of the loops;

the identified movable base station responsive to the alert signal to indicate to mobile units communicating with the identified movable base station to establish a telephone communication connection to another base station.

27. The system in accordance with claim 26 wherein one of the opposite ends of one of the loops overlaps one of the opposite ends of another of the loops.

28. The apparatus in accordance with claim 1 wherein the movable interface unit is further responsive to radio signals received from the telephone office via the stationary interface unit to locate an identified mobile unit and to transmit to the identified mobile unit signals corresponding to radio signals received from the telephone office.

29. The apparatus in accordance with claim 1 and comprising a plurality of stationary interface units and wherein the area is defined relative to the plurality of interface units.

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MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

ABSTRACT

A mobile communication system employs moving base stations moving in the direction of flow of traffic moving along a roadway. The moving base station communicates with fixed radio ports connected to a gateway office. A plurality of moving base stations are spaced apart on a closed loop and move with the flow of traffic along one roadway on one leg of the loop and with a flow of traffic on another roadway in another leg of the loop. The moving base stations communicate with a plurality of fixed radio ports connected by a signal transmission link to a gateway office which, in turn, is connected to the wire line network. The moving base stations are each provided with a pair of directional antennas with one antenna directed toward the flow of traffic and another antenna directed to the fixed radio ports.

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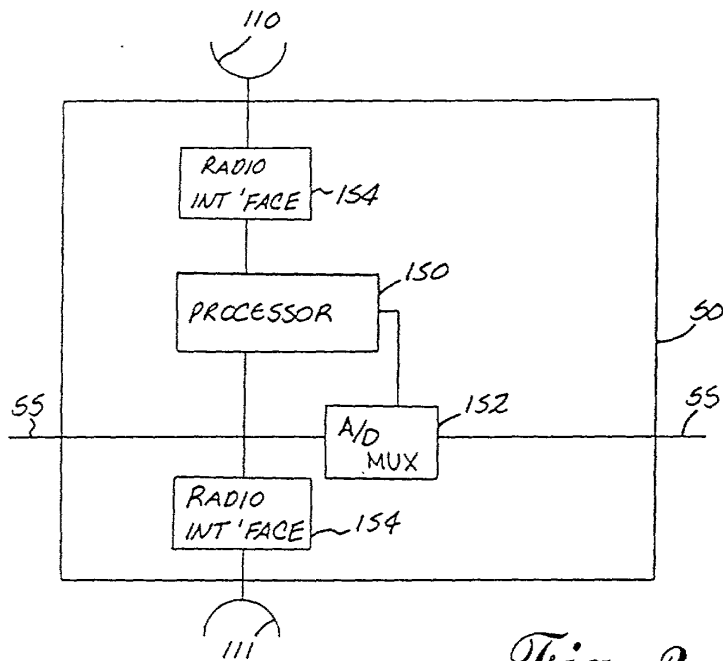


Fig. 2

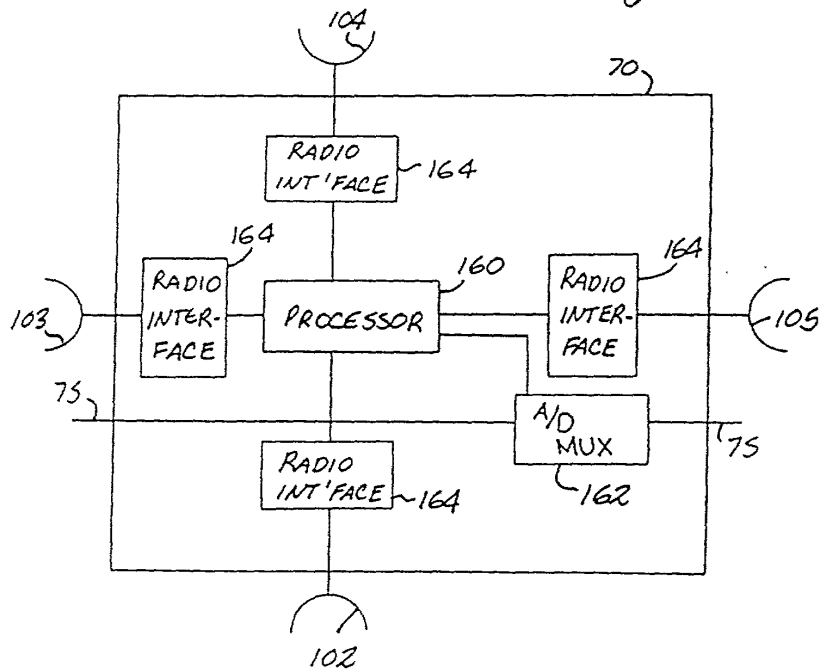


Fig. 3

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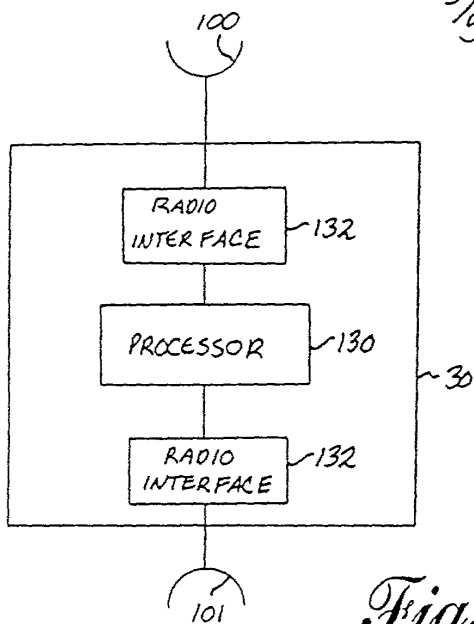


Fig. 4

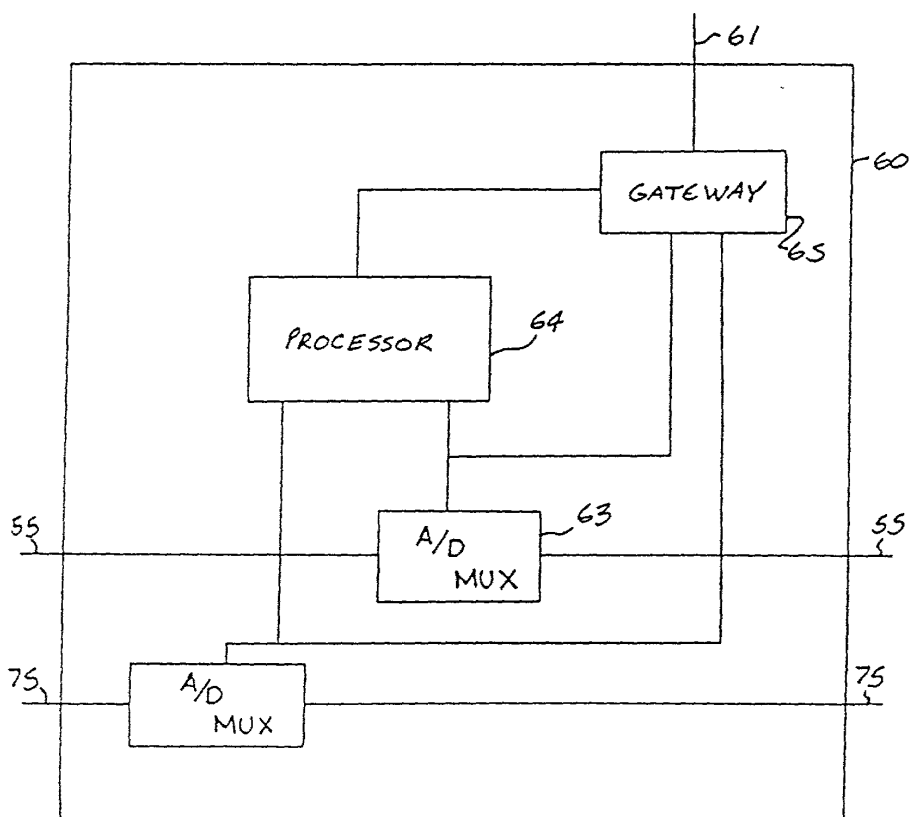


Fig. 5

4/5

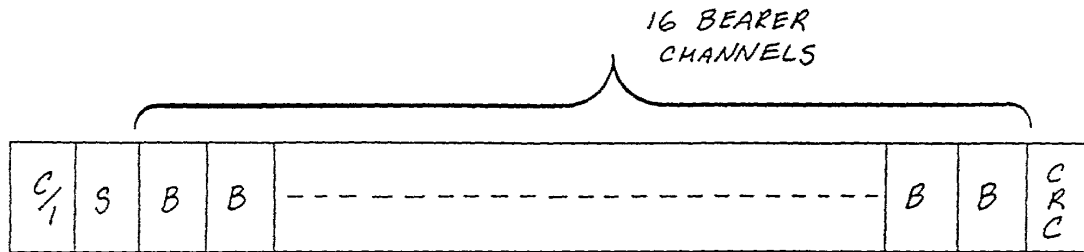


Fig. 6



Fig. 7

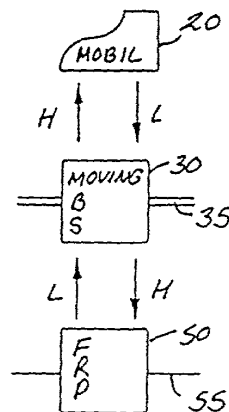


Fig. 8

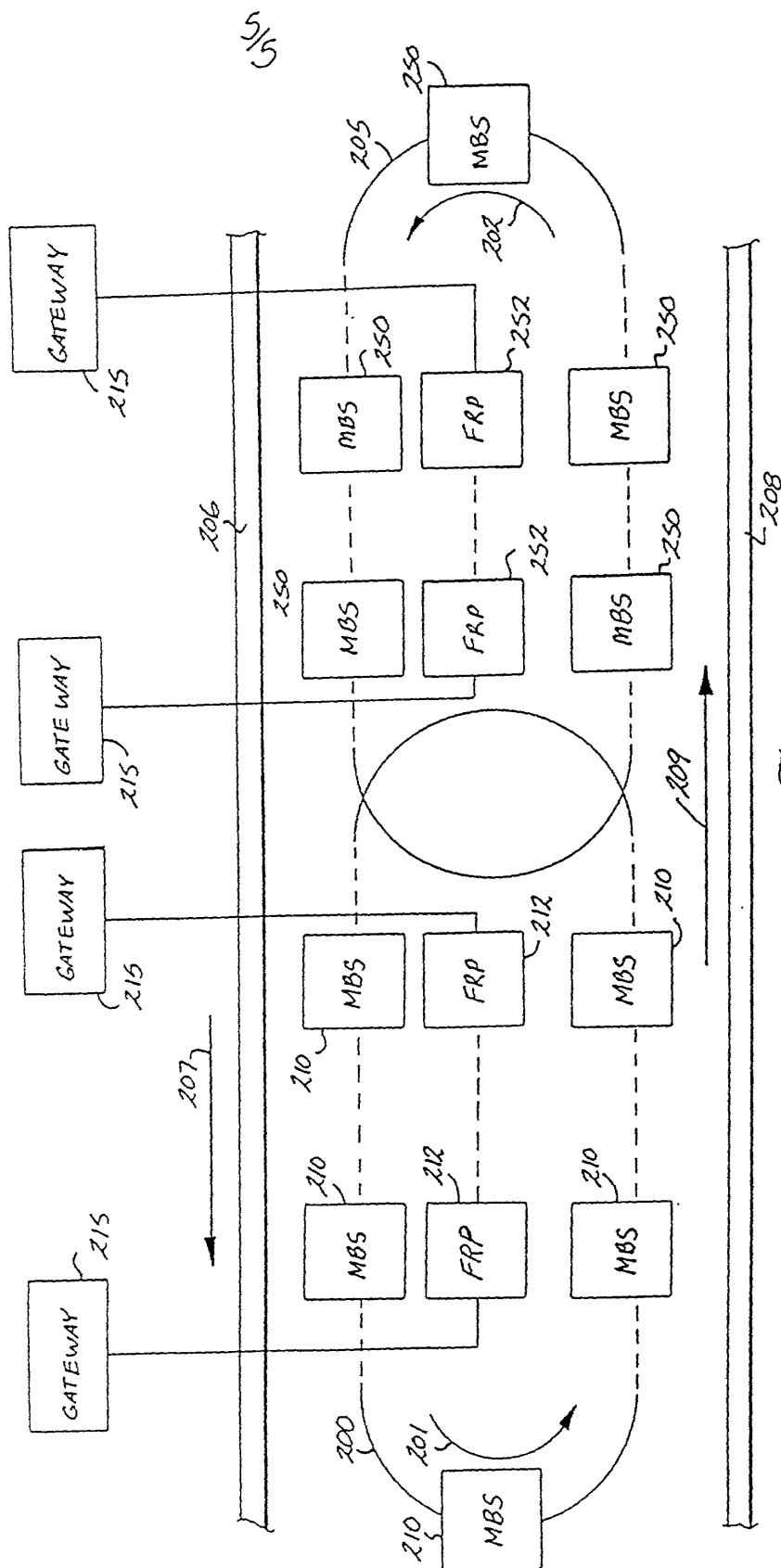


Fig. 9

DECLARATION FOR PATENT APPLICATION

As below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION
the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Priority Claimed

(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending or abandoned)
<u>PCT/US95/07037</u>	<u>June 2, 1995</u>	<u>pending</u>

I hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

John E. McGarry, Reg. No. 22,360; H. Lawrence Smith, Reg. No. 24,900; Peter Visserman, Reg. No. 25,185; Thomas L. Lockhart, Reg. No. 29,324; Timothy E. Eagle, Reg. No. 31,755; Joel E. Bair, Reg. No. 33,356; Richard J. McKenna, Reg. No. 35,610; and Alvin R. Wirthlin, Reg. No. 40,267. Address all telephone calls to VARNUM, RIDDERING, SCHMIDT & HOWLETT LLP at telephone number (616) 336-6000. Address all correspondence to Bridgewater Place, Post Office Box 352, Grand Rapids, Michigan 49501-0352.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Charles D. Gavrilovich
Inventor's signature Charles D. Gavrilovich Date 7-18-1996
Residence 7 S 533 Plainfield Road, Naperville, Illinois 60540 Citizenship U.S.
Post Office Address same as above

Full name of second joint inventor (given name, family name) _____
Inventor's signature _____ Date _____
Residence _____ Citizenship _____
Post Office Address _____

Full name of third joint inventor (given name, family name) _____
Inventor's signature _____ Date _____
Residence _____ Citizenship _____
Post Office Address _____

☐ Additional inventors are being named on separately numbered sheets attached hereto.

PATENT NUMBER

U.S. UTILITY PATENT APPLICATION

O.I.P.E.	PATENT DATE
FNIC SCANNED <u>TWO</u> <u>Q.A. [Signature]</u>	

SECTOR	CLASS 455	SUBCLASS 517	ART UNIT 2686	EXAMINER J.C. Cortee

FILED WITH: ☐ DISK (CRF) ☐ FICHE
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PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION								
ORIGINAL			CROSS REFERENCE(S)					
CLASS	SUBCLASS		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
<u>455</u>	<u>11.1</u>		<u>455</u>	<u>13.1</u>	<u>512</u>	<u>517</u>	<u>426</u>	
INTERNATIONAL CLASSIFICATION								
<u>H0416</u>	<u>7</u>	<u>26</u>						
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☐ Continued on Issue Slip Inside File Jacket

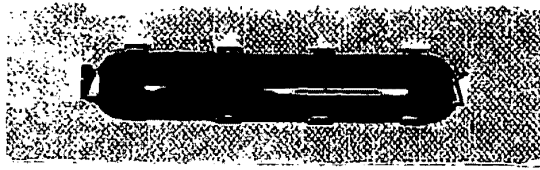
☒ TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg. <u>5</u>	Figs. Drwg. <u>9</u>	Print Fig. <u>1</u>	Total Claims <u>71</u>	Print Claim for O.G. <u>1</u>
☐ a) The term of this patent subsequent to _____ (date) has been disclaimed.	<u>Joy Contee 4/2/03</u> (Assistant Examiner) (Date)			NOTICE OF ALLOWANCE MAILED	
				ISSUE FEE	
Amount Due				Date Paid	
☒ b) The term of this patent shall not extend beyond the expiration date of U.S. Patent. No. <u>5,729,826</u> <u>6,026,277</u>					
	(Primary Examiner) (Date)				
☐ c) The terminal _____ months of this patent have been disclaimed.				ISSUE BATCH NUMBER	
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WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368 Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.					

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Class	Sub.	Date	Exmr.
455	11.1 422 430 440 450 512	6/20/02	JL
455	above subs	12/28/02	JL
455	↑ above subs	4/1/03	JL
342	106 109 114 139 140 146 357+	5/18/03	J.G
Updated search above		5/21/03	J.G
updated 455 342	subs	11/2/03	JL

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
available class	4/2/03	JL	

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	Date	Exmr.
converted J.D. mynet	9/02	JL
updated w/ search using EAST	4/2/03	JL
Quochien	5/24/03	J.G
Nguyen Vo	5/20/03	J.G

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O.I.P.E. CLASSIFIER		59	106
FORMALITY REVIEW	DB	65373	10/14/99

INDEX OF CLAIMS

✓ Rejected N Non-elected
 = ... Allowed I Interference
 - (Through numeral) ... Canceled A Appeal
 + ... Restricted O Objected

Claim	Original	Date
1	51	12/21/02
2	52	12/21/02
3	53	12/21/02
4	54	12/21/02
5	55	12/21/02
6	56	12/21/02
7	57	12/21/02
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150	200	12/21/02

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PTO/SB/05 (4/98)

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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR § 1.53(b))

Attorney Docket No.

Gavrilovich P1US2

First Inventor or Application Identifier

GAVRILOVICH, Charles D.

Title

CELLULAR NETWORK

Express Mail Label No.

EL 122 464 935 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO:

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ *Fee Transmittal Form (e.g. PTO/SB/17)
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification [Total Pages 25]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix

- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claims (s)
- Abstract of the Disclosure

3. ☒ Drawings (35 U.S.C. 113) [Total Sheets 5]

4. Oath or Declaration [Total Pages 1]

- a. ☐ Newly executed (original or copy)
b. ☒ Copy from prior application (37 CFR § 1.63(d))
(for continuation/divisional with Box 16 completed)
i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 CFR 1.63(d)(2) and 1.33(b).

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY
SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED
(37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS
RELIED UPON (37 C.F.R. § 1.28).

5. ☐ Microfiche Computer Program (Appendix)

6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
a. ☐ Computer Readable Copy
b. ☐ Paper Copy (identical to computer copy)
c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))

8. ☐ 37 CFR § 3.73(b) Statement [☐ Power of Attorney
(when there is an assignee)

9. ☐ English Translation Document (if applicable)

10. ☐ Information Disclosure Statement (IDS)/PTO-1449 [☐ Copies of IDS Citations

11. ☒ Preliminary Amendment

12. ☒ Return Receipt Postcard (MPEP 503)
(should be specifically itemized)

13. ☐ *Small Entity Stmt(s) [☒ Statement filed in prior application
(PTO/SB/09-12) Status still proper and desired

14. ☐ Certified copy of Priority Document(s)
(if foreign priority is claimed)

15. ☒ Other: Check for \$1,766.00

16. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☒ Continuation [☐ Divisional [☐ Continuation-in-part(CIP) of prior application no. 08 / 953,962 filed 10/20/97

Prior application information: -Examiner: REDMON, J. Group/Art Unit: 2744

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

[☐ Customer Number or Bar Code Label or [☒ Correspondence address below
(Insert Customer No. or Attach bar code label here) .

NAME

ADDRESS

Bridgewater Place, 333 Bridge Street, N.W.

P.O. Box 352

CITY

Grand Rapids

STATE

Michigan

ZIP CODE

49501-0352

COUNTRY

USA

TELEPHONE

(616) 336-6000

FAX

(616) 336-7000

Name (Print/Type)

PETER VISSERMAN

Registration No. (Attorney/Agent)

25,185

Signature

Peter Visserman

Date

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FEE TRANSMITTAL Patent fees are subject to annual revision on October 1. Thereafter, the fees effective October 1, 1997. Small Entity payments <u>must</u> be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.		<i>Complete if Known</i>		
		Application Number		
		Filing Date		
		First Named Inventor	GAVRILOVICH, Charles D.	
		Examiner Name		
		Group/Art Unit		
TOTAL AMOUNT OF PAYMENT		\$1,766.00	Attorney Docket Number	Gavrlovich P1US2

METHOD OF PAYMENT (check one)		FEE CALCULATION (Continued)																																																																																																																																																												
1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayment to: Deposit Account No. 22-0257 Deposit Account Name: Varum, Riddering, et al. ☐ Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17 ☐ Charge the Issue Fee Set in 37 CFR § 1.18 at the Mailing of the Notice of Allowance 2. ☒ Payment Enclosed ☐ Check ☐ Money Order ☐ Other		3. ADDITIONAL FEES <table border="1"> <thead> <tr> <th>Large Entity Code</th> <th>Small Entity Code</th> <th>Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65 Surcharge-late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25 Surcharge-late provisional fee or cvr sht</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130 Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520 For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112</td><td>920* Requesting publication of SIR prior to Examination action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113</td><td>1,840* Requesting publication of SIR after to Examination action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55 Extension for reply within 1st month</td><td></td></tr> <tr><td>116</td><td>380</td><td>216</td><td>190 Extension for reply within 2nd month</td><td></td></tr> <tr><td>117</td><td>870</td><td>217</td><td>435 Extension for reply within 3rd month</td><td></td></tr> <tr><td>118</td><td>1,360</td><td>218</td><td>680 Extension for reply within 4th month</td><td></td></tr> <tr><td>128</td><td>1,850</td><td>228</td><td>925 Extension for reply within 5th month</td><td></td></tr> <tr><td>119</td><td>300</td><td>219</td><td>150 Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>300</td><td>220</td><td>150 Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>260</td><td>221</td><td>130 Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510 Petition to institute a public use procdg</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>55 Petition to revive - unavoidable</td><td></td></tr> <tr><td>141</td><td>1,210</td><td>241</td><td>605 Petition to revive - unintentional</td><td></td></tr> <tr><td>142</td><td>1,210</td><td>242</td><td>605 Utility issue fee (or reissue)</td><td></td></tr> <tr><td>143</td><td>430</td><td>243</td><td>215 Design Issue Fee</td><td></td></tr> <tr><td>144</td><td>580</td><td>244</td><td>290 Plant Issue Fee</td><td></td></tr> <tr><td>122</td><td>130</td><td>122</td><td>130 Petitions to the Commissioner</td><td></td></tr> <tr><td>123</td><td>50</td><td>123</td><td>50 Petitions related to provisional appl.</td><td></td></tr> <tr><td>126</td><td>240</td><td>126</td><td>240 Submission of Information Discl Stmt</td><td></td></tr> <tr><td>518</td><td>40</td><td>581</td><td>40 Recording each patent assignment per property (times number of properties)</td><td></td></tr> <tr><td>146</td><td>790</td><td>246</td><td>395 Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr> <tr><td>149</td><td>790</td><td>249</td><td>395 For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr> <tr><td colspan="4">Other fee (specify) _____</td><td></td></tr> <tr><td colspan="4">Other fee (specify) _____</td><td></td></tr> <tr> <td colspan="4">*Reduced by Basic Filing Fee Paid</td> <td>SUBTOTAL (3)</td> </tr> <tr> <td colspan="4"></td> <td>\$1,766.</td> </tr> </tbody> </table>		Large Entity Code	Small Entity Code	Fee (\$)	Fee Description	Fee Paid	105	130	205	65 Surcharge-late filing fee or oath		127	50	227	25 Surcharge-late provisional fee or cvr sht		139	130	139	130 Non-English specification		147	2,520	147	2,520 For filing a request for reexamination		112	920*	112	920* Requesting publication of SIR prior to Examination action		113	1,840*	113	1,840* Requesting publication of SIR after to Examination action		115	110	215	55 Extension for reply within 1st month		116	380	216	190 Extension for reply within 2nd month		117	870	217	435 Extension for reply within 3rd month		118	1,360	218	680 Extension for reply within 4th month		128	1,850	228	925 Extension for reply within 5th month		119	300	219	150 Notice of Appeal		120	300	220	150 Filing a brief in support of an appeal		121	260	221	130 Request for oral hearing		138	1,510	138	1,510 Petition to institute a public use procdg		140	110	240	55 Petition to revive - unavoidable		141	1,210	241	605 Petition to revive - unintentional		142	1,210	242	605 Utility issue fee (or reissue)		143	430	243	215 Design Issue Fee		144	580	244	290 Plant Issue Fee		122	130	122	130 Petitions to the Commissioner		123	50	123	50 Petitions related to provisional appl.		126	240	126	240 Submission of Information Discl Stmt		518	40	581	40 Recording each patent assignment per property (times number of properties)		146	790	246	395 Filing a submission after final rejection (37 CFR 1.129(a))		149	790	249	395 For each additional invention to be examined (37 CFR 1.129(b))		Other fee (specify) _____					Other fee (specify) _____					*Reduced by Basic Filing Fee Paid				SUBTOTAL (3)					\$1,766.
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SUBMITTED BY VARUM, RIDDERING, SCHMIDT & HOWLETT LLP				Complete (if applicable)	
Typed or Printed Name		PETER VISSERMAN		Reg. Number	25,185
Signature			Date	9/22/99	Deposit Account User ID 22-0257

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant[s]: CHARLES D. GAVRILOVICH

For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE
STATION



Assistant Commissioner for Patents
Washington, D.C. 20231

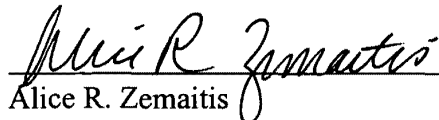
"Express Mail" Mailing Label No.: EL 122 464 935 US

Date of Deposit: September 22, 1999

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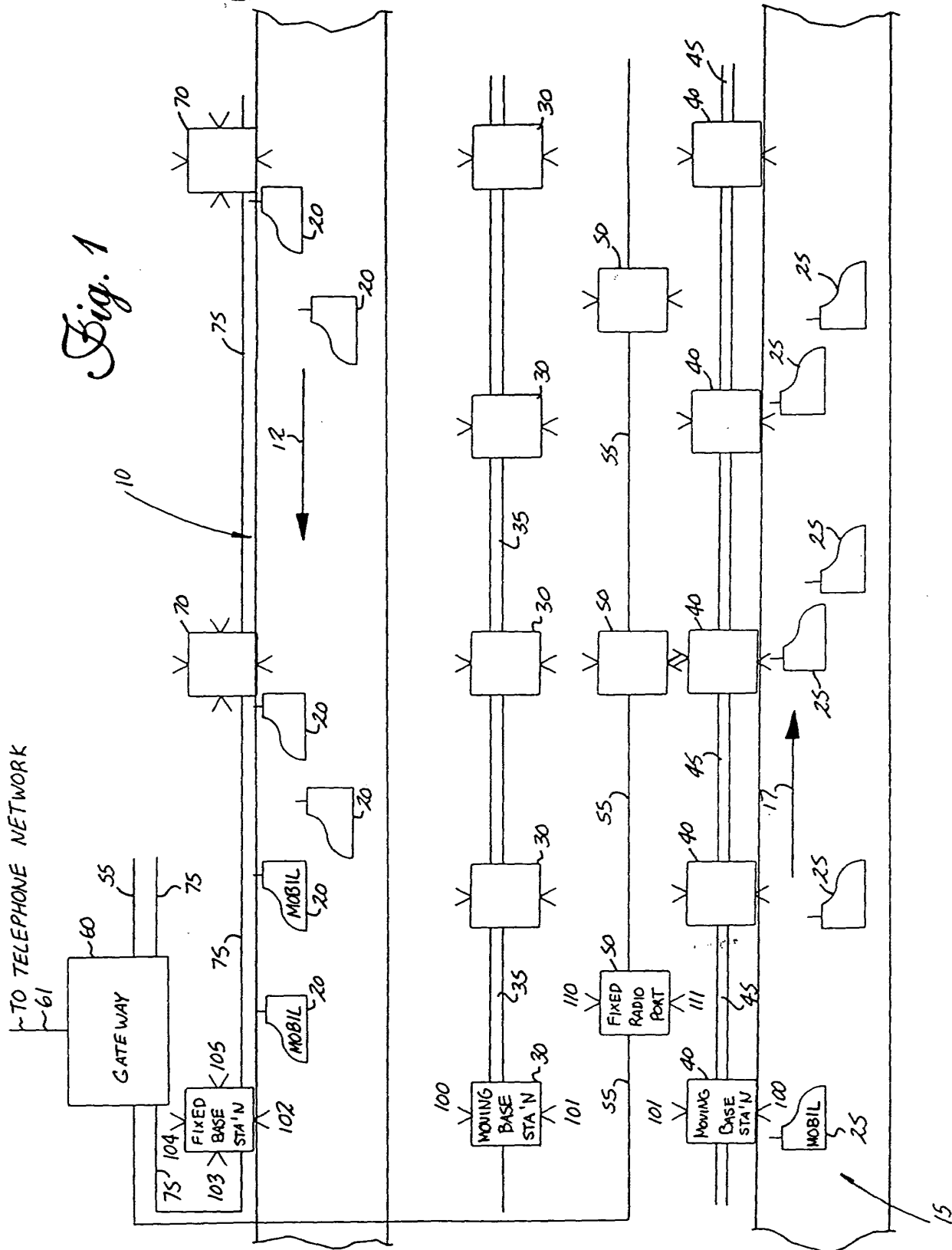
Dated: 9-22-99



Alice R. Zemaitis
VARNUM, RIDDERING, SCHMIDT & HOWLETT LLP
Bridgewater Place
Post Office Box 352
Grand Rapids, Michigan 49501-0352
(616) 336-6000

TO TELEPHONE NETWORK

Fig. 1



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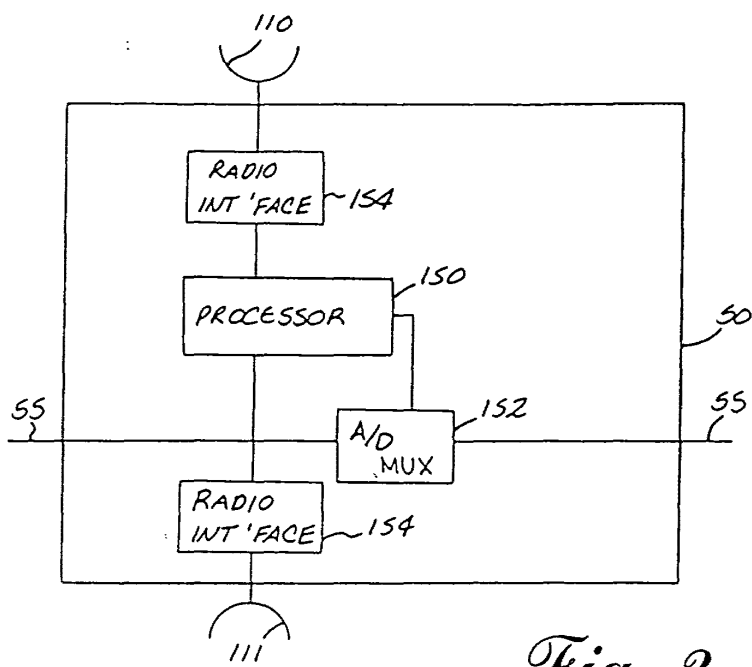


Fig. 2

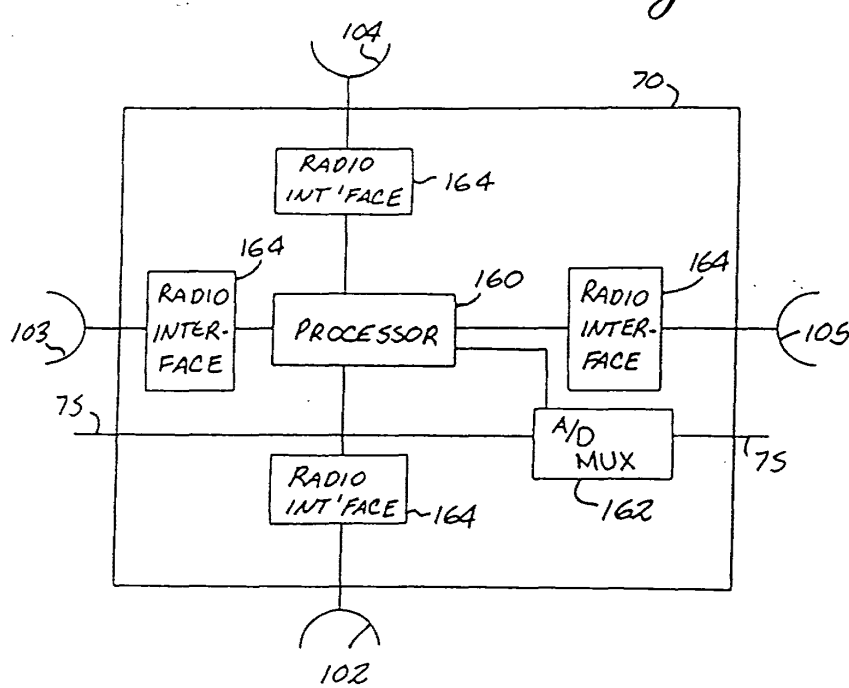


Fig. 3

00401584.09299

09401584-092290

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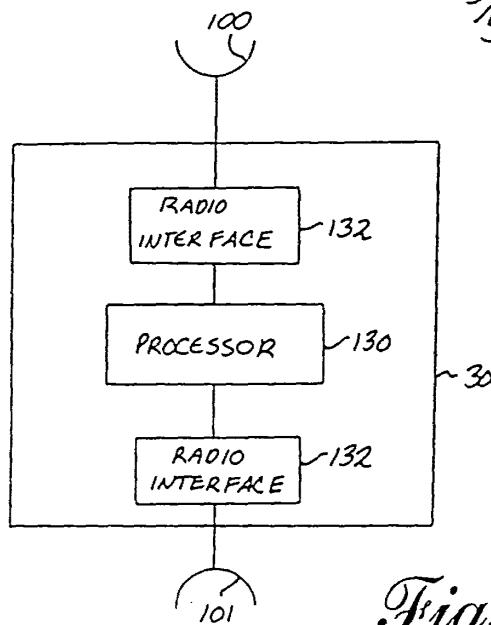


Fig. 4

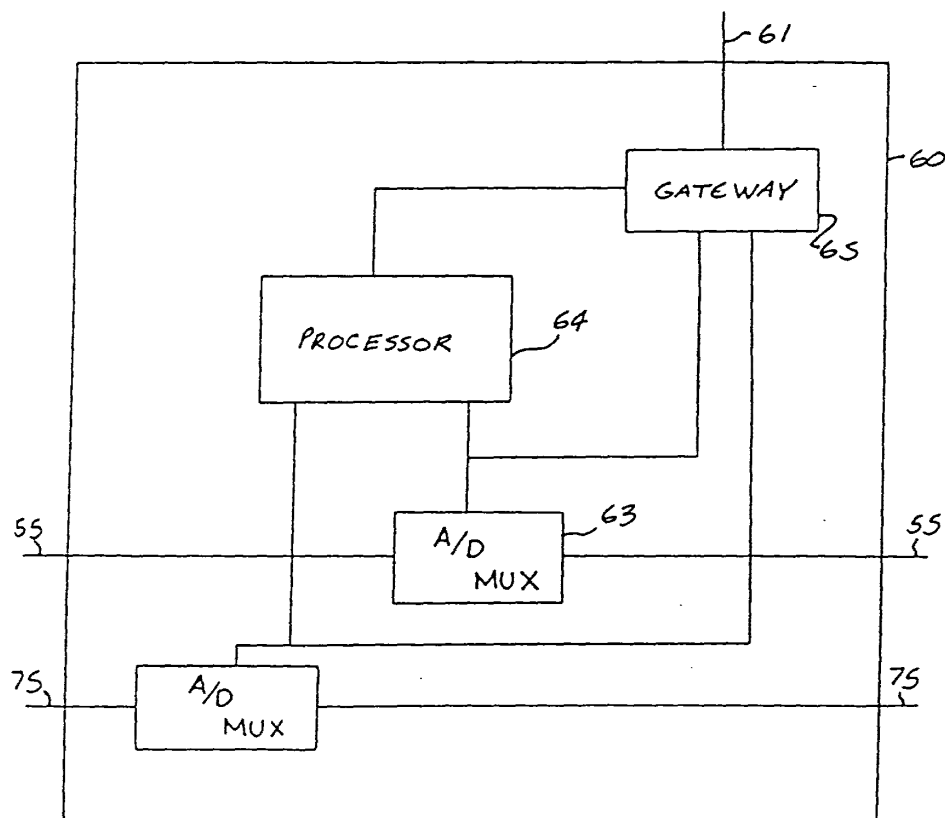


Fig. 5

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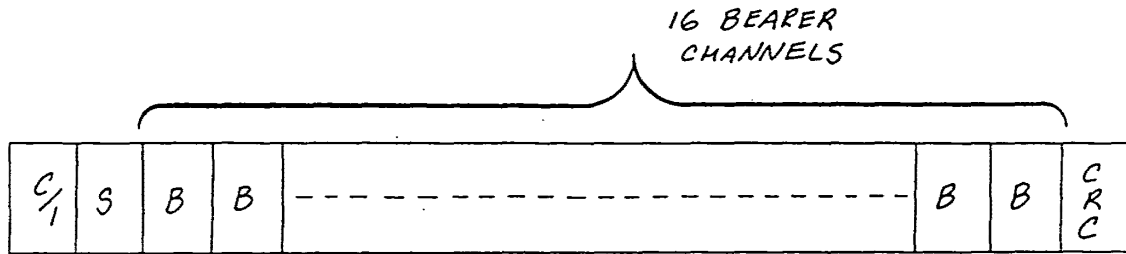


Fig. 6

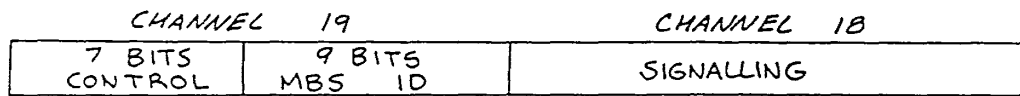


Fig. 7

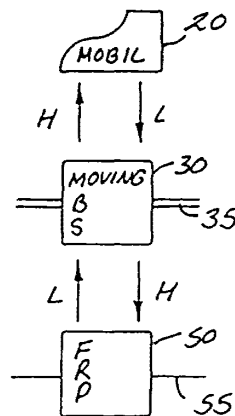


Fig. 8

00445-00000000

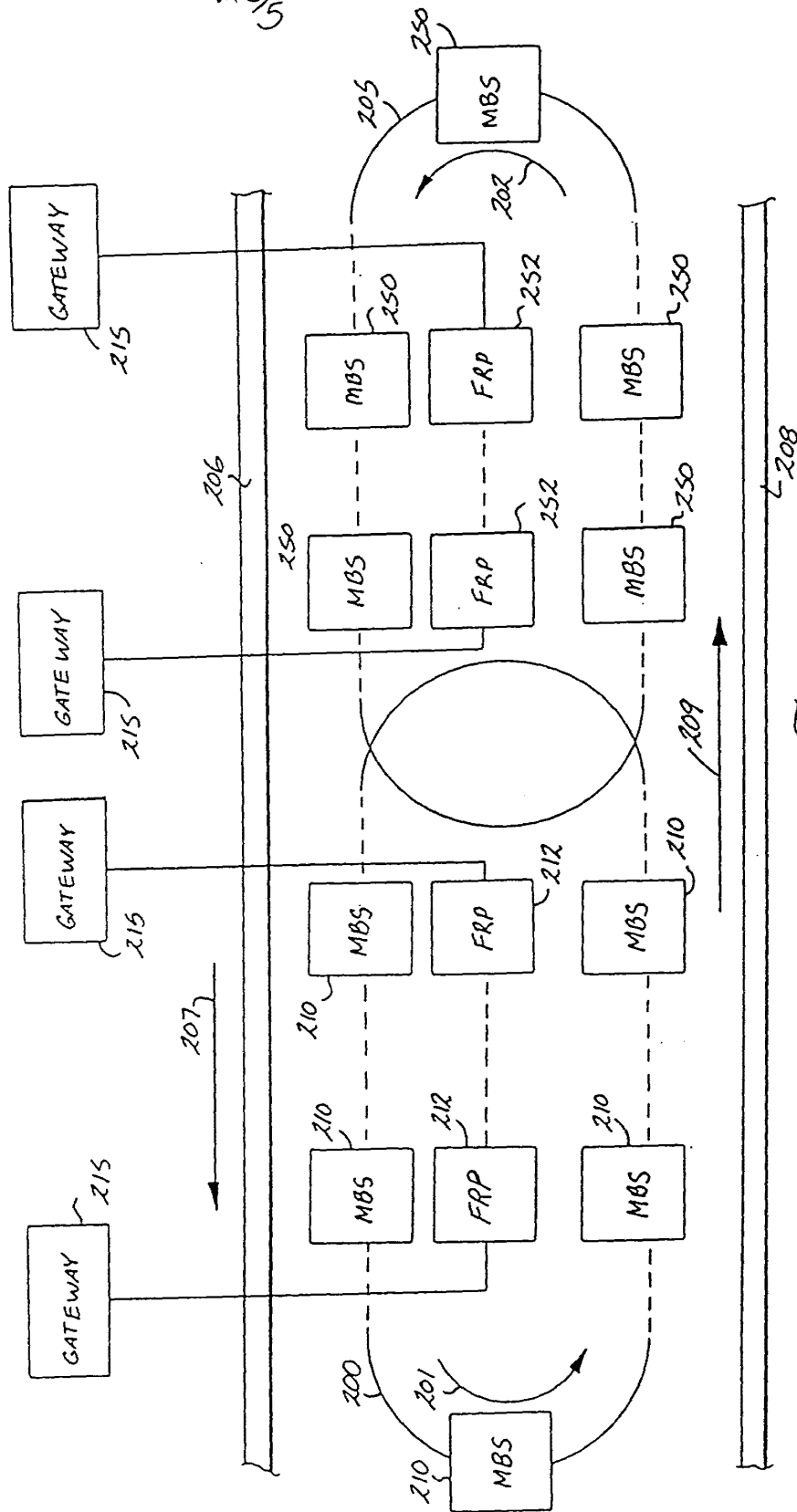


Fig. 9

MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

BACKGROUND OF THE INVENTION

Related Applications

This application is a continuation of U.S. Application Serial No. 08/953,962, filed October 20, 1997, which is a continuation of U.S. Application Serial No. 08/687,722, filed July 26, 1996, now U.S. Patent 5,729,826, which is a national phase application of PCT/US95/07037, filed June 2, 1995.

Field of the Invention

The invention relates to cellular telephone systems in which a mobile unit communicates by wireless communication to a base station connected to the wire telephone network and more particularly to cellular telephone systems adapted for use with fast-moving mobile units.

Background Art

In a typical cellular telephone system, an area is divided into a plurality of cells with each cell having a centrally located cell site. A mobile unit moving in such a cellular network communicates by radio with a nearest cell site. The cell sites are each connected by cable or point-to-point microwave to a telephone network interface. The network interface typically provides communication among cell sites and between the cell sites and the so-called wire line telephone network. The functions of a typical network interface are described in The Bell System Technical Journal, January 1979, Volume 58, No. 1. One of the functions to be performed by the telephone network interface is the so-called "handoff" function. As a mobile unit moves through a cellular network, it will move away from one cell site and toward another cell site. Each cell site monitors signal quality of the signal received from the mobile unit and passes information to the telephone network interface and determines when a call in progress is to be transferred from one cell site to another. This procedure is known as "handoff". The handoff process involves several operations including selecting a cell site trunk between the MTSO and the new cell site, sending a message to the mobile unit transmitter/receiver to tune

from its present voice channel to a voice channel in the new cell site corresponding to the newly selected trunk, setting up a talking path in the MTSO from the cell site trunk to the trunk of the telephone network presently in use in the call, and idling the talking path in the switching network in the MTSO between the old cell trunk and the telephone network trunk assigned to the call.

A problem with existing mobile telephone systems is the considerable time required in handoffs. This becomes a particular problem in urban areas which are highly congested. A basic principle of cellular telephone systems is the concept of frequency reuse. It can be shown that traffic capacity of a cellular system is increased by a factor N^2 as the size of the cell, i.e., its diameter, is decreased by a factor of N . This is due to the fact that, at least in principle, all frequencies in the mobile telephone spectrum are available for use in each independent cell. Thus, as the number of cells is increased, the total number of calls that can concurrently exist in an area is increased. A drawback, however, to decreasing the size of the cells is that a mobile unit tends to cross cell boundaries more often, requiring a larger number of handoffs which will tend to overload the mobile telephone switching office (MTSO) to the point where existing calls may be interrupted or dropped.

Personal communication service (PCS) functions in substantially the same manner as the mobile cellular system. In PCS, the user may be in a building or walking in a street or riding a vehicle and using a handset which communicates with a base station in the same manner that the mobile unit communicates with the base station or cell site in the cellular network. It is envisioned that PCS, by implementing very small cells, could provide service to a very large number of users, for example in a densely populated urban area. The difficulty with PCS is the same as in the cellular system in that handoffs become the bottleneck.

Modern cellular systems use what is known as code division multiple access (CDMA) spread-spectrum communications. In direct-sequence coding CDMA (DS-CDMA), the energy of the user signal is distributed uniformly over the system bandwidth through the spreading process providing separation between users of the same frequency in adjacent cells. A requirement of DS-CDMA is that no interfering signal received may be significantly stronger

than the desired signal since it would jam the weaker signal. This type of coding is used in what is sometimes referred to as hierarchal cell structures. The most commonly referenced hierarchal structure is a macro/umbrella cell overlaying a number of micro cells. A fast-moving mobile unit, for example, may be served by the macro cell to avoid an extreme number of handovers.

5 Slow-moving users are allocated to micro cells to save capacity for the macro cells. Using the DS-CDMA concept, micro cells and macro cells share the same frequency. To avoid strong interference at a micro cell from mobile unit in communication with a macro base station, the output power of the mobile unit in the micro cell is increased to overpower the interfering signal. The use of hierarchal cell structure to provide high-quality speech, data communication at rates
10 up to 2 megabits per second and video communication with mobile units travelling at rates in excess of 100 miles per hour and accommodating PCS are seen as needed to meet future mobile telecommunication demands.

In the hierarchal cell structure, the low tier, small cells, e.g., on the order of 100 feet in diameter, accommodate low speeds. The low speed is mostly pedestrian traffic and other traffic moving at speeds below 30 miles per hour. The advantages of small cells is low power, simple, inexpensive and light-weight terminals. What is desirable is an infra structure which allows use of such terminals in all applications, whether in the home or office as a cordless phone, on streets, in shopping malls, airports, etc., and in cars on expressways at highway speeds. Additionally, high-spectrum reuse is needed to provide low-cost, high-quality service which
20 requires a large bandwidth for each subscriber.

To provide wire line toll, quality-voice service, a 32-kilobit per second bit rate is required with ADPCM coders. As wireless data services emerge, even more spectrum bandwidth will be required. In the future, it may be possible to utilize the spectrum in the 60 gigahertz range providing very large amounts of bandwidth. However, the radio wave characteristics at
25 that frequency dictate a very short range, line of site propagation, requiring very small cells. However, as noted, small cells and fast-moving mobile units are incompatible due to the time required for handoff.

SUMMARY OF THE INVENTION

These and other problems of the prior art are overcome in accordance with this invention by means of a moving base station which is interposed between a moving mobile telephone unit and a fixed base station. In accordance with this invention, a movable base station
5 moves with the traffic at a rate of speed which is comparable to the speed of the traffic and communicates with a moving mobile telephone unit via standard mobile radio transmission. The movable base station further communicates by radio signals with a plurality of fixed antennas spaced along the path of travel of the mobile base station. The several fixed antennas are connected to a telephone wire line network via a telephone gateway office in a standard fashion.
10 In accordance with this invention, the fixed radio ports are synchronized and the interface between the moving base station and the fixed radio ports is a time division multiplexed (TDM) - direct-sequence, spread-spectrum CDMA.

In one particular embodiment, a number of fixed base stations are provided in addition to moving base stations allowing slower moving traffic, such as pedestrian traffic or rush hour mobile traffic to communicate via the fixed base stations.

In a specific embodiment of the invention, the moving base stations are provided with highly directional antennas directed to moving traffic and highly directional antennas directed to the radio ports. Communications from the fixed radio ports to the movable base stations are at a relatively low power level and from the movable base stations to the mobile units are at a relatively higher power level. Due to the characteristics of the direct-sequence, spread-spectrum CDMA, the higher power level signal will overpower the lower level signal such that the mobile unit does not receive communications from the fixed radio port but only from the movable base station. In the reverse direction, a low level of signal is transmitted from the mobile units to the movable base station and a high-level signal is transmitted from the base
25 station to the fixed radio ports, thereby eliminating any direct communication from the mobile unit to the fixed radio port.

In one embodiment of the invention, the movable base stations are supported on a series of closed loops and ends of adjacent loops overlap to facilitate transfer of telephone cells between adjacent loops.

DETAILED DESCRIPTION

FIG. 1 is a diagrammatic representation of a mobile telecommunication system incorporating principles of the invention. FIG. 1 represents, for example, a divided highway with mobile units 20 traveling on a first roadway 10 in one direction and a plurality of mobile units 25 traveling along a second roadway 15, in the opposite direction. A plurality of moving base stations 30 are disposed along one side of the roadway 10. The base stations are spaced apart by a selected distance equivalent to the diameter of the cell served by the moving base station. The moving base stations 30 may be moved by means of a rail 35, or other suitable conveying device which may include an automotive vehicle travelling on the roadway, in the same direction as the traffic flow on the roadway 10, as indicated by the arrow 12. In a similar fashion, a plurality of moving base stations 40 are disposed adjacent the roadway 15 moving in the direction of the traffic as indicated by the arrow 17. The moving base stations 40 are moved along a rail 45. The moving base stations 30, 40 may be supported on any suitable conveying device such as rails 35, 45. The conveying device may be at ground level or overhead, depending on the terrain and available space for the device. The moving base stations are preferably disposed for optimum radio communication with the mobile units on the roadways.

Disposed between the moving base stations moving along the rails 35, 45 are a plurality of fixed radio ports 50 which are connected by means of a fiber optic ring 55 or a similar signal transmitting device to a telephone office connected to the wire line telephone network and referred to as a gateway office. The gateway office 60 forms the interface between the mobile telecommunication system and the wire line telephone network. The gateway office is a well-known equipment. It is part of the telephone network and is responsible for call processing in conjunction with the base stations. As described further later herein, the gateway office will include certain processor hardware and software to detect a best signal quality indication and to selectively transmit information with a best signal quality indicator to the

telephone network. A plurality of fixed base stations 70 are disposed in the vicinity of the roadway 10 and are connected to the gateway office 60 by means of a fiber optic ring 75 or similar signal transmission device.

In operation, the moving base stations 30 may move in the direction of the flow of the traffic at a rate of, for example, 60 miles per hour, which may be faster than some traffic and slower than other traffic. The moving base station preferably handles telecommunications with mobile units which travel at a rate of not more than 30 miles per hour faster or slower than the moving base station. For example, the moving base stations 30, 40 may be traveling at the rate of 60 miles per hour to accommodate traffic moving in the range of 30 to 90 miles per hour. In the arrangement of FIG. 1, fixed base stations 70 would accommodate communications with mobile units traveling at a speed of less than 30 miles per hour including pedestrian traffic and stationary units. It will be readily apparent that instead of having fixed and moving base stations as depicted in FIG. 1, slowly moving and rapidly moving units may be used as well. A particular moving base station is effective when the mobile units are moving in the same direction as a base station. FIG. 1 shows two roadways traveling in opposite directions with the moving base stations disposed between moving in the direction of the traffic. The base stations may also be placed on opposite sides of the same roadway with two-way traffic with the moving base stations moving in opposite directions on the opposite sides of the roadway.

In the typical cellular telephone system, the base station, also referred to as a cell site, forms an interface between the mobile unit and the gateway office. As such, the base stations may perform a number of functions, including functions such as locating a particular mobile unit, as well as voice processing and functions associated with call setup, call supervision, and call termination. Additionally, the base stations perform the function of handing off and receiving an existing call involving a mobile unit which has moved into or out of the normal service area of a base station. All of these are well-known base station functions. In some proposed mobile telephone systems, the base stations are primarily only radio interface units and a base station controller, connected to a plurality of base stations performs call-handling functions for the plurality of base stations. The system in accordance with the

invention differs from the prior art primarily in that the base stations 30, 40 are moving with the traffic and communicate with the gateway office 60 via fixed radio ports 50. Furthermore, the various call-handling functions, including handoff, are performed by the moving base station. Advantageously, because of movement of the base station in the same direction as the traveling mobile unit, the number of handoffs is greatly reduced.

Each of the moving base stations 30, 40 is provided with antennas 100, 101. The antennas 100, 101, preferably high gain, directional antennas for use in mobile communication, are well know and commercially available. The fixed base stations 70 are provided with four separate antennas 110 extending in four different directions. The antennas 100 on the base stations 30, 40 are used to communicate with the mobile units 20, 25 whereas the antennas 101 on the moving base stations 30, 40 are used to communicate with the fixed radio ports 50. The fixed base stations 70 are preferably each provided with four antennas 102-105. Fewer than four antennas may also be used. In that case, at least one omni-directional antenna is used. In the configuration of FIG. 1, the antennas 102 are arranged to communicate with the mobile units 20 and the antennas 103-105 are arranged to communicate with other mobile telephone communications from slow moving traffic or stationary subscribers. The fixed radio ports 50, in the configuration of FIG. 1, are each provided with a pair of directional antennas 110, 111 of the same general type as the directional antennas 100-105. As the moving base stations 30, 40 move relative to the fixed radio ports 50, data representing voice signals and call related information is transmitted between the antennas 101 on the moving base stations 30, 40 and the antennas 110, 111 on the fixed radio ports 50.

FIG. 2 is a diagrammatic representation of the fixed radio ports 50. The unit includes a standard microprocessor 150 as well as a radio interface circuit 154 providing an interface between the radio signals received on the antennas 110, 111 and the processor 150. The circuits are of a type typically used in fixed base stations and are well known in the art. Additionally, each radio port 50 includes a processor 150 connected to an add/drop multiplexer (ADM) 152. The ADM 152 interfaces with the fiber optic cable 55 and is able to add data from the processor 150 to the data stream on the fiber optic cable 55. Additionally, the ADM 152

recognizes a data stream accompanied by an address identifying the processor 150 and transfers such data from the data stream of the fiber optic cable 55 to the processor 150. As will be described further later herein, the processor 150 computes a signal quality indicator for the information received from the radio interface circuits 154, based primarily on radio signal strength intensity, in a well-known fashion. Processor 150 controls the transfer information between the fiber optic cable 55 and the various moving base stations via the antennas 110, 111.

FIG. 3 is a block diagram representation of one of the fixed base stations 70. The fixed base stations 70 perform the functions of a standard prior art fixed base station. The base stations 70 are connected to the fiber optic ring 75 and include an add/drop multiplexer (ADM) 162 which provides an interface between the processor 160 and the fiber optic ring 75.

As mentioned earlier, both the optical ring 55 and optical ring 75 are connected to the gateway office 60. The primary function of the gateway office is to provide the interface to a wired telephone network. It distributes the telecommunications traffic between the network and the moving base stations via the fixed radio ports. The fiber optic rings 55, 75 are preferably continuous rings with an add/drop multiplexer for each ring in the gateway office. Data transmission on the fiber optic rings 55, 75 is preferably in accordance with one of the well-known SONET or synchronous digital hierarchy (SDH) transmission protocols.

The directional antennas 100-105, 110, 111 may be of a sectorized architecture or may be phased array antennas with highly directional radio frequency beams. Such antennas are preferably used to decrease interference between the mobile base stations and the fixed radio ports, allowing greater spectrum reuse. Antenna diversity can be provided with two spatially separated radio beams separated in time with a predefined time-delay offset for easier separation at reception. Various techniques for obtaining high antenna diversity are well known in the art and antennas employing such techniques are commercially available.

FIG. 4 is a block diagram representation of the moving base station 30. The station 30 includes a processor 130 connected via radio interfaces 132, 134 to the antennas 100, 101, respectively. The processor 130 may be a standard microprocessor and the radio interface circuits 132 may be standard radio interface circuits. The microprocessor is preferably

programmed to handle the call processing functions performed in a prior art system by a call site or by a shared base station controller. In this manner, the moving base station has greater autonomy and requires less communications with a shared base station controller or the like. The circuits 132, like the radio interface circuits 154 in the fixed radio port 50 and the radio interface circuits 164 in the fixed base station 70, are well known and commercially available circuits.

The radio interface between the mobile units 20, 25 and the moving base stations 30, 40 and the fixed base station 70 is a standard radio interface, well known in the art. The radio interface between the moving base stations 30, 40 and the fixed radio ports 50 is preferably a time division multiplexed, direct-sequence, spread-spectrum, code-division multiple-access interface (TDM/CDMA). Multiple channels between the base station and the fixed radio ports are time division multiplexed as time slots in a data stream. The data stream is spread with a pseudo-random code over the allocated spectrum. A pilot sequence is inserted in the transmitted signal for ease of synchronization in a well-known manner. The interface between the movable base station and the fixed radio port is preferably transparent to the overall system in spectrum use.

Frequency division or time division may be used for duplex communications. In the frequency division duplex (FDD) mode, data is simultaneously transmitted in both directions, each in a different spectrum band. In a typical system in the FDD mode, the TDM frame transmission duration will be approximately 500 microseconds making the interface substantially transparent to overall system delay.

The interface between the mobile unit and the movable base may be the standard IS-95-based PCS air interface standard. The channel capacity for the so-called "extended mode" (2.5 mhz) has been determined to be seven channels at 32 kilobits per second. The FCC allocated licensed spectrum for personal communications services (PCS) includes 10-mhz licenses and 30-mhz licenses. Each 10-mhz license provides two separated 5-mhz bands and each 30- mhz license provides two separated 15-mhz bands, for two-way communications. Two 5-mhz bands can support 14 duplex channels at 32 kilobits per second and two 15-mhz bands can support 42 duplex channels at 32 kilobits per second.

Voice signals between a mobile unit and the gateway office are encoded in a standard fashion using ADPCM voice encoding with a minimum bit rate of 32 kilobits per second in each channel. The interface between the moving base station and the fixed radio port is adapted to carry up to 19 channels of 32 kilobits per second each at 16 bits per time slot. The frame structure includes 16 bearer channels of 32 kilobits per second at 16 bits per time slot. The time division multiplexed frame rate between the movable base station and the fixed radio port is 608 kilobits per second. To achieve a processing gain of 9 decibels, the frame rate is multiplied by a factor of 8, yielding 4,864 kilobits per second, which fit into a single 5-mhz band. FIG. 6 is a tabular representation of the channel allocation showing 16 bearer channels plus 3 channels for signalling, control, and error code. FIG. 7 is a representation of channels 18 and 19 of FIG. 6.

The moving base stations are addressed using predefined code sequences derived in a known manner by the use of Walsh functions. U.S. Pat. 5,103,349 entitled "System and Method for Generating Signal Wave Forms in CDMA Cellular Telephone System" describes the use of Walsh functions for code generation. U.S. Pat. 5,103,349 is incorporated by reference herein. As described in that patent, by choosing a Walsh function of order 8 provides 8 orthogonal codes in the present embodiment using spread spectrum CDMA uses the all 0 Walsh sequence as a pilot carrier with the other 7 sequences available for moving base station communications. The code sequences may be repeated as ABCDEFG; ABCDEFG; . . . Although fewer codes could be used, preferably no less than 3 are used. Because of differing propagation times for signals between a particular moving base station and two or more different fixed radio ports, it is not possible to satisfy the condition of time alignment required for Walsh function orthogonality for 2 or more fixed radio ports at one time. For this purpose, two outer pseudonoise codes are used to provide discrimination between signals arriving at the moving base station from different fixed radio ports. The pseudonoise code rate is preferably 4,864 kilobits per second. The sequence length for the transmitted carrier signal is preferably 32,768 chips, as described in U.S. Pat. 5,103,459. The outer pseudonoise codes modulate the signal in quadrature phase shift keying.

The pilot signal will be transmitted in both directions, from the moving base stations to the fixed radio ports and vice, versa. This is made possible by the line of site fading characterized as Rician.

5 The pilot sequence will be long enough that a number of different sequences can be generated by shifts in the basic sequence. The separation will be great enough to ensure that there is no interference between pilot signals. Each moving base stations will use a different offset from a neighboring moving base station to provide signal separation. Similarly, each fixed radio port will use a different offset from a neighboring fixed radio port.

10 The FCC has allocated a 20 mhz of unlicensed spectrum, including a 10 mhz band for voice products and a 10-mhz band for data products. Thus, one continuous 10-megahertz channel is available and time division multiplex transmission is preferably used. The bit rate for both directions of transmission will be twice the frequency division duplex rate, introducing an overall delay of 500 microseconds and a processing gain of 9 decibels. In the time division duplex mode, the transmission times and direction, forward and reverse between the mobile unit and the moving base station and between the moving base station and the fixed radio ports, are aligned. In one half of the time division, duplex cycle signals are transmitted from the mobile unit to the moving base station and, from there, to the fixed radio port. In the other half-cycle, signals are transmitted from the fixed radio port to the moving base station and then to the mobile unit.

20 The two 15-mhz licensed spectrum bands (30 mhz) are preferably divided into three 5-megahertz channels in each direction, utilizing the same architecture as described earlier herein with respect to the 5-megahertz licensed spectrum. In the 15-mhz licensed spectrum, each of the 5-megahertz channels will support 14 traffic channels, for a total of 42 traffic channels in each 15-mhz band. The air interface between the moving base station and the fixed radio port, as well as the signal structure, can be modified and adapted to a variety of allocations of spectrum and air interface standards.

25 In the present embodiment, as described earlier herein, 7 orthogonal codes are available for communication between the fixed radio ports 50 and the moving base stations 30,

40. As described earlier herein and depicted in FIGS. 6 and 7, one 16 bit communication channel, channel 19, is set aside for control and identification bits. As depicted in FIG. 7, channel 19 may comprise 7 control bits and 9 identification bits. The 9 identification bits provide 512 unique identification numbers. Using 7 orthogonal codes and 512 identification numbers, 3,854 moving base stations can be uniquely identified. When the moving base stations are separated by a spacing of 200 feet, the total distance of coverage using the 3,854 moving base stations is approximately 135 miles. FIG. 1 shows a portion of the system with moving base stations moving in opposite directions along oppositely directed roadways and fixed radio ports with dual antennas. Vehicular traffic moving in opposite directions on the same roadway are preferably served by moving base stations on opposite sides of the roadway. Where each roadway has only one-way traffic, the system is preferably disposed between the roadways. In one embodiment of the invention, depicted in FIG. 9, two separate loops 200, 205 are disposed between two separate roadways 206, 208 with the traffic on the roadways indicated by the arrows 207 and 209. The loops 200 and 205 comprise moving base stations 210 and 250, respectively. The base stations, in this embodiment, are moving in the direction indicated by the arrows 201 and 202. Since, as a practical matter, the loops 200, 205 are not of indefinite length, a plurality of loops may be required to cover a desired area. To avoid interruption in communications, the ends of the loops are preferably sufficiently close together, or overlapping, to provide an overlapping area of coverage for mobile units traveling in the area of the loop ends. This will allow one of the mobile stations nearing the end of the loop of which it is a part to hand off the call to a mobile station of the adjacent loop.

Each loop preferably has a single gateway for connection to the wire telephone network. One advantage of that arrangement is that it eliminates the need for registration of moving base stations, which is required where a moving base station moves between gateways. FIG. 9 shows a pair of gateways 215 associated with the loop 200 and a pair of gateways 255 associated with the loop 205. The two gateways of a loop are both connected to the fixed radio ports of the loop at all times and may be operated in a load sharing mode with each capable of

handling the total telecommunication's traffic for the loop in the event of a failure in one of the gateways.

To avoid interrupting communications with a mobile unit traveling along the roadway in the area where two adjacent loops end, any existing calls are handed off from the moving base station near the terminating end of its loop to a moving base station of the next loop. The handoff process is essentially the same as a handoff between moving base stations on the same loop, except that the handed off call will be routed to the wire network to a different gateway. This procedure is equivalent to a handoff between cell sites of different cells in the existing cellular network in a manner which is well known in the art. The loops 200 and 205 may physically overlap to assure proper overlap of communications between moving base stations of the two loops and to avoid loss of communication with a mobile unit handed off from one loop to another.

The timing and synchronization between the moving base station and a fixed radio port with which the moving base station communicates is phase-locked to the pilot signals received from the fixed radio port with which the moving base station communicates. For synchronization purposes, the moving base station will receive a Global Positioning Satellite (GPS) Coordinated Universal Time (UCT) timing signal once each second.

CDMA Technology is well-known for sensitivity to power control. Specifically, the more powerful signals tend to "mask out" less powerful signals at the receiver. Typically, elaborate power control schemes are implemented to ensure that all signals arrive at the receiver at the same level. In accordance with the system of this invention, however, the sensitivity to power level of CDMA is used to advantage. The principles of signal transmission employed in the system of the invention is illustrated in FIG. 8. Two power levels of radio transmission, high (H) and low (L), are defined. Referring to FIG. 1, high-power level signals are transmitted from the moving base station 30 to the mobile unit 20 and from the base station 30 to the fixed radio port 50. Low power level signals are transmitted from the fixed radio port 50 to the moving base station 30. Similarly, low power signals are transmitted from the mobile unit 20 to the moving base station 30. Since the moving base station receives a low power level signal from the fixed

radio port and transmits a high level power signal toward terminals, the high power level received at the mobile unit 20 will mask out any signals of the low power signal transmitted from the fixed radio port to the moving base station. In a similar fashion, any low signal transmitted from the mobile unit 20 reaching the fixed radio port 50 will be masked by the high power level signal transmitted from the moving base station to the fixed radio port. As stated earlier, the antennas 100-105, 110, 111 are preferably highly directional antennas with very little feedback from the transmit signal to the receive signal. Feedback due to reflections and other extraneous sources can be readily eliminated at the moving base station using well-known noise cancellation techniques.

When a mobile unit set is first powered up or first enters a service area, the mobile unit must register in the manner described earlier, by transmitting its unique address in the new service area. The address will be received by the closest moving base station 30 and transmitted via a fixed radio port and the gateway switch 60 to the telephone network. This registration procedure is required so that an incoming call for the mobile unit can be appropriately directed.

The spacing of mobile based stations 20 and the fixed radio ports 50 of FIG. 1, together with the strength of the signal transmitted between the moving base stations and the fixed radio ports, determines the number of fixed radio ports with which a moving base station can communicate at any point in time. The spacing and signal strength is preferably such that each fixed radio port receives signals from three moving base stations. When a fixed radio port receives data, accompanied by the identification number of the moving base station, the processor 150 (FIG. 2) computes a signal quality indication on the received signal. The signal quality indication is a figure of merit preferably computed as a function of signal strength and signal-to-noise ratio. It is added to the received data and added to the fiber optic ring 55 via the ADM 152. The gateway 60 preferably receives the same data from several different ones of the fixed radio ports 50 and stores the data in an internal memory in the gateway 60 in association with the moving base station identification number and Walsh function spreading code. The address of the fixed radio port from which the data has been received is stored in the memory of processor 64 as well. Accordingly, multiple copies of the same data transmitted by a single

moving base station are stored in the memory of the processor 64 in the gateway. The signal quality indications computed by the processors 150 in each of several fixed radio ports are compared to a predefined signal quality indication threshold, and the data corresponding to a signal quality indication below the threshold value is discarded. Otherwise, the data is retained.

5 A cyclic redundancy code transmitted with the data is used to detect any TDM frame errors. The best data, i.e., associated with the best signal quality indication is transferred from the gateway 60 to the telephone network. Data received from the telephone network at the gateway 60 and intended for a registered mobile unit is stored in the memory of the processor 150 in a register particularly associated with the moving base station currently serving the mobile unit. This data
10 will be sent via the optical ring 55 to all fixed radio ports that are identified in the memory of the processor 65 as fixed radio ports with an acceptable signal quality indication. The received data will be transmitted from each of the fixed radio ports which received the data together with the identification code and Walsh function code of the moving base station to which the data is directed. The transmission of data from different fixed radio ports will be staggered, delayed by different amounts, so that they can be received and separated at the moving base stations. The delays can be precisely controlled by means of synchronous distribution via the optical ring 55, in the SONET or SDH format. The receiving moving base station, by means of its processor 130, compares the multiple copies of the received data signals, aligns them and combines them for the best reception.

20 Each of the moving base stations will have one of N assigned codes, where N may be any number, but preferably is at least 3 or more. Seven Walsh function codes are preferably used. The codes may be repeated in sequence, as for example, ABCDEFGABCDEFG. The codes are assigned in sequence to the various moving base stations so that two moving base stations having the same code will be physically separated by a sufficient distance to prevent
25 interference in the communications between fixed radio ports and moving base stations having the same identity code. The operation of the fixed base stations 70 is essentially the same as that of a standard fixed base station. In congested traffic areas, a mobile unit which is stopped or slowly moving, e.g., less than 30 miles per hour, will preferably be serviced by one of the fixed

base stations 70. As the speed of travel of the mobile unit 20 increases, a handoff will occur between the fixed base station and a moving base station. The procedures for determining whether a mobile unit is to be served by a fixed base station or a moving base station are the same procedures as described earlier herein in determining which moving base station is selected to serve a mobile unit, i.e., based on signal strength and error rate. Thus, when a call involving a mobile unit is initiated or when it is determined that a handoff should occur, the mobile unit may be handed from a moving station to a fixed station, or vice versa. Each mobile unit monitors pilot signals from fixed and moving base stations and synchronizes to the base station providing the best signal. The mobile unit may "connect" with three fixed or moving base stations while searching for a fourth in what is known as the "soft" hand-off mode. As the speed of the vehicle increases, fixed or slow moving base stations will be dropped. In more congested areas where traffic speed will vary between 0 and 60 miles per hour, base stations speed may, for example, be set to move at 30 mph. The moving base station should then be able to accommodate all traffic in the 0-60 mph range.

It will be understood that the above-described arrangement is merely illustrative of the application of the principles of the invention and that other arrangements may be devised by those skilled in the art without departing from the scope of the invention as defined by the appended claims.

CLAIMS

WHAT WE CLAIM IS:

1. ~~Interface apparatus for establishing signal connections between a telephone office connected to a telephone network and mobile telephone units transmitting radio signals and moving in a specified direction, the interface apparatus comprising:
a stationary interface unit connected to the telephone office via a signal transmission connection;
a plurality of spaced apart movable base stations, each of the base stations uniquely associated with the telephone office and supported on a conveying device for limited~~

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movement in the specified direction within an area defined relative to the stationary interface, the movable base stations each responsive to radio signals transmitted by the mobile telephone units to transmit corresponding radio signals to the stationary interface unit and the stationary interface unit responsive to the radio signals transmitted from the movable units to transmit signals corresponding to the signals transmitted from the movable units to the telephone office via the signal transmission connection.

2. The interface apparatus in accordance with claim 1 wherein the mobile telephone unit moves along a roadbed and the movable interface unit is movably supported on conveying apparatus disposed along path extending parallel to the roadbed.

3. The interface apparatus in accordance with claim 2 wherein the conveying apparatus comprises a rail movably supporting the movable interface unit.

4. The interface apparatus in accordance with claim 2 wherein the stationary interface unit is disposed on one side of the conveying apparatus opposite the roadbed.

5. The interface apparatus in accordance with claim 1 wherein the movable interface unit comprises signal processing circuitry and a first radio antenna directed toward the mobile telephone unit and a second radio antenna directed toward the stationary interface unit and wherein the stationary interface unit comprises signal processing circuitry and a radio antenna directed toward the movable interface unit, the movable interface unit responsive to radio signals received at the first antenna to transmit corresponding radio signals via the second antenna to the stationary interface unit and the stationary interface unit responsive to radio signals received via the radio antenna of the stationary interface unit to transmit corresponding signals to the telephone office via the signal transmission connection.

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6. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to hand-off and receive existing calls to mobile units in an associated service area.

7. The interface apparatus in accordance with claim 1 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform a plurality of functions including locating an identified mobile unit in an associated service area.

8. The interface apparatus in accordance with claim 1 wherein the radio signals transmitted between the movable interface unit and the stationary interface unit are transmitted in accordance with a code division multiple access, direct sequence, spread spectrum transmission signalling protocol.

9. The interface apparatus in accordance with claim 8 wherein signals transmitted from the mobile telephone unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the stationary interface unit are transmitted at a second power level higher than the first power level.

10. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a time division duplex manner.

11. The interface apparatus in accordance with claim 8 wherein data transmitted between the stationary interface unit and the movable interface unit is transmitted in a frequency division duplex manner.

12. The interface apparatus in accordance with claim 8 wherein each movable interface unit is synchronized to a selected stationary unit by transmission of pilot signals to the selected unit.

13. The interface apparatus in accordance with claim 1 wherein the movable interface unit is responsive to radio signals received from the stationary interface unit to transmit corresponding radio signals to the mobile telephone unit and wherein signals transmitted from the stationary interface unit to the movable interface unit are transmitted at a first power level and signals transmitted from the movable interface unit to the mobile telephone unit are transmitted at a second power level higher than the first power level.

14. Interface apparatus for establishing signal connections between a telephone office and a plurality of mobile telephone units transmitting radio signals, certain of the mobile telephone units moving in a specified direction, the interface apparatus comprising:

- a plurality of movable interface units uniquely associated with the telephone office; and
- a plurality of stationary interface units connected to the telephone office via a signal transmission connection;

each of the movable interface units movable in the specified direction and within a limited area defined relative to the stationary interface units and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding radio signals in the direction of the stationary interface units, each of the stationary interface units responsive to radio signals transmitted from an adjacent movable unit to transmit signals corresponding to the signals transmitted from the adjacent movable unit to the telephone office via the signal transmission connection.

15. The interface apparatus in accordance with claim 14 wherein:

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the movable interface units are movable along an interface unit path extending in a direction parallel to the predefined path and having a first side adjacent the predefined path;

the stationary interface units are spaced apart and disposed on a second side of the interface unit path opposite the first side of the interface unit path;

each of the movable interface units comprises signal processing circuitry and an associated first radio antenna directed toward the first side and an associated second radio antenna directed toward the second side;

each of the stationary interface units comprises signal processing circuitry and an associated radio antenna directed toward the interface unit path;

each of the movable interface units is responsive to radio signals received at the associated first antenna to transmit radio signals via the associated second antenna to the stationary interface unit; and

each of the stationary interface units is responsive to radio signals received via the associated radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

16. The interface apparatus in accordance with claim 14 wherein the movable units move along the interface unit path at a predefined speed.

17. The interface apparatus in accordance with claim 16 wherein the predefined speed is a function of an average speed of the plurality of mobile telephone units.

18. The interface apparatus in accordance with claim 14 and further comprising a plurality of mobile telephone units moving along another path in an opposite direction opposite the specified direction and a plurality of movable interface units movable in the opposite direction and wherein:

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the plurality of mobile telephone units moving in the specified direction move along a first roadbed and the plurality of mobile telephone units moving in the opposite direction move along a second roadbed spaced apart from the first roadbed;

the plurality of movable interface units movable in the specified direction are disposed along one side of the first roadbed adjacent the second roadbed;

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the plurality of movable interface units movable in the opposite direction are disposed along one side of the second roadbed adjacent the first roadbed; and

the plurality of stationary interface units are disposed between the plurality of movable interface units movable in the specified direction and the plurality of movable interface units movable in the opposite direction.

19. The interface apparatus in accordance with claim 14 and further comprising a plurality of stationary interface units connected to the telephone office via a signal transmission connection and responsive to radio signals transmitted by a mobile telephone unit to transmit corresponding signals to the telephone office.

20. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and each of the movable base stations is operative to perform hand-off and receiving functions relative to existing calls for mobile units within an associated service area.

21. The interface apparatus in accordance with claim 14 wherein each of the movable base stations has an associated service area and is operative to perform a plurality of functions, including locating an identified mobile unit in an associated service area.

22. The interface apparatus in accordance with claim 14 wherein the telephone office is connected to a telephone network and wherein a plurality of stationary interface units are responsive to radio signals transmitted by an identified one of the movable interface units and

each stationary interface unit responsive to radio signals from the identified movable interface
5 unit is operative to compute a signal quality indication for data represented by the transmitted
radio signals and to transmit to the telephone office data signals corresponding to the transmitted
radio signals together with a corresponding signal quality indication, the telephone office
responsive to the receipt of the data signals and signal quality indication to transmit to the
telephone network data received from a selected one of the stationary interface units having a
10 preferred signal quality indication.

23. The interface apparatus in accordance with claim 14 wherein each of the
stationary units is responsive to a data message received from the telephone office to transmit a
corresponding radio message to selected ones of the movable interface units and wherein the
telephone office is operative to transmit a predetermined data message intended for a selected
one of the movable interface units to selected ones of the stationary interface units and each of
the selected ones of the stationary interface units is responsive to receipt of the predetermined
data message to transmit corresponding radio signals to the selected one of the movable interface
units.

24. The interface apparatus in accordance with claim 23 wherein the
predetermined data message is transmitted to each of the selected ones of the stationary interface
units in a timed sequence and the selected ones of the stationary interface units transmits the
corresponding radio signals in a corresponding timed sequence.

25. A mobile telephone system comprising:
a telephone office connected to a telephone network;
a stationary interface unit connected via a signal transmission connection to the
telephone office;

5 a movable interface unit uniquely associated with the telephone office and
movable at a predetermined speed along a first predefined path of travel and in a direction

defined by a direction of travel of a mobile telecommunication unit traveling along a second predetermined path defined within a limited area defined relative to the stationary interface;

the stationary interface unit comprising signal processing circuitry and a stationary interface radio antenna directed toward the first predefined path of travel;

the moving interface unit comprising signal processing circuitry and a first radio antenna directed toward the second predefined path of travel and a second radio antenna directed toward the stationary interface unit;

the moving interface unit responsive to radio signals received at the first radio antenna to transmit corresponding radio signals via the second radio antenna to the stationary interface and the stationary interface responsive to radio signals received at the stationary interface radio antenna to transmit corresponding signals to the telephone office via the signal transmission connection.

26. A mobile telephone system arranged for communication with mobile telephone units and comprising:

first and second telephone offices connected to a telephone network;

a first closed loop having opposite ends and a second closed loop having opposite ends, one of the opposite ends of the first loop disposed adjacent one of the opposite ends of the second loop, each of the loops movably supporting a plurality of movable base stations;

a plurality of stationary interface units disposed adjacent each of the loops, each connected to one of the telephone offices;

each movable base station communicating with a stationary interface unit and responsive to radio telephone signals transmitted by a mobile telephone unit to establish a telephone communication connection with one of the telephone offices via one of the stationary interface units;

the telephone offices operative to record position of each of the movable base stations on each loop and to transmit an alert signal via one of the stationary interface units to an identified movable base station approaching one of the opposite ends of one of the loops;

27. The system in accordance with claim 26 wherein one of the opposite ends of one of the loops overlaps one of the opposite ends of another of the loops.

28. The apparatus in accordance with claim 1 wherein the movable interface unit is further responsive to radio signals received from the telephone office via the stationary interface unit to locate an identified mobile unit and to transmit to the identified mobile unit signals corresponding to radio signals received from the telephone office.

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MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

ABSTRACT

A mobile communication system employs moving base stations moving in the direction of flow of traffic moving along a roadway. The moving base station communicates with fixed radio ports connected to a gateway office. A plurality of moving base stations are spaced apart on a closed loop and move with the flow of traffic along one roadway on one leg of the loop and with a flow of traffic on another roadway in another leg of the loop. The moving base stations communicate with a plurality of fixed radio ports connected by a signal transmission link to a gateway office which, in turn, is connected to the wire line network. The moving base stations are each provided with a pair of directional antennas with one antenna directed toward the flow of traffic and another antenna directed to the fixed radio ports.

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DECLARATION FOR PATENT APPLICATION

As below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION
the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations § 1.56.
I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Priority Claimed

(Number)

(Country)

(Day/Month/Year Filed)

☐ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PCT/US95/07037

June 2, 1995

pending

(Application Serial No.)

(Filing Date)

(Status) (patented, pending or abandoned)

I hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

John E. McGarry, Reg. No. 22,360; H. Lawrence Smith, Reg. No. 24,900; Peter Visserman, Reg. No. 25,185; Thomas L. Lockhart, Reg. No. 29,324; Timothy E. Eagle, Reg. No. 31,755; Joel E. Bair, Reg. No. 33,356; Richard J. McKenna, Reg. No. 35,610; and Alvin R. Wirthlin, Reg. No. 40,267. Address all telephone calls to VARNUM, RIDDERING, SCHMIDT & HOWLETT LLP at telephone number (616) 336-6000. Address all correspondence to Bridgewater Place, Post Office Box 352, Grand Rapids, Michigan 49501-0352.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature _____

Date _____

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Full name of third joint inventor (given name, family name) _____

Inventor's signature _____

Date _____

Residence _____

Citizenship _____

Post Office Address _____

☐ Additional inventors are being named on separately numbered sheets attached hereto.

SERIAL NUMBER 09/401,584	FILING DATE 09/22/99	CLASS 455	GROUP ART UNIT 2744	ATTORNEY DOCKET NO. GAVRILOVICH-

APPLICANT

CHARLES D. GAVRILOVICH, NAPERVILLE, IL.

****CONTINUING DOMESTIC DATA*******

VERIFIED OK JC THIS APPLN IS A CON OF 08/953,962 10/20/97
 WHICH IS A CON OF 08/687,722 07/26/96 PAT 5,729,826

****371 (NAT'L STAGE) DATA*******

VERIFIED OK JC WHICH IS A 371 OF PCT/US95/07037 06/02/95

****FOREIGN APPLICATIONS*******

VERIFIED WY JC

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 10/14/99

Foreign Priority claimed 35 USC 119 (a-d) conditions met ☒ Yes ☐ No ~~Yes~~	STATE OR COUNTRY IL	SHEETS DRAWING 5	TOTAL CLAIMS 83	INDEPENDENT CLAIMS 24

Verified and Acknowledged OK JC OK
 Examiner's Initials Initials

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TITLE

MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

FILING FEE RECEIVED \$1,766	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit _____



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Bib Data Sheet

CONFIRMATION NO. 4845

SERIAL NUMBER 09/401,584	FILING DATE 09/22/1999 RULE	CLASS 455	GROUP ART UNIT 2681	ATTORNEY DOCKET NO. GAVRILOVICH-
APPLICANTS CHARLES D. GAVRILOVICH, NAPERVILLE, IL;				
** CONTINUING DATA ***** This application is a CON of 08/953,962 10/20/1997 PAT 6,026,277 which is a CON of 08/687,722 07/26/1996 PAT 5,729,826 which is a 371 of PCT/US95/07037 06/02/1995				
** FOREIGN APPLICATIONS *****				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 10/14/1999				
Foreign Priority claimed ☐ yes ☒ no 35 USC 119 (a-d) conditions ☐ yes ☒ no ☐ Met after met Allowance Verified and Acknowledged <u>SJS</u> Examiner's Signature Initials		STATE OR COUNTRY IL	SHEETS DRAWING 5	TOTAL CLAIMS 83
				INDEPENDENT CLAIMS 24
ADDRESS LAW OFFICE OF CHARLES D. GAVRILOVICH, JR. 985 PASEO LA CRESTA SUITE A CHULA VISTA ,CA 91910-6729				
TITLE MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION				
FILING FEE RECEIVED 1766	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit	

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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01 FC:201	380.00 OP
02 FC:203	567.00 OP
03 FC:202	819.00 OP

PTO-1556

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PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2001

Application or Docket Number

09/40/584

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 82	Minus ** 83	=
Independent	* 25	Minus *** 24	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 70	Minus ** 83	=
Independent	* 13	Minus *** 24	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	FEE
BASIC FEE	740.00
X\$18=	
X84=	
+280=	
TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	94.00
+280=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	
ADDITIONAL FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	
ADDITIONAL FEE	

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number

9/401584

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	83 minus 20=	* 63
INDEPENDENT CLAIMS	24 minus 3 =	* 21
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 83	Minus	** 83 =
Independent	* 24	Minus	*** 24 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 83	Minus	** 83 =
Independent	* 24	Minus	*** 24 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 21	Minus	** 83 =
Independent	* 22	Minus	*** 24 =
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE		RATE	FEE
	380.00	OR		760.00
X\$ 9=	567	OR	X\$18=	
X39=	819	OR	X78=	
+130=		OR	+260=	
TOTAL	1766	OR	TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=	—	OR	X\$18=	
X39=	—	OR	X78=	
+130=	—	OR	+260=	
TOTAL ADDIT. FEE	—	OR	TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-873)						SERIAL NO. 40584 APPLICANT(S)		FILING DATE 9-22-99	
CLAIMS									
	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT				
	NO.	DEF.	NO.	DEF.	NO.	DEF.		NO.	DEF.
101							61		
102							62		
103							63		
104							64		
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TOTAL NO.			24				TOTAL NO.		
TOTAL DEF.			54				TOTAL DEF.		

**MULTIPLE DEPENDENT CLAIM
FEE CALCULATION SHEET
(FOR USE WITH FORM PTO-476)**

SERIAL NO.

46584

FILING DATE

9-22-99

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEF.	IND.	DEF.	IND.	DEF.
1						
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TOTAL	4		24			
TOTAL	25					
DEF.	29					

	IND.	DEF.	IND.	DEF.	IND.	DEF.
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94						
95						
96						
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98						
99						
100						
TOTAL			24			
TOTAL			50			
DEF.						

#2/A
12-21-99
J.M. Douglas

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

12-21-99
J.M. Douglas

Applicant(s): CHARLES D. GAVRILOVICH

For: MOBILE COMMUNICATION SYSTEM WITH MOVING BASE STATION

Continuation of Serial No.: 08/953,962

Examiner: Redmon, J.

Filed: October 20, 1997

Group Art Unit: 2744

Docket No.: Gavrilovich P1US2

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the application, please amend the application as follows:

In the Claims:

Please delete claims 1-29 and add the following claims 30-112 as follows:

30. A transmitter adapted to transmit a signal to a mobile unit while the

transmitter has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the transmitter is controlled independently to the anticipated motion of the mobile unit.

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31. A transmitter in accordance with claim 30 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

32. A transmitter in accordance with claim 31, wherein the transmitter is further adapted to travel on a conveyor device along the predetermined path.

33. A transmitter in accordance with claim 32, wherein the signal corresponds to a received signal received at the transmitter from a fixed radio port.

34. A receiver adapted to receive a signal from a mobile unit while the receiver has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the receiver is controlled independently to the anticipated motion of the mobile unit.

35. A receiver in accordance with claim 34 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

36. A receiver in accordance with claim 35, wherein the receiver is further adapted to travel on a conveyor device along the predetermined path.

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37. An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:
a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band higher than a low frequency radio frequency band; and
a transmitter adapted to transmit a resultant signal within the frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port.

38. An apparatus in accordance with claim 37, wherein the frequency band has a lower limit of 300 megahertz.

39. An apparatus in accordance with claim 38, wherein the frequency band is an optical frequency band.

40. An apparatus in accordance with claim 38, wherein the frequency band is a millimeter wave frequency band.

41. An apparatus in accordance with claim 40, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

PATENT

42. An apparatus in accordance with claim 41, wherein the frequency band is an oxygen absorption frequency band.

43. An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:
a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band higher than a low frequency radio frequency band; and
a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit.

44. An apparatus in accordance with claim 43, wherein the frequency band has a lower limit of 300 megahertz.

45. An apparatus in accordance with claim 44, wherein the frequency band is an optical frequency band.

46. An apparatus in accordance with claim 44, wherein the frequency band is a millimeter wave frequency band.

PATENT

47. An apparatus in accordance with claim 46, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

48. An apparatus in accordance with claim 47, wherein the frequency band is an oxygen absorption frequency band.

49. A movable base station adapted to establish a communication link between a fixed port and mobile unit while the movable base station has a motion relative to Earth along a predetermined path and in accordance with an anticipated motion of the mobile unit, wherein the motion of the movable base station is controlled independently to the anticipated motion of the mobile unit.

50. A movable base station in accordance with claim 49, wherein the motion of the movable base station is based, at least in part, on a speed of the mobile unit.

51. A movable base station in accordance with claim 50, wherein the motion of the movable base station is based, at least in part, on a speed of a another mobile unit.

52. A movable base station in accordance with claim 51, wherein the motion of the mobile base station is based, at least in part, on a received signal strength of a signal transmitted by the mobile unit.

PATENT

53. A movable base station in accordance with claim 52, wherein the motion of the mobile base station is based, at least in part, on another received signal strength of another signal transmitted by the another mobile unit.

20 54. A movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit, comprising:

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a first radio interface adapted to establish a first communication link between the movable base station and the mobile unit; and

a second radio interface adapted to establish a second communication link between the movable base station and the fixed port, wherein the motion of the movable base station is independently controllable to the motion of the mobile unit.

55. A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band higher than a low frequency radio frequency band.

56. A movable base station in accordance with claim 55, wherein the frequency band has a lower limit of 300 megahertz.

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57. A movable base station in accordance with claim 56, wherein the frequency band is an optical frequency band.

58. A movable base station in accordance with claim 56, wherein the frequency band is a millimeter wave frequency band.

59. A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

60. A movable base station in accordance with claim 59, wherein the frequency band is an oxygen absorption frequency band.

61. A movable base station in accordance with claim 54 wherein the predetermined path has a contour corresponding to a roadway contour and the anticipated motion of the mobile unit is on the roadway.

62. A movable base station in accordance with claim 61, wherein the movable base station is further adapted to travel on a conveyor device along the predetermined path.

63. An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

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a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band higher than a low frequency radio frequency band;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

64. An apparatus in accordance with claim 63, wherein the frequency band has a lower limit of 300 megahertz.

65. An apparatus in accordance with claim 64, wherein the frequency band is an optical frequency band.

66. An apparatus in accordance with claim 64, wherein the frequency band is a millimeter wave frequency band.

67. An apparatus in accordance with claim 65, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

PATENT

68. An apparatus in accordance with claim 67, wherein the frequency band is an oxygen absorption frequency band.

69. An apparatus in accordance with claim 73, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

70. An apparatus in accordance with claim 69, wherein the transmitter is further adapted to transmit the resultant signal in accordance with the signal transmitted from the best fixed radio port.

71. An apparatus in accordance with claim 70, wherein the processor is further adapted to determine a plurality of best fixed radio ports and to combine a group of signals of the plurality of signals to produce the resultant signal, the group of signals transmitted from the plurality of best fixed radio ports.

72. An apparatus in accordance with claim 71, wherein the processor is further adapted to combine the group of signals by synchronizing the group of signals to produce a plurality of synchronized signals and combining the plurality of synchronized signals in

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accordance with the quality of each of the plurality of synchronized signals to produce the resultant signal.

73. An apparatus in accordance with claim 63, wherein the amount of information transferred to the mobile unit is maximized by transmitting the information through at least one of the plurality of fixed radio ports, the at least one fixed radio port providing a greatest quality communication link between the at least one fixed radio port and the mobile unit in relation to other communication links between other fixed radio ports of the plurality of fixed radio ports and the mobile unit.

74. An apparatus in accordance with claim 73, wherein the greatest quality communication link comprises:
a first wireless communication link between the at least one fixed radio port and the receiver; and
a second wireless communication link between the transmitter and the mobile unit.

75. An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

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a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

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a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency band higher than a low frequency radio frequency band; and

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a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

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76. An apparatus in accordance with claim 75, wherein the frequency band has a lower limit of 300 megahertz.

77. An apparatus in accordance with claim 76, wherein the frequency band is an optical frequency band.

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78. An apparatus in accordance with claim 76, wherein the frequency band is a millimeter wave frequency band.

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79. An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

80. An apparatus in accordance with claim 79, wherein the frequency band is an oxygen absorption frequency band.

81. An apparatus in accordance with claim 75, wherein the processor is further adapted to establish a second communication link between the plurality of mobile units and a least a second of the plurality of fixed radio ports based on the plurality of signal quality indicators.

82. An apparatus in accordance with claim 81, wherein the apparatus is further adapted to move along a predetermined path between the plurality of mobile units and the plurality of fixed radio ports.

83. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of a plurality of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of mobile units to geographic area is at least 6,500 mobile users per square kilometer.

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84. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers within a geographic area less than 1800 square meters.

85. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

86. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

87. A communication system adapted to simultaneously provide a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

88. A communication system adapted to simultaneously provide a

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communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

89. A method of transmitting a signal to a mobile unit having an anticipated motion relative to Earth, the method comprising the steps of:

controlling a motion of a transmitter along a predetermined path in accordance with the anticipated motion of the mobile unit, wherein the motion of the mobile unit is controlled independently to the motion of the transmitter; and transmitting the signal to the mobile unit.

90. A method in accordance with claim 89, wherein the step of controlling comprises the steps of:

moving the transmitter along a conveying device deposited along the predetermined path; and

adjusting a speed of the transmitter in accordance with the motion of the mobile unit.

91. A method in accordance with claim 90, wherein the step of adjusting comprises the steps of:

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observing a relative motion between the mobile unit and the transmitter;
and adjusting the speed of the transmitter to minimize the relative motion between the
mobile unit and the transmitter.

92. A method in accordance with claim 91, wherein the step of moving
the transmitter comprises the steps of:
moving the transmitter next to a roadway;
calculating an average speed of a plurality of mobile units traveling along
the roadway; and
adjusting the speed of the transmitter in accordance with the average
speed.

93. A method of receiving a signal transmitted from a mobile unit having an
anticipated motion relative to Earth, the method comprising the steps of:
controlling a motion of a receiver along a predetermined path in
accordance with the anticipated motion of the mobile unit, wherein the motion of the
mobile unit is controlled independently to the motion of the receiver; and
receiving the signal at the receiver.

94. A method in accordance with claim 93, wherein the step of controlling
comprises the steps of:

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moving the receiver along a conveying device deposited along the
predetermined path; and
5 adjusting a speed of the receiver in accordance with the motion of the
mobile unit.

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95. A method in accordance with claim 94, wherein the step of adjusting
comprises the steps of:
observing a relative motion between the mobile unit and the receiver; and
adjusting the speed of the receiver to minimize the relative motion
between the mobile unit and the receiver.

96. A method in accordance with claim 95, wherein the step of moving
the receiver comprises the steps of:
moving the receiver next to a roadway;
calculating an average speed of a plurality of mobile units traveling along
5 the roadway; and
adjusting the speed of the receiver in accordance with the average speed.

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97. A method of providing a communication link between a communication
network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the

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plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of

- 5 moving a movable base station in accordance with the motion of the mobile unit;
- receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency bandwidth higher than a low frequency radio frequency bandwidth;
- 10 transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and
- maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

98. An apparatus in accordance with claim 97, wherein the frequency band has a lower limit of 300 megahertz.

99. An apparatus in accordance with claim 98, wherein the frequency band is an optical frequency band.

100. An apparatus in accordance with claim 98, wherein the frequency band is a millimeter wave frequency band.

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101. An apparatus in accordance with claim 99, wherein the frequency band comprises a frequency spectrum from 50 GHz to 70 GHz.

102. An apparatus in accordance with claim 101, wherein the frequency band is an oxygen absorption frequency band.

103. A method of providing a communication connection between a communication network and a plurality of mobile units having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

establishing a first communication link between the plurality of mobile units and a first fixed port of the plurality of fixed ports through a movable base station having a motion in accordance with the motion of the mobile units; and

simultaneously handing off the plurality of mobile units to a second fixed port of the plurality fixed ports.

104. A method in accordance with claim 103, wherein the step of simultaneously handing off the plurality of mobile units comprises the steps of:

combining a first incoming signal transmitted from the first fixed port and a second incoming signal transmitted from the second fixed port to produce a resultant signal; and

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transmitting the resultant signal to the plurality of mobile units from the
movable base station.

105. A method in accordance with claim 104, wherein the step of combining
comprises the steps of:

determining a first quality of the first signal;

determining a second quality of the second signal; and

adding the first signal to the second signal in accordance with the first
quality and the second quality.

106. A method in accordance with claim 105, wherein the step of adding
comprises the step of minimizing a contribution of the first signal to the resultant signal by
ignoring the first signal.

107. A method comprising the step of simultaneously providing a
communication channel having a data rate of at least 2 megabits per second to each of a plurality
of mobile units traveling at a speed greater than 45 kilometers per hour, wherein the density of
mobile units to geographic area is at least 6,500 mobile users per square kilometer.

108. A method comprising the step of simultaneously providing a
communication channel having a data rate of at least 2 megabits per second to each of at least 12

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mobile units traveling at a speed greater than 45 kilometers within a geographic area less than 1800 square meters.

109. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits per second to each of at least 24 mobile units traveling at a speed greater than 25 kilometers per hour within a geographic area less than 1000 square meters.

110. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 20 megabits per second to each of at least 2 mobile units traveling at a speed greater than 50 kilometers per hour within a geographic area less than 1000 square meters.

111. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile

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Concl. units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest
distance between any two of the 6 mobile units is less than 60 meters.

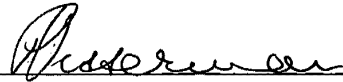
Respectfully submitted,

CHARLES D. GAVRILOVICH

Date

9/22/99

By



Peter Visserman, Reg. No. 25,185

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