



ETSI TECHNICAL COMMITTEE SMG

SPECIAL MOBILE GROUP

**Report of Meeting No. 24 held in Madrid
15-19 December 1997**

(Part A)

Executive Summary SMG #24

The SMG #24 Plenary Meeting was held in Madrid, Spain. It was hosted by Telefónica. SMG # 24 was attended by 270 delegates, including delegations from ANSI T1P1, RITT (China), ARIB (Japan), chairs of GSM MoU and UMTS Forum as well as 5 ETSI Board members.

1 UMTS AND IMT 2000 MATTERS

SMG2 presented their findings regarding four UTRA (UMTS terrestrial radio access) concepts. SMG 2 reported that the essential requirements had been fulfilled by all concepts. SMG 2 was not able to reach a consensus and asked SMG to take a decision on one concept that should be used by SMG 2 for the refinement phase until mid 1998.

Regarding IPR the SMG Chairman reminded the ETSI members to fulfil their membership duties. ETSI's legal adviser reported that she had received some IPR statements, but no information about essential IPR.

After an intensive and comprehensive discussion a vote for indication of intend was held. This resulted in 58.45 % of the weighted votes for W-CDMA and 41.55 % for TD-CDMA and no votes for the two other concepts. A decision requires 71 %. A vote will be held in SMG#24bis (28-29 January 1998).

Regarding **UMTS services** the standard on services principles was approved.

Regarding **UMTS network aspects** the definition of the GSM-UMTS core network pivoting GSM core network evolution was agreed.

Several **ITU contributions** to TG8/1 and SG11 were approved and the ITU work program was updated.

2 GSM MATTERS

Several specifications of **Release '97** were approved, e.g.

- Support of mobile number portability (stage 1)
- Support of private numbering plan (stage 1)
- GPRS: all radio related specifications and some network related specifications

The rest of Release '97 is planned for approval in SMG # 25.

287 Change Requests were approved. The work plan for harmonisation between T1P1's GSM specifications were approved. The AMR performance requirements were agreed in principle.

3 SMG MATTERS

SMG agreed in principle that a more efficient global co-operation is needed for future GSM and UMTS standardisation. It was felt necessary to enable the full participation of relevant parties outside ETSI and to avoid complex co-operation structures between different standardisation bodies. The SMG Chairman was charged to explore with all relevant parties, whether one joint working structure avoiding parallel work and overhead co-ordination could be implemented within the framework of an ETSI Partnership Project.

Status: Approved

(Part B)

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Fred Hillebrand, Chairman of SMG, opened the meeting and thanked Telefónica for hosting the meeting.

Francisco Ruiz-Vinuesa, Network General Director of Telefónica Móviles, addressed the meeting and welcomed the delegates on behalf of the hosts.

Fred Hillebrand welcomed the delegation from ARIB (the Japanese Standards organisation responsible for the IMT-2000 radio access), participating for the first time at an SMG plenary, and its Head of delegation Akio Sasaki. He also welcomed Mel Woinsky, T1P1 Chairman; Thomas Beijer, UMTS Forum Chairman; Dr. Adriana Nugter, GSM-MoU Chair; members of the ETSI Board: Peter Koch, Kiritkumar Lathia, Pierre Perrichon, Peter Bumann, Gerry Lawrence; the delegations from North America, China, Hong Kong, Israel and Australia; the large number of delegates participating for the first time in an SMG meeting, and - last but not least - the “semi-permanent” SMG delegates.

0 MEETING REPORT OF SMG#23

The SMG#23 report had been approved by correspondence. SMG#24 plenary noted that approval.

1 TARGETS OF SMG #24, SHORT CHAIRMAN’S REPORT

Fred Hillebrand gave a short Chairman’s report (Tdoc SMG 1021/97).

Main activities:

- Co-ordination of UMTS and IMT-2000 matters
- Presentations to ETSI GA, UMTS Forum GA and some major conferences
- Negotiations with ETSI management on decisions relevant for SMG

Other points:

- The obligations of ETSI members concerning IPR declarations were not fulfilled sufficiently by all members.

The **following targets** for SMG#24 were proposed and approved by SMG#24:

- Approval and review of GSM release ‘97
- UTRA milestone M2: selection of one concept
 - * consensus process in SMG#24
 - * voting if needed in SMG#24bis
- UMTS services: Agreement on the concept
- UMTS network aspects: the way forward
- Clarification of the IMT-2000 family concept by review and approval of the ITU contributions for the January/February ’98 TG8/1 and SG11 meetings.

2 ADOPTION OF AGENDA

The agenda in Tdoc SMG 1020/97 was approved with the addition of Agenda Item 5.7: *T1P1 work items* and a clarification that the decision on an SMG#24bis meeting would be made before Friday, 19th December, lunch. The agenda of side events in Tdoc SMG 1046/97 was also approved.

3 SMG MATTERS

3.1 ELECTION OF SMG OFFICIALS

For the election of the SMG Chair, Fred Hillebrand passed the chair to the SMG Vice Chairman Alan Cox. For the position of SMG chair, the only candidate was Fred Hillebrand. SMG#24 approved unanimously to propose to the General Assembly a nomination of Fred Hillebrand as SMG Chairman for a further period.

For the position of SMG3 chair, the only candidate was Michel Mouly. He was elected by SMG#24 for a further period.

For the position of SMG7 chair, the only candidate was Rémi Thomas. He was elected by SMG#24 for a further period.

For the position of SMG vice chair, the only candidate was Gunnar Sandegren. He was elected by SMG#24 for a further period.

3.2 PT SMG

Ansgar Bergmann presented Tdoc SMG 1038/97, *PT SMG status report to SMG#24*, source PT SMG. It was approved.

New problems within ETSI have been arising every 1-2 months, the latest ones: New travel rules August 97, Proposal to reduce the payment for STF contracts, Board decision to limit experts' contracts to 18 months.

Pierre Perrichon commented that the PT SMG status report should in future be delivered in the form as used before SMG#22, that is as a Word document including all necessary information as annexes rather than referring to other temporary documents. This was agreed.

Liaison activities of PT SMG with T1P1: it was clarified that liaison on administrative matters is meant.

AP Antun Samukic To provide a Tdoc about the information exchange between Korean TTA and ETSI/PT SMG (to become Tdoc SMG 1164/97).

For the question of in-time delivery of new versions of specifications by PT SMG, raised in a letter from SMG2 to the PT SMG leader in Annex I of Tdoc SMG 1017/97, SMG#24 noted the SMG2 priority of in-time delivery of new versions of specifications by PT SMG against support of SMG2 (subgroup) meetings and agreed that this is mainly a decision of each STC.

CD-ROMs: PT SMG and ETSI secretariat produce after each SMG plenary a CD-ROM with the plenary documentation. A majority of delegates asked for a CD-ROM #24 without waiting for the material of SMG#24bis. On the general question of trade-off between timely delivery of the CD-ROM and amount of newest specifications etc., SMG#24 didn't make any further conclusions.

Around 30 delegates announced their interest in obtaining the earlier SMG plenaries documents in electronic form.

SMG#24 discussed shortly whether to change the name "PT SMG". It was clarified that the new names STF12, STF83 etc. decided by ETSI affect the budgetary units of STFs belonging to PT SMG.

AP Ansgar Bergmann: To make a proposal whether to change the name PT SMG and if yes, to propose a new name for PT SMG.

Voluntary Scheme for PT SMG funding: Per Björndahl presented Tdoc SMG 1092/97, *Report to SMG#24 from STF SMG Funding Task Force meeting #1*. The group

- reviewed the PT SMG activities,
- discussed means of raising funds evaluated the business plan for resources 1999-2000 and issues of a legal entity
- and established an action plan until SMG#26.

Dissemination of information as a task for PT SMG: It was the common view that when resources of PT SMG are restricted, this task should have a lower priority. It was pointed out that this approach had already been used hitherto.

3.3 ORGANISATION OF GSM AND UMTS STANDARDISATION

Hans Hauser presented Tdoc SMG 1062/97, *Future Organisation for GSM and UMTS Standardisation*, source T-Mobil, Mannesmann Mobilfunk, E-Plus Mobilfunk, aiming at a smooth and efficient standardisation process for the evolution of GSM and towards UMTS. The GSM community is now a global community of operators and manufacturers but has experienced difficulties to open up for a wider participation in ETSI/SMG. Organisations from outside Europe still cannot become full ETSI members. Even voting rights for associate members in Technical Bodies were not endorsed by ETSI's General Assembly in November 97. Present working methods with ANSI T1P1 on common GSM specifications are proven as best possible solution for co-operation with other standard bodies, but they are very complex. This situation calls for a closer and more efficient overall co-operation. The GSM MoU Association and especially the APIG (Asian Pacific Interest Group) of GSM MoU have expressed their desire to participate fully in GSM work and in Third Generation standardisation and to ensure roaming with Japan.

For these reasons, these three companies proposed the establishment of SMG as the joint working structure among the interested bodies to produce GSM and UMTS standards for ETSI (as an ETSI partnership project) and for the other interested bodies, avoiding parallel work and overhead co-ordination; current budget allocations for ETSI/SMG to be considered as an asset for this possible joint working structure; the SMG Chairman to carry out an exploratory mission in this sense.

Comments in the discussion:

- Pietro Porzio-Giusto indicated support of the paper and asked for some results before a possible SMG#24bis.
- Neil Lilly indicated full support of the effort from GSM MoU.
- Gary Jones indicated support of the proposal from the American GSM community and their readiness for participating in the efforts.
- Peter Bumann (member of the ETSI Board) stated that the EPP concept was invented with SMG in mind.
- Tony Wiener indicated support for the proposal, but questioned possible additional costs. Armin Toepfer responded that as the number of committees would be reduced, hence costs would go down.
- Per Björndahl commented the review task force (see section 3.2) having had this idea in mind as a way forward.
- Patrick Blanc questioned the role of such an organisation as compared to ITU. Armin Toepfer explained that the work would be complementary, ITU defining the framework, a group like SMG doing the detailed technical development, evolution and maintenance of competitive standards.
- Albert Dorgelo asked to add TIA to the contacts mentioned in section 3.
- Neil Lilly commented that the scheme would allow improved ways to contribute to ITU if prepared in SMG with such a new basis.
- Neil Lilly commented that voting/balloting rights of Standards Organisations using the SMG specifications should not to be impacted.
- Paola Tonelli proposed to put the emphasis on UMTS. Gary Jones confirmed that the American community has in the first line GSM in mind. He expressed the support of GSM NA of the fact that the proposal not only includes UMTS but also GSM.
- Alistair Urie explained that similar rules as the ETSI Partnership Project rules would probably be applicable for other interested standards organisations.
- Heikki Ahava indicated work in the US very often being done in Fora outside the standardisation groups and brought to the standardisation groups in a rather mature state, so to include such fora in the preparation.
- Rémi Thomas commented that practical steps, how to approve CRs etc, require experience and time, and expressed the expectation that the scheme would not yet be working within three months.
- Gunnar Sandegren explained that the idea would be one body leading the specification activities on GSM and UMTS; preparation of specifications should be done so that the adopting in the regional standards organisations would be a formality. He saw the proposal as a necessary corrective factor for the mismatch between spreading of the GSM standard and influence on its development.
- Alan Cox: For information: There wasn't a majority against extending technical voting to associate members. The non-decision of GA should not be seen as the major objective or reason for the proposal.
- Gerry Lawrence and Pierre Perrichon, presenting a view from the ETSI Board: Proposal fits well to the EPP concept. Pierre Perrichon remembered that there is also the ISDN evolution UMTS Core Network as an ETSI project outside of SMG.

- Gunnar Sandegren: The project should take care for recognising convergence parts, but should not be responsible itself for that convergence.

Decisions on the matter:

- It was agreed by SMG#24 as important that both GSM and UMTS are included in the proposal.
- Time plan: It was agreed Fred Hillebrand to give a status report into SMG#24bis (if held), and to propose a concept for SMG#25.
- SMG#24 endorsed the paper in principle.

Neil Lilly commented that the time plan would fit well for reporting to the next GSM MoU.

Later in the meeting, Hans Hauser presented a revision of Tdoc SMG 1062/97 in Tdoc SMG 1142/97.

Rémi Thomas and Didier Chauveau argued against stating in section 1 of Tdoc SMG 1142/97 the general rule of equal rights for all participants, this being a decision still to be made.

Peter Bumann and Peter Adams asked to inform all relevant ETSI groupings like ETSAG, Board, GA, the ad hoc group on fixed/mobile convergence and others in order to have a good acceptance for the way ahead.

It was clarified that Albert Dorgelo's request to add TIA was not followed because TIA has no activities in GSM or UMTS. As a consequence, Albert Dorgelo requested the modification (6) below which was accepted by SMG#24.

It was clarified that for the MPTs to be contacted, first priority shall be the Chinese MPT, second priority the Japanese MPT.

Modifications of Tdoc SMG 1142/97:

- (1)“The SMG Chairmandelegation—should report to SMG#25 and propose/recommend a way forward.”
- (2)“It is expected that the mission team-SMG Chairman will contact”
- (3)Heading of section 1 to become “Guidance for exploratory mission”.
- (4)Section 1: Replace “have to be provided” by “is to be considered”.
- (5)Insert: “The SMG Chairman will seek support for this mission by the two SMG Vice Chairmen. This team will be supported by the PT SMG leader.”
- (6)replace “considering 3rd generation work issues” by “UMTS work issues”.

With these modifications, Tdoc SMG 1142/97 was approved. The approved version is Tdoc SMG 1154/97 replacing Tdoc SMG 1062/97 and Tdoc SMG 1142/97.

4 UMTS MATTERS

4.1 UTRA

4.1.1 SMG2 status report

Niels Peter Skov Andersen presented the SMG2 status report on the UMTS Terrestrial Radio Access (UTRA) definition process (see Tdoc SMG 1017/97 and Tdoc SMG 893/97). SMG2's detailed work towards that definition was initiated by a workshop on radio access technologies held December 1996. Since then SMG2 have dealt with UMTS Terrestrial Radio Access at several meetings amongst these four SMG2 plenaries, four ad-hoc meetings dedicated to UMTS, a joint SMG2-ARIB workshop, a question and answer session and numerous concept group meetings.

In the first step of the process the procedure and time schedule for the UTRA definition was elaborated by SMG2 and agreed by SMG at SMG#21. Hereafter, the requirements impacting the UMTS Terrestrial Radio Access was collected and the high level requirements for the UMTS Terrestrial Radio Access documented and approved by SMG#22. The high level requirements were further detailed in UMTS 21.01. At the same time UMTS 30.03 describing evaluation criteria for the UTRA definition procedure was elaborated. UMTS 21.01 and UMTS 30.03 were approved by SMG#22. In parallel with the work on these reference documents, SMG2 were collecting technical proposals for radio access technologies for the UMTS Terrestrial Radio Access. These proposals grouped into the following five concepts:

- α -concept based on wideband CDMA (WCDMA)
- β -concept based on OFDMA
- γ -concept based on wideband TDMA (WB-TDMA)
- δ -concept based on TDMA with spreading (WB TDMA/CDMA)
- ϵ -concept based on ODMA (Opportunity Driven Multiple Access)

This grouping was presented to SMG#22 for approval. Hereafter, SMG2 formed five concept groups to assist in evaluation of the different building blocks suggested. Through the period since SMG#22 detailed evaluation of the proposals have been performed and the different original proposals combined into one single proposal for UMTS Terrestrial Radio Access per concept group. Originally the intention was then to merge the concepts into one single concept for the UMTS Terrestrial Radio Access. Unfortunately, SMG2 have failed to do so.

The concepts have been refined and their performance been evaluated in detail. Link level results and system level results have been discussed within SMG2. Further, SMG2 have checked the different concepts against the high level requirements. In general the concepts can be claimed to fulfil the high level requirements. However, SMG2 remarked

- that the area of private and residential operation and the use of unpaired spectrum are not areas on which the concept groups have placed the highest attention;
- that therefore the issue of UMTS deployment of private and residential operation would require further studies in SMG2 to ensure that the requirements in this area are properly met;

- that the issue of how UMTS can be implemented to enable an operator to make the most effective use of the unpaired spectrum, has not been fully addressed and will require further studies in SMG2;
- *that, in particular it may be necessary to consider modification of any adopted UMTS Terrestrial Radio Access concept to improve these aspects of performance.*

Regarding the results of the evaluation and refinement work performed, SMG2 informed SMG about the following findings and conclusions regarding the epsilon concept (ODMA - Opportunity Driven Multiple Access):

- Investigation of relay systems has been carried out within SMG2 considering the technology called Opportunity Driven Multiple Access – ODMA. The protocols used in ODMA are very similar to those of a packet radio system currently being trialed. System level simulations were carried out in accordance with UMTS 30.03 which showed that wide area high data rate coverage was possible in all environments using a subscriber relay system and that there was potential for increased capacity when used in a cellular hybrid.
- Feasibility studies were conducted to determine the practicality of supporting relaying using the basic WCDMA and WB TDMA/CDMA designs. The conclusion was that both the WCDMA and the WB TDMA/CDMA designs were sufficiently flexible to support relaying with negligible increase to the mobile station complexity or cost. These technologies can therefore offer the flexibility of simple relaying but also provide a suitable platform for advanced relay protocols such as ODMA.
- For the above reasons it was decided that relaying/ODMA should be presented as an enhancement to both WCDMA and WB TDMA/CDMA rather than as a standalone technology. As a result, documentation from the studies of epsilon concept is included as a part of the evaluation reports on the alpha and delta concepts.

Regarding the four other concepts (α , β , γ , δ), Niels Peter Skov Andersen reported further

- that SMG2 have not been able to obtain any further merging;
- moreover that, considering the uncertainty on simulations and the differences in the assumptions made in order to evaluate the performance of the concepts, SMG2 have not be able to conclude that any single one of these concept provides a better solution than the other concepts;
- that therefore, SMG2 request SMG to decide on the basis of which of the concepts α , β , γ , or δ , SMG2 shall continue the work on the UMTS Terrestrial Radio Access.

In order to assist SMG in making the decision SMG2 have prepared the following documentation for each of the concepts:

- A summary of system description for the concept
- A summary of the concept evaluation for the concept
- An evaluation report for the concept

SMG2 could not recommend SMG to make a direct comparison of the performance results for the concepts based directly on the values contained in the evaluation documentation. This was due to the different nature of the concepts, which has lead to

differences in the assumptions for the performance evaluation, which lead to differences in the results. Especially regarding guard bands SMG2 highlighted that it is difficult to perform a direct comparison of Minimum Coupling Loss (MCL) based guard band analysis, as, e.g., the likelihood for different scenarios might be different for the different concepts.

SMG2 have not been able to reach a consensus on how the results of the evaluation should be compared, and is therefore unlikely to be able to reach a consensus on the technology for UMTS Terrestrial Radio Access in the foreseeable future. SMG2 therefore recommended to SMG that the best way forward for the elaboration of the UMTS radio interface would be for SMG to make a decision on one concept that should be used by SMG2 in the refinement phase.

Niels Peter Skov Andersen expressed the understanding of SMG2 that by deciding to base the UMTS Terrestrial Radio Access on a given concept, SMG approves the summary of the system description for that concept; that this means that the further refinement of the selected concept is done with reference hereto; that changes in order to improve the concept shall be justified relative to the concept described in the summary system description.

For the detailed reports on the concept groups, see section 4.1.4.

Decisions of SMG#24:

- The epsilon concept, ODMA (Opportunity Driven Multiple Access) is not regarded as a candidate concept group; it is an advanced relay protocol applicable to all concept groups.
- Technical Report UMTS 30.06, *UMTS Terrestrial Radio Access Concept (UTRA) evaluation*, was approved.

For decisions of SMG#24 concerning the further treatment of the UTRA definition in SMG#24bis, see section 6.1.

4.1.2 Voting process in SMG#24

Hélène Lafferre, ETSI legal advisor, presented Tdoc SMG 995/97, *Procedure of vote for indication of intent on UTRA in SMG#24*.

Comments of SMG#24:

Section 0: No comments.

Section 1: It was clarified that the voting at SMG#24 was not a vote for a decision on the matter but rather a vote for indication of members' opinions, Therefore, abstentions were also proposed to be counted.

Section 2: It was clarified that registration for voting at SMG#24 was also possible during the SMG#24 before the voting. The deadline in Tdoc SMG 883/97 for sending the registration form was an administrative measure to have enough registrations processed before SMG#24 but could not restrict rights of members to participate at voting. Peter Donat explained that two members had misinterpreted Tdoc SMG 883/97 as not

allowing participation at the voting for members missing the deadline of 11th December, and that they therefore were not present at the meeting.

Heikki Ahava asked to document which delegates registered for voting for which companies. This was agreed by SMG#24, and later in the meeting Ian Doig presented Tdoc SMG 1106/97 the requested information.

Section 3.3: Weighted voting was requested by Vodafone. Adriana Nugter pointed at the lack of symmetry of the ETSI rules where members do a secret vote and associate members have to declare their opinion openly; the SMG Chairman asked delegates from associate members wishing an anonymous declaration of associate members' opinion to contact him; however, no associate member expressed such a request during SMG#24.

Tdoc SMG 995/97 was approved by SMG#24.

For decisions of SMG#24 concerning the further treatment of the UTRA definition in SMG#24bis, see section 6.1.

4.1.3 UTRA IPR

Hélène Lafferre presented Tdoc SMG 1066/97¹, *Report on Essential IPRs declared in relation to the work of SMG#24*.

Andy Bell, NEC Technologies (UK), stated that Tdoc SMG 998/97 had, for technical reasons, not been available in time for inclusion in Tdoc SMG 1066/97.

Fred Hillebrand read out section 4.1 of the ETSI IPR policy:

- “4.1 Each MEMBER shall use its reasonable endeavours to timely inform ETSI of ESSENTIAL IPRs it becomes aware of. In particular, a MEMBER submitting a technical proposal for a STANDARD shall, on a bona fide basis, draw the attention of ETSI to any of that MEMBER's IPR which might be ESSENTIAL if that proposal is adopted.
- 4.2 The obligations pursuant to Clause 4.1 above do however not imply any obligation on MEMBERS to conduct IPR searches.”

Clarifications:

- These declarations are to be made by companies without an explicit request of ETSI. They are not restricted to the company's IPRs but also include all IPRs of other companies the company is aware of. Hélène Lafferre explained that ETSI secretariat considers the declaration of the owner as public, but considers the disclosure of IPRs of other companies as not sufficiently reliable for being published.
- Whereas the obligations for granting licences are valid also if a declaration has not been made, a declaration is still requested.

¹ Collector's Note: Tdoc SMG 1067/97, *TD-CDMA (delta), the best of both worlds*, was issued in some copies with the wrong number 1066/97.

Hélène Lafferre has written a letter to ETSI members and also to non-members. A maximum period of three months for a response is foreseen:

“6.1 When an ESSENTIAL IPR relating to a particular STANDARD is brought to the attention of ETSI, the Director-General of ETSI shall immediately request the owner to give within three months an undertaking in writing that it is prepared to grant irrevocable licences on fair, reasonable and non-discriminatory terms and conditions under such IPR to at least the following extent:

- MANUFACTURE, including the right to make or have made customised components and sub-systems to the licensee's own design for use in MANUFACTURE;
- sell, lease, or otherwise dispose of EQUIPMENT so MANUFACTURED;
- repair, use, or operate EQUIPMENT; and
- use METHODS.

The above undertaking may be made subject to the condition that those who seek licences agree to reciprocate.”

Comments on IPR declarations received: Neil Lilly indicated that - according to his information - companies having contributed to more than one concept group only declared IPRs in the concept group supported by the company. Alistair Urie explained on behalf of Alcatel that their declaration also applies to IPRs relevant for other concept groups than the delta group.

Hamid Amir-Alikhani stated some IPR declarations in Tdoc SMG 1066/97 not to be detailed enough.

Jean Pierre Charles, France Télécom, stated proponents of the beta and gamma group not to have declared IPRs.

Dirk Weiler stated that the final situation of IPRs is not available but an estimation of the situation can be done.

Rémi Thomas estimated that the list presented in Tdoc SMG 1066/97 is far from being complete.

Patent searches: Patent searches on a regular basis could be conducted by ETSI on a request (and participation in the costs) of ETSI members or EC/EFTA, but are at present excluded in the ETSI rules of procedure.

Essential IPRs: Peter Bumann pointed out that there are different categories of IPRs, such as essential IPRs, commercial IPRs, technical IPRs. The definition of essential IPR is found in the annex of the IPR policy document:

“6 **"ESSENTIAL"** as applied to IPR means that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of standardisation, to make, sell, lease, otherwise dispose of, repair, use or operate EQUIPMENT or METHODS

which comply with a STANDARD without infringing that IPR. For the avoidance of doubt in exceptional cases where a STANDARD can only be implemented by technical solutions, all of which are infringements of IPRs, all such IPRs shall be considered ESSENTIAL.”

List of companies approached without response: A list of companies possibly having UTRA relevant IPRs was given to ETSI secretariat on a confidential basis and can't be published.

Consequences of not declaring/granting IPRs: Hélène Lafferre explained that, if IPRs haven't been declared, the consequences are not clear, because a bona fide approach is applied. If an ETSI member or non-member refuses to grant licenses, corrective actions of ETSI (such as withdrawal of parts of a standard) are possible (8.1 and 8.2 of the ETSI IPR policy paper).

Dirk Weiler presented Tdoc SMG 930/97, stating the following position:

- the more patents relevant for a standard, the more license fees to be expected
- the most difficult position to be that where companies mainly want to earn on their patents, rather than to participate in the manufacturing/application of the technology, and do not apply the ETSI IPR policy rules

He presented statistical results (contained in the same document) of a patent research concentrating on CDMA (on only WCDMA) and TD/CDMA (excluding the - in Siemens' opinion mostly GSM relevant - patents for TDMA).

Michael Färber stated DS CDMA relevant patents not to be relevant for TD/CDMA. He explained that this was confirmed by Siemens patent lawyers.

Different interpretations of these results (e.g., a correlation of IPRs and maturity of a proposal) and comments of the search methods were stated.

Handling of IPRs in Japan: Akio Sasaki presented information from Tdoc SMG 906/97, *Current Situation and principle attitude of standardisation Activities on Radio Transmission Technology for IMT-2000 in ARIB*: Even if the number of WCDMA relevant patents were very high, the policy would be to grant licences at very low costs (for ARIB members). (The other issues of the document are discussed under section 4.1.5.7.)

Peter Adams asked for clarification on the following sentence in section 4 of Tdoc SMG 906/97 on IPRs: “ARIB has not defined an IPR policy for the IMT-2000 specifications but rather the current IPR policy may be applied.”

Kiritkumar Lathia: The issue of access to a network depends on detailed technology and frequency band. Roaming is a network issue and not a radio access issue. The DoCoMo position confronts SMG with an a priori decision. IPR statements of ARIB are problematic. For the GSM market, the evolution path to UMTS is a very essential issue.

Akio Sasaki also presented Tdoc SMG 1116/97, IPR policy of ARIB. It clarifies the conditions and applicable scope and territory.

Akio Sasaki also explained corresponding to the raised question that ARIB is considering to decide the application of the current IPR policy of ARIB to IMT-2000 specifications around February 1998.

Leo Vercauteren pointed at the problems of a lot of small (research) companies having relevant IPRs, problems being different if operators hold patents.

Armin Toepfer presented Tdoc SMG 1061/97, *UTRA Decision - IPR Statements*, source T-Mobil, E-Plus Mobilfunk, Mannesmann Mobilfunk. He presented the following position:

- The German GSM operators are seriously concerned that patent issues if at all are not resolved in a satisfactory manner.
- It is their expectation that licenses are granted under fair and reasonable conditions without any discrimination to all members of the industry for the production of UMTS/IMT-2000 products, whatever UTRA concept will be chosen.
- The encouragement of members of the industry to notify the respective ETSI body any difficulty experienced obtaining such licenses under fair and reasonable conditions, no matter whether IPRs belong to ETSI members or not.

It was recognised by SMG#24 that the requirements expressed in Tdoc SMG 1061/97 cannot be reached by the ETSI rules. The Chairman remembered the meeting that an ice breaking activity on IPR matters for GSM had been conducted by GSM MoU in the late eighties.

4.1.4 SMG2 Presentation and discussion of UTRA concepts

Niels Peter Skov Andersen presented the UTRA concept groups (in random order):

- beta concept (OFDMA) in Tdoc SMG 894/97, Tdoc SMG 895/97 and Tdoc SMG 896/97
- delta concept (WB-TDMA/CDMA) in Tdoc SMG 897/97, Tdoc SMG 898/97 and Tdoc SMG 899/97
- gamma concept (WB-TDMA) in Tdoc SMG 900/97, Tdoc SMG 901/97 and Tdoc SMG 902/97
- alpha concept (WCDMA) in Tdoc SMG 903/97, Tdoc SMG 904/97 and Tdoc SMG 905/97

The full documentation is available as Technical Report UMTS 30.06, *UMTS Terrestrial Radio Access Concept (UTRA) evaluation*.

SMG#24 thanked SMG2 for the excellent work done.

Discussion of the SMG2 evaluation: For the limits of applying the results for a direct technical comparison, see section 4.1.

Further discussion of the UTRA definition: Among others, the following aspects were discussed:

- preferences of non-European operators
- relevance of multi-mode terminals for IMT-2000
- relevance of a single global radio interface for roaming
- importance of compatibility with GSM

- political nature of a decision on UTRA
- relations between radio access and mobility management
- missing GSM MoU requirements for 2nd generation inter-standard roaming
- missing spectrum harmonisation between North America and the other regions

Several members expressed the position of their company in favour of a concept group.

4.1.5 Contributions from other bodies on UTRA definition

4.1.5.1 UMTS Forum contributions

Thomas Beijer presented information in Tdoc SMG 1049/97, *Operators' Requirements on UTRA (UMTS Terrestrial Radio Access)*, a liaison from the UMTS Forum to SMG and emphasized the requirement of selection of only one radio interface for UTRA.

4.1.5.2 MoU criteria for UTRA selection

Adriana Nugter presented requirements of GSM MoU for the UTRA selection:

- single global radio interface
- evolution from GSM platform
- global standardisation policy
- all GSM MoU members should be able to influence events
- no blocking IPRs
- fair and open access of IPRs for all technologies
- MoU endorsement depending on IPR position.

Adriana Nugter and Bengt Nordstrom (Smartone Mobile Communications) expressed their concerns on ETSI's decision not to give voting rights to associate members.

4.1.5.3 Statement of the European Commission

Bartolomé Arroyo Fernandez, European Commission, DGXIII, declared the following position:

“Although the process of defining the actual UMTS standard still lies ahead for which ETSI has established the rules applicable to the IPR aspects involved, the current choice of the concept including its basic parameters is a decisive one. The Commission is encouraged by the recent move of the various actors to notify ETSI of know-how they may possess and which is related to the UMTS standard.

While recognising that patents may constitute a valuable asset for firms in the commercial and global context, it is of the uttermost importance that full transparency is achieved as early as possible on the IPR situation with regard to UMTS.

Besides their technical merits, the concepts proposed for UMTS therefore in our view would gain credibility to the extent that already at this stage the conditions are known to which interested parties will be granted access to the know-how necessary to implement

UMTS. Hence, it is important - at global level - to establish who owns IPRs related to UMTS and to what extent the IPR situation for the technical solutions proposed is mature.

We will carefully monitor the decisions related to UMTS which have a global impact, and call on all parties concerned to contribute in achieving transparency at this juncture. We would consider necessary action in case IPR questions would threaten to affect the further development of UMTS in Europe and at global level.”

4.1.5.4 DECT Forum

Ruud van Bokhorst presented Tdoc SMG 1121/97, *Requirements for UMTS/UTRA as expressed by the DECT community*, informing about the DECT Forum and its relation to ETSI and indicating the expectations on UMTS/UTRA:

- Inclusion of at least those services and facilities offered today by DECT and GSM, i.e., fixed and mobile, private and public
- Allocation of sufficient spectrum to use these services adequately in the private and public domains
- UMTS should provide the same flexibility and efficiency as DECT's TDD (Time Division Duplex) and DCS (Dynamic Channel Selection) provide, i.e:
 - * to cater for high traffic conditions in unpredictable indoor and outdoor radio environments;
 - * to cater for unbalanced and variable uplink and downlink data throughput needs;
 - * to allow for shared spectrum usage in the same geographical area.

In the discussion, it was clarified that DECT doesn't use UMTS frequency.

4.1.5.5 T1P1 position on UTRA definition

Mel Woinsky presented Tdoc SMG 1064/97, stating that T1P1.5 have reviewed the alpha and delta concept groups and are continuing to evaluate all technologies for their suitability for the North American needs.

4.1.5.6 SMG2 Operators' Interest Group

Keith Mayes presented Tdoc SMG 1027/97, a position paper of the Operators' Interest Group, a technical grouping of 18 operators within SMG2 discussing common concerns of operators and pooling their technical resources as regards UTRA issues. The OIG identified several major questions to still be open, e.g. guard band issues.

4.1.5.7 ARIB position

Akio Sasaki presented Tdoc SMG 906/97, *Current Situation and principle attitude of standardisation Activities on Radio Transmission Technology for IMT-2000 in ARIB*. ARIB is preparing a WCDMA solution for the IMT-2000 radio access, in a phased approach of specification between 1997 and 1999 and commercial service from the beginning of the year 2001 onwards. ARIB is willing to modify their WCDMA concept

at any stage in the extent necessary to reach a world wide IMT-2000 system based on WCDMA. For IPR related issues in the document, see 4.1.3.

It was clarified at present that several radio interface approaches in different levels are studied in ARIB, a WCDMA solution in producing detailed specifications, an IS-95 evolution proposal to merge with the ARIB WCDMA and an OFDMA solution for judgement whether to enter the detailed specification process in ARIB.

Juha Rapeli asked whether the ARIB IMT-2000 has already been decided and/or which would be the ARIB event where the IMT-2000 would be further discussed (where SMG delegates could participate).

Answer Akio Sasaki: ARIB has agreed a draft specification version 0 on WCDMA. A draft specification has a draft nature until the defined completion date when a formal approval will be requested. The decision for a DS-CDMA was made in ARIB meeting in January 1997. SMG delegates were not able to participate in the discussion for that decision because at that time there was no rule of mutual participation between ETSI/SMG and ARIB. But they can participate in the discussion on parameters of the solution.

In this matter, Akio Sasaki presented the *Meeting schedule of IMT-2000 study committee in ARIB* in Tdoc SMG 1117/97. Hamid Amir-Alikhani indicated that the dates for the OFDMA related activities are missing in that paper.

Note: OFDMA (called BDMA in ARIB.) related activities are considered by ARIB to be out of scope for mutual participation targets. As for an information, the exact date for discussion on OFDMA is Dec. 22, 1997.

Andy Watson predicted WCDMA to be in operation (in the first phase, for basic telephony) for two or three years before UMTS like operation starts.

Answer Akio Sasaki: The step one of IMT-2000 commercial services from the spring of the year 2001 will offer multi media services with a capability of at least up to 384 kbit/s data rates.

Gunnar Sandegren: Why does Siemens support WCDMA in Japan?

Answer Dr. Kohnhäuser/Dirk Weiler: Siemens supported WCDMA only in the scope of the FRAMES project (where Siemens, Nokia, Ericsson participated and where the technology foresaw different modes in WCDMA and TD/CDMA).

Fumiyuki Adachi, NTT DoCoMo, presented Tdoc SMG 1037/97, a letter from NTT DoCoMo to SMG. Main issues:

- Memorandum of Understanding NTT DoCoMo - Telecom Italia Mobile - Telecom Finland for co-operation on a 3rd generation communication system
- NTT DoCoMo's support of WCDMA and the evolved GSM Core Network
- Co-operation with other parties in Asia and Oceania
- IPR policy of NTT DoCoMo.

Andy Bell presented Tdoc SMG 999/97, *Supporting ETSI/ARIB co-operation on WCDMA*, source NEC, Panasonic, Fujitsu, Mitsubishi Electric, indicating that the source companies are

contributing to the standardisation of WCDMA both in ETSI and ARIB, support the principle of regional standardisation activities put forward in Tdoc SMG 906/97, where the regional body is solely and completely responsible for the approval and publication of regional standards according to their own requirements. However, these companies actively encourage any mutually beneficial convergence of the ETSI and ARIB (and any other) WCDMA standards as has already successfully happened in the ETSI Alpha Concept and ARIB WCDMA working groups.

Heikki Ahava argued PDC to require very low license fees. He reported the technical co-operation between Nokia/Ericsson and ARIB having been very good, and proposals to have been evaluated strictly on technical grounds.

Pietro Porzio-Giusto: After a selection of the alpha concept, standardisation in SMG should start as it was the case in GSM after the decision on basic radio interface parameters. The difference is that other bodies like ARIB would have to get the possibility to co-operate.

Josef Huber, Dirk Weiler: As regards Tdoc SMG 1037/97: TD/CDMA has not been discussed in Japan. The statement that Japan will select WCDMA whatever solution is taken in ETSI, is hardly compatible with the claim to go for ITU standardisation.

Hamid Amir-Alikhani: Isn't it premature to state that the choice must be WCDMA?

Answer: Service should start in 2001. The decision of DoCoMo is WCDMA.

Hamid Amir-Alikhani: Tdoc SMG 906/97: Is there no other technology studied in ARIB than WCDMA for the IMT-2000 radio access?

Answer Akio Sasaki: No other technology than WCDMA is studied in detail as a proposal; OFDMA is studied and at the end of this month it will be decided whether to open a detailed OFDMA study. In reality very few members in ARIB want to study OFDMA, but such a decision is necessary.

Hamid Amir-Alikhani: Hence, as OFDMA has a TDMA component, TDMA is studied as an alternative approach?

Sasaki: ARIB decided that W-TDMA cannot be a basis for a proposal to ITU.

Summary: In ARIB there is broad support and major progress in WCDMA, but other proposals are also on the table.

Rémi Thomas: We have so many new information in this meeting that a decision is not yet possible. Both papers state that ARIB will chose WCDMA whatever ETSI decides. Service is planned for 2000/2001, but this will be basic telephony only, and of no use for the GSM world. Do GSM operators want to get rid of GSM?

Radivoj Kar explained the decisions in Japan having been misunderstood in Europe; The basic decision having been WCDMA; then the government having obliged the Japanese Mobile world to look for a world wide standard; the first contacts having been to Europe and the expectation to be that - if WCDMA is selected in ETSI - the solution to be harmonized. IPRs: Japanese companies, in particular Mitsubishi, don't use their IPRs for making money but for protection (cross-licensing).

Fred Hillebrand: Such statements should be made official in written form to ETSI. There is a mismatch in the schedules in Europe and Japan, due to the pressure of the Japanese Ministries to allocate new spectrum only in a new technology. Certainly the co-operation between SMG and ARIB should be increased; in particular, the schedules should be aligned in future.

Akio Sasaki agreed to write a letter to SMG/ETSI with a clear IPR statement, in particular whether the conditions apply only to ARIB members. See also Tdoc SMG 1116/97.

Juha Rapeli: Can SMG members participate at the ARIB meeting later this month?

Akio Sasaki responded that participation is welcome according to the agreement ARIB/SMG, and that several meetings are scheduled. The necessary information was made available during SMG#24, see Tdoc SMG 1117/97.

Kiritkumar Lathia: Tdoc SMG 1037/97, signed by the President of NTT Mobile Communications Network (DoCoMo), says: "Our decision as of this point is that NTT DoCoMo will not select TD/CDMA, even if ETSI selects this technology." Over the page the document states that introduction in the year 2000 is a must for DoCoMo. Questions: Will DoCoMo support WCDMA whatever ETSI will chose? Question 2: Will the core network be attached to an evolved GSM core network? Or will, in 2000/1, the radio be attached to the PDC core network?

Fumiyuki Adachi: NTT DoCoMo strongly believes that WCDMA is the best solution, that opinion is also shared in Asia. GPRS like services, namely Voice, Internet, Multimedia services, are planned in 2000. An overlay and parallel use with interworking function of PDC and the evolved GSM Core Network is planned for 2001.

Bengt Nordström: The application of the GSM Core Network evolution is a good success, the alternative being an IS41 evolution.

Fred Hillebrand: The approaches in TTC are not evidently in line with the positions expressed by DoCoMo in Tdoc SMG 1037/97. Could a document be provided (after SMG#24) what the policy on Core Network development in Japan is? How will the integrity of the GSM platform be guaranteed?

Fumiyuki Adachi: Such a document will be provided by NTT DoCoMo. Alistair Urie: The information should be complete, e.g., as regards selling systems to third parties, IPRs in the proposal outside of DoCoMo.

Kiritkumar Lathia: There must be a roll-out plan for Japan. The building up of an overlay network will take around two years. Which GSM Core network specifications will be used? How can GPRS be included?

Don Jayasuriya: Time scales: The UMTS Forum proposed a European roll-out in 2002, this was confirmed by the UK consultation and the EC consultation results. CEPT proposed to make the necessary steps for providing the frequencies in time. Licensing certainty in UK is planned for end 1998. IPR matters must be clarified, discussions must be continued not only in ETSI, also, e.g., DG IV must be engaged in that discussion.

Clarification of time scales: Japanese schedules talk about spring of the year 2001 for start of commercial service, this means 8-9 Months ahead of Europe depending on the start in January 2002.

Alistair Urie: The Japanese IMT-2000 version 1 might go in direct competition with GSM in Asia, and this is already visible.

Paul Simmons: How can compatibility and convergence be feasible in the time scales, seeing the different solutions for IMT-2000 which will be realised and the requested compatibility with second generation systems?

4.1.6 Presentation of contributions to the concept groups

The contributions to the concept groups were discussed in a controversial manner. SMG#24 did not conclude on technical points in addition to the SMG2 results nor on a modification of criteria.

4.1.6.1 Alpha concept

Antti Toskalla presented Tdoc SMG 1069/97, *Dual mode GSM/UMTS terminal complexity*, source Nokia, Ericsson. The document argues the WCDMA UMTS radio interface to have as good or better GSM/UMTS dual mode properties as/than any other candidates. This was objected by Michael Färber.

Mikael Gudmundson presented Tdoc SMG 939/97, *Performance comparison based on SMG2 evaluation reports: WCDMA vs. WB-TDMA/CDMA*, source Ericsson. The paper argues the WCDMA concept to give, on basis of the prioritised test cases and of those cases where both concepts have submitted results to SMG2 and on results of the SMG2 evaluation reports and related documentation, to give better system capacity results than TD/CDMA in all cases, especially in low-speed environments. Michael Färber referred to Tdoc SMG 1023/97 giving a different interpretation. Patrick Blanc, Hamid Amir-Alikhani and Simon Pike commented on the validity of technical approaches, evaluation backgrounds and methods and on missing support in SMG2 for discussing such aspects.

Andy Bell presented Tdoc SMG 1000/97, *Supporting the selection of WCDMA for UTRA*, source NEC. The paper argues W-CDMA to be the superior choice based on coverage, capacity, flexibility, cost, and development risks related criteria. Andy Watson argued this position to concentrate on basic speech application. Paul Simmons repeated the argument about the Japanese time scales to risk to narrow the 3rd generation services. Dirk Weiler asked where extensive W-CDMA field tests have been performed in Europe. Andy Bell answered that demonstrators have been used in the Frames project and in Japan, and that IS-95 is a good field test for CDMA. Keith Mayes, Vodafone, stated that real world tests are missing. Rémi Thomas raised doubts on WCDMA having lower development risks, due to the high priority of compatibility with GSM and the narrow range of services in the Japanese phase 1. He stated there not to be a test bed for frames mode 2 in the test bed. Alistair Urie argued that, if IS-95 is taken as reference field test, the lesson to learn would be real capacity to be much lower than theoretically predicted (load margin factor).

Teuvo Jarvela presented Tdoc SMG 1071/97, *Radio interface selection for UMTS*, source Nokia. The document states Nokia to have concluded, based on extensive tests, W-CDMA to be the best choice for the continuous evolution of GSM to UMTS/IMT-2000.

Gunnar Sandegren presented Tdoc SMG 1072/97, *Aspects of selecting Radio Access technology for the 21st century*, source Ericsson. The paper argues W-CDMA to have advantages due to coverage, capacity, support for multimedia and Internet, complexity and maturity, migration and re-farming aspects and gives marketing and commercial backgrounds/forecasts on GSM and UMTS. Kiritkumar Lathia: Other commercial aspects include Return on investment (in cellular systems after not less than 7 years, 15 years to write off investments). Gunnar Sandegren pointed out that Ericsson, in addition to elaborate on UTRA, is also driving the GSM radio access development.

Andrew W.D. Watson presented Tdoc SMG 1022/97, *Alpha concept evaluation - An alternative view*, source Motorola. Motorola's position is that the basics (channel modelling etc.) for the alpha concept have taken a large number of simplifications and that therefore the predicted performance must be seriously questioned. This was objected by Mikael Gudmundson, Ericsson.

4.1.6.2 Beta group

No additional documents were presented.

4.1.6.3 Gamma group

No additional documents were presented.

4.1.6.4 Delta group

Alistair Urie argued the importance of compatibility of 3rd generation systems with corresponding 2nd generation systems to be very high. He presented Tdoc SMG 1067/97, *TD-CDMA (delta), the best of both worlds*, source Alcatel, Bosch, Italtel, Motorola, Nortel, Siemens and Sony, favouring the TD-CDMA solution.

Paul Crichton and Michael Färber presented Tdoc SMG 1023/97, *Enhanced TD-CDMA, A revolution for UMTS and an evolution of GSM*, source Alcatel, Bosch, Italtel, Motorola, Nortel, Siemens, Sony. Johan Sköld argued the enhanced TD-CDMA to have been presented only recently; he criticised numbers in the document. Sunil Vadgama responded other groups also to have made progress leading to changes in the last few weeks. Kiritkumar Lathia challenged Johan Sköld's argument asking why SMG should not allow progress in the delta concept just because the W-CDMA solution being frozen. Johan Sköld responded that this is the idea of the refinement phase.

Vagan Shakhgildian argued that seeing the work of SMG2 mainly concentrating within 6 months, a 2 weeks old result could not be called "too recent". He draw the attention to Tdoc SMG 1022/97, *WB-CDMA - an alternative view*, source Motorola, were evaluation methods of the alpha solution are challenged.

Sunil Vadgama presented Tdoc SMG 1087/97, *TD-CDMA performance degradation with the new OQPSK spreading*, and Tdoc SMG 1088/97, *Simulation Results in the detectability of*

WB-BCCH pilot signal of the delta concept, both source Fujitsu, contradicting elements of Tdoc SMG 1023/97.

Jean-Louis Dornstetter presented Tdoc SMG 1093/97, *Clarification with Respect to the documents on TD-CDMA Performance Tdoc 1087/97 and tdoc 1088/97 by Fujitsu*, source Nortel, Motorola, contradicting positions in document Tdoc SMG 1087/97 and Tdoc SMG 1088/97, referring to SMG2 papers of the Cork meeting.

Joseph Huber recommended Tdoc SMG 1023/97 to be studied by SMG2; he argued the TD-CDMA approach to inherently contain a Time Division Duplexing solution (for the unpaired band).

Paul Simmons emphasized two reasonings used in Tdoc SMG 1023/97, soft handover not to be required and lower costs of ownership.

Johan Sköld challenged the table at the bottom of page 10 in Tdoc SMG 1023/97.

Jean-Louis Dornstetter sees the decision between a clean break for a W-CDMA solution or the (r)evolution of GSM to TD-CDMA where the theoretical performances are governed by physical laws. He stated the new detector in the TD-CDMA solution not to be a new technical aspect, but rather an improvement of evaluation; major points relevant for the performance of the radio access - outside of the area of multiplexing/modulation - not to have been examined by SMG2.

Niels Peter Skov Andersen defended the technical parts of the SMG2 work. He asked for consensus of manufacturers on improving the solution based on a decision for any concept group. Talking as an operator, he saw less importance of the minimum required block size for re-farming where 2Mbit/s services require a relatively big allocation of frequency.

Josef Huber argued important criteria to be minimum bandwidth required, closeness to GSM, asymmetric cases, IPR, improvement capacities for reuse factor.

Patrick Blanc presented Tdoc SMG 1042/97, *France Telecom position on UTRA concept*, and Tdoc SMG 1019/97, *Technical Analysis and Comparison of UTRA concept*, both source France Télécom. The position is:

- France Télécom regrets that there is no technical report from SMG2 regarding the evaluation and comparison of these concepts;
- there were no independent evaluation of the concepts. The France Télécom internal simulations results appeared to be significantly different from those presented by the concept groups, especially for capacity evaluation by system simulations;
- Support of high bit rate services to be given by TD-CDMA but not by W-CDMA.
- IPR from Qualcomm on fast power control and soft handover issued from IS'95, and there being probably other Japanese IPR on WCDMA;
- environment for GSM compatible evolution given for TD-CDMA, not CDMA;
- equivalence in stability;
- no validation of the operational aspects of the different concepts using experimental networks in Europe. (These experimental networks could provide some answers to the concerns expressed during the evaluation procedure, where simulations might not be fully convincing.)

- lack of experience of operation of CDMA solutions in Europe.

Juha Rapeli presented Tdoc SMG 1073/97, *UMTS Deployment by Private Operators*, source Philips, seeing an advantage of

- TDMA (with less than 400 kbit/s) in a single transceiver without duplex filters and without shielding

against

- CDMA requiring a duplex filter, separation of receiver and transceiver, shielding, separation of digital processing from analogue/digital I/F.

In easy terms: time division of sending and receiving to allow smaller and cheaper terminals, these differences not disappearing with mass production (objected by Robert Vass, Ericsson, but maintained by Rapeli because the additional chip would not disappear). Also an equivalence of the four proposals, but ignoring latest antenna developments (SDMA on the fixed side, two antennas in the terminal). This being less applicable for spreaded signals where the source can only be localised after de-spreading.

Juha Rapeli presented Tdoc SMG 1074/97, *UMTS Radio Access for cost efficiency and consumer features of UMTS terminal*, source Philips, raising the TDD question, giving an evaluation of feasibility for alpha and delta, concluding it to be intrinsic in delta.

4.1.6.5 ODMA

Keith Mayes presented Tdoc SMG 1028/97, *Information on ODMA*, source Vodafone, Siemens, Ericsson. Potential of ODMA were investigated (due to resource constraints, only for the alpha and delta group, but the results are also applicable for beta and gamma) for UTRA. It was concluded that the ODMA relaying techniques allow very wide area high data rate coverage, increased capacity and reduction of transmitted power.

4.1.7 Results of Voting of indication of intent

The voting was held on the following question:

“The members of SMG² are requested to indicate by their vote what would have been the technical solution among the technical proposals related to UTRA they would have chosen, had a formal selection by vote been conducted. Abstentions should be indicated in the voting form but they will only be recorded for information.”

Result of the voting: 141 ETSI full members participated.

alpha: 58.45%, 716 votes

² The members of SMG are ETSI full members registering in an SMG meeting.

beta: 0%

gamma: 0%

delta: 41.55%, 509 votes

abstentions: 19 members with a total weighting of 167 votes.

Note: The number of members voting for each alternative were not counted, because that might disclose the votes. This was challenged by some delegates. The legal advisor confirmed this position after further examinations.

4.1.8 Further discussion of UTRA

Hamid Amir-Alikhani stated that the OFDMA concept group maintains their proposal.

4.2 UMTS SERVICES

Alan Cox presented Tdoc SMG 983/97 which includes a short summary of the decisions required from SMG#24 by SMG1. Derek Richards presented the following documents for approval and information:

ETS 22.01 “Service Principles” CRs A005 and A006 to ETS 22.01 “Service Principles” in Tdoc SMG 966/97 and Tdoc SMG 967/97 were approved.

Eric Ljungberg, Telia, presented Tdoc SMG 1008/97, *Comments on CR to TS 22.01 Service principles regarding multiple subscriptions*, proposing to remove the requirement to allow multiple subscriptions per IC card where this involves more than one Service Provider of equal status; this was supported by several operators. Derek Richards explained that the CR in Tdoc SMG 966/97 does not introduce this requirement but rather clarifies an existing requirement. Alan Cox recalled that he had raised similar concerns in SMG1, but there had been little support for his concerns; he recommended to follow the SMG1 conclusion to keep the requirement and to come back if and when difficulties were identified; Gary Jones supported that view.

Eric Ljungberg was asked to prepare in a side group during SMG#24 a paper with a more concrete proposal. This turned out not to reach agreement, so SMG1 was invited to study this aspect again, taking note of the views expressed in SMG.

UMTS TR 22.60 v.1.0.0 - Mobile multimedia services including mobile Intranet and Internet services in Tdoc SMG 960/97 was presented for information.

Service Continuity and Provision of VHE via GSM/UMTS: This new work item and its work item description in Tdoc SMG 1044/97 were approved by SMG#24; updating and completion of the WID is expected.

Service aspect proposed for Chapter 9 of UMTS 30.01 Version 3.1.0: Inclusion of the text in Tdoc SMG 1041/97, source SMG1, into the UMTS Baseline document UMTS 30.01 was approved.

UMTS 22.25, *Quality of Service and Network Performance*, in Tdoc SMG 959/97 was presented in its version 2.0.0. Niels Peter Skov Andersen will review the network parameters in section 5.1.2, Simon Pike in 5.6.1; in particular the requirement of synchronisation (skew) of media components < 10 ms might be too ambitious; the update rate of the video should be considered. The specification was approved.

UMTS 22.80 version 2.0.1, *UMTS Relationship to other Standards*, in Tdoc SMG 964/97 was noted. Derek Richards emphasized that as visible in the document, contacts to other bodies and fora (e.g. on Internet) would be necessary. It will be used for the mission on SMG globalisation and work in SMG1 will be suspended while this activities goes on. As a result, the report was not formally approved.

UMTS 22.05, *Services and Service Capabilities*, in Tdoc SMG 955/97, was presented for information. Derek Richards commented that further work is needed, for example in sections like 5.3; Niels Peter Skov Andersen proposed a clearer separation of bearer/teleservice requirements (addressing the data rates etc. as perceived by the user) from radio transmission attributes where some freedom exists how to fulfil the service requirements.

UMTS 22.07, *Terminal and smart card concepts*, version 1.0.0) in Tdoc SMG 956/97, was presented for information. Derek Richards urged in particular operators to review whether their requirements are neatly expressed.

UMTS 22.24, *New Charging and Accounting Mechanisms* in Tdoc SMG 958/97 and **UMTS 22.71, *Automatic Establishment of Roaming Relationships*** in Tdoc SMG 962/97 were presented for information and should be studied carefully by SMG delegates. They will be passed for comments to MoU 3GIG and to ETNO.

UMTS 22.70, *Virtual Home Environment*, in Tdoc SMG 961/97, was presented for information. In its further elaboration, contact to Information Technology groups might be necessary.

UMTS 22.75, *Advanced Addressing*, in Tdoc SMG 963/97, was presented for information.

Further UMTS work items are in preparation; SMG1 was advised to create the work item descriptions and to come with short papers on strategic issues to SMG for guidance before starting detailed reports.

The role model approaches in TG.25 and UMTS 22.01 are related to each other in a figure in Tdoc SMG 968/97. The discussion on the role model is also carried out with the UMTS group of NA6 with good mutual understanding.

SMG1 was thanked to their good efforts and success to implement SMG#23 wishes.

4.3 UMTS NETWORKS ASPECTS

Michel Mouly presented a *Proposal for a contribution to ITU on the interface section of Q.FIN* Annex D in Tdoc SMG 1100/97. It was approved.

Ansgar Bergmann presented Tdoc SMG 882/97, *GSM-UMTS Core Network definition pivoting GSM Core Network evolution*. It was approved.

Eckehard Valta questioned consequences on the fixed/mobile convergence ad hoc group of the ETSI General Assembly (GA). Fred Hillebrand stated that the ideas of fixed/mobile convergence in ETSI are vague. In the activity to study that convergence, clear work items would have to be identified. These could then be elaborated by the responsible Technical Bodies. Michel Mouly added that the proposed managerial means are meant for phase 1 whereas convergence would be picked up in phase 2. Alistair Urie indicated the possibility to distinguish within SMG3 a project for GSM-UMTS Core Network phase 1 and phase 2. Neil Lilly indicated further requirements from 3GIG to be forwarded to GSM in early 1998.

Jonas Sundborg presented Tdoc SMG 1043/97, *Migration and evolution from GSM*, source Ericsson. Several speakers emphasized the necessity of evolution and compatibility which becomes more ambitious, the more advanced features are introduced into UMTS. The paper proposes three points,

- SMG to state migration and evolution as a formal requirement, including a definition or guiding principles for what this shall mean,
- SMG to state which group, preferably SMG1, shall be responsible for specifying the details of this requirement and
- SMG to state guiding principles for how conflicts shall be resolved if all requirements for migration/evolution and functionalities/capabilities respectively can not be met.

It was argued that evolution should certainly be a formal requirement. For the responsibilities on evolution aspects between the STCs, also proposals were brought up (by François Courau and Armin Toepfer) to establish SMG3 SA as an STC. Due to lack of time, the discussion of Tdoc SMG 1043/97 did not reach formal conclusions. It was also discussed in an SMG-CG ad hoc during SMG#24 plenary and will be further discussed between the STC Chairmen.

New Access Network to Core Network (BSS-NSS) interface: Michel Mouly presented Tdoc SMG 1112/97, the WID of a new work item *New Access Network to Core Network (BSS-NSS) interface*. It was approved in principle and forwarded to SMG3 for revision if needed and final approval in SGM#25.

Dirk Weiler raised the general comment that WIDs should first be seen by the STCs.

NTT DoCoMo plans for migration to third generation core network: Masami Yabusaki, NTT DoCoMo, presented the NTT DoCoMo plans for migration to third generation core network in Tdoc SMG 1118/97. The basic idea is to attach the IMT-2000 radio access to the GSM-UMTS Core Network and to provide an interworking function between the PDC Core Network and IMT-2000 Core Network. The first commercial phase beginning in 2001 would be based on the GSM specifications with the draft UMTS evolution. The second commercial phase beginning in 2001 and 2002 would be based on the evolved GSM-UMTS specifications.

This position has been identified in TTC as a possible input to SG11; further information is given in Tdoc SMG 1085/97, a letter from Tokuo Iida, TTC Executive Managing Director. TTC sees INAP as a long term ultimate solution.

4.4 UMTS PROGRAM MANAGEMENT

4.4.1 UMTS Specifications

Concerning the following documents:

- ETR271 UMTS Objectives and overview
- ETR309 Vocabulary for UMTS
- ETR291 UMTS System requirements
- ETR312 Scenarios and considerations for the introduction of the UMTS
- TCR TR 015 "Work programme for the standardization of the Universal Mobile Telecommunications System (UMTS)"
- TC TR 004 "Work programme for the standardization of the Universal Mobile Telecommunications System (UMTS) (UMTS 00.01)"

the following handling was proposed by Antun Samukic in Tdoc SMG 1052/97 and approved by SMG#24:

- These ETRs should be stored on the ETSI server under sub-directory "SMG5" with the note on the status of the documents.
- To clarify the actual positions on UMTS these documents should be formally withdrawn.

UMTS 30.20, *Technical characteristics, capabilities and limitations of mobile satellite systems applicable to the UMTS* (draft version 3.1.0) in Tdoc SMG 1055/97 was approved.

4.4.2 UMTS 30.00 (UMTS work program)

Antun Samukic presented Tdoc SMG 1053/97, the updated UMTS work program in UMTS 30.00 which was approved by SMG#24 as version 3.3.0.

4.4.3 New UMTS Work items:

Service Continuity and Provision of VHE via GSM/UMTS: This new work item and its work item description in Tdoc SMG 1044/97 were approved by SMG#24; updating and completion of the WID is expected. (Cf. section 4.2.)

Further UMTS work items are in preparation; SMG1 was advised to create the work item descriptions and to come with short papers on strategic issues to SMG for guidance before starting detailed reports. (Cf. section 4.2.)

New Access Network to Core Network (BSS-NSS) interface: Michel Mouly presented Tdoc SMG 1112/97, the WID of a new work item *New Access Network to Core Network (BSS-NSS) interface*. It was approved in principle and forwarded to SMG3 for revision if needed and final approval in SMG#25. (Cf. section 4.3.)

4.4.4 UMTS baseline document

Antun Samukic presented Tdoc SMG 1054/97, the draft updated UMTS baseline document in UMTS 30.01.

Hans Hauser stressed section 9.3, Charging aspects, of the baseline document: "Some conflicting elements of charging related aspects in UMTS 22.24 and TG.24 with MoU

BARG which currently plans to establish UMTS charging principles have been discovered. Discussions leading to clarifications are needed.” He quoted BARG plans to contribute in 1999 to the matter; that would be too late. Outside of the meeting he identified that BARG is now intending to study the issue in 1998 and tries to establish for that purpose a joint working party similar to the way it was done for CAGE 2+.

It was agreed to update the information in section 9 on location services.

Comment Simon Pike: Some statements in 30.01 are background information and not decisions of SMG.

It was agreed that section 10.8, section 14.3 first paragraph and section 14.4 should be deleted.

The version including all agreed comments will be distributed as version 3.2.0 after SMG#24.

Tdoc SMG 1009/97, *Proposed changes to UMTS 30.01*, source Telia, was presented. It was agreed to collect further comments to UMTS 30.01 during the week of SMG#24; however to update UMTS 30.01 only corresponding to decisions that had already been made; that companies wanting to change positions or agree new positions, should provide standalone papers on the proposals (without indication of changes to UMTS 30.01).

UMTS documentation on the Web: Antun Samukic presented Tdoc SMG 1057/97 for information, giving information where to find electronic versions of the UMTS documentation on the Web.

4.5 ITU CONTRIBUTIONS

ITU Workplan for SMG: David Williams presented the updated *Workplan for SMG contributions to ITU* in Tdoc SMG 1010/97, source David Williams and Makis Kokkos. Due to a formatting problem with a figure in section 4, the document was re-issued as Tdoc SMG 1129/97. Regarding a question from Harald Dettner, it was clarified that any SMG member can identify the need for contribution.

SMG#24 approved Tdoc SMG 1129/97, revising Tdoc SMG 1010/97.

Tdoc SMG 1094/97, *ITU-T contributions table*, was presented for information and noted by SMG#24.

Regarding the length of discussions on ITU contributions in SMG plenary, Niels Peter Skov Andersen suggested to have initial discussions of the ITU inputs in side events during SMG plenaries.

Contributions to ITU-T SG11: Tdoc SMG 1011/97, a change request to Q.FIN to update the table of IMT-2000 capabilities and features was objected by Tdoc SMG 997/97, presented by Alain Sultan; Tdoc SMG 997/97 proposes to use the terms of a circular letter (8/LCCE/47) issued by TG8/1, specifying the IMT requirements for bearer capabilities in IMT-2000, in particular “at least 2 Mbit/s”. This was supported by different speakers, Peter Adams, Neil Lilly, Patrick Blanc, Gary Jones, and contradicted by Timo Ali-Vehmas, Derek Richards, and others. It was agreed that a change of an approved SMG position (namely to change “at least 2 Mbit/s”, as stated in the UMTS

baseline document, UMTS 30.01, to “up to 2 Mbit/s”) would require a proper input. Tdoc SMG 1011/97 was approved with the modification to go back to the requirement of at least 2 Mbit/s.

Tdoc SMG 932/97, source SMG Chairman, was presented by Ansgar Bergmann as a proposed SMG policy paper (to be reflected in the baseline document).

Tdoc SMG 1012/97 is a subset of Tdoc SMG 932/97 presented for approval as a change request to Q.FIN. Derek Richards presented Tdoc SMG 1026/97 proposing to delete figure 1 and the latter 2 paragraphs in section 4 of Tdoc SMG 1012/97. Reason is not to restrict ITU work. Gary Jones supported Tdoc SMG 1012/97 and objected against Tdoc SMG 1026/97. Tdoc SMG 1012/97 was agreed by SMG#24, with Lucent stating disagreement, with the following modification: To replace the circles in the figure by straight lines. The revision presented in Tdoc SMG 1125/97, however, was not agreed to implement the decision so that no approved document emerging from Tdoc SMG 1012/97 was established at SMG#24.

For Tdoc SMG 932/97, it was agreed that section 2.3 would need elaboration to include network concepts; the table in section 2.2 was felt too restricted, it was commented that it should refer to at least 2Mbit/s and should better reference requirements in other (ITU) papers than to repeat some of them. (Comments from Harald Dettner, Alistair Urie, Neil Lilly).

It was agreed to replace section 3 of Tdoc SMG 932/97 by the sections 6.4 ff. in Tdoc SMG 1012/97.

Tdoc SMG 1132/97, revising Tdoc SMG 932/97, was approved with one modification: “The interested parties representing the various” instead of “The possible network operators of different”.

Contribution to ITU-T SG11 on the interface section of Q.FIN: A change request to Q.FIN on IMT-2000 interfaces, source SMG3, was presented by Michel Mouly. Tdoc SMG 1013/97 is a misprint not showing necessary revision marks. The correct printing is in Annex D of the SMG3 status report in Tdoc SMG 1100/97. SMG#24 approved the document in Annex D of Tdoc SMG 1100/97 to be presented to SG11 on behalf of SMG.

Tdoc SMG 1014/97, proposing a new definition of the IMT-2000 family concept and describing the role of SMG, was presented by David Williams. It was agreed to delete the word “concept” in the title of section 1: “IMT-2000 Family ~~Concept~~”. Derek Richards presented Tdoc SMG 1025/97, source Lucent, objecting a restriction of ITU from detailed protocol definition. It was supported by British Telecom and Alcatel. Didier Chauveau proposed deletion of the words “GSM phase 2+ and” in Tdoc SMG 1014/97 arguing that GSM phase 2+ is outside of the interest of ITU. Due to lack of time, SMG#24 did not take a final decision on Tdoc SMG 1014/97.

Contributions to TG8/1: Niels Peter Skov Andersen presented Annex 5 and 6 of the Status report of SMG2 to SMG#24 (Tdoc SMG 1017/97), two SMG2 documents to be presented to ITU meetings for information purposes. SMG#24 approved these documents to be presented to TG8/1 on behalf of SMG.

Tdoc SMG 1111/97, *Proposed SMG Contribution to TG8/1 on IMT-2000 Family*, was presented by Chris Wildey on behalf of the SMG ITU-R Co-ordinator.

Patrick Blanc proposed such papers to be communicated between TG8/1 members. He asked, if the document is approved by SMG, how it could be modified by TG1 in Mainz.

It was clarified that SMG approved positions cannot be changed by ITU members. Chris Wildey commented further that the family concept must be explained, this does not require passing through TG1.

There were requests for clarifications on section 5 from Patrick Blanc, Steve Hayes and Simon Pike, to section 6 from Didier Chauveau and Peter Adams, the latter arguing a publication within ITU to be helpful for e.g. IPR questions. Bob Tompkins proposed more harmonisation with Tdoc SMG 1014/97. Simon Pike asked such papers to be forwarded to SMG and SMG2 in time.

A revision of Tdoc SMG 1111/97 in Tdoc SMG 1128/97 was approved by SMG#24 to be presented to TG8/1 on behalf of SMG.

Chris Wildey presented Tdoc SMG 1097/97, a proposed LS to ERC TG1 responding to the ERC TG1 LS to SMG on WRC-99 Agenda item on Global Radio Control Channel. Tdoc SMG 1097/97 was approved by SMG#24 with minor modifications (the revised version to be issued as Tdoc SMG 1163/97).

A Liaison Statement to ITU-R TG8/1 on speech codecs, Source SMG11, in Tdoc SMG 954/97, was presented by Phil Gaskell. SMG approved the document to be presented to TG8/1 on behalf of SMG.

Co-operation with other Standards Organisations: Ansgar Bergmann presented Tdoc SMG 1109/97, *Draft Summaries of two telephone conferences TIA/SMG/T1P1*. The document was noted.

Fred Hillebrand presented Tdoc SMG 1110/97 (replacing Tdoc SMG 1058/97), *IMT-2000 Co-ordination*, proposing dates and agendas for IMT-2000 co-ordination meetings with TTC, ARIB, T1P1, TIA and TTA. The document was approved by SMG#24 with editorial corrections, see Tdoc SMG 8/98 (issued after SMG#24).

4.6 OTHER UMTS ISSUES

SMG2 is planning a workshop on UTRA after the decision on a concept has been made by SMG.

5 GSM MATTERS OF STCS

Results of Change Requests presented to the meeting are in Annex 2. Therefore the results are not always repeated in this part B.

Discussion of STC GSM matters in SMG#24 was restricted to essential decisions (focus R97) requested from SMG plenary. Status reports of STCs on GSM matters were not foreseen in SMG#24. In this report, only a reference to the status reports (where available) is given.

5.1 SMG1

5.1.1 Phase 2 change Requests

GSM 02.81: All CRs in Tdoc SMG 978/97 were approved.

5.1.2 Release 96 Change Requests

Both CRs in Tdoc SMG 970/97 on GSM 02.01 were approved.

A CR to GSM 02.30 in Tdoc SMG 974/97 was revised during SMG#24. The revised version in Tdoc SMG 1149/97 was approved by SMG#24.

Both CRs in Tdoc SMG 972/97 (to 02.42 and 02.07 regarding the indication of time in addition to time zone) were approved.

A CR In Tdoc SMG 975/97 on GSM 02.41 was approved.

5.1.3 Release 97

GSM 02.66, *Support of Mobile Number Portability (MNP) Stage 1*, was approved.

GSM 02.95, *Support of Private Numbering Plan (SPNP) Stage 1*, in Tdoc SMG 980/97 was approved to become part of R97.

GSM 02.96, 03.96 and 04.96, *Name Identification Supplementary Service Stage 1, 2 and 3* together with CR 04.80-A007 r2 in Tdoc SMG 1081/97 were approved.

In this matter, Derek Richards presented Tdoc SMG 1065/97, *Stage 1 of the CNAP*, asking for methods to include needs from markets other than the North American one.

It was clarified that variants for other market needs are expected to be added in future.

Release 97 Change Requests:

Tdoc SMG 976/97, Tdoc SMG 977/97, Tdoc SMG 979/97 were approved.

Tdoc SMG 973/97 contains CR 02.11-A009 introducing the requirement that roaming from one GSM PLMN area to another shall be possible without interruption of GPRS services, and that the availability is subject to inter-PLMN agreements.

Niels Peter Skov Andersen asked whether consequences on charging, registration etc. have been studied; also it was objected that at the end of the GPRS phase 1 specification an essential new requirement appears. Niels Peter Skov Andersen stated the position of Tele Denmark, that introduction of handover between PLMNs should not be introduced on a partial basis but only after a broad study for all services, also taking into account regulatory situations. Mikko Kanerva indicated that for some time the GPRS stage 1 and 2 has not excluded GPRS service continuation between PLMNs (under the proviso of agreements between operators).

Tdoc SMG 973/97 is not approved. Maintenance of GPRS sessions when changing networks may be studied within the scope of inter-PLMN handover.

All CRs related to network alerting in Tdoc SMG 971/97 were approved by SMG#24.

5.2 SMG2

The **GSM related part of the SMG2 Status report** in Tdoc SMG 1017/97 was presented by Niels Peter Skov Andersen.

The situation for hosts is still earnest, in particular for subgroup meetings hosts are needed.

For priority in PT SMG of establishment of the new versions of specifications against support of meetings (letter from SMG2 to PT SMG leader in Annex I of Tdoc SMG 1017/97), see section 3.2.

Liaison from SMG2 to SMG on Cell re-selection enhancements (Annex II of Tdoc SMG 1017/97: Noted.

Change requests: The following change requests to the GSM standard were presented to SMG#24 for approval:

97-985	R97	CR 03.64 A031r1 Clarification on the use of hysteresis for cell re-selection
97-946	R97	CR 04.03 A005 r2 Introduction of GPRS
97-946	R97	CR 04.04 A001 r2 Introduction of GPRS
97-941	R97	CR 04.08 A181 r5 System Information type 10
97-941	R97	CR 04.08 A246 Frequency redefinition procedure for multislot configuration
97-941	R97	CR 04.08 A247 r2 Clarification to SACCH procedures for multislot configuration
97-942	R97	CR 04.08 A251 r1 Mobile assisted frequency allocation
97-940	R96	CR 08.08 A090 Correction of Circuit Pool Description
97-940	R97	CR 08.08 A092 r1 Clean-up for WI Improved Transcoder Handling
97-639	R97	CR 08.58 A022 r1 Mobile assisted frequency allocation
97-1002	R97	CR 05.01 A010 r1 Introduction of GPRS
97-1003	R97	CR 05.02 A020 r1 Corrections and clarifications to GPRS
97-1003	R97	CR 05.02 A021 Multislot classes for GPRS
97-1003	R97	CR 05.02 A022 r1 System information for GPRS on BCCH
97-1003	R97	CR 05.08-A023 r2 Alignment of 51- and 52-multiframe PCCCH
97-1004	2	CR 05.05 A058 r1 Improvement to DCS MS sensitivity
97-1004	R97	CR 05.05 A059 r1 Improvement to DCS MS sensitivity
97-1004	R97	CR 05.05 A063 r2 Reference performance for GPRS

97-1005	2	CR 05.08 A039 Allowed time to decode BCCH data
97-1005	R96	CR 05.08 A040 Allowed time to decode BCCH data
97-1005	R96	CR 05.08 A041 Dual band MS cell re-selection enhancement
97-1005	R97	CR 05.08 A042 r3 Mobile Assisted Frequency Allocation
97-1005	R97	CR 05.08 A043 Channel Quality Report in GPRS
97-1006	R97	CR 05.50 A005 r1 Introduction of simulation results for GPRS receiver performance

All CRs in the table were approved by SMG#24 except CR 05.08-A042r3.

CR A042r2 to GSM 05.08 R97 in Tdoc SMG 1144/97 was approved by SMG#24.

GSM 04.14, *Individual equipment type requirements and interworking Special conformance testing functions* in Tdoc SMG 1018/97 was presented to SMG#24 for information.

General Packet Radio Services: The following specifications were approved: GSM 08.14 in Tdoc SMG 943/97, GSM 08.16 in Tdoc SMG 944/97 and GSM 08.18 in Tdoc SMG 945/97. They should be published after SMG#25.

Improved Data Rates through Optimised Modulation: Based on the feasibility study report on Improved Data Rates through Optimised Modulation (EDGE), SMG are asked to decide whether to continue the work on this work item or not (Tdoc SMG 1015/97 and Tdoc SMG 1016/97). A new linear high level modulation scheme together with improved link layer management, symbol rate 361 kbit/s has been evaluated for use in

- GPRS (EGPRS): 11.2 - 65.2 kbit/s in one timeslot paid by 3-4 dB loss of sensitivity and 6-7 dB loss of C/I performance; the scheme could allow 50% of users to double their data rate if the present cell planning is re-used. If that is not acceptable a new cell planning would be necessary.
- Circuit switched data (ECSD) for transparent and non-transparent service

A time schedule could be feasible allowing the completion of EDGE specifications mid 1999. Quarter Amplitude Modulation (QAM) is actually used.

An RF amplifier in the mobile station would require a certain linearity, but this is dependent of the finally selected modulation scheme and the roll-out. Simulations are shown on page 17 of Tdoc SMG 1016/97. The power amplifier is certainly one of the topics to be regarded if the WI is accepted. It is understood that transceivers with the new and old modulation scheme be mixed.

It was clarified that the feasibility study concentrated on radio aspects. Service and network aspects would have to be studied.

Phil Gilchrist presented Tdoc SMG 1107/97, *Enhanced Data rates for GSM Evolution (EDGE)*, source Motorola. It argues that EDGE should concentrate on the GPRS application, mainly in order to avoid service diversification and because the ISDN based core networks of today don't offer high rate circuit switched data. Niels Peter Skov Andersen commented that the radio access lower layers should be as generic as possible. Paul Simmons pointed out that also the switching part of the BSS would need modifications for the switching part in the BSS.

Johan Sköld presented a WID for EDGE in Tdoc SMG 996/97, source Ericsson, Nokia and Airtouch.

Dirk Weiler presented Tdoc SMG 1068/97, *Handling of Work Item 184 (Improved Data Rates through Optimised Modulation)*, source DeTeMobil, Mannesmann, Bosch, Sony, Siemens proposing proposed that SMG2 should perform a comparative study with the UTRA radio interface.

SMG#24 decided to split the work item into a part on GSM radio access and a work item on Core network aspects; synergies with other work items, such as GPRS, UTRA and AMR, should be considered in the work on the EDGE-BSS work item. A priority of application of EDGE to GPRS was suggested; Niels Peter Skov Andersen stated that still a Circuit oriented radio access can be combined for fixed network packet and vice versa.

Updated WIDs in Tdoc SMG 1147/97 and Tdoc SMG 1148/97 were approved by SMG#24.

Tdoc SMG 1162/97 was noted: Nokia will host a workshop on EDGE in the first quarter of 1998 (planned to be on the 16-17 February, 1998 in Helsinki).

Capacity of the BCCH: As asked by SMG, SMG2 reported on ways to extent the capacity of the BCCH. The answer is found in Annex IV of Tdoc SMG 1017/97. The method identified is to exploit phase 1 layer 2 error handling. As experience has shown that implementations have deviated from parts of error handling, SMG2 will invite GSM-MoU TWG for assistance regarding the checking of the compatibility of existing mobile stations in relation to the proposals for BCCH evolution; SMG7 should assist by providing the necessary test descriptions.

SMG is invited note:

- SMG2 is going to study general means of improving cell re-selection (Annex II).
- SMG2's attempt together with the PT to prioritise the work of the PT (Annex I). See section 3.2 (PT SMG status report).
- SMG2 is considering the introduction of packet radio channels as a step of platform for the radio interface. Consequently the handling of Release '97 for the radio part should use the mechanism foreseen in the version management for a new platform.

5.3 SMG3

Michel Mouly presented Tdoc SMG 1100/97, the *SMG3 status report*.

There are still urgent needs for hosts for SMG3 and its subgroups. Fred Hillebrand and Michel Mouly will send a letter asking relevant companies for hosting of SMG3 (subgroup) meetings.

AP PT SMG To prepare a letter asking relevant companies for hosting of SMG3 (subgroup) meetings.

CAMEL Phase 2: CR 03.78-A008r8 on CAMEL Phase 2 Stage 2 in Tdoc SMG 909/97: Work is ongoing, the CR was presented for information to allow monitoring of the progress in CAMEL phase 2.

GSM 09.60 GPRS Tunnelling Protocol (GTP) across the Gn and GPRS Interface in Tdoc SMG 910/97, CR in Tdoc SMG 911/97: approved by SMG#24.

Tdoc SMG 912/97: two CRs for the introduction of Shared Inter-Working Function (SIWF), completing the work of SMG3 on SIWF. The CRs were approved by SMG#24. SMG#24 confirmed the completion of SMG3 work on work item SIWF.

Tdoc SMG 913/97: Camel phase 1 and SOR: Change requests for R96. All approved by SMG#24.

Specification SPS 03052-1, *INAP Protocol specification for CAMEL Phase 1* and SPS 03052-2, *INAP PICS for SSF for CAMEL Phase 1* in Tdoc SMG 914/97: Both specifications were approved by SPS. As foreseen in the subcontract SMG-SPS, they were presented for approval at SMG. SMG#24 approved the specification.

CRs in Tdoc SMG 915/97 were approved by SMG#24.

Tdoc SMG 916/97, GSM 10.78, *CAMEL Project scheduling and open issues version 1.5.0* was approved by SMG#24 as an excellent example of project monitoring specification.

Tdoc SMG 917/97, Change requests for R96. One of the CRs fulfils a requirement of SMG#23 to make contest free monitoring of MAP interfaces possible.

GSM 03.53, *TFO stage 2* in Tdoc SMG 929/97, was presented for information to SMG#24.

PI Rémi Thomas, William Navarro (Nortel)	To clarify a question on Tdoc SMG 929/97 regarding handover.
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Tdoc SMG 937/97 and Tdoc SMG 938/97 contain many CRs on GPRS (03.60 and 03.64). It was not possible to print out these documents for every delegate. They were available in electronic form and in paper form on request.

SMG#24 approved the CRs in Tdoc SMG 937/97 and Tdoc SMG 938/97. Corrections if necessary could be made by use of change requests for SMG#25. The reason for this extraordinary procedure is to allow the GPRS experts to work immediately after SMG#24 on a stable text.

All CRs in Tdoc SMG 909/97, Tdoc SMG 971/97, Tdoc SMG 986/97, Tdoc SMG 987/97 and Tdoc SMG 988/97 were approved by SMG#24.

Group/broadcast calls over more than one MSC: CRs to ASCI phase 2 in Tdoc SMG 989/97 were approved by SMG#24. This completes the function to allow group/broadcast calls over more than one MSC.

Tdoc SMG 990/97, a set of CRs on 04.65, was approved by SMG#24.

CR 04.08-A249r2 on Clarification on audio connection (Phase 2) in Tdoc SMG 991/97 was approved by SMG#24. A corresponding CR in Tdoc SMG 986/97 had also been approved by SMG#24.

CRs for R95 and R96 on GSM 03.81 for handling of number parameters related to line identification services in Tdoc SMG 991/97 were approved by SMG#24.

CR 04.88-A004 on Call Barring after reconnection (Release 97-CAMEL) in Tdoc SMG 1047/97 was approved by SMG#24.

Tdoc SMG 1048/97 had been approved already by SMG#24.

A CR to 03.02 on GPRS in Tdoc SMG 1086/97 was approved by SMG#24.

Status report Annex A, a liaison statement from SMG3 WPC on version management: see section 5.12.3.

Status report Annex B: SMG3 informs SMG about limitations of the proposed solution for filtering Short Messages at the HLR. SMG decided that SMG3 should continue their work with that solution as a working assumption, that means, members could still propose a complete solution with less limitations to SMG3.

CNAP stage 2: It was clarified that the solution described is only applicable in certain regions. Alternative solutions may be specified when needed.

CRs on CAMEL (phase 1) R96 A003 and A010 to GSM 03.78 v.5.1.0, A102 to GSM 09.02 v.5.6.0, A013, A015, A016, A018 to GSM 09.78 v.5.1.0 in Tdoc SMG 888/97 were approved.

5.4 SMG4

Non strategic Change requests:

Change Requests for **HSCSD and 14.4 kbit/s** in Tdoc SMG 921/97, for 03.40 on SMS screening and SIM toolkit security headers in Tdoc SMG 918/97, for R96 corrections on Cell Broadcast SMS in Tdoc SMG 919/97 were approved by SMG#24.

Tdoc SMG 920/97 contains change requests on shared interworking function. They were approved by SMG#24. The SIWF work item is considered as completed as the stage 3 changes of SMG3 were approved as well.

Various corrections to GSM 07.05 and 07.07 in Tdoc SMG 922/97 were approved.

A CR to GSM 07.60 on GPRS in Tdoc SMG 1030/97 was approved.

Cordless Telephony System: SMG4 informs SMG that SMS is not addressed in the CTS work, see liaison statement to SMG, SMG1 and SMG9 in Tdoc SMG 1050/97. Robert Vass raised concerns on the proposed inclusion of SMS in CTS phase 1, referring to Tdoc SMG 1126/97, and proposed to forward the issue to SMG 1. On more general principles, Alistair Urie presented Tdoc SMG 1143/97, requesting a harmonization of services supported by CTS with the GSM services. This more general request was forwarded to SMG1 for further study as well as the concerns raised by SMG4.

Mobile Station Application Execution Environment: Stefan Aprath presented Tdoc SMG 1032/97, the initial version of GSM 10.57, *Project scheduling and open issues: Mobile Station Execution Environment (MExE)*. The document is the first outline of the project schedule for that work item.

A proposed liaison statement to MNCRS (a US centred group developing JAVA), *Definition of Java enabled GSM terminal*, in Tdoc SMG 1050/97 was approved, but SMG wants more information on that group, participation conditions, structure, deliverables and so on. SMG4 is mandated to liaise directly with MNCRS.

AP Stefan Aprath To provide the requested information on MNCRS to SMG.

Liaison with WAP: As a response to the letter from SMG (Tdoc SMG 879/97) to the WAP consortium a liaison statement from WAP in Tdoc SMG 1101/97 had been received. It was presented by Timo Ali-Vemos.

A proposed LS: *Response to LS from WAP Consortium* in Tdoc SMG 1114/97, Source: Alcatel, Nortel, Siemens, was presented by Brian Day. It was approved.

Another LS in to WAP Consortium in Tdoc SMG 1032/97, proposed by SMG4, was postponed either to SMG#24bis, or, if SMG#24bis is not convened or doesn't treat the issue, to SMG4.

SMG4 was mandated to liaise with WAP on condition of open participation and access to their documents. Robert Vass indicated the intention of the WAP consortium to make those provisions in January 1998.

Infra red interface in the MS: A proposed liaison statement on MS/TE infra red interface to the IrDA special interest group in Tdoc SMG 1040/97 was approved by SMG#24.

Tdoc SMG 1050/97 proposes that CRs agreed for R97 are introduced for R96. Approved.

Strategic CRs

A CR in Tdoc SMG 1029/97 to GSM 07.08 on GSM API was approved by SMG#24; the voting process on the specification is to be continued.

GSM 07.10, *Multiplexing protocol*, in Tdoc SMG 1031/97: there were objections to perform editorial improvements before approval. Rémi Thomas presented Tdoc SMG 1080/97, source France Telecom, stating that the specification is based on proposals from two manufacturers. France Télécom would prefer to change the specification to design a single protocol with a choice between two options; also it is criticised that the specification had not been presented to SMG for information. Peter Neumann presented Tdoc SMG 1134/97, source Ericsson and Siemens, proposing:

1. "in the first place is to approve GSM TS 07.10 as it is proposed by SMG4 *and*, if found suitable, to encourage further extension of multi-mode protocol sets, allowing operation on any physical bearer, like infrared links.

Should this proposal not be found as acceptable due to the remaining containment of several protocols in 07.10, then another proposal

2. in the second place is to remove the HDLC mode from 07.10, leaving the basic mode, thereby allowing simple implementations based on standards, and not on proprietary solutions. In addition we support the development of *another* standard for an advanced protocol, exceeding the capabilities of the HDLC mode and suited for applications carried on any bearer, including half duplex infrared links.

In both cases we strongly recommend that the specifications are not remitted back to SMG4, but that SMG#24 endorse the technical content of the specification, however allows editorial restructuring by the rapporteur of the text to accomplish a level of integrity acceptable to all parties, to be presented and approved at SMG#25.”

Vodafone said that they would oppose any suggestion to remove the HDLC mode and would prefer to remove the Basic Mode if removal of one or other mode was deemed necessary.

The SMG4 Chairman’s view is that the changes proposed are editorial, and that there were no suggestions that the technical content of the specification should be changed.

The meeting was made the proposal to

- approve the specification or
- send it back to SMG4

A show of hands showed 15 for the first, five for the second option. A possible vote in SMG#25 will be indicated. This might need to consider removal of one or other of the two Modes if SMG4 is unable to merge them or otherwise amend GSM 07.10 editorially to the satisfaction of SMG#25.

AP	A possible vote in SMG#25 will be indicated in the agenda.
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As the objections were sustained, it was concluded that the functional contents were approved by SMG#24, that the technical contents of the document were accepted by a broad majority in SMG#24 and that 07.10 is considered as having been presented for information to SMG#24.

A CR in Tdoc SMG 1031/97 was approved by SMG#24.

For version handling, see section 5.12.3.

5.5 T1P1 WORK ITEMS

The revised work plan for PCS 1900 Service Provider Number Portability in Tdoc SMG 1084/97 was noted.

T1P1 Harmonization Workplan: The *T1P1 Harmonization Workplan* in Tdoc SMG 1083/97 was endorsed.

Mel Woinsky presented Tdoc SMG 1082/97 on the need for a small process refinement which would specify that T1P1 would report to the SMG plenary on CR’s and related documents for which it is the designated lead, after reaching endorsement of the appropriate STCs. In response, SMG#24 approved a Liaison Statement to T1P1 in Tdoc SMG 1145/97, *Response to Letter on Process Refinements*: SMG#24 agrees that T1P1.5 present their technical work to SMG; it should be visible that the items have been agreed in the relevant STCs as well.

SMG#24 agrees that T1P1.5 present their technical work to SMG; it should be visible that the items have been agreed in the relevant STCs as well.

5.6 SMG6

Gisela Hertel, SMG6 Chair, presented Tdoc SMG 890/97, Network and Service Management Requirements for UMTS (UMTS 21.06) for information. It is planned for approval at SMG#25.

Iñaki Cabrera, Chairman of TMN WG5, stated that TMN WG5 sees no need to modify the content of specification UMTS 21.06.

Iñaki Cabrera presented Tdoc SMG 1089/97 and Tdoc SMG 1090/97.

Tdoc SMG 1089/97 informs that

- TMN5 has appointed a liaison officer to EP SMG (Iñaki Cabrera, Airtel Móvil SA)
- TMN5 will appoint a liaison officer to SMG6
- TMN5 invites SMG6 to follow a similar approach, participating in TMN5, TC TMN and TC TMN Management Team Meetings.

Fred Hillebrand clarified that there is no agreement between SMG and TMN(5) about joint meetings or mutual participations between SMG6 and TMN5, because such things are in the autonomy of SMG6. He also clarified that whether SMG6 sends liaison persons to TMN5 or not is a decision of SMG6.

Tdoc SMG 1090/97 informs about the TMN5 intention to adopt the SMG6 specification UMTS 21.06 and UMTS 32.01 and to approve them as TMN specifications arguing this to be in line with the ETSI Board decision on responsibility split between TMN and SMG.

The SMG6 Chair informed SMG6 having difficulties to understand an intention to take over and publish under one's name specifications from a group which has done the work.

Ian Doig explained that TMN cannot approve UMTS 21.06 because it is in the (ETSI approved) work program of SMG.

SMG commented the decision quoted in the document ("Until the transfer by the ETSI Board of UMTS network management from SMG6 to TC TMN") not to be correctly quoted.

It was decided not to discuss in SMG papers in the SMG6 area which were not presented to SMG6. SMG expects SMG6 to continue their work program.

5.7 SMG7

Rémi Thomas presented the SMG7 status report in Tdoc SMG 923/97.

All CRs in Tdoc SMG 924/97 and Tdoc SMG 925/97 (Corrections of signalling tests, addition of a test on L2 pseudo-length), in Tdoc SMG 926/97 and Tdoc SMG 927/97 (Corrections of RF/non-signalling tests), were approved.

The CRs to TBRs on EFR are approved but on hold; the CRs to TBRs to change the reference versions of 11.10 are postponed.

CR TBR31-A004 and CR TBR19-A010 in Tdoc SMG 928/97, both titled *Inclusion of HSCSD Multislot test cases*, propose, among other changes, a replacement of the reference to GSM 11.10 phase 2 by GSM 11.10 phase 2+. The consequences of such an action require further analysis, therefore both Change request were postponed.

CR TBR19-A009 and CR TBR31-A003 in Tdoc SMG 928/97, proposing a reduction of test repetitions, were approved but put on hold. This is in order to fulfil a recent request from the European Commission (EC) to have a common planning between ETSI and the EC on updating TBRs. A meeting with Mark Bogers, DGXIII of the EC, on type approval matters is planned for early February 1998.

Input to ACTE: On request of EC DGXIII, an input to ACTE justifying updates for TBR 19 and TBR 31 in Tdoc SMG 1033/97 has been provided by PT SMG. The document was presented for information.

Phase 2+ mobile station testing requirements outline: Tdoc SMG 1034/97 outlines the MS Phase 2+ testing requirements, it is based upon the SMG 10.00 specification and the Phase 2+ Work items database. This document is indicative for the moment, its purpose is to provide a first estimate of Phase 2+ impact on the Type Approval and MS test specification processes. It was presented for information. SMG#24 noted the document.

RLP testing: CRs in Tdoc SMG 1122/97 and Tdoc SMG 1123/97 aim to remove problems in certain RLP tests due to which the tests were not implementable and hence declared “special condition tests” (this means that a manufacturer conformance declaration replaces the tests). These CRs were approved. Some difficulties to gather a joint expertise of SMG4 and SMG7 experts on this matter were reported. If necessary a session dedicated to RLP testing can be organised during the next signalling sub group meeting to be held on January 12-13, 1998 in Paris, SMG4 experts are welcome at this meeting.

TTCN signalling test cases: SMG#24 endorsed SMG7’s proposal:

- Anite can bring to SMG7 TTCN translations of HSCSD signalling test cases,
- SMG7 will review these translations if there is nothing more urgent to be tackled,
- once such TTCN translations would be agreed by SMG7, it will be up to SMG to decide whether the relevant ATSS are informative or normative.

SMG7 asked SMG to take care of the definition of a GPRS regulatory framework. Delegates are asked to consider the issue so that SMG#25 can cause the necessary actions.

Comments of SMG7 on version management: See section 5.12.3.

5.8 SMG8

SMG8 didn’t request any decisions from SMG#24.

5.9 SMG9

All CRs in Tdoc SMG 886/97 were approved by SMG#24. Non strategic CR A044 to GSM 11.14, missing in the paper version of Tdoc SMG 886/97, was also approved.

Tdoc SMG 886/97 does wrongly indicate R97 for CR 11.11-A053, it is R96.

GPRS: What shall the Mobile Equipment (ME) do if the SIM doesn't support GPRS (that is, the GPRS security related information)? A proposal is discussed at present in SMG9 to allow the ME use of security relevant information stored in the ME, if the IMSI stored in the ME and SIM are equal. See Tdoc SMG 889/97 for information.

Klaus Vedder informed that on 20-23 January SMG9 will convene the 50th SIMEG/SMG9 meeting in Sophia Antipolis.

R97 is planned in SMG9 for SMG#25.

Auxiliary device access using SIM application toolkit: Tdoc SMG 887/97, proposed 98 work item description for *Auxiliary device access using SIM application toolkit*, was presented. Robert Vass and Timo Ali-Vehmas argued against acceptance of the work item. SMG#24 noted the proposal as an interesting one and asked SMG9 to discuss it further and come with a proposal back to SMG#25.

Note: 02.17 and 11.11 already foresees two-SIM ME.

GSM-API for SIM Toolkit applications based on JAVA: Tdoc SMG 1059/97, *GSM-API for SIM Toolkit applications based on JAVA*, and a corresponding WID in Tdoc SMG 1063/97, both source T-Mobil, were presented by Hans Hauser. SMG#24 approved the WI in principle, SMG9 will take the lead and will look for all necessary information exchange and discussion with other groups. SMG9 will present a revised WID to SMG#25.

5.10 SMG10

SMG10 didn't request any decisions from SMG#24.

5.11 SMG11

Phil Gaskell presented the contentious issues requiring decisions by SMG#24.

Requirements and Objectives of AMR: Tdoc SMG 953/97, *AMR performance requirements (AMR-3)*, presents performance requirements and objectives for the speech quality of the GSM AMR system under static and dynamic test conditions.

Rémi Thomas presented Tdoc SMG 1105/97, *Some comments on AMR*, source France Télécom, proposing that the AMR performance requirements for dynamic conditions are set to guarantee that the AMR has really an improved robustness compared to the EFR, especially in bad channel conditions.

William Navarro argued on behalf of Nortel, no definition of dynamic conditions to be known yet. He explained that Nortel has no problem with the proposals for static conditions, but feels that further work on the dynamic conditions are necessary.

Tdoc SMG 1096/97, AMR performances specifications, source BellSouth, was presented by Alain Ohana. The document recommends as the primary objective to provide the best possible performances in full rate and half rate modes for the ideal case under static conditions, and to request that in half rate mode, candidates to aim at EFR performances. He

proposed SMG#24 to accept Tdoc SMG 953/97 as far as the static conditions are concerned; for the dynamic conditions to wait for the input from SMG2 WPB (promised for March 1998).

Tdoc SMG 953/97 was approved. For the purpose of the selection phase SMG11 was mandated by SMG to elaborate the performance requirements for dynamic conditions taking into account the proposed scenarios from SMG2 WPB when the scenarios themselves will become available.

The status of the study phase for wideband AMR was presented. The completion of the study phase is expected by June 1998.

CRs in Tdoc SMG 949/97, Tdoc SMG 950/97 and Tdoc SMG 952/97 were approved by SMG#24.

Inband Tandem Free Operation (TFO) of Speech Codecs; Service Description; Stage 3 in Tdoc SMG 1007/97 was presented for information to SMG#24.

5.12 GSM PROGRAM MANAGEMENT

5.12.1 Release 97

SMG#24 agreed to complete Release 97 at SMG#25. GSM and UMTS program management will be on the agenda of SMG#24bis.

5.12.2 New and completed work items

Improved Data Rates through Optimised Modulation (EDGE, split into EDGE-NSS and EDGE-BSS): WIDs in Tdoc SMG 1147/97 and Tdoc SMG 1148/97 were approved by SMG#24. Cf. section 5.2.

GSM-API for SIM Toolkit applications based on JAVA: SMG#24 approved the WI in principle, SMG9 will take the lead and will look for all necessary information exchange and discussion with other groups. SMG9 will present a revised WID to SMG#25 based on Tdoc SMG 1063/97. Cf. section 5.9.

Auxiliary device access using SIM application toolkit: SMG#24 noted the proposal of this '98 work item in Tdoc SMG 887/97 as an interesting one and asked SMG9 to discuss it further and come with a proposal back to SMG#25.

Shared Inter-Working Function (SIWF): This work item has been completed at SMG#24, cf. sections 5.3 and 5.4.

5.12.3 Version management

Liaison statements from SMG3 and SMG7 as well as comments from SMG2 and SMG4 on version management were not presented at SMG#24 due to lack of time. However, Tdoc SMG 1135/97, *Report on implementation of Version Management decided by SMG#23 version 6.0*, source PT SMG, intends to take all comments received from STCs and experts into account.

SMG#24 decided to apply Tdoc SMG 1135/97 until a review in SMG#25. The document elaborates the two options to develop a specification, either in a new platform (and hence a new major version) or by indication of all options in the present major version 5.

6 ANY OTHER BUSINESS

6.1 SMG#24BIS

Fred Hillebrand presented Tdoc SMG 1138/97, the *DRAFT Voting procedure for UTRA*, source SMG Co-ordination Group.

It was asked what the further proceeding in case of simple majorities could be.

It was clarified that SMG can't force a concept group to withdraw; there is also nobody entitled to withdraw a concept group.

It was clarified that there is no rule requesting a representative of a member to be an employee of that member. As the voting by proxy is explicitly forbidden in section 1.7.1.1 of the ETSI Technical Working Procedures.

Mannesmann Mobilfunk stated a sustained opposition against using one vote per ETSI member for the voting for SMG#24bis (cf. ETSI Technical Working Procedures sub-clause 1.7.1).

Modifications of Tdoc SMG 1138/97:

- Third paragraph of section 1: replace "SMG2" by "SMG".
- In the heading of 3.4, delete " , no proxy voting".
- In section 3.4, delete sentence "Voting by proxy will not be permitted."
- Revised section 3.5 to reflect the use of weighted voting

With these modifications, Tdoc SMG 1138/97 was approved by SMG#24. The revised version is in Tdoc SMG 1157/97.

Agenda of SMG#24bis: Fred Hillebrand presented Tdoc SMG 1137/97, the *DRAFT agenda of SMG#24bis*. The following modification were agreed:

- Replace "Future Program report" by "Report". Agenda Item 4 to become the second sub-item of Agenda Item 5.
- Add location, beginning and end of the meeting (Paris, 28th January, 1998, 9:00h, end 29th January, 16:00h).

With these modifications, Tdoc SMG 1137/97 was approved. The revised version is in Tdoc SMG 1156/97.

7 NEXT MEETINGS

SMG's plenary and Co-ordination Group dates 1998/1999 in Tdoc SMG 1155/97 (a revision of Tdoc SMG 1136/97) now foresee three (ordinary) plenaries a year, because otherwise STCs

wouldn't have sufficient time for consolidated outputs between the third and fourth meeting in the year. Tdoc SMG 1155/97 was approved, the information is repeated below:

Meeting No.	Plenary Date	Plenary Venue	SMG Co-ord. Group
SMG#24bis	28-29 Jan 98	Paris, Alcatel	23 Jan 98 Frankfurt (Steigenberger Airport Hotel)
SMG #25	16 - 20 March 98	Warsaw, Poland	5 - 6 March 98 London, Vodafone
SMG #26	22 - 26 June 98	Finland	11-12 June 98 Slough, Cellnet
SMG #27	12 - 16 Oct. 98	Praha, Czech Republic	1 - 2 Oct. 98 Dusseldorf
SMG#28	8 - 12 February 99		26 - 27 January 99
SMG#29	21 - 25 June 99		8 - June 99 Stockholm, Ericsson
SMG#30	18 - 22 October 99		5 - 6 October 99

Note : In order to finalise documents, produce electronic versions and prepare Plenaries properly, STCs should not meet during the two weeks before every Plenary.

Italtel offered to host SMG#28 (or SMG#29).

ANNEX 1: LIST OF PARTICIPANTS

ANNEX 2: STATUS OF CRS PRESENTED TO THE MEETING

ANNEX 3: LIST OF DOCUMENTS

ANNEX 4: LIAISON STATEMENTS

ANNEX 5: STATUS OF SMG SPECIFICATIONS AFTER SMG#24

**ANNEX 6: ROADMAP FOR THE FINALISATION OF GSM PHASE 2+ WORK
ITEMS - VERSION 24.0**

**ANNEX 7: SYSTEM DESCRIPTION SUMMARIES OF THE CONCEPT GROUPS
(TDOC SMG 894/97, TDOC SMG 897/97, TDOC SMG 900/97,
TDOC SMG 903/97)**

ANNEX 8: SMG-CG REPORTS

ANNEX 9: PT SMG STATUS REPORT AT SMG#24

**ANNEX 10: TDOC SMG 8/98, IMT 2000 CO-ORDINATION (MEETINGS IN
JAPAN, FEBRUARY 1998)**

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Status List of CHANGE REQUESTS presented to

SMG#24

Introduction :

This following list contains the final status of all Change Requests, that were presented to SMG#24.

The statistics (see below) is based on that list.

New specifications that were submitted for approval are also listed.

CRs under responsibility of the following STCs have been submitted by the time of printing : *09-Feb-01*

21 CRs presented by SMG	1
25 CRs presented by SMG	2
83 CRs presented by SMG	3
39 CRs presented by SMG	4
97 CRs presented by SMG	7
14 CRs presented by SMG	9
3 CRs presented by SMG	11

282 CRs presented in total

Statistics*09-Feb-01*

Phase 2

64	CRs	approved
1	CRs	approved, on hol
1	CRs	postponed

Phase R96

104	CRs	approved
1	CRs	approved, on hol
1	CRs	postponed
1	CRs	revised

Phase R97

98	CRs	approved
3	CRs	approved, on hol
2	CRs	information
2	CRs	rejected

Phase UMTS

4	CRs	approved
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282 CRs were presented in total

Status_new_Specs

TDoc	SPEC	PHAS	SUBJECT	STATUS	NEW_VE	SOURC
97-981	02.66	R97	Support of Mobile Number portability	approved	5.0.0	SMG1
97-110	30.06	UMTS	UTRA Evaluation Report	approved	3.0.0	SMG2
97-945	08.18	R97	BSS GPRS Protocol (BSSGP)	approved	5.0.0	SMG2
97-944	08.16	R97	Gb interface, Network Service	approved	5.0.0	SMG2
97-943	08.14	R97	Gb interface Layer 1	approved	5.0.0	SMG2
97-929	03.53	R97	Transcoder free operation (TFO)	informatio	1.0.0	SMG3
97-910	09.60	R97	Draft GSM 09.60 v.2.0.0	approved	5.0.0	SMG3
97-103	07.10	R97	GSM 07.10 v. 2.0.0 TE-MS Multiplexing protocol	postponed		SMG4
97-108	04.96	R97	Name Identification Supplementary Services	approved	5.0.0	T1P1.5
97-108	03.96	R97	Name Identification Supplementary Services	approved	5.0.0	T1P1.5
97-108	02.96	R97	Name Identification Supplementary Services	approved	5.0.0	T1P1.5
97-982	02.96	R97	Name Identification Supplementary Services	revised	5.0.0	T1P1.5

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
02.01	Principles of Telecommunication Services Supported by a GSM Public Land Mobile Network(PLMN).							
	A007		R96	F	If a user subsc'd to General Bearer Service (e.g. BS 20) requires in a ca	97-970	approved	5.3.0
	A008		R96	D	Editorial corrections	97-970	approved	5.3.0
02.07	Mobile Station (MS) Features.							
'strategic'	A015		R97	B	Network Alerting in the MS: Feature applicable to mobile terminating	97-971	approved	5.4.0
'strategic'	A016		R96	B	Alignment of NITZ - Network name, time and timezone information w	97-972	approved	5.4.0
02.11	Service Accessibility.							
	A009		R97	B	Requirement for possibility of roaming between PLMNs without GPRS	97-973	rejected	
02.30	Man-machine Interface (MMI) of the Mobile Station (MS).							
	A021		R96	D	Spec 02.30 contains many ref's to the Dir Num w/o clearly defining w	97-974	revised	5.7.0
'strategic'	A021	1	R96	D	Spec 02.30 contains many ref's to the Dir Num w/o clearly defining w	97-1149	approved	5.7.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
02.41	Operator Determined Barring							
	A008		R96	D	Clarification of the ODB Barring Categories for ECT:To allow the inv	97-975	approved	5.2.0
02.42	Network Identity and Timezone (NITZ); Service Description, Stage 1							
'strategic'	A002		R96	B	Alignment of NITZ (Network Identity and Time Zone) Correct inconsi	97-972	approved	5.1.0
02.53	A001		R97	F	CR to GSM 02.53 Modifications to Annex A (informative): Limitation	97-950	approved	5.1.0
02.60	General Packet Radio Service Stage 1 Description							
	A002		R97	D	Clarification of GPRS release 1997 content and minor editorial improv	97-976	approved	5.2.0
	A003		R97	C	Clarification/Improvement of definition of Quality of Services aspects	97-976	approved	5.2.0
02.78	Customized Applications for Mobile network Enhanced Logic (CAMEL); Service definition (Stage 1)							
	A014		R97	B	changes are purely editorial and apply to both, CAMEL R96 and R97,	97-977	approved	5.4.0
02.81	Line Identification Supplementary Services - Stage 1.							
'strategic'	A006		2	F	Seen in Goteborg - Presentation of add'l calling party number if receive	97-978	approved	4.6.0
'strategic'	A007		R97	A	Same CR applied to R97	97-978	approved	5.1.0
	A008		2	F	With CR A006 to GSM 02.81 the concept of the additional line identiti	97-978	approved	4.6.0
	A009		R97	A	Same CR applied to R97	97-978	approved	5.1.0
02.93	Completion of Calls to Busy Subscriber (CCBS) Service Description - Stage 1							
	A017		R97	C	The priority in queue handling has been removed by earlier CRs. The s	97-979	approved	5.5.0
	A018		R97	C	Inclusion of the interaction between CCBS and CAMEL Phase2.	97-979	approved	5.5.0
03.02	Network Architecture							
	A005	4	R97	B	Changes needed for GPRS regarding Network Architecture	97-1086	approved	5.3.0
03.10	GSM Public Land Mobile Network (PLMN) Connection Types.							
	A007		R96	F	Removal of 2*14.4=19.2 Transparent configuration	97-921	approved	5.4.0
03.18	Basic Call Handling							
	A004	1	R97	B	Network's indication of Alerting Categories	97-971	approved	5.3.0
	A007	2	R96	F	Sending ACM & similar messages only once for a call	97-911	approved	5.3.0
	A009	3	R96	D	Concentration of description of core call handling functions in 03.18, C	97-913	approved	5.3.0
	A011	1	R97	B	Modification due to the introduction of SIWF	97-912	approved	5.3.0
	A012		R96	F	Interaction between OR of late call forwarding & CAMEL	97-915	approved	5.3.0
03.40	Technical Realization of the Short Message Service (SMS) Point-to-point(PP)							
	A064		R97	B	Security headers	97-918	approved	5.8.0
	A065		R97	B	Transmission of the SME OA	97-918	approved	5.8.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
03.41	Technical Realization of Short Message Service Cell Broadcast (SMSCB).							
	A045		R96	F	Failure reasons	97-919	approved	5.8.0
	A046		R96	F	Recovery indication	97-919	approved	5.8.0
	A047		R96	D	SET-DRX	97-919	approved	5.8.0
	A048		R96	C	Clarification of the Update field in the Write Replace PDU	97-919	approved	5.8.0
	A049		R96	D	Unknown-Error/Unspecified-Error	97-919	approved	5.8.0
	A050		R96	D	Unrecognised Information Elements	97-919	approved	5.8.0
	A051		R96	D	Use of high priority messages and reserved slots	97-919	approved	5.8.0
	A052		R96	C	Schedule period length	97-919	approved	5.8.0
03.49	Example Protocol Stacs for Interconnecting Cell Broadcast Centre (CBC) and Base Station Controller (BSC)							
	A026		R96	F	ASN.1 corrections and 03.41 alignment	97-919	approved	5.7.0
	A027		R97	F	Cell list structures	97-919	approved	5.7.0
	A028		R96	C	UNBIND and BIND-FAILURE	97-919	approved	5.7.0
	A029		R96	C	Version control for the CBC-BSC interface	97-919	approved	5.7.0
	A030		R96	D	Definition of parameters	97-919	approved	5.7.0
	A031		R96	C	Schedule period length	97-919	approved	5.7.0
03.50	Transmission Planning Aspects of the Speech Service in the GSM Public Land Mobile Network (PLMN) System.							
	A009		2	B	CR to GSM 03.50 Allow use of artificial ear Type 3.2 for ME tests	97-949	approved	4.3.0
	A011		R96	D	CR to 03.50 Correction of wrong reference to ITU-T Recommendation	97-949	approved	5.0.3
03.54	High Speed Circuit Switched Data (HSCSD) - Stage 2							
	A004		R97	D	Clarification on the MAP Dialouge	97-920	approved	5.2.0
	A005		R97	F	Correlation of ISUP messages	97-920	approved	5.2.0
	A006		R97	F	Dedicated services (BS4x or BS5x) should not be restricted to the non	97-920	approved	5.2.0
	A007		R97	F	RR parameters over the K-interface	97-920	approved	5.2.0
03.60	General Packet Radio Service (GPRS) Service description; Stage 2							
	A011	1	R97	C	Idle mode and connected mode	97-937	approved	5.2.0
	A012	1	R97	C	SMS delivery path	97-937	approved	5.2.0
	A013	3	R97	D	Editorial changes on 03.60	97-937	approved	5.2.0
	A014	5	R97	C	Editorial changes and clarifications on GSM 03.60	97-937	approved	5.2.0
	A015	4	R97	C	MS purge for GPRS	97-937	approved	5.2.0
	A016	3	R97	C	Maximum N-PDU size	97-937	approved	5.2.0
	A017	4	R97	C	To align the anonymous PDP context activation with the non-anonymo	97-937	approved	5.2.0
	A018	5	R97	C	Routing area update procedure	97-937	approved	5.2.0
	A019	3	R97	C	Clarification of the routing area update procedure and cell identifier	97-937	approved	5.2.0
	A021	2	R97	B	TLLI reallocation	97-937	approved	5.2.0
	A022	3	R97	B	Additional PDP configuration options	97-937	approved	5.2.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
	A023	3	R97	F	GSN number and address	97-937	approved	5.2.0
	A024	4	R97	B	Access point name	97-937	approved	5.2.0
	A025	2	R97	C	More robust network-requested PDP context activation procedure	97-937	approved	5.2.0
	A026	1	R97	C	Addition of a reset indication message from the SGSN to the VLR	97-937	approved	5.2.0
	A028	5	R97	C	Handling of CS paging requests by the SGSN after a failure	97-937	approved	5.2.0
	A030	5	R97	C	QoS definitions	97-937	approved	5.2.0
	A031	2	R97	C	Alert and monitoring procedures at the MSC/VLR for class A and B	97-937	approved	5.2.0
	A032	1	R97	C	Further description of the network-requested context activation proced	97-937	approved	5.2.0
	A033		R97	C	Detach indication from the SGSN to the VLR	97-937	approved	5.2.0
	A035	2	R97	C	No more combined (GPRS+non-GPRS) "Ready for SM" notification t	97-937	approved	5.2.0
03.64	Overall description of the GPRS radio interface; Stage 2							
'strategic'	A031	1	R97	C	Clarification on the use of hysteresis for cell re-selection	97-985	approved	5.2.0
03.68	Voice Group Call Service (VGCS) - Stage 2							
	A011		R97	B	Update of 03.68 to cover inter-MSC Voice group calls	97-989	approved	5.4.0
03.69	Voice Broadcast service (VBS) - Stage 2							
	A010		R97	B	Update of 03.69 to cover inter-MSC Voice Broadcast Calls	97-989	approved	5.4.0
03.78	CAMEL Phase 1 (stage 2)							
	A008	8	R97	B	Support of CAMEL phase 2 (stage2)	97-909	information	6.0.0
	A009	4	R96	D	Concentration of description of core call handling functions in 03.18, C	97-913	approved	5.3.0
	A011		R96	F	Removal of CallingPartyNumber from Connect	97-915	approved	5.3.0
	A013		R96	F	Removal of the CalledPartyNumber for MO calls from IDP	97-915	approved	5.3.0
	A014	1	R96	F	Use of the CallReference Number & GMSC address in SRI	97-915	approved	5.3.0
03.79	Support of Optimal Routing phase 1 (stage 2)							
	A004	3	R96	D	Concentration of description of core call handling functions in 03.18, C	97-913	approved	5.2.0
03.81	Line Identification Supplementary Services - Stage 2.							
	A004	3	2	F	Handling of number parameters related to the line identification service	97-1045	approved	4.7.0
	A005	1	R96	A	Handling of number parameters related to the line identification service	97-1045	approved	5.1.0
04.03	Mobile Station - Base Station System (MS - BSS) Interface Channel Structures and Access Capabilities.							
'strategic'	A005	2	R97	B	Introduction of GPRS	97-946	approved	5.3.0
04.04	Layer 1 - General Requirements.							
'strategic'	A001	2	R97	B	Introduction of GPRS	97-946	approved	5.1.0
04.07	Mobile Radio Interface Signalling Layer 3 - General Aspects							
	A008	5	R97	B	Inclusion of GPRS	97-988	approved	5.3.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
'strategic'	A010		R96	F	Alignment of the compact notation with the way it is used	97-987	approved	5.3.0
04.08	Mobile Radio Interface - Layer 3 Specification							
'strategic'	A181	5	R97	C	System information type 10	97-941	approved	5.8.0
	A206	5	R97	B	Network Alerting in the MS: Consequential CR - A new Information El	97-971	approved	5.8.0
'strategic'	A245		R96	F	Inconsistency of user rate in IE bearer capability	97-986	approved	5.8.0
'strategic'	A246		R96	F	Frequency redefinition procedure for multislot configuration	97-941	approved	5.8.0
'strategic'	A247	2	R96	F	Clarification to SACCH procedures for multislot configuration	97-941	approved	5.8.0
'strategic'	A248	2	R96	A	Clarification on audio connection	97-986	approved	5.8.0
'strategic'	A249	2	2	F	Clarification on audio connection	97-991	approved	4.21.0
'strategic'	A251	1	R97	B	Mobile assisted frequency allocation	97-942	approved	5.8.0
'strategic'	A253		R97	D	Multiple allocation of IEs within on protocol	97-986	approved	5.8.0
'strategic'	A255		R96	F	Alignment of the compact notation with the way it is used	97-987	approved	5.8.0
04.21	Rate Adaption on the Mobile Station - Base Station System (MS-BSS) Interface.							
	A009		R96	F	Removal of 2*14.4=19.2 Transparent configuration	97-921	approved	5.4.0
	A010		R96	F	Update of the protocol stack models in Annex A	97-921	approved	5.4.0
04.64								
	A001	1	R97	C	Various corrections and alignments with other specifications	97-938	approved	5.1.0
	A002	2	R97	C	NACK/SACK procedure	97-938	approved	5.1.0
	A003		R97	C	T200 default values	97-938	approved	5.1.0
	A004		R97	B	Introduction of new primitive	97-938	approved	5.1.0
	A005		R97	C	Frame reject response	97-938	approved	5.1.0
	A006	1	R97	C	Minimum value for N201	97-938	approved	5.1.0
	A007	1	R97	C	Cipher parameter input	97-938	approved	5.1.0
	A008	1	R97	B	Introduction of data mode parameter in LLC	97-938	approved	5.1.0
	A009		R97	B	Separate N201 parameter for I and U-UI frames	97-938	approved	5.1.0
	A010	1	R97	C	Cell update procedure	97-938	approved	5.1.0
	A011	1	R97	F	ABM SAPIs	97-938	approved	5.1.0
	A012	1	R97	F	Update of service primitive names	97-938	approved	5.1.0
	A013	1	R97	C	Maximum number of octets in an information field, N201	97-938	approved	5.1.0
	A014		R97	C	Removal of the length indicator field	97-938	approved	5.1.0
04.65								
	A001	1	R97	B	Introduction of new primitive	97-990	approved	5.1.0
	A003	1	R97	B	Introduction of header compression for SN-UNITDATA	97-990	approved	5.1.0
	A004	1	R97	B	Introduction of data compression for SN-UNITDATA	97-990	approved	5.1.0
	A005	1	R97	C	SNDCP XID negotiation	97-990	approved	5.1.0
	A007		R97	B	Update of service primitives	97-990	approved	5.1.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
	A008		R97	C	Separation of N201-I and N201-U	97-990	approved	5.1.0
	A010	1	R97	D	1st editorial changes	97-990	approved	5.1.0
	A011	2	R97	F	2nd editorial changes	97-990	approved	5.1.0
	A012	1	R97	F	Various corrections	97-990	approved	5.1.0
04.80	Mobile Radio Interface Layer 3 - Supplementary Services Specification Formats and Coding							
	A007	2	R97	B	Calling Name Presentation	97-1081	approved	5.1.0
	A007	2	R97	B	Changes due to Calling Name Presentation	97-1048	approved	5.1.0
04.88	Call Barring (CB) Supplementary Services - Stage 3.							
	A004		R97	C	Call Barring after reconnection	97-1047	approved	5.1.0
05.01	Physical Layer on the Radio Path (General Description)							
'strategic'	A010	1	R97	B	Introduction of GPRS	97-1002	approved	6.0.0
05.02	Multiplexing and Multiple Access on the Radio Path							
'strategic'	A020	1	R97	F	Corrections and clarifications to GPRS	97-1003	approved	6.0.0
'strategic'	A021		R97	B	Multislot classes for GPRS	97-1003	approved	6.0.0
'strategic'	A022	1	R97	B	System information for GPRS on BCCH	97-1003	approved	6.0.0
'strategic'	A023	2	R97	C	Alignment of 51- and 52-multiframe PCCCH	97-1003	approved	6.0.0
05.05	Radio Transmission and Reception							
'strategic'	A058	1	2	C	Improvement to DCS MS sensitivity	97-1004	approved	4.21.0
'strategic'	A059	1	R96	A	Improvement to DCS MS sensitivity	97-1004	approved	5.7.0
'strategic'	A063	2	R97	B	Reference performance for GPRS	97-1004	approved	6.0.0
05.08	Radio Subsystem Link Control							
'strategic'	A039		2	F	Allowed time to decode BCCH data	97-1005	approved	4.21.0
'strategic'	A040		R96	A	Allowed time to decode BCCH data	97-1005	approved	5.6.0
'strategic'	A041		R96	C	Dual band MS cell re-selection enhancement	97-1005	approved	5.6.0
'strategic'	A042	2	R97	B	Mobile Assisted Frequency Allocation	97-1144	approved	5.6.0
'strategic'	A042	3	R97	B	Mobile Assisted Frequency Allocation	97-1005	rejected	5.6.0
'strategic'	A043		R97	B	Channel Quality Report in GPRS	97-1005	approved	6.0.0
05.50	Background for RF Requirements.							
'strategic'	A005	1	R97	B	Introduction of simulation results for GPRS receiver performance	97-1006	approved	6.0.0
07.01	General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)							
	A027		R96	D	Editorial Modification for HSCSD	97-921	approved	5.7.0
	A028		R96	F	Valid combinations of HSCSD parameters	97-921	approved	5.7.0
	A029		R96	C	LLC Handling in GBS	97-921	approved	5.7.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
07.02	Terminal Adaptation Functions (TAF) for Services Using Asynchronous Bearer Capabilities							
	A011		R96	F	Clarification to L2R	97-921	approved	5.5.0
07.03	Terminal Adaptation Functions (TAF) for Services Using Synchronous Bearer Capabilities							
	A009		R96	F	Clarification to L2R	97-921	approved	5.4.0
07.05	Use of Data Terminal Equipment - Data Circuit Terminating Equipment (DTE-DCE) Interface for Short Message Services (SMS) and Cell Br							
	A037		R96	F	Unnecessary conversion in Annex A	97-922	approved	5.5.0
07.07	Digital cellular telecommunications System (Phase 2) AT Command set for GSM Mobile Equipment (ME)							
	A044		R96	D	Update of alternating call figures	97-922	approved	5.5.0
	A045		R96	F	V.120/RDI correction	97-922	approved	5.5.0
	A046		2	F	AT+CPIN or AT+CKPD must be mandatory in some cases (phase 2)	97-922	approved	4.2.0
	A047		R96	A	AT+CPIN or AT+CKPD must be mandatory in some cases (phase 2+)	97-922	approved	5.5.0
'strategic'	A048		R97	B	MUX 07.10 AT commands	97-1031	approved	5.5.0
07.08	GSM Application Programming Interface							
'strategic'	A002		R96	F	Correction of references	97-1029	approved	5.2.0
07.60	General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS							
	A002		R97	F	IP configuration parameters and PPP clarifications	97-1030	approved	5.1.0
08.08	Mobile Switching Centre - Base Station system (MSC-BSS) Interface Layer 3 Specification							
'strategic'	A090		R96	F	Correction of Circuit Pool Description	97-940	approved	5.8.0
'strategic'	A092	1	R96	F	Clean-up for work item Improved Transcoder Handling	97-940	approved	5.8.0
08.20	Rate Adaptation on the Base Station System - Mobile Service Switching Centre (BSS-MSC) Interface.							
	A004		R96	F	Removal of 2*14.4=19.2 Transparent configuration	97-921	approved	5.3.0
08.58	Base Station Controler - Base Transceiver Station (BCS-BTS) Interface Layer 3 Specification							
'strategic'	A022	1	R97	B	Mobile assisted frequency allocation	97-942	approved	5.6.0
09.02	Mobile Application Part (MAP) Specification							
	A084	3	R97	B	Network's indication of alerting	97-971	approved, on hol	6.0.0
	A094	2	R97	B	Modifications due to ASCII phase 2	97-989	approved, on hol	6.0.0
	A103	6	R97	B	Introduction of SIWFS	97-912	approved, on hol	6.0.0
	A106	4	R96	F	Corrections	97-917	approved	5.8.0
	A107	2	R96	F	Addition of a context specific TAG for SendRoutingInfoRes	97-917	approved	5.8.0
	A108		R96	F	object identifier values for proprietary extensions	97-917	approved	5.8.0
	A112		R96	F	Correction due to GAD	97-915	approved	5.8.0
09.07	General Requirements on Interworking between the Public Land Mobile Network (PLMN) and the Intergrated Services Digital Network (ISD							
	A036		R96	F	Correction of V.120 and RDI interworking	97-922	approved	5.6.0

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	A037		R96	C	LLC Modification	97-921	approved	5.6.0
09.78	CAMEL Application Part phase 1 (stage 3)							
	A019		R96	F	Removal of CallingPartyNumber from Connect	97-915	approved	5.3.0
	A020		R96	F	Removal of the transparent mode monitoring	97-915	approved	5.3.0
	A021		R96	F	Update the SCCP class requirements in 09.78	97-915	approved	5.3.0
	A022		R96	F	Remove mapping of CalledPartyBCD number and order sequence in A	97-915	approved	5.3.0
11.10-1	Conformance Specification							
	A328		2	F	CR to 11-10-1,Editorial correction to Section 26.10.2.5.3	97-924	approved	4.21.0
	A329		R96	F	CR to 11-10-1,Editorial correction to Section 26.10.2.5.3	97-925	approved	5.4.0
	A330		2	D	CR to 11.10-1 Editorial modifications to section 3.2.2, table 3.1 Applic	97-924	approved	4.21.0
	A331		R96	D	CR to 11.10-1 Editorial modifications to section 3.2.2, table 3.1 Applic	97-925	approved	5.4.0
	A334		2	D	CR to 11.10-1 Editorial modifications to section 26.12.2.2	97-924	approved	4.21.0
	A335		R96	D	CR to 11.10-1 Editorial modifications to section 26.12.2.2	97-925	approved	5.4.0
	A336		2	D	CR to 11.10-1 Editorial modifications to section 26.12.2.1.3	97-924	approved	4.21.0
	A337		R96	D	CR to 11.10-1 Editorial modifications to section 26.12.2.1.3	97-925	approved	5.4.0
	A338		2	D	CR to 11.10-1 Editorial modifications to section 31.6.2.4	97-924	approved	4.21.0
	A339		R96	D	CR to 11.10-1 Editorial modifications to section 31.6.2.4	97-925	approved	5.4.0
	A340		R96	D	CR to 11.10-1 Phase 2+ Addition of HSCSD test cases in Table 3.1: A	97-925	approved	5.4.0
	A341		2	F	CR to 11.10-1 Phase 2 Addition of a test purpose in 26.11.3 to test L2	97-924	approved	4.21.0
	A343		2	F	CR to 11.10-1 Correction of 26.7.4.3.4	97-924	approved	4.21.0
	A344		R96	F	CR to 11.10-1 Correction of 26.7.4.3.4	97-925	approved	5.4.0
	A345		R96	F	CR to 11-10-1 Phase 2+ Addition of a test purpose in 26.11.3 to test L	97-925	approved	5.4.0
	A346		2	D	CR to 11.10-1 Editorial modifications to Annex 3.2.3.1/3/4 removal of	97-924	approved	4.21.0
	A347		R96	D	CR to 11.10-1 Editorial modifications to Annex 3.2.3.1/3/4 removal of	97-925	approved	5.4.0
	A348		R96	F	CR to 11.10-1 Phase 2+HSCSD test case 26.13.1.1.2 Multislot Signalli	97-925	approved	5.4.0
	A349		R96	F	CR to 11.10-1 Phase 2+ HSCSD test case 26.13.1.2.1 Multislot signalli	97-925	approved	5.4.0
	A350		R96	F	CR to 11.10-1 Phase 2+ HSCSD test case 26.13.1.3.4 Multislot signalli	97-925	approved	5.4.0
	A351		2	F	CR to 11.10-1 Section 26.10.2.3 Incorrect Frequencies Specified	97-924	approved	4.21.0
	A352		R96	F	CR to 11.10-1 Phase 2+Section 26.10.2.3 Incorrect Frequencies Speci	97-925	approved	5.4.0
	A353		R96	F	CR to 11.10-1 Phase 2+-HSCSD test case 26.13.1.1.1 Multislot signall	97-925	approved	5.4.0
	A354		2	D	CR to 11.10-1 Editorial modifications to section 22.5	97-926	approved	4.21.0
	A355		R96	D	CR to 11.10-1 Editorial modifications to section 22.5	97-927	approved	5.4.0
	A356		2	B	CR to 11.10-1 Allow use of artificial ear type 3.2 for speech teleservice	97-926	approved	4.21.0
	A357		R96	B	CR to 11.10-1 Allow use of artificial ear type 3.2 for speech teleservice	97-927	approved	5.4.0
	A358		2	D	CR to 11.10-1 Phase 2- Section 14 - incorrect references to Phase 1	97-926	approved	4.21.0
	A359		R96	D	CR to 11.10-1 Phase 2+-Section 14 - incorrect references to Phase 1	97-927	approved	5.4.0
	A360		2	E	CR to 11.10-1 Phase 2- section 20.8, Cell reselection when C1 (servin	97-926	approved	4.21.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
	A361		R96	F	CR to 11.10-1 Phase 2+- Section 20.8 Cell reselection when C1 (servin	97-927	approved	5.4.0
	A362		2	F	CR to 11.10-1 Phase 2- section 20.20.2, Multiband cell selection and r	97-926	approved	4.21.0
	A363		R96	F	CR to 11.10-1 Phase 2+- section 20.20.2, Multiband cell selection and	97-927	approved	5.4.0
	A364		2	F	CR to 11.10-1 Phase 2- section 30.6.1 Echo loss	97-926	approved	4.21.0
	A365		R96	F	CR to 11.10-1 Phase 2+- Section 30.6.1 Echo loss	97-927	approved	5.4.0
	A366		2	D	CR to 11.10-1 Phase 2-Editorial modifications to section 12.1.1.4.2	97-926	approved	4.21.0
	A367		R96	D	CR to 11.10-1 Phase 2+-Editorial modifications to section 12.1.1.4.2	97-927	approved	5.4.0
	A368		2	F	CR to 11.10-1 Phase2 Editorial modifications to section 20.1.4.1 & 20.	97-926	approved	4.21.0
	A369		R96	F	CR to 11.10-1 Phase2+ Editorial modifications to section 20.1.4.1 & 2	97-927	approved	5.4.0
	A370		2	B	CR to 11-10-1 Section 30 and section 2 Allow use of artificial ear type	97-926	approved	4.21.0
	A371		R96	B	CR to 11-10-1 Section 30 and section 2 Allow use of artificial ear type	97-927	approved	5.4.0
	A372		2	D	CR to 11-10.1 Addition of test case references	97-926	approved	4.21.0
	A373		R96	D	CR to 11-10.1 Addition of test case references	97-927	approved	5.4.0
	A374		2	D	CR to 11-10.1 Editorial modification of section 22.2	97-926	approved	4.21.0
	A375		R96	D	CR to 11-10.1 Editorial modification of section 22.2	97-927	approved	5.4.0
	A376		R96	B	CR to 11.10-1 Phase 2+Transmitter: Output RF spectrum in multislot c	97-927	approved	5.4.0
	A377		R96	B	CR to 11.10-1 Phase 2+Reference sensitivity - full rate data channels i	97-927	approved	5.4.0
	A378		R96	B	CR to 11.10-1 Phase 2+Transmit power control timing and confirmatio	97-927	approved	5.4.0
	A379		R96	B	CR to 11.10-1 Phase 2+Transmitter: Frequency error and phase error i	97-927	approved	5.4.0
	A380		2	D	CR to 11.10-1 Phase 2+Transmitter: Frequency error and phase error i	97-926	approved	4.21.0
	A381		R96	D	CR to 11.10-1 Phase 2+Transmitter: Frequency error and phase error i	97-927	approved	5.4.0
	A382		2	F	CR to 11.10-1 Section 29.3.1.2.2 Total loss of UA frame	97-1122	approved	4.21.0
	A383		R96	F	CR to 11.10-1 Section 29.3.1.2.2 Total loss of UA frame	97-1123	approved	5.4.0
	A384		2	F	CR to 11.10-1 Section 29.3.2.2.2 Transmission Window	97-1122	approved	4.21.0
	A385		R96	F	CR to 11.10-1 Section 29.3.2.2.2 Transmission Window	97-1123	approved	5.4.0
	A386		2	F	CR to 11.10-1 Section 29.3.2.6.1 SS in checkpoint recovery mode	97-1122	approved	4.21.0
	A387		R96	F	CR to 11.10-1 Section 29.3.2.6.1 SS in checkpoint recovery mode	97-1123	approved	5.4.0
	A388		2	F	CR to 11.10-1 Section 29.3.2.6.2 End of a window	97-1122	approved	4.21.0
	A388		R96	F	CR to 11.10-1 Section 29.3.2.6.2 End of a window	97-1123	approved	5.4.0
	A390		2	F	CR to 11.10-1 Section 29.3.2.6.3 End of a sequence	97-1122	approved	4.21.0
	A391		R96	F	CR to 11.10-1 Section 29.3.2.6.3 End of a sequence	97-1123	approved	5.4.0
	A392		2	F	CR to 11.10-1 Section 29.3.2.6.5 No response to checkpointing	97-1122	approved	4.21.0
	A393		R96	F	CR to 11.10-1 Section 29.3.2.6.5 No response to checkpointing	97-1123	approved	5.4.0
	A394		2	F	CR to 11.10-1 Section 29.3.2.6.7 Total loss of response to checkpointi	97-1122	approved	4.21.0
	A395		R96	F	CR to 11.10-1 Section 29.3.2.6.7 Total loss of response to checkpointi	97-1123	approved	5.4.0
11.10-3	Layer3 (L3) Abstract Test Suite (ATS)							
	312		2	F	Correction of 2nd TMSI-Reallocation in TC_26_7_1	97-891	approved	4.21.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
	313		2	F	Cell Selection Implementation Errors	97-892	approved	4.21.0
	314		2	F	Corrections to handover test case 26_6_5_7	97-891	approved	4.21.0
	315		2	F	Corrections to handover test case 26_6_5_6	97-891	approved	4.21.0
	316		2	F	Corrections to handover test case 26_6_5_5_1	97-891	approved	4.21.0
	317		2	F	Corrections to TC 26_10_3_1	97-891	approved	4.21.0
	318		2	F	Corrections to handover test case 26_6_5_9	97-891	approved	4.21.0
	319		2	F	Corrections to handover test case 26_6_5_8	97-891	approved	4.21.0
	320		2	F	TTCN modifications to C_26_8_1_4_5_1, TC_26_8_1_4_4_1, Setup_	97-891	approved	4.21.0
	321		2	F	Corrections to handover test case 26_6_5_5_2	97-891	approved	4.21.0
	322		2	F	Problem with test case TC_26_6_5_4_2	97-891	approved	4.21.0
	323		2	F	Naming collision with FullRateCh_B_1 & Est_MO_Call_init in EFR	97-891	approved	4.21.0
	324		2	F	Simplification for checking of Mobile Time Difference IE in TCs 26_6	97-891	approved	4.21.0
	325		2	F	Implementation problems with TC_26_6_5_3_2	97-891	approved	4.21.0
	326		2	F	Test case 26_8_2_1 problems	97-891	approved	4.21.0
	327		2	F	Test case 26_8_1_4_3_2 problems	97-891	approved	4.21.0
	328		2	F	Problems with TC 26_6_4_2_2	97-891	approved	4.21.0
	329		2	F	Problem with use of lists as parameters	97-891	approved	4.21.0
	331		2	F	Problems with TC 26_10_2_5	97-891	approved	4.21.0
	332		2	F	TTCN modifications to TC_26_9_6_1_1	97-891	approved	4.21.0
	333		2	F	Problems with TC 26_10_2_2	97-891	approved	4.21.0
	334		2	F	Use correct channels in TC_26_5_7_1_4	97-891	approved	4.21.0
	335		2	F	New Test Step (InitCM) Needed In-Order Use Custom Call Initiation	97-891	approved	4.21.0
	336		2	F	Problems with TC 26_10_2_3	97-891	approved	4.21.0
	337		2	F	Problem with use of lists as parameters	97-891	approved	4.21.0
	338		2	F	CS ATS implementation errors	97-892	approved	4.21.0
	340		2	F	CS ATS implementation errors (Modification of TC_20_6 suitable for	97-892	approved	4.21.0
	341		2	F	Adjusting RF power levels in TC 26_7_4_3_1	97-891	approved	4.21.0
11.11	Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface.							
	a052	2	R97	b	Introduction of UCS2	97-886	approved	5.8.0
	a057		R97	c	MO SMS control by SIM	97-886	approved	5.8.0
	a058		R97	b	addition of GPRS data field	97-889	information	5.8.0
11.14	Specification of Subscriber Identity Module - Mobile Equipment (SIM - ME) Interface for SIM Application Toolkit							
	A044		R96	F	high priority of DISPLAY TEXT	97-1124	approved	5.6.0
	a045		R97	B	new type of DISPLAY TEXT and SET UP CALL	97-886	approved	5.6.0
	a047	1	R97	D	Extension of informative Annex on help information feature.	97-886	approved	5.6.0
	a048		R97	C	Enhancement to PROVIDE LOCAL INFORMATION	97-886	approved	5.6.0
	a049		R96	F	GET INPUT - Hidden text	97-886	approved	5.6.0

Spec	CR	rev	Phase	Cat	SUBJECT	TDoc	Status	NEW_VERS
	a050		R97	B	Default choice possibility for Get Input	97-886	approved	5.6.0
	a051	2	R97	B	Improvement of the dialogue with the user	97-886	approved	5.6.0
	a052		R97	C	cell identity available in call control by SIM	97-886	approved	5.6.0
	a053		R96	F	Profile download	97-886	approved	5.6.0
	a054		R97	B	send USSD	97-886	approved	5.6.0
	a055		R97	B	MO SMS control by SIM	97-886	approved	5.6.0
22.01	Universal Mobile Telecommunications System (UMTS): Service aspects; Service principles							
	A004		UMTS	D	Comparing UMTS 22.01 V3.1.1 distributed at SMG#23 with UMTS	97-965	approved	3.2.0
	A005		UMTS	D	UMTS 22.01 Multiple Subscriptions: Restructuring of sections 8,9 an	97-966	approved	3.2.1
	A006		UMTS	D	UMTS 22.01 Numbering Principles: Improving the accuracy of text on	97-967	approved	3.2.1
30.20	A001		UMTS	B	Characteristics of Satellite Systems	97-1055	approved	3.1.0
TBR 19	A009	2	F		CR to TBR 19 Reduction of test cases for EFR TC_26_12_2_1 AND	97-928	approved, on hol	
	A010	2	B		CR to TBR 19 Inclusion of HSCSD Multislot test cases	97-928	postponed	
TBR 31	A003		R96	F	CR to TBR 31 Reduction of test cases for EFR TC_26_12_2_1 AND	97-928	approved, on hol	
	A004		R96	B	CR to TBR 31 Inclusion of HSCSD Multislot test cases	97-928	postponed	

SMG#24 Tdoc List

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-0880	Agenda and Schedule of SMG#24	TC SMG Chairman	2	P-97-0885
P-97-0881	Involvement of Asia Pacific GSM MoU Members in the UMTS terrestrial Radio Access (UTRA) Decision	TC SMG Chairman	4.1	
P-97-0882	GSM-UMTS Core Network definition pivoting GSM Core Network evolution	TC SMG Chairman	4.1	
P-97-0883	Procedure for voting on UTRA	TC SMG Chairman & ETSI's Legal Adviser	4.1	P-97-0995
P-97-0884	SMG-CG 23bis 30/10/97 in Bonn Meeting Report	PT SMG Co-Ordinator	4.3	
P-97-0885	Agenda and Schedule of SMG#24 (revised TDoc 880/97)	TC SMG Chairman	2	P-97-1020
P-97-0886	Non strategic CRs to GSM 11.11 and GSM 11.14 (see missing CR in TDoc 1124/97)	SMG9	5.5	
P-97-0887	New Work item - Auxiliary device access using SIM application toolkit	SMG9	5.5	
P-97-0888	GSM 03.48 (SIM toolkit secure messaging), v2.0.1 - for approval	SMG9	5.5	
P-97-0889	Status and summary of SMG9 related GPRS issues and CR to GSM 11.11	SMG9	5.5	
P-97-0890	UMTS 21.06 (Network and service management requirements for UMTS	SMG6	5.5	
P-97-0891	Non-strategic CRs 312 to 329 and 331 to 337 and 341 to GSM 11.10-3 Phase 2	SMG7	5.5	
P-97-0892	Non strategic CRs 313, 338 and 340 to GSM 11.10-3 Phase 2	SMG7	5.5	
P-97-0893	Summary of the UTRA definition procedure in SMG2	SMG2	4.1	
P-97-0894	Summary of the concept description of the Beta concept	SMG2	4.1	
P-97-0895	Summary of the concept evaluation of the Beta concept	SMG2	4.1	
P-97-0896	Concept Group Beta OFDMA : System Description Performance Evaluation	SMG2	5.3	
P-97-0897	Concept Group Delta WB-TDMA/CDMA: System Description Summary	SMG2	4.1	
P-97-0898	Concept Group Delta WB-TDMA/CDMA: Evaluation Summary	SMG2	4.1	
P-97-0899	Concept Group Delta WB-TDMA/CDMA: System Description Performance Evaluation	SMG2	5.3	
P-97-0900	Concept Group Gamma - WB-TDMA: System Description Summary	SMG2	4.1	
P-97-0901	Concept Group Gamma - WB-TDMA: Evaluation Summary	SMG2	4.1	
P-97-0902	Concept Group Gamma: Wideband TDMA: Evaluation document	SMG2	5.3	
P-97-0903	Concept Group Alpha: Wideband Direct-Sequence CDMA: System Description Summary	SMG2	4.1	
P-97-0904	Concept Group Alpha: Wideband Direct-Sequence CDMA: Evaluation Summary	SMG2	4.1	
P-97-0905	Concept Group Alpha: Wideband Direct-Sequence CDMA (WCDMA) Evaluation Document	SMG2	5.3	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-0906	Current Situation and Principle Attitude of Standardization Activities on Radio Transmission Technology for IMT-2000 in ARIB	ARIB	4.1	
P-97-0907	Co-ordination of ITU Work in ETSI, ETSI/B10(97)09	TC SMG Chairman	4.6	
P-97-0908	Information copy of Ericsson IPR Statement	Ericsson	4	
P-97-0909	Stage 2 of CAMEL Phase 2 (CR 03.78 A008r8)	SMG3	5.4	
P-97-0910	GSM 09.60 v.2.0.0 GPRS Tunnelling Protocol (GTP)	SMG3	5.4	
P-97-0911	CR A007r2 to GSM 03.18 v.5.1.0	SMG3	5.4	
P-97-0912	CR A011r1 to GSM 03.18 and A103r5 to GSM 09.02	SMG3	5.4	
P-97-0913	Changes to GSM 03.18, GSM 03.78 & GSM 03.79 to ease the documentation for further services	SMG3	5.4	
P-97-0914	DEN/SPS-03052-1 - INAP; Part 1: Protocol specification for CAMEL Phase 1	SMG3	5.4	
P-97-0915	CRs to GSM 03.18, 03.78 and 09.02: Corrections for CAMEL Phase 1 (R96)	SMG3	5.4	
P-97-0916	GSM 10.78 v.1.5.0 Project scheduling and open issues: CAMEL	SMG3	5.4	
P-97-0917	CRs A106r4 A107r2 and A108 to GSM 09.02	SMG3	5.4	
P-97-0918	Non strategic CRs A064 and A065 to GSM 03.40 v.5.7.0	SMG4	5.5	
P-97-0919	CRs A045 to A052 to GSM 03.41 v.5.7.0 and A026 to A031 to GSM 03.49 v.5.6.0	SMG4	5.5	
P-97-0920	Non strategic CRs A004 to A007 to GSM 03.54 v.5.1.0	SMG4	5.5	
P-97-0921	Non strategic CRs for HSCSD and 14.4 kbit/s	SMG4	5.5	
P-97-0922	Non strategic CRs to GSM 07.05, 07.07 and on work item V.120/RDI interworking	SMG4	5.5	
P-97-0923	SMG7 STATUS REPORT	SMG7 Chairman	5.5	
P-97-0924	Non strategic CRs A328, A330, A332, A334, A336, A338, A342, A343, A346, A348, A351 to GSM 11.10-1 Phase 2 (SIG)	SMG7	5.5	
P-97-0925	Non strategic CRs A329, A331, A333, A335, A337, A339, A340, A344, A345, A347, A349, A350, A352, A353 to GSM 11.10-1 Phase 2+ (SIG)	SMG7	5.5	
P-97-0926	Non strategic CRs A354, A356, A358, A360, A362, A364, A366, A368, A370, A372, A374, A380 to GSM 11.10-1 Phase 2 (RF)	SMG7	5.5	
P-97-0927	Non strategic CRs A355, A357, A359, A361, A363, A365, A367, A369, A371, A373, A375, A376, A377, A378, A379, A381 to GSM 11.10-1 Phase 2+ (RF)	SMG7	5.5	
P-97-0928	Non strategic CRs A009, A010 to TBR 19 and Strategic CRs A003, A004 to TBR 31	SMG7	5.5	
P-97-0929	GSM 03.53 v.1.0.0 for information	SMG3	5.4	P-97-1113
P-97-0930	Questions on IPR issues	Siemens	4.1	
P-97-0931	Withdrawn	Vodafone	5.5	
P-97-0932	IMT 2000 Family of Systems Concept	TC SMG Chairman	4.1	P-97-1132
P-97-0933	PT SMG Job Description - Version 3.13	PT SMG	3.2	
P-97-0934	PT SMG 1997 budget	PT SMG	3.2	
P-97-0935	PT SMG 1998 budget	PT SMG	3.2	
P-97-0936	Summary of telephone conferences TIA - SMG/T1P1	PT SMG	4.6	P-97-1109
P-97-0937	CRs to 03.60 (electronic copy only)	SMG3	5.4	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-0938	CRs to 04.64 (electronic copy only)	SMG3	5.4	
P-97-0939	Performance comparison WCDMA vs TD - CDMA	ERICSSON	4.1	
P-97-0940	Strategic CRs A090 and A092r1 on 08.08	SMG2	5.3	
P-97-0941	Strategic CRs A246, A247r2 and A181r5 to GSM 04.08	SMG2	5.3	
P-97-0942	Strategic CRs A022r1 to GSM 08.58 and A251r1 to GSM 04.08	SMG2	5.3	
P-97-0943	GSM 08.14 v.2.0.0 - BSS - Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1	SMG2	5.3	
P-97-0944	GSM 08.16 v.2.0.0 - BSS -- Serving GPRS Support Node (SGSN) interface; Network Service	SMG2	5.3	
P-97-0945	GSM 08.18 v.2.0.0 - BSS - Serving GPRS Support Note (SGSN) BSS GPRS Protocol (BSSGP)	SMG2	5.3	
P-97-0946	Strategic CRs A005r2 to GSM 04.03 and A001r2 to GSM 04.04	SMG2	5.3	
P-97-0947	GSM 04.60 V.1.0.0 - MS - BSS interface; Radio Link Control/Medium Access Control (RL/MAC) protocol	SMG2	5.3	
P-97-0948	Not allocated			
P-97-0949	Non Strategic CRs A009 to GSM 03.50 v. 4.2.0 and A011 to GSM 03.50 v.5.0.2	SMG11	5.5	
P-97-0950	Non Strategic CR A001 to GSM 02.53 v.5.0.0	SMG11	5.5	
P-97-0951	TS 04.53 v.1.0.0 - Inband Tandem Free Operation (TFO) of Speech Codecs; Service Description; Stage 3	SMG11	5.5	P-97-1007
P-97-0952	Extension to Work Item Description for TFO	SMG11	5.5	
P-97-0953	AMR performance requirements (AMR-3)	SMG11	5.5	
P-97-0954	Draft LS to ITU-R TG8/1 on speech codecs	SMG11	4.6	
P-97-0955	UMTS TS 22.05 v.1.4.1 - Services and Service Capabilities	SMG1	4.2	
P-97-0956	UMTS 22.07 v.1.0.0 - Terminal and smart card concepts	SMG1	5.2	
P-97-0957	UMTS 22.15 v.1.2.2 - Service aspects; Charging and Billing	SMG1	4.2	
P-97-0958	UMTS TR 22.24 v.1.2.2 - New Charging and Accounting Mechanisms	SMG1	4.2	
P-97-0959	UMTS TR 22.25 v.2.0.0 - Quality of Service and Network Performance	SMG1	4.2	
P-97-0960	UMTS TR 22.60 v.1.0.0 - Mobile multimedia services including mobile Intranet and Internet services	SMG1	4.2	
P-97-0961	UMTS 22.70 v.1.0.0 - Virtual Home Environment	SMG1	4.2	
P-97-0962	UMTS TR 22.71 v.1.1.1 - Automatic Establishment of Roaming Relationships	SMG1	4.2	
P-97-0963	UMTS 22.75 v.1.0.0 - Service aspects; Advanced Addressing	SMG1	4.2	
P-97-0964	UMTS TR 22.80 V.2.0.1 - Relationship to other Standards	SMG1	4.2	
P-97-0965	Non strategic CR A004 to UMTS 22.01 v.3.1.1	SMG1	4.2	
P-97-0966	Non strategic CR A005 to UMTS 22.01 v.3.2.0	SMG1	4.2	
P-97-0967	Non strategic CR A006 to UMTS 22.01 v.3.2.0	SMG1	4.2	
P-97-0968	SMG1-UMTS Meeting report Dec. 2-4, 1997 in Helsinki	SMG1	4.2	
P-97-0969	UMTS 22.01 v.3.2.0 - Service Aspects; Services principles	SMG1	4.2	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-0970	Non strategic CRs A006 and A007 to GSM 02.01 v.5.2.0	SMG1	5.2	
P-97-0971	Strategic CRs A015 to GSM 02.07, A004 to GSM 03.18 and A084 to GSM 09.02 Non strategic CR A206 to GSM 04.08	SMG1	5.2	
P-97-0972	Strategic CRs A002 to GSM 02.42 v.5.0.1 and A016 to GSM 02.07 v.5.3.1	SMG1	5.2	
P-97-0973	Non strategic CR A009 to GSM 02.11 v.5.0.0	SMG1	5.2	
P-97-0974	Non strategic CR A021 to GSM 02.30 v.5.6.0	SMG1	5.2	P-97-1149
P-97-0975	Non strategic CR A008 to GSM 02.41 v.5.1.0	SMG1	5.2	
P-97-0976	Non strategic CRs A002 and A003 to GSM 02.60	SMG1	5.2	
P-97-0977	Non strategic CR A014 to GSM 02.78 v.5.3.0	SMG1	5.2	
P-97-0978	Strategic CRs A006 and A007 to GSM 02.81 and non strategic CRs A008 and A009 to GSM 02.81	SMG1	5.2	
P-97-0979	Non strategic CRs A017 and A018 to GSM 02.93 v.5.4.0	SMG1	5.2	
P-97-0980	Support of Private Numbering Plan (SPNP); Service Description, Stage 1	SMG1	5.2	
P-97-0981	GSM 02.66 v.1.4.0 Support of Mobile Number Portability (MNP); Service Description; Stage 1	SMG1	5.2	
P-97-0982	GSM 02.96 v.2.0.0 - Name Identification Supplementary Services; Stage 1	SMG1	5.2	
P-97-0983	SMG1 Progress Summary Report on GSM & UMTS	SMG1	5.2	
P-97-0984	Not allocated			
P-97-0985	Strategic CR A031r1 to GSM 03.64 v.5.1.0	SMG2	5.3	
P-97-0986	Strategic CRs A245, A248r1, A253 to GSM 04.08	SMG3	5.4	
P-97-0987	Strategic CRs A010 to GSM 04.07 and A255 to GSM 04.08	SMG3	5.4	
P-97-0988	Non strategic CR A008r5 to GSM 04.07 v.5.2.0	SMG3	5.4	
P-97-0989	Non strategic CRs on 03.68, 03.69, 09.02 for ASCI, agreed by SMG3, Phase 2+, Release '97	SMG3	5.4	
P-97-0990	Non strategic CRs on 04.65, agreed by SMG3, Phase 2+, Release '97	SMG3	5.4	
P-97-0991	Strategic CR A249r2 to GSM 04.08 v.4.19.1	SMG3	5.4	
P-97-0992	Contribution to the document UMTS 30.01 version 3.1.0 " UMTS Baseline Document"	UMTS Forum Market Aspects Group	4.2	
P-97-0993	ETSI Status List	I. Doig, ETSI ECS Dept	3.2	
P-97-0994	ETSI Membership List	I. Doig, ETSI ECS Dept	4	
P-97-0995	Procedure of vote for indication of intent on UTRA in SMG#24 (Revision of TD 883/97)	SMG Chairman and ETSI's Legal Adviser	4.1	
P-97-0996	Update of work item 184: Improved Data Rates through Optimised Modulation	Ericsson, Nokia, Airtouch	5.6	
P-97-0997	Comments on TDoc SMG 1011/97	FRANCE TELECOM	4.6	
P-97-0998	IPR Licensing Declaration - UTRA IPR	NEC	4.1	
P-97-0999	ETSI/ARIB Cooperation Joint Statement NEC-PANA	NEC/PANASONIC	4.1	
P-97-1000	Selection of Wideband CMDA on UTRA concept	NEC	4.1	
P-97-1001	GSM 10.60 v5.3.0 GPRS Project Management	PT80V	5.1	
P-97-1002	Strategic CR A010 to GSM 05.01 v. 5.2.0	SMG2	5.3	
P-97-1003	Strategic CRs A020 to A023 to GSM 05.02	SMG2	5.3	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-1004	Strategic CRs A058, A059, A063 to GSM 05.05	SMG2	5.3	
P-97-1005	Strategic CRs A039 to A043 to GSM 05.08	SMG2	5.3	
P-97-1006	Strategic CR A005 to GSM 05.50 v. 5.1.0	SMG2	5.3	
P-97-1007	Inband Tandem Free Operation (TFO) of Speech Codecs; Service Description; Stage 3 (Revision of TD 951/97)	SMG11	5.5	
P-97-1008	Comments on CR to TS 22.01 Service Principles regarding multiple subscriptions	TELIA	4.2	
P-97-1009	Proposed changes to UMTS 30.01 v.3.0.0	TELIA	4.4	
P-97-1010	Workplan for SMG contributions to ITU	ITU-T Co-ordinator, ITU-R Co-ordinator	4.6	P-97-1129
P-97-1011	Contribution to ITU-T SG11 CR for Q-FIN	D. Williams, ITU-T Co-ordinator	4.6	
P-97-1012	Contribution to ITU-T SG11 CR for Q-FIN	D. Williams, ITU-T Co-ordinator	4.6	P-97-1125
P-97-1013	Contribution to ITU-T SG11 CR for Q-FIN	D. Williams, ITU-T Co-ordinator	4.6	
P-97-1014	Contribution to ITU-T SG11 and ITU-R TG 8/1	D. Williams, ITU-T Co-ordinator	4.6	
P-97-1015	EDGE Feasibility Study WI 184 - Improved Data Rates through Optimised Modulation v.1.0	SMG2	5.3	
P-97-1016	EDGE Standardization schedule	SMG2	5.3	
P-97-1017	SMG2 STATUS REPORT	SMG2	5.3	
P-97-1018	GSM 04.14 v.1.0.0 Individual equipment type requirements and interworking Special conformance testing functions	SMG2	5.3	
P-97-1019	Technical Analysis and Comparison of UTRA concept	FRANCE TELECOM	4.1	
P-97-1020	SMG#24 Agenda and Schedule	PT SMG	2	
P-97-1021	Chairman's report	TC SMG Chairman	1	
P-97-1022	Alpha concept evaluation - An alternative view	Motorola	4.1	
P-97-1023	Enhanced Delta	Motorola	4.1	
P-97-1024	Enhanced Delta - Questions and answers	Motorola	4.1	P-97-1076
P-97-1025	IMT-2000 Standardisation and Family Concept	Lucent Technologies	4.6	
P-97-1026	Proposed changes to Q.FIN and Two Tier Roaming	Lucent Technologies	4.6	
P-97-1027	Operator interest group	Operator interest group	4.1	
P-97-1028	Information on ODMA	Vodafone - Siemens - Ericsson	4.1	
P-97-1029	Strategic CR A002 to GSM 07.08 v.5.1.0	SMG4	5.5	
P-97-1030	Non strategic CR A002 to GSM 07.60 v.5.0.0	SMG4	5.5	
P-97-1031	GSM 07.10 Multiplexing protocol	SMG4	5.5	
P-97-1032	Proposed Liaison statements and project schedule for MEXE	SMG4	5.5	
P-97-1033	Justifications for TBR 19 and TBR 31 updates	PT SMG	5.5	
P-97-1034	Phase 2+ MS Testing	PT SMG	5.5	
P-97-1035	A letter from Georges Schmidt - Omnipoint for information	TC SMG Chairman		
P-97-1036	The answer to the letter from Georges Schmidt for information	TC SMG Chairman		
P-97-1037	Letter from NTT DOCOMO for information	TC SMG Chairman		

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-1038	PT SMG Status Report	PT SMG Co-ordinator	3.2	
P-97-1039	Satellite Network Standardisation in SMG	PT SMG		
P-97-1040	Not allocated			
P-97-1041	SMG1 UMTS Text for Chapter 9 of UMTS 30.01	SMG1 UMTS	4.2	
P-97-1042	France Telecom position on UTRA concept	France Telecom	4.1	
P-97-1043	Migration and Evolution from GSM	Ericsson	4.2	
P-97-1044	Virtual Home Environment	SMG1 UMTS	4.2	
P-97-1045	Strategic CRs A004r3 to GSM 03.81 Phase 2 and Rel.96	SMG3	5.4	
P-97-1046	Side Events during SMG#24	TC SMG Chairman	1	
P-97-1047	Non strategic CR A004 to GSM 04.88 v.5.0.0	SMG3	5.4	
P-97-1048	Strategic CR A007r2 to GSM 04.80 v.5.0.1	SMG3	5.4	
P-97-1049	Operators' Requirements for UTRA (UMTS Terrestrial Radio Access)	UMTSF Operators Group	4.1	
P-97-1050	SMG4 Issues at SMG#24	SMG4	5.5	
P-97-1051	SMG-CG 23ter summary	PT SMG	5.6	
P-97-1052	Withdrawal of some UMTS documents	PT SMG	4.5	
P-97-1053	UMTS Work Programme, draft UMTS 30.00 v.3.3.0	PT SMG	4.5	
P-97-1054	UMTS Baseline document, draft UMTS 30.01 v.3.2.0	PT SMG	4.5	
P-97-1055	Strategic CR A001 to UMTS 30.20 v.3.0.0	PT SMG	4.5	
P-97-1056	Not allocated			
P-97-1057	Availability of UMTS documents on DOCBOX	PT SMG	4.5	
P-97-1058	IMT-2000 co-ordination	TC SMG Chairman	4.2	P-97-1110
P-97-1059	GSM-API for SIM Toolkit applications based on JAVA	T-Mobil		
P-97-1060	Not allocated			
P-97-1061	UTRA Decision - IPR Statements	T-Mobil, Mannesmann Mobilfunk, E-Plus Mobilfunk	4.1	
P-97-1062	Future Organisation for GSM and UMTS Standardization	T-Mobil, Mannesmann Mobilfunk, E-Plus Mobilfunk	4.1	P-97-1154
P-97-1063	Proposed Work Item: GSM-API for SIM-Toolkit	T-Mobil	5.5	
P-97-1064	Letter of 09/12/97 - T1P1 document 97-213	T1P1 Chairman	4.1	
P-97-1065	Stage 1 of CNAP	Lucent Technologies	5.2	
P-97-1066	Report on Essential IPRs declared in relation to the work of SMG#24	ETSI	4.1	
P-97-1067	TD-CDMA (delta), the best of both worlds	Alcatel, Bosch, Italtel, Motorola, Nortel, Siemens and Sony	4.1	
P-97-1068	Handling of WI 184 (Improved Data Rates through Optimized Modulation)	DeTeMobil, Mannesmann, Bosch, Sony, Siemens	5.3	
P-97-1069	Dual Mode GSM/UMTS Terminal Complexity	Nokia, Ericsson	4.2	
P-97-1070	Not allocated			
P-97-1071	Radio Interface Selection for UMTS - WDCMA	Nokia	4.1	
P-97-1072	Aspects on selecting Radio Access Technology for the 21st Century	Ericsson	4.1	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-1073	UMTS Deployment by Private Operators	Philips	4.1	
P-97-1074	UMTS Radio Access for cost efficiency and consumer features of UMTS terminal	Philips Consumer Communications	4.1	
P-97-1075	CR Database	PT SMG	5.6	P-97-1158
P-97-1076	A summary of Enhanced TD-CDMA (Revision of Tdoc 1024/97)	Motorola	4.1	
P-97-1077	SMG2 Presentation	SMG2 Chairman	4.1	
P-97-1078	LS - WRC-99 Agenda Item on Global Radio Control Channel	CEPT ERC Task Group 1 on UMTS	4.1	
P-97-1079	ETNO FMC Group discussion on UMTS Radio aspects	ETNO FMC Chairman	4.1	
P-97-1080	Approval of specification GSM 07.10 TE-MS Multiplexer	France Telecom	5	
P-97-1081	LS on Calling Name Presentation (CNAP) Specifications	T1P1	5.2	
P-97-1082	Process Refinements	T1P1	5.2	
P-97-1083	T1P1 Harmonization Workplan	T1P1	5.2	
P-97-1084	Revised Work Plan for PCS 1900 Service Provider Number Portability	T1P1	5.5	
P-97-1085	Letter from T. IIDA, TTC for information	TC SMG Chairman	1	
P-97-1086	Non strategic CR on 03.02, agreed by SMG3, Phase 2+, Release '97	SMG3	5.3	
P-97-1087	TD-CDMA Performance Degradation with the New OQPSK Spreading	Fujitsu	4.1	
P-97-1088	Simulation Results on the Detectability of WB-BCCH Pilot Signal of the Delta concept	Fujitsu	4.1	
P-97-1089	Proposed way of collaboration EP SMG/TC TMN	TC TMN/WG5	4.3	
P-97-1090	UMTS Network Management Deliverables	TC TMN/WG5	4.3	
P-97-1091	SFR Statement regarding UMTS	SFR	4.2	
P-97-1092	Report to SMG#24 from STF SMG Funding Task Force meeting #1	Per Björndahl	3.3	
P-97-1093	Clarification with Respect to the documents on TD-CDMA Performance Tdoc 1087/97 and Tdoc 1088/97 by Fujitsu	Nortel, Motorola	4.1	
P-97-1094	ITU-T contributions table	ITU-T	4.6	
P-97-1095	Results of the vote	TC SMG Chairman	4.1	
P-97-1096	AMR Performances Specification	Bellsouth Mobility DCS	5.5	
P-97-1097	Draft LS to ERC TG1 in response to TG1 LS Tdoc 1078/97 - WRC-99 Agenda item on Global Radio Control Channel	ETSI SMG	4.1	P-97-1163
P-97-1098	Not allocated			
P-97-1099	Procedure for voting on UTRA in SMG#24bis	SMG Chairman and ETSI's Legal Adviser	4.1	P-97-1157
P-97-1100	SMG3 STATUS REPORT	SMG3	5.4	
P-97-1101	LS from WAP Management Board to ETSI	Nokia, Ericsson, Motorola and Unwired Planet	5.6	
P-97-1102	UMTS 30.06 (electronic copy only)	PT SMG	4.2	
P-97-1103	Fujitsu IPR statement	Fujitsu	4.1	
P-97-1104	Criteria of China Telecom to evaluate the Third Generation Cellular System	MPT PR. China	4.1	
P-97-1105	Some Comments on AMR	France Telecom	5.5	

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-1106	Voting representatives for Full ETSI members, at UTRA vote of indication; 16/12/1997	ETSI	4.1	
P-97-1107	Enhanced Data rates for GSM Evolution (EDGE)	Motorola	5.3	
P-97-1108	GPRS Schedule	Motorola	5.1	
P-97-1109	Draft Summaries of two telephone conferences TIA/SMG (Revision of TD 936/97)	Ansgar Bergmann	4.6	
P-97-1110	IMT-2000 Co-ordination (Revision of TD 1058/97)	SMG Chairman	4.6	P-97-1159
P-97-1111	Proposed SMG Contribution to TG8/1 on IMT-2000 Family	On behalf of SMG PT ITU-R Co-ordinator	4.6	P-97-1128
P-97-1112	GSM UMTS WI Description Sheet	SMG3 Chairman	4.5	
P-97-1113	Withdrawn			
P-97-1114	Response to LS from WAP Consortium	Alcatel, Nortel, Siemens		P-97-1161
P-97-1115	SMG9 SIM Aspects at SMG#24	SMG9 Chairman	5.5	
P-97-1116	IPR Policy of ARIB	ARIB	4.1	
P-97-1117	The meeting Schedule of IMT-2000 Study Committee in ARIB	ARIB	4	
P-97-1118	NTTDoCoMo's View for the Development of Evolved GSM CN	NTTDoCoMo	4.1	
P-97-1119	Not allocated			
P-97-1120	LS on CNAP 02.96 v.2.0.0	T1P1.5	5.2	
P-97-1121	Requirements for UMTS/UTRA as Expressed by the DECT Community	DECT Forum Chairman	4.3	
P-97-1122	CRs to GSM 11.10-1 Phase 2 (RLP)	SMG7	5.5	
P-97-1123	CRs to GSM 11.10-1 Phase 2+ (RLP)	SMG7	5.5	
P-97-1124	Non strategic CR A044 to GSM 11.14 (Missing in TDoc 886/97)	SMG9	5.5	
P-97-1125	Contribution to ITU-T SG11 CR for Q-FIN (Revision of TD 1012/97)	Ericsson	4.6	
P-97-1126	Dataservices and SMS applicability for CTS phase 1	Ericsson	5.2	
P-97-1127	Status report of the CTS work item at SMG#24	CTS Work Item Rapporteur	5.2	
P-97-1128	Proposed SMG contribution to TG8/1 on IMTS-2000 Family (revision of TDoc 1111/97)	On behalf of SMG PT ITU-R Co-ordinator	4.6	
P-97-1129	Workplan for SMG Contributions to ITU (revision of TDoc 1010/97)	ITU-T Co-ordinator, ITU-R Co-ordinator	4.6	
P-97-1130	Not allocated			
P-97-1131	Not allocated			
P-97-1132	IMT-2000 Family of systems (Revision of Tdoc 932/97)	SMG#24		
P-97-1133	UMTS Policy	GSM MoU Chairman	4	
P-97-1134	Approval of GSM TS 07.10 Multiplex protocol	Ericsson, Siemens		
P-97-1135	Report on implementation of Version Management decided by SMG#23 version 6.0	PT SMG	5.6	
P-97-1136	SMG's Plenary and Steering Group Dates 1998/1999	SMG Co-ordination Group	6	P-97-1155
P-97-1137	Draft agenda SMG#24 Bis	SMG Co-ordination Group	6	P-97-1156
P-97-1138	Draft Voting procedure for UTRA	SMG Co-ordination Group	6	P-97-1157
P-97-1139	Not allocated			

NUMBER	TITLE	SOURCE	AGENDA ITEM	REPLACED BY TDOC
P-97-1140	LS MS/TE Infra Red interface and the IrDA Special Interest Group	SMG4	5.5	
P-97-1141	Vodafone Position on UMTS Radio Interface Standard Selection	Vodafone Ltd	4.2	
P-97-1142	Future Organisation for GSM and UMTS Standardization	T-Mobil, Mannesmann Mobilfunk, E-Plus Mobilfunk	4.1	P-97-1154
P-97-1143	CTS Stage 1 Phase 1	Alcatel	5.2	
P-97-1144	CR A042r2 to GSM 05.08 R97	SMG2	5.3	
P-97-1145	LS to T1P1 - Response to Letter of process refinements	SMG		
P-97-1146	MoU TWG/ECTEL Activities on Handset Antenna and Battery Life Measurements	Chairman Ad Hoc Group		
P-97-1147	WI Description for EDGE-NSS	EDGE WI Drafting Group	5.3	
P-97-1148	WI Description for EDGE-BSS	EDGE WI Drafting Group	5.3	
P-97-1149	Non strategic CR affecting GSM 02.30 (Revision of TD 974/97)	SMG1 Chairman	5.2	
P-97-1150	Road map and Work item data base version 24.0	PT SMG	5.6	
P-97-1151	Summary of SMG Co-ordination Meeting #24	PT SMG	6	
P-97-1152	Proposed changes to UMTS 30.01 v.3.0.0	Telia	4.4	
P-97-1153	Meeting dates of SMG3 meetings and request for hosts	SMG3	5.4	
P-97-1154	Future Organisation for GSM and UMTS Standardization (Revision of TD 1142/97)	SMG	4.1	
P-97-1155	SMG's Plenary and Steering Group Dates 1998/1999 (Revision of TD 1136/97)	SMG Co-ordination Group	6	
P-97-1156	Draft Agenda SMG#24BIS (Revision of TD 1137/97)	TC SMG Chairman	6	
P-97-1157	Procedure for voting on UTRA in SMG#24 bis (Revision of TD 1138/97)	SMG	6	
P-97-1158	CR Database (Revision of TD 1075/97)	PT SMG		
P-97-1159	IMT-2000 Co-ordination (Revision of TD 1110/97)	SMG Chairman	4.6	
P-97-1160	LS to IrDA Group on GSM 07.10	SMG		
P-97-1161	Response to LS from WAP Consortium (Revision of TD 1114/97)	Alcatel, Nortel, Siemens		
P-97-1162	Preliminary announcement of EDGE Workshop	Nokia		
P-97-1163	Draft Liaison statement to ERC TG1 in response to TG1 liaison statement T Doc 1078/97	PT SMG		
P-97-1164	Some information on visit of Mr. Kyu-Jin WEE, Chair, IMT-2000 Subcommittee of Korean TTA	PT SMG	4.5	

Source: SMG11

Subject: Liaison Statement to ITU-R TG8/1 on speech codecs

As part of ETSI SMG's programme of work on UMTS, SMG is monitoring and contributing to the work of ITU-R TG8/1 on IMT2000. SMG is aware that TG8/1 has an interest in speech codecs for IMT 2000 and that it has requested the assistance of ITU SG16 (see Appendix 3).

ETSI STC SMG11 is the competent body responsible for speech aspects of the GSM and UMTS standards. The committee has many years of experience assessing speech quality and defining speech and channel codecs specifically for mobile networks. To assist TG8/1 with their work, SMG11 would like to offer TG8/1 information on high performance speech codecs which have been or are being produced for GSM and UMTS which could be relevant to IMT2000 speech services.

ETSI SMG standardised in January 1996 a high quality speech codec for GSM, the Enhanced Full Rate (EFR) codec. This achieves high performance benchmarks exceeding G.726 under clear channel conditions. The EFR codec also achieves good background noise performance, an important requirement for mobile applications. Practical experience of mobile networks has demonstrated that the performance of the speech codec in background noise is critical as mobiles are frequently used in cars and on the street. The EFR codec has now been deployed on a number of GSM networks throughout the world. Further information on the EFR performance in relation to G.726 and G.729 is provided in Appendix 1.

SMG11 is currently in the process of defining an Adaptive Multi Rate (AMR) codec. The source codec will operate at rates probably between 4 kbit/s and 16 kbit/s. The codec is an integrated solution tailored to the mobile application and aims to provide robust high quality speech together with the flexibility to deliver capacity enhancements by means of low bit-rate operation. The codec rate used is selected dynamically to respond to the rapidly changing radio conditions and to local capacity requirements. The selection of the codec bit rate is selected by an adaptation algorithm specific to the system application e.g. GSM or UMTS. However, the speech codec will be generic and applicable to many mobile systems.

While AMR was initially aimed at GSM, its high performance targets and the flexibility obtained by the switchable codec bit-rates (modes) make it an interesting candidate for UMTS and IMT2000. SMG11 is already examining the suitability of the codec for UMTS. The AMR speech codec specifications are planned to be completed by December 1998. Further information on the codec is provided in Appendix 2.

If TG8/1 would like further information on the codecs mentioned, SMG11 would be willing to send further details and, if appropriate, to make a presentation to TG8/1 at their next ordinary meeting in May 1998.

Appendix 1. GSM EFR speech codec

This document provides some general information on the GSM EFR specifications and on the subjective performance of the GSM EFR codec (hereafter referred to only as the “EFR codec”). A special emphasis is given to a subjective performance comparison between the EFR codec and G.729.

EFR Codec Standardization Status

The EFR codec was selected as a basis for a new high quality speech service for PCS 1900 in the US in 1995. The formal standardization procedure in TIA and T1 was completed in 1996. ETSI standardized the same codec for GSM and DCS 1800 in 1996. The EFR codec will thus be the basis of a high quality speech service for GSM, DCS 1800, and PCS 1900 systems in all continents. Today these systems together have more than 30 million subscribers and this number is growing fast.

The EFR specification is bit-exact for both the encoder and the decoder. A fixed-point C-language reference implementation is part of the specification. Test vectors are available to enable manufacturers to verify their implementation.

All parts of the EFR codec have been extensively tested for suitability for mobile environments.

EFR Codec Algorithm

The EFR codec is based on the ACELP algorithm (Algebraic Code Excited Linear Prediction). The source coding bit-rate is 12.2 kbps. The frame length of the codec is 20 ms.

VAD/DTX

The EFR standard includes a specification for VAD/DTX (or discontinuous transmission). Both voice activity detection (VAD) and comfort noise generation (CNG) are specified. The VAD/DTX function reduces the interference level of the system and saves handset power.

Error Concealment

The EFR specification provides an example algorithm for replacement of erroneous speech frames.

Channel Coding

The EFR specification includes channel coding for the GSM full-rate traffic channel (22.8 kbps). The channel coding specification is separate from the source coding specification. Channel coding is system specific and this specification is not needed as such for 3rd generation systems. However, the specification gives useful guidance for developing EFR channel coding for new radio channels. The EFR codec has been extensively tested in erroneous conditions with different error rates.

Complexity

The computational complexity of the EFR codec (encoder and decoder together) is approximately 15 MIPS with typical DSPs. The total memory requirements including RAM and ROM memory are approximately 10 k 16-bit words. Detailed complexity and memory usage analyses are included in the EFR specifications.

Delay

The algorithmic delay of the EFR codec is 20 ms.

Testing and verification

The EFR codec has been tested very extensively in connection with the standardization in both the

US and Europe. COMSAT laboratories performed subjective tests for the EFR codec in 1995. These results were used in the PCS-1900 standardization in the US. The tests included clean channel tests with different speech input levels and tandeming, a talker dependency test, channel error tests, and background noise tests.

During the ETSI standardization the EFR codec was tested according to a specified test plan in 6 different testing laboratories.

Extensive characterization tests were also carried out by ETSI. The results of all the tests carried out in ETSI standardization have been collected in a characterization document which is part of the EFR specifications.

Speech Quality

The EFR codec provides wireline quality speech in all typical usage conditions. Perhaps the most important improvement over other codecs used in different mobile systems is the speech quality in background noise conditions. Background noise (such as, e.g., car noise or street noise) is an important condition for mobile systems and has caused problems in existing systems. The ITU-T G.729 codec also has quality problems in background noise conditions.

The following tables and graphs present some test results from COMSAT laboratories where the EFR codec, the 32 kbps ADPCM codec, and the ITU-T G.729 codec were compared in subjective tests. The test results show that G.729 fails wireline quality requirements in background noise conditions and tandem conditions. G.729 is significantly worse than the EFR codec with clean speech in different input levels, talker dependency, background noise, and tandeming (mobile-to-mobile calls).

COMSAT tests

The most extensive tests comparing the EFR codec with G.729 have been performed by the COMSAT laboratories. These tests were conducted as part of the EFR codec standardization for the PCS 1900 system. The results are presented in the following.

The test conditions included the basic speech quality at different input levels, tandeming with the codec itself and with G.726 at 32kbit/s, talker dependency, and several different background noise conditions. The main results are presented in the following table. G.726 at 32kbit/s was used as a reference.

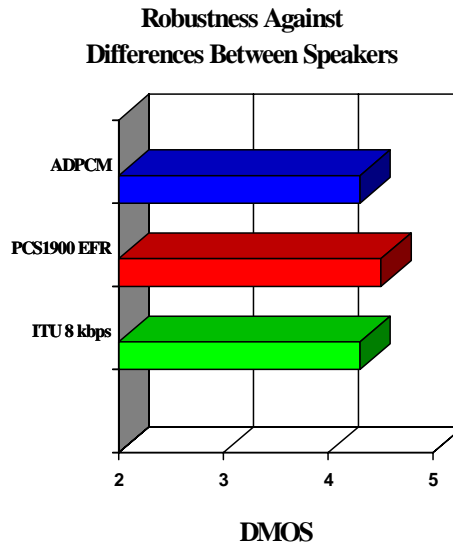
Test Condition	G.726 at 32kbit/s	GSM EFR	G.729
Clean speech, high level, -16 dBOL (MOS)	3.682	3.844	3.411
Clean speech, medium level, -26 dBOL (MOS)	3.557	3.620	3.349
Clean speech, low level, -36 dBOL (MOS)	2.974	2.865	2.740
Self-tandem = codec-codec tandem (MOS)	3.073	3.380	2.859
Tandem with G.726 at 32kbit/s (MOS)	3.161	3.568	3.307
Talker dependency (DMOS)	4.302	4.503	4.302
Background noise, Home noise 20 dB (DMOS)	4.538	4.650	4.263
Background noise, Car noise 10 dB (DMOS)	4.425	4.506	3.919
Background noise, Car noise 20 dB (DMOS)	4.575	4.556	4.138
Background noise, Street noise 10 dB (DMOS)	3.681	4.125	3.700
Background noise, Office noise 20 dB (DMOS)	4.281	4.481	3.700

Full characterisation data on the EFR codec is contained in the ETSI Technical Report "Performance Characterisation of the GSM EFR speech codec", GSM 06.55.

The following graphs show some of the results in an easy-to-read graphical form. "ADPCM" refers to the 32 kbps G.726 codec, "PCS1900 EFR" refers to the EFR codec, and "ITU 8 kbps" refers to the G.729 codec.

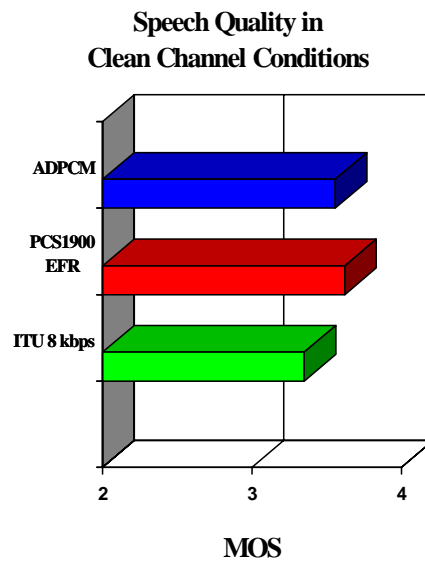
Talker Dependency Test

- Degradation category rating (DMOS)
- Input level -26 dBmOL
- 32 kbps ADPCM as a landline reference
- ITU modified IRS weighting
- 32 listeners
- 48 sentence pairs (12 speakers)



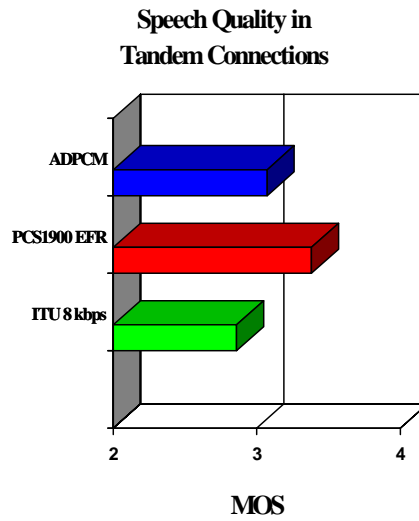
Clean Channel Tests

- Absolute category rating (MOS)
- Input level **-26 dBmOL**
- 32 kbps ADPCM as a landline reference
- Flat weighting
- 32 listeners
- 48 sentence pairs (6 speakers)



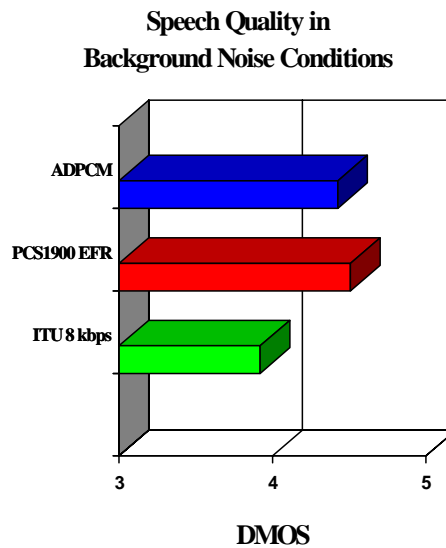
Tandeming Tests

- Codec/codec tandem
- Absolute category rating (MOS)
- Input level -26 dBmOL
- 32 kbps ADPCM as a landline reference
- Flat weighting
- 32 listeners
- 48 sentence pairs (6 speakers)



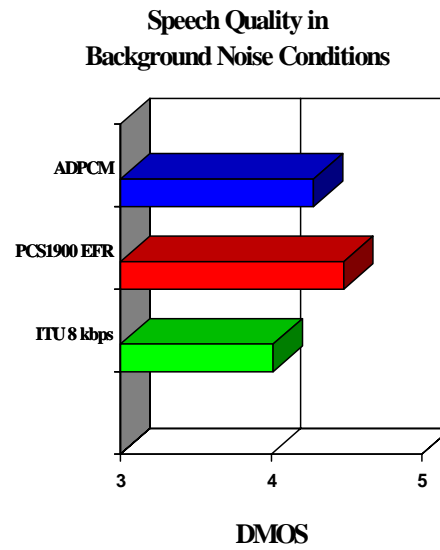
Background Noise Test

- Car Noise, 15 dB S/N
- Degradation category rating (DMOS)
- Input level -26 dBmOL
- 32 kbps ADPCM as a landline reference
- Flat weighting
- 36 listeners
- 36 sentence pairs (4 speakers)



Background Noise Test

- Office Noise, 20 dB S/N
- Degradation category rating (DMOS)
- Input level -26 dBmOL
- 32 kbps ADPCM as a landline reference
- Flat weighting
- 36 listeners
- 36 sentence pairs (4 speakers)



ETSI GSM EFR Pre-Selection Tests (Tele Danmark Research)

Tests have also been performed by Tele Danmark Research to compare G.729 directly with the EFR codec. The results show that in all test conditions (basic speech quality, background noise, talker independence) the EFR codec is better than G.729. Furthermore, the results confirm that in background noise G.729 performs clearly worse than the wireline reference.

The tests included an Absolute Category Rating (ACR) test for basic speech quality as well as Degradation Category Rating (DCR) tests for background noise performance (vehicle noise, music) and talker dependency. The ACR test results are presented in MOS and the DCR test results in DMOS. The following table summarizes the results for the different test conditions. The G.728 speech codec (16 kbps LD-CELP) was used as a wireline reference.

Test Condition	Reference G.728	GSM EFR	G.729
Clean speech (MOS)	3.43	3.65	3.32
Vehicle Noise, 10 dB SNR (DMOS)	4.59	4.26	3.72
Background music, 20 dB SNR (DMOS)	4.24	4.20	3.41
Talker dependency, male (DMOS)	4.34	4.77	4.56
Talker dependency, female (DMOS)	4.36	4.81	4.51
Talker dependency, child (DMOS)	4.38	4.83	4.40

ETSI GSM EFR Pre-Selection Tests (BT)

The tests performed by BT also compare G.729 directly with the EFR codec. The test results (Annex 3) are in conformance with the Tele Danmark Research test results. In all test conditions the EFR codec is better than G.729. Furthermore, G.729 is significantly worse than the wireline reference in background noise. Both the Tele Danmark Research and BT test results also show that G.729 quality varies depending on the talker more than the EFR codec quality. Specifically, child voices give much better results with the EFR codec.

The tests included an Absolute Category Rating (ACR) test for basic speech quality as well as Degradation Category Rating (DCR) tests for background noise performance (vehicle noise, music) and talker dependency. The ACR test results are presented in MOS and the DCR test results in DMOS. The following table summarizes the results for the different test conditions. The G.728 speech codec (16 kbps LD-CELP) was used as a wireline reference.

Test Condition	Reference G.728	GSM EFR	G.729
Clean speech (MOS)	3.85	3.96	3.67
Vehicle Noise, 10 dB SNR (DMOS)	4.54	4.36	3.64
Background music, 20 dB SNR (DMOS)	4.46	4.29	3.75
Talker dependency, male (DMOS)	4.56	4.89	4.50
Talker dependency, female (DMOS)	4.61	4.91	4.71
Talker dependency, child (DMOS)	4.80	4.82	4.53

Appendix 2. Information on the AMR codec standardization

1. Overview.

Most speech codecs including the existing GSM codecs operate at a fixed coding rate. Channel protection (against errors) is added also at a fixed rate. The coding rates are chosen as a compromise between best clear channel performance and robustness to channel errors. The AMR system achieves performance improvements by adapting the speech and channel coding rates near-instantaneously to respond to the changing quality of the radio channel. This gives better clear channel quality and better robustness to errors.

As well as quality improvements, mobile networks need the capability to increase capacity by operating at low bit rates on some or all mobiles. The radio resource algorithm, enhanced to support AMR operation, selects the codec bit-rate according to channel quality and the traffic load on the cell in order to obtain the best balance between quality and capacity. It is intended that the control system should not be fixed but can be enhanced as experience of the AMR system is gained on real networks; it may also be tuned to meet particular operator's network needs.

The codec can be applied in many ways of which important examples are

- robustness to channel errors.
- increasing network capacity by operating at a low source coding rates
- ability to trade speech quality and network capacity in a controlled manner according to radio and traffic conditions and to operator priorities.

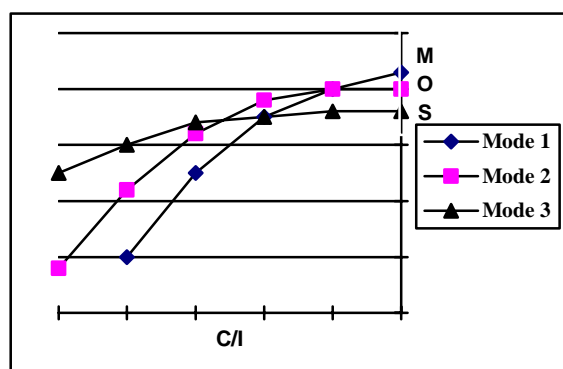
Typical codec parameters

The performance requirements for the AMR codec have been defined but the precise bit-rates have not been selected yet.

Source coding rates	4 kbit/s to 16 kbit/s
Clear channel performance at high source coding rate	Same as EFR (see Appendix 1)
Background noise performance at high source coding rates	Same as EFR

GSM application

When AMR is applied to the GSM system which uses a TDMA radio multiplex structure and operates at two gross bit-rates of 22.8 kbs and 11.4 kbs, a family of performance curves is yielded as shown in the example below. In this example, three codec modes are shown all operating in a 22.8 kbs channel including channel protection and the performance is illustrated as a function of carrier to interference ratio.



The AMR speech codec is applicable to other access technologies in which case the use of the different bit-rates and the mode switching may be quite different from that of GSM. The overall performance will depend on the specifics of the channel and any rate control (adaptation) system.

Appendix 3. ITU-R TG8/1 LS to ITU SG 16



INTERNATIONAL TELECOMMUNICATION UNION
**RADIOCOMMUNICATION
STUDY GROUPS**

**Revision 1 to
Document 8-1/TEMP/153-E
18 September 1997
Original: English only**

13th Meeting of Task Group 8/1
8-19 September 1997, Toronto, Canada



Ad Hoc ITU-T

DOCUMENT CATEGORY	: Liaison statement
SOURCE	: AH ITU-T
APPROVAL STATUS	: Approved
DATE	: 18 September 1997
TO	: ITU-T SG 16
ACTION	: Forward to SG 16
SCHEDULE	: --

LIAISON STATEMENT TO ITU-T SG 16 SPEECH AND MULTIMEDIA CODING FOR IMT-2000

Task Group 8/1 thanks ITU-T SG 16 for its liaison on the progress on speech coding issues for IMT-2000. We are pleased to hear that the G.729 speech codec at 8 kbit/s has passed the intensive test on the robustness against both random bit errors and detected frame erasures and that the floating-point implementation of the coder has been determined for decision of SG16 in January 1998. TG 8/1 is also aware of the delayed time schedule for the standardization process for the 4 kbit/s speech coder.

Task Group 8/1 believes that the G.729 codec at 8 kbit/s and its extensions at 12 kbit/s could be appropriate for speech codecs for IMT-2000. Noting that the 12 kbit/s speech coder of the G.729 can be applied for music, we wish to know about other candidate audio codecs for IMT-2000 and their performance and characteristics.

We also like to hear about the activities on multimedia compression, multiplexing and control issues with candidate codecs associated with IMT-2000 application, both inside and outside of ITU. We encourage SG 16 to assist TG 8/1 in developing the requirements (bit-rate, delay, etc.) for multimedia streams, e.g. audio, video, control or data to define the IMT-2000 requirements.

Further information on the channel model requested by SG 16, will be specified when the candidate radio interfaces are to be submitted for evaluation next year.

TG 8/1 strongly invites your experts to participate in the 14th meeting of Task Group 8/1 in Geneva during 27 April to 8 May 1998, and wishes to liaise closely with SG 16.

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ETSI SMG
SMG#24
Madrid, Spain
15 – 19 December 1997

Tdoc SMG 1145/97

To: T1P1

Subject: Response to Letter on Process Refinements

SMG has received and studied your proposal for refinement of the co-operation process. SMG agrees to your proposal that for the work items for which T1P1 is the designated lead, the CRs to GSM specifications will be presented to the responsible STCs for review, comment and endorsement. SMG agrees that T1P1 then presents these CRs and documents which are related to the work item to the SMG plenary for final agreement.

It is the experience of SMG, that to ensure a smooth handling of work item documentation at SMG meetings, that it is important that the final version of CRs and other documentation has been made available for the members of the relevant STCs. This can be done by providing the final documentation either at the STC meetings or by use of the STC's E-mail reflector. Therefore SMG recommends T1P1.5 to do so in advance of the SMG plenary meeting. It is also helpful for SMG delegates to have a clear indication that the documentation has been seen by the STCs.

**ETSI SMG Plenary
Madrid, 15-19 December 1997**

**Tdoc SMG 1150 / 97
Agenda Item: 5.2**

Source: PT SMG

**Title: Road map for GSM phase 2+ and UMTS
Work Items - Version 24.0**

Date: December 19, 1997

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Note: Road-Map here-in contained is based upon inputs received from SMG STC Chairmen during SMG#24.

Following SMG#24, STCs and PT SMG may propose revisions of this paper which will be reflected in intermediate versions 24.x

This document (RdMap240.doc) is extracted from the WI Data Base and has the same version number as the Work Item Data Base (WI-24-0.mdb).

1. GSM Phase 2 - Finalized at or before SMG#15

These Work Items were introduced in GSM Specifications V4.X.Y Series.

WORK ITEM TITLE
BSS Repeaters (RPT)
DCS1800 4 Watt mobile power class
Operation of Multi-band GSM/DCS by a single Operator
SMS concatenation
Three Volt Technology SIM
Display of Service Provider Name by the ME

2. GSM Phase 2+ Before R96

WORK ITEM TITLE
Compression of User Data
DECT access to GSM networks
SIM I/F data Transfer Speed Enhancement
Special SMS Message indication
Transparently supporting UPT phase 1

3. GSM Phase 2+ R96 - As finalized at SMG#21

WI Title	Prime responsible STC
Network Identity and Time Zone	SMG01
Explicit Call Transfer (ECT)	SMG01
High Speed Circuit Switched Data (HSCSD)	SMG01
Radio Local Loop (RLL) using GSM - This is a Report -	SMG01
CAMEL phase 1	SMG01
Enhanced Full Rate Speech codec (EFR)	SMG01
Support of Optimal Routeing (SOR)	SMG01
ME Personalisation	SMG01
Barred Dialling Numbers	SMG01
Support of additional call set-up MMI procedures	SMG01
Second SMS broadcast channel	SMG01
Handsfree MS	SMG02
Enhanced Multi-Level Precedence and Pre-emption Service - phase 1	SMG03
Voice Group Call Service (VGCS) - phase 1	SMG03
Voice Broadcast Service (VBS) - phase 1	SMG03
Improved Transcoder Handling (First Alternative)	SMG03
Packet Data on Signalling Channels	SMG03
Concurrent SMS/CB and data transfer in 07.05	SMG04
Extensions to the SMS alphabet	SMG04
SMS Interworking Extensions	SMG04
Support of Restricted Digital Information and V.120 rate adaptation in GSM	SMG04
Inclusion of deferred tracing capabilities in GSM 12.08	SMG06
Service Dialling Numbers	SMG09
SIM Application Toolkit	SMG09
14.4 kbit/s User Data Rate	T1P1

4. GSM Release 97 - At SMG#24

	Date due SMG	Prime	WI rapporteur
Network Indication of Alerting in the MS (Calls&NW initiated USSD)	S24	SMG01	Nicolas Renaud
CAMEL phase 2	S25	SMG01	Stefan Kleier
SMS enhancements phase 1	S24	SMG01	Nicolas Renaud
Support of Private Numbering Plan (SPNP)	S23	SMG01	Ms T.Sundbye
Completion of Calls to Busy Subscriber (CCBS)	S25	SMG01	Mr N.Jorgensen
General Packet Radio Service Phase 1 (GPRS) - radio part	S24	SMG02	J.Hamalainen
BTS performance requirements for very small cell scenarios	S24	SMG02	Howard Benn
Mobile Assisted Frequency Allocation (MAFA)	S24	SMG02	Mr B.Persson
MS Antenna Test Method	S24	SMG02	Olle Edvardsson
General Packet Radio Service Phase 1 (GPRS) - network part	S24	SMG03	Hans Petter Naper
ASCI Phase 2	S24	SMG03	PT SMG
Overload control enhancement for Location Registers	S23	SMG03	Required
Interworking with Mobile Satellite Systems	tbd	SMG03	NN
New Multiplexing Protocol on the ME-TE Interface	S24	SMG04	Lars Novak
SMS Mobile Busy	S25	SMG04	Mr P.Edlund
Support of Shared Interworking Function (SIWF)	S24	SMG04	Mr S.Ouvrier
Modeling of Fault Management Services	S26	SMG06	Mark Cataldo
A-bis Management of Alarms/faults on the BTS site	S26	SMG06	Mr. A. Yuhan
A-bis Management of reconfiguration of BTS site	S26	SMG06	Mr. A. Yuhan
A-bis Management of Measure on the BTS site	S26	SMG06	Mr. A. Yuhan
Security mechanisms for the SIM Toolkit feature	S24	SMG09	Nigel Barnes
Characteristics and test methods for handsfree mobile station	S24	SMG11	Mr J-Y Monfort
Calling Name Presentation (CNAP)	S24	T1P1	Sonia Doshi
North American Equal Access	S23	T1P1	Stephen Hayes
Service Provider Number Portability (USA)		T1P1.5	

5 GSM Release 98 Snap-Shot at SMG#24

WI Title	Releas	Date due	Prime	WI rapporteur	WI Rapp
Technical Enhancements/improvements for phase 2	tbd	unknown	All STCs	PT12	
Call Deflection	98	S28	SMG01	Mr A.Conrad	T-Mobil
FOLLOW ME	98	S28	SMG01	Erwin Postmann	Siemens
Forwarding of SMSs	98	S26 ?	SMG01	Nicolas Renaud	France Telecom
GSM Cordless Telephony System CTS ("Home Base Station")	98	S26	SMG01	Mikael Dahlkvist	Ericsson
GSM Mobile Number Portability (EURO)	98	tbd	SMG01	Willem Levelt	KPN
ISDN-based DECT/GSM interworking - ph 1 and Ph 2 R98	98	S23	SMG01	Ms I.Graetz	Siemens AG
Localized Service Area (SoLSA) Renamed from "Home Area Priority"	98	S28	SMG01	Tommy Kokkola	Nokia
Multiple Subscriber Profile (MSP)	98	S25 ?	SMG01	Ian Crawford	Vodafone
Network Indication of Alerting in the MS (Mobile Terminated Short message)	98		SMG01		
User-to-User Signalling (UUS)	98	S28	SMG01	Mr A. Conrad	T-Mobil
USSD Enhancements	98		SMG01	Olle Eriksson	L M Ericsson
General Packet Radio Service Phase 2 (GPRS) - radio part	98	S28	SMG02	J.Hamalainen	Nokia
Improved Data Rates through Optimised Modulation	tbd	tbd	SMG02	Johan Sköld	Ericsson
Service to GSM Handportables in trains	tbd	unknown	SMG02	Required	
Calling line identification enhancements	tbd	unknown	SMG03	Required	
Efficient cellular support of new services in GSM network service areas	tbd	tbd	SMG03	Required	
Exchange of network capabilities information	tbd	unknown	SMG03	Required	
General Packet Radio Service Phase 2 (GPRS) - network part	98	S28	SMG03	H.Kari	Nokia
Generic signalling mechanism for service support	tbd	unknown	SMG03	Required	
Idle mode classmark	tbd	unknown	SMG03	Required	
LAPDm performance enhancement	98	S26	SMG03	None	
Tandem Free Operation of speech codecs in Mobile-to-Mobile Calls (MMCs)	98	S26 >	SMG03/11	W.Navarro	Nortel
MS Application Execution Environment	98	S28	SMG04	John Candish	Nortel
Enhancements of Fault Management Services	98	S26	SMG06	Mark Cataldo	Lucent
GSM 1900 Conformance Testing (Handsets)	98 Pending	tbd	SMG07	Carl Warfel	BellSouth
Development of the SIM test specification (GSM Phase 2)	tbd	S25	SMG09	Gary A. Waite	Aspects Software Ltd.
Interworking with non-GSM applications on the SIM	98	S23 ?	SMG09	Mr W.Mohrs	T-Mobil
Low Voltage SIM/ME Specification	tbd	S30	SMG09	Rune Lindholm	Nokia
Mutual Authentication	98 ??	S23	SMG09	Ms S.Manning	Vodafone
Fraud Information Gathering System(FIGS)	98	S23	SMG10	Tim Wright	Vodafone
Lawful Interception	98	S25	SMG10	David Miles	Cellnet
Adaptive Multi-Rate (AMR)	98	S28	SMG11	Kari Jarvinen	Nokia
Test methods for handset and headset mobile station	98	S25	SMG11	Ian Goetz	Cellnet
GSM / AMPS Roaming	98 ?	unknown	T1P1.5	Ed Ehrlich (Contact)	Nortel
Harmonization of the PCS1900 Standards with the GSM Base Specification	98	S26	T1P1.5	Kerry Weaver	Nokia
Requirements for equipments/systems interfacing GSM	tbd	tbd	tbd		

6. GSM Phase 2+ and UMTS Release 99 and beyond

Work Items for UMTS will be introduced in the next version of this document.

7. GSM Phase 2+ New Work Items being prepared

WI Title	Prime responsible	WI rapporteur	WI Rapp company
GSM 1900 Conformance Testing (Handsets)	SMG07	Carl Warfel	BellSouth

8. Work Items deleted by SMG

WI Title
Adaptions for deregulated networks
Advice of Charge on Special Services (AoCSS)
Call Forward Enhancements (CFE)
Completion of Calls to Subscriber when No Reply (CCNRy)
Completion of Calls to Subscriber when Not Reachable (CCNRc)
Direct Subscriber Access and Restriction (DSAR)
Exchange of network capabilities information
Fault and Configuration Management for Other Elements
Fault and Configuration Management of OA&M Capabilities
IMEI Security Enhancements
Inter operation with UPT phase 2
Malicious Call ID (MCID)
Mobile Access Hunting (MAH)
Network level Management
New Barring Services
Overload control enhancement for Location Registers
Payphone Services
Premium Rate Services
Standard access SMS, SC-SMES
Subscriber Class for AoC
Transmission of date/time via CB
Unified SMS CB scheduling algorithm
Universal access to freephone numbers

9. Work Items proposed for deletion by STC's

WI Title	Comments
Emergency Call TS12 with additional Data Transfer	No progress
Enhancement of MAP Extensibility Mechanisms	
Provisions for Hot Billing	No input received from MoU- BARG/TADIG's WI "Near real time Record transfer" ?

10. Work Items renamed

WI Title	WI RENAMED
Location Services	Wireless Mobile Station Location
Support of Home Area Priority	Support of Local Service Area (SoLSA)
Network control of ringing tones (Renamed)	Network Indication of Alerting in the MS

ETSI/SMG#24
Madrid, Spain
15 - 19 December 1997

SMG 97-1160

To IrDA Special Interest Group

From SMG

Title: Mobile Station to Terminal Equipment Infra Red interface

During 1997 ETSI technical committee SMG agreed a work item for a new GSM specification which describes a multiplexing protocol between a TE and an MS which is independent of the physical connection. This would allow different services (e.g. data, phonebook management and SMS) to run in parallel over a single serial interface.

This specification (GSM 07.10) has now been elaborated by SMG's data services subgroup (SMG4) and is expected to be finally approved in March 1998.
During the work on GSM 07.10 it was noted that the IrDA Special Interest Group has already addressed many but not all of the requirements for GSM 07.10 .

SMG recognizes that an infra red interface is inevitable for GSM phones but at present there is a risk that mobile manufacturers will achieve this by proprietary means. In order to achieve industry support of a standardized interface, SMG would like to understand more about the intentions of the IrDA Special Interest Group and encourage discussions between ETSI SMG4 and the IrDA Special Interest Group so that the requirements of GSM could potentially be met by an infra red physical interface.

If IrDA Special interest Group feel that this would be a suitable approach, SMG4 would be prepared to arrange for a joint meeting of the interested parties in a short time frame.¹

Attached to this LS is a short note outlining SMG4's requirements and a copy of draft GSM 07.10.

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Stefan Aprath, PT SMG, Tel. +334 92944324, email: stefan.aprath@etsi.fr

ETSI/GSM Multiplexing Protocol for the connection between a Terminal equipment and a GSM mobile phone.

It is becoming increasingly important for the connection between a GSM mobile phone and a Terminal equipment to support a number of concurrent services. e.g. SMS, Circuit switched data, Facsimile, Voice, GPRS.

The outline of these requirements are as follows :-

1. encapsulate existing standardised GSM protocols without the need to change the GSM protocol being encapsulated.
2. be optional and capable of being enabled by the TE and or the MS
3. optionally allow for error detection (e.g. CRC) on a per virtual channel basis
4. provide byte (8 bit) transparency - preferably without the need for bit stuffing.
5. include a channel addressing mechanism for each 'application'
6. support digital voice
7. provide a priority mechanism
8. be efficient on electrical power consumption
9. be efficient on memory capacity utilisation
10. be efficient on processing power utilisation
11. provide out of band (RTS/CTS) and in band (X-ON/X-OFF) flow control for each virtual channel and for the physical channel
12. have a low power/wake up mechanism
13. be easy for a TE software developer to implement
14. introduce minimal delay
15. be efficient for data transfer. i.e. minimal protocol overhead / bandwidth considerations.
16. capable of operating over an asynchronous V24 interface in start stop format.
17. preferably be based on an existing standard.
18. have no IPR restrictions.
19. have variable length capability
20. have the ability to operate full duplex
21. provide optional error recovery by retransmission (ARQ) and time-out supervision.
22. make provision for autonomous exit by the MS and TE
23. capable of auto re-synchronisation in event of TE/MS disconnection - reconnection
24. make provision for handling incoming (mobile terminated) unsolicited calls. e.g. Fax
25. be capable of handling digitised voice

SMG4 has studied a number of areas where work had been done on similar multiplexing requirements including IrDA but found none which were suitable without change. Consequently, in order to progress their work speedily, SMG4 has generated a GSM Technical Specification 07.10 (a copy of which is attached) which satisfies GSM's requirements. However SMG4 is well aware of the interest in providing a multiplexing infra red interface to GSM mobile phones.

It may be possible to consider the support of 07.10 over an infra red interface since 07.10 is independent of the physical connection. Alternatively, it may be possible for IrDA to be enhanced / modified to incorporate the requirements for a GSM multiplexing protocol.

SMG4 feels that it would be beneficial to understand more about the intentions of the IrDA Special Interest Group and to convey to them the requirements for GSM mobile phones as seen by SMG4 through a joint meeting.

TE-MS Multiplexer
[GSM/UMTS spec 07.10]



European Telecommunications Standards Institute

Reference

<Workitem>

Keywords

<keyword[, keyword]>

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Intellectual Property Rights

To be inserted by PT12. There are no known IPR issues concerning TS 07.10 or its Annexes.

Foreword

To be inserted by PT12.

Introduction

The 07.10 multiplexer protocol is operating between a MS and a TE and allows a number of simultaneous sessions over a normal serial asynchronous interface. Each session consists of a stream of bytes transferring all kinds of data, for instance voice, fax, data, SMS, CBS, phonebook, battery status, GPRS, USSD etc. This permits, for example, SMS and CBS to be transferred to a TE when a data connection is in progress. Many other combinations are possible including digital voice. It is for instance possible to transfer digital voice in combination with SMS. The multiplexer allows a complete system to be partitioned in a flexible way between a MS and TE.

The design of the multiplexer is flexible and independent of MS/TE platforms, and it allows existing applications to work without any modifications.

The multiplexer is designed, with special care for battery-powered devices, to include very important functionality such as power saving control and priorities. It is also specially designed to require minimum processing power and memory consumption.

The multiplexer has two modes, basic and HDLC.

The HDLC mode, which is based on the ISO HDLC standard (ISO/IEC 13239:1997) has two sets of procedures; a simple set and an optional set which includes full error recovery. The basic mode and the HDLC simple set are intended for use in situations where the link between MS and TE is essentially error free and neither mode provides error-recovery procedures.

The basic mode is intended for use in situations where the HDLC transparency mechanism (byte stuffing) can not be implemented.

The optional set of HDLC procedures are intended for use in situations where the link is subject to errors.

Both modes, basic and HDLC, have one common multiplexer control channel. On this channel, management information is exchanged, such as parameter negotiation, power saving control information, testing, flow control, close down etc.

The multiplexer is optional, but when supported, it is activated with the 07.07 AT+CMUX command.

1 Scope

"This document specifies/establishes/gives guidance on/defines..."

"This document is applicable to ..."

2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

2.1 Normative references

- [1] EN 301 234 (V2.1 onwards): "Example 1".
- [2] EG 201 568 (V1.3.5): "Example 2".

2.2 Informative references

- [3] ETS 300 499 (1996): "Example 3".
 - [4] ETS 300 999: "Example 4".
-

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

<defined term>: <Definition>.

example: The text serving as an example.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

<symbol>	<Explanation>
<2 nd symbol>	<2 nd Explanation>

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

<ACRONYM1>	<Explanation>
<ACRONYM2>	<Explanation>

4 Overview of Multiplexing System

The multiplexer provides mechanisms for conveying streams of data between TE and MS over a single start-stop framed, serial link. Figure 1 shows the arrangement of the various protocol levels and functions. The multiplexer layer provides multiplexing of data arranged in octet streams with no other framing; if the structure of the data has to be

conveyed, a convergence layer may be necessary. This Specification defines some convergence layers, others may be added later.

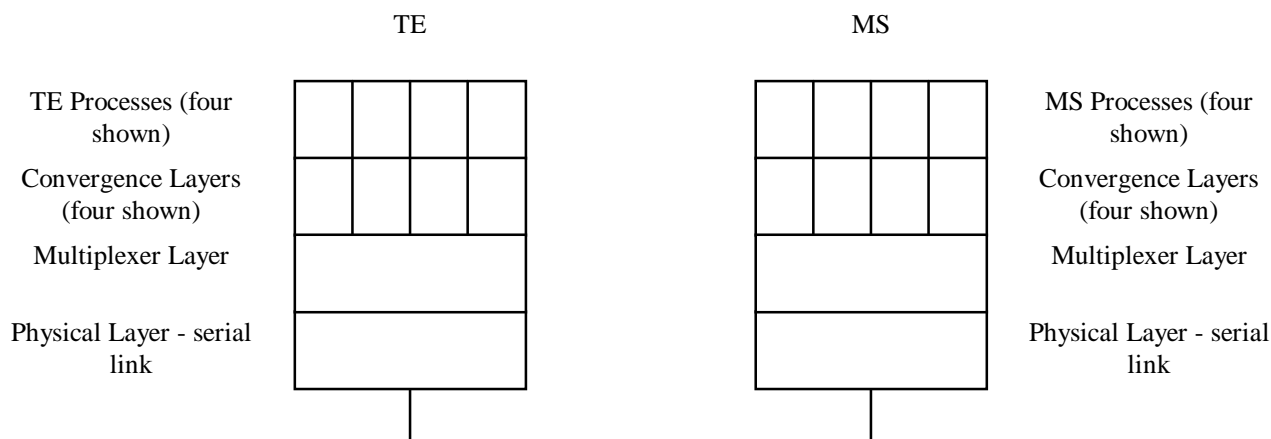


Figure 1: Protocol Stacks

The multiplexer provides a virtual connection between a process in the TE and a similar process in the MS. For example, a PC application supporting SMS functions could be connected to the SMS handler in the MS via a multiplexer channel.

This Specification uses start-stop transmission with eight-bit characters. Communication between the two multiplexing entities takes place using frames constructed as defined below.

Each channel between TE and MS is called a Data Link Connection (DLC) and is established separately and sequentially.

Each DLC may have individual flow control procedures for buffer management purposes and the aggregate link also has overall flow control mechanisms.

5 HDLC Mode

This section describes the HDLC mode of operation which relies heavily on the well-known and long-established High-level Data Link Control (HDLC) procedures described in ISO/IEC 13239. The main characteristics of the HDLC mode are given below:

- A simple set of procedures with no error recovery mechanism, for use on reliable connections.

- An optional set of procedures including an error recovery mechanism, for use on connections subject to errors.

- A multiplexer control channel which conveys management and control information between the MS and TE.

- A mechanism that permits either MS or TE to enter power-saving modes without compromising the integrity of the multiplexer.

- A comprehensive set of convergence layers which enables many types of data to be carried while preserving the structure of the original data.

- The ability to operate on connections which use either hardware or software (XON/XOFF) flow control.

The simple set of procedures uses UIH frames to transmit information; these frames are easy to process because their structure permits the HDLC Frame Check Sequence (FCS) to be pre-calculated rather than being constructed on a

character-by character basis. The procedures used are very straightforward and it is not necessary to implement the usual HDLC state machines.

The optional set of procedures uses I frames as its transmission mechanism for data which needs protection. Alternatively, UI frames or UIH frames may be used for those channels where the timely delivery of the information is more important than its reliability because erroneous frames will be discarded. UI frames would be used in those cases where it is important that the data delivered is accurate.

DLCs have two modes of operation; error-recovery mode (ERM) and non-error-recovery mode (non-ERM), the choice of mode is made when a DLC is established. DLCs using ERM may exist on the same link as DLCs using non-ERM. The use of ERM is optional. Non-ERM uses the UI frame or UIH frame to carry user data; ERM uses the I frame.

5.1 Frame Structure and Frame Types

All information transmitted between the TE and MS is conveyed in frames. The structure of the frames described in this document are in accordance with ISO/IEC 13239:1997.

5.1.1 Frame Structure

The frame structure is shown in Figure 2. Note that this structure does not include information added for synchronisation (i.e. Start and stop bits) or transparency purposes. The order of transmission is from left to right.

Flag	Address	Control	Information	FCS	Flag
0111 1110	1 octet	1 octet	Unspecified length but integral number of octets	1 octet	0111 1110

Note that the closing flag may also be the opening flag of the following frame.

Figure 2: Frame Structure

5.1.1.1 Flag Sequence Field

Each frame begins and ends with a flag sequence octet which is defined as the bit pattern 0111 1110 (7Eh).

5.1.1.2 Address Field

The address field consists of a single octet. It contains the Data Link Connection Identifier (DLCI), the C/R bit and the address field extension bit as shown in Figure 3.

Bit No.	1	2	3	4	5	6	7	8
	EA	C/R	D		L	C	I	

Figure 3:Format of Address Field

The DLCI is used to identify an individual user information stream as well as to identify connections between TE and MS. Multiple DLCIs shall be supported but the number is implementation-specific. The DLCIs are dynamically assigned. The values used for specific DLCIs are given in clause 5.4.

The C/R (command/response) bit identifies the frame as either a command or a response. In conformance with HDLC rules, a command frame contains the address of the data link connection entity to which it is transmitted while a response frame contains the address of the data link connection entity transmitting the frame. For a given DLC, the DLCI value of the address field remains the same but the C/R bit changes, as shown in Table 1.

Table 1: Command/response bit usage

Command/response	Direction		C/R value
Command	Initiator	————→ Responder	1
	Responder	————→ Initiator	0
Response	Initiator	————→ Responder	0
	Responder	————→ Initiator	1

According to the rules of ISO/IEC 13239:1997, the range of the address field may be extended by use of the EA bit. When the EA bit is set to 1 in an octet, it signifies that this octet is the last octet of the address field. When the EA bit is set to 0, it signifies that another octet of the address field follows. In this Specification there is only one address octet so the EA bit is always set to 1. Note that future amendments to this Specification may extend the address field and use the EA bit.

5.1.1.3 Control Field

The content of the control field defines the type of frame. The control fields of the frames used in this Specification are described in Table 2.

Table 2: Coding of Control Field

Frame Type	1	2	3	4	5	6	7	8	Notes
SABM (Set Asynchronous Balanced Mode)	1	1	1	1	P/F	1	0	0	
UA (Unnumbered Acknowledgement)	1	1	0	0	P/F	1	1	0	
DM (Disconnected Mode)	1	1	1	1	P/F	0	0	0	
DISC (Disconnect)	1	1	0	0	P/F	0	1	0	
UIH (Unnumbered Information with Header check)	1	1	1	1	P/F	1	1	1	
UI (Unnumbered Information)	1	1	0	0	P/F	0	0	0	Optional
I (Information)	0	N(S)			P/F	N(R)			Optional
RR (Receiver Ready)	1	0	0	0	P/F	N(R)			Optional
RNR (Receiver Not Ready)	1	0	1	0	P/F	N(R)			Optional
REJ (Reject)	1	0	0	1	P/F	N(R)			Optional

In Table 2, P/F is the Poll/Final bit and N(R) and N(S) are receive and send sequence numbers, respectively. The functions of these bits are described later.

5.1.1.4 Information Field

The information field is the payload of the frame and carries the user data and any convergence layer information. The field is octet structured. The information field is only present in I frames, UI frames and UIH frames.

5.1.1.5 Frame Checking Sequence Field (FCS)

The FCS shall be the ones complement of the sum (modulo 2) of

a) the remainder of

$$x^k (x^7 + x^6 + x^5 + x^4 + x^3 + x^2 + x^1 + 1)$$

divided (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1,$$

where k is the number of bits in the frame existing between, but not including, the final bit of the opening flag and the first bit of the FCS, excluding start and stop elements (start/stop transmission), and bits (synchronous transmission) and octets (start/stop transmission) inserted for transparency, and

b) the remainder of the division (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1$$

of the product of x^8 by the content of the frame existing between, but not including, the final bit of the opening flag and the first bit of the FCS, excluding start and stop elements (start/stop transmission), and bits (synchronous transmission) and octets (start/stop transmission) inserted for transparency.

As a typical implementation, at the transmitter, the initial content of the register of the device computing the remainder of the division is preset to all ones and is then modified by division by the generator polynomial (as described above) of the address, control and information fields; the ones complement of the resulting remainder is transmitted as the 8-bit FCS.

At the receiver, the initial content of the register of the device computing the remainder is preset to all ones. The final remainder after multiplication by x^8 and then division (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1$$

of the serial incoming protected bits and the FCS, will be 1111 0011 (x^7 through x^0 , respectively) in the absence of transmission errors.

In the case of the UIH frame the FCS is calculated on the contents of the address and control fields only. This means that the I-field is not protected but does permit pre-calculation of the FCS for the repertoire of DLCIs that are to be used. The FCS is calculated in the normal manner for all other frames in Table 2.

5.1.2 Format Conventions

All transmitted characters will be sent using one start bit, eight data bits, no parity bit and one stop bit.

In the field descriptions, bit 1 is transmitted first.

Addresses, commands, responses and sequence numbers shall be transmitted low-order bit first (for example, the first bit of the sequence number that is transmitted shall have the weight 2^0).

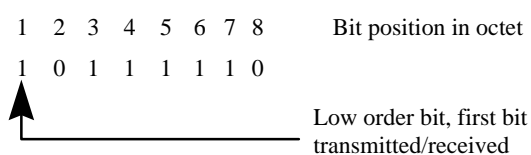
The FCS shall be transmitted to the line commencing with the coefficient of the highest term.

NOTE: The use of these conventions in this Specification means that octet values are often expressed in the reverse bit order from conventions used in many other standards. The conventions are used here because of the importance of the correct order of bit transmission; care should be taken during implementation.

5.1.3 Transparency

5.1.3.1 Control-octet transparency

The following transparency mechanism shall be applied to each frame from address field to FCS field inclusive. The control escape octet is a transparency identifier that identifies an octet occurring within a frame to which the following transparency procedure is applied. The encoding of the control escape octet is:



The transmitter shall examine the frame between the opening and closing flag sequences including the address, control, and FCS fields and, following completion of the FCS calculation, shall:

Upon the occurrence of the flag or a control escape octet, complement the 6th bit of the octet, and

Insert a control escape octet immediately preceding the octet resulting from the above prior to transmission.

The receiver shall examine the frame between the two flag octets and shall, upon receipt of a control escape octet and prior to FCS calculation:

Discard the control escape octet, and
Restore the immediately following octet by complementing its 6th bit.

NOTE: Other octet values may optionally be included in the transparency procedure by the transmitter. Such inclusion shall be subject to prior system/application agreement.

5.1.3.2 Start/stop transmission - extended transparency

When necessary, and if negotiated between the stations, the transmitter may apply the above transparency procedure to other octets in addition to the flag and control escape octets. At present, the only other octets are flow-control characters. The procedure is described in clause 5.1.3.2.1.

5.1.3.2.1 Flow-control transparency

The flow-control transparency option provides transparency processing for the DC1/XON and DC3/XOFF control characters defined in ISO/IEC 646 (i.e., 1000100x and 1100100x, respectively, where x may be either 0 or 1). This has the effect of assuring that the octet stream does not contain values which could be interpreted by intermediate equipment as flow control characters (regardless of parity).

5.1.4 Frame Validity

An invalid frame in the frame format is one which meets any one (or more) of the following conditions:

- is not properly bounded by two flags;
- does not have at least three octets between flags after removal of characters inserted for transparency;
- indicates presence of a transmission error in that the FCS check fails;
- contains an address field with more than one octet.

Invalid frames shall be discarded without notification to the sender. Actions taken by the multiplexer to indicate reception of an invalid frame to the MS or TE are left to implementors. However, an indication that a frame with an FCS error has been received may be of use when supporting DLCs for voice/audio.

As an optional procedure in response to an invalid frame in error recovery mode, a receiver may transmit an REJ frame.

5.1.5 Frame Abort

Aborting a frame is not supported.

5.1.6 Inter-frame Fill

The time between frames shall be filled by sending continuous stop-polarity except in the case of the wake-up procedure (see clause 5.2.5). The receiver shall also operate correctly if the time between frames is filled with flag characters. If a receiver receives more than three consecutive flags it shall begin to transmit continuous flags at the first available time (see clause 5.2.5).

5.1.7 Frame Types

5.1.7.1 Information transfer format command and response

The function of the information, I, command and response shall be to transfer sequentially numbered frames, each containing an information field, across a data link.

The encoding of the I command/response control field shall be as shown in table 2.

The I frame control field shall contain two sequence numbers:

N(S), send sequence number, which shall indicate the sequence number associated with the I frame; and

N(R), receive sequence number, which shall indicate the sequence number (as of the time of transmission) of the next expected I frame to be received, and consequently shall indicate that the I frames numbered up to N(R) - 1 inclusive have been received correctly.

5.1.7.2 Unnumbered Information (UI) command and response

The UI command/response shall be used to send information without affecting the V(S) or V(R) variables at either station. Reception of the UI command is not sequence number verified by the data link procedures; therefore, the UI frame may be lost if a data link exception occurs during transmission of the command, or duplicated if an exception condition occurs during any reply to the command. There is no specified response to the UI command/response.

5.1.7.3 Unnumbered information with header check (UIH) command and response

The UIH command/response shall be used to send information without affecting the V(S) or V(R) variables at either station. UIH is used where the integrity of the information being transferred is of lesser importance than its delivery to the correct DLCI. For the UIH frame, the FCS shall be calculated over only the address and control fields.

Reception of the UIH command/response is not sequence number verified by the data link procedures; therefore, the UIH frame may be lost if a data link exception occurs during the transmission of the protected portion of the command, or duplicated if an exception condition occurs during any reply to the command. There is no specified response to the UIH command/response.

5.1.7.4 Receive ready, RR, command and response

The receive ready, RR, frame shall be used by a station to

- a) indicate that it is ready to receive an I frame; and
- b) acknowledge previously received I frames numbered up to N(R) - 1 inclusive.

When transmitted, the RR frame shall indicate the clearance of any busy condition that was initiated by the earlier transmission of an RNR frame by the same data station. See clause 5.2.3.3.5.1.

5.1.7.5 Reject, REJ, command and response

The reject, REJ, frame shall be used by a station to request retransmission of I frames starting with the frame numbered N(R). I frames numbered N(R) - 1 and below shall be considered as acknowledged. Additional I frames awaiting initial transmission may be transmitted following the retransmitted I frame(s).

With respect to each direction of transmission on the data link, only one REJ exception condition from a given station to another station shall be established at any given time. A REJ frame shall not be transmitted until an earlier REJ exception condition has been cleared as indicated in 6.3.3.5.2.2.

The REJ exception condition shall be cleared (reset) upon the receipt of an I frame with an N(S) equal to the N(R) of the REJ frame.

5.1.7.6 Receive not ready, RNR, command and response

The receive not ready, RNR, frame shall be used by a station to indicate a busy condition; i.e., temporary inability to accept subsequent I frames. I frames numbered up to N(R) - 1 inclusive shall be considered as acknowledged. The I frame numbered N(R) and any subsequent I frames received, if any, shall not be considered as acknowledged; the acceptance status of these frames shall be indicated in subsequent exchanges.

5.1.7.7 Set asynchronous balanced mode (SABM) command

The SABM command shall be used to place the addressed combined station in the asynchronous balanced mode (ABM) where all control fields shall be one octet in length. The station shall confirm acceptance of the SABM command by

transmission of a UA response at the first opportunity. Upon acceptance of this command, the DLC send and receive state variables shall be set to zero.

When this command is actioned, the responsibility for all unacknowledged I frames assigned to data link control reverts to a higher layer. Whether the content of the information field of such unacknowledged I frames is reassigned to data link control for transmission or not is decided at a higher layer.

5.1.7.8 Disconnect (DISC) command

The DISC command shall be used to terminate an operational or initialization mode previously set by a command. It shall be used to inform one station that the other station is suspending operation and that the station should assume a logically disconnected mode. Prior to actioning the command, the receiving station shall confirm the acceptance of the DISC command by the transmission of a UA response.

When this command is actioned, the responsibility for all unacknowledged I frames assigned to data link control reverts to a higher layer. Whether the content of the information field of such unacknowledged I frames is reassigned to data link control for transmission or not is decided at a higher layer.

5.1.7.9 Unnumbered acknowledgement (UA) response

The UA response shall be used by the secondary/combined station to acknowledge the receipt and acceptance of SABM and DISC commands.

5.1.7.10 Disconnected mode (DM) response

The DM response shall be used to report a status where the station is logically disconnected from the data link. When in disconnected mode not commands are accepted until the disconnected mode is terminated by the receipt of a SABM command. If a DISC command is received while in disconnected mode a DM response should be sent.

5.2 Procedures and States

5.2.1 DLC Establishment

In most cases the establishment of a DLC will be initiated by the TE, however, the protocol is balanced and the initiation may come from the MS. The action taken by the higher layers of the TE upon the initiation of the establishment of a DLC from the MS is outside the scope of this specification.

The station wishing to establish a DLC transmits a SABM frame with the P-bit set to 1. The address field contains the DLCI value associated with the desired connection. If the responding station is ready to establish the connection it will reply with a UA frame with the F-bit set to 1. If the responding station is not ready or unwilling to establish the particular DLC it will reply with a DM frame with the F-bit set to 1.

Once a DLC has been established the stations are both said to be in a connected mode, for the particular DLC, and transfer of information by I frames, UI frames or UIH frames may commence.

If no UA or DM response has been received after T1 the initiating station may retransmit the SABM. This action may be repeated until a response is obtained or action is taken by a higher layer.

5.2.2 DLC Release

The release of a DLC may be initiated by either station by the transmission of a DISC frame with the P-bit set to one. Confirmation of the DLC release is signalled by the other station sending a UA frame with the F-bit set to 1. Once the DLC has been released the stations enter disconnected mode for that particular DLC.

If the station receiving the DISC command is already in a disconnected mode it will send a DM response.

If no UA or DM response has been received after T1 the initiating station may retransmit the DISC. This action may be repeated until a response is obtained or action is taken by a higher layer.

5.2.3 Information Transfer

The multiplexer has three methods of transmitting information; by the use of I frames (ERM), UI frames or UIH frames (non-ERM). I frames are used when the data must be protected either because the link is subject to errors or the accuracy of the data is of particular importance. UI frames are used when no error-recovery procedures are necessary but it is important to know that data received is correct. An example of the use of UI frames is in carrying IP (Internet Protocol) traffic where error recovery procedures are performed, if necessary, by a higher layer. The use of UIH frames is appropriate if the link is not subject to errors. UI or UIH frames may also be used for data in situations where the delays inherent in error-recovery procedures are unacceptable, such as transmission of voice data. The use of I frames or UI frames is optional.

5.2.3.1 Priority

Each data stream has a priority associated with it. The priority is a number in the range 0-63 with lower numbers having lower priority. The TE assigns a priority to each DLC and informs the MS of the priority by means of the multiplexer control channel (see clause 5.2.4). In the absence of a message assigning priorities DLCs shall be given priorities according to Table 8. The transmitter is in control of which frames are transmitted and how they are constructed and it is not intended to specify precisely how this task is performed. If data of higher priority than that currently being transmitted is waiting the transmitter has several options available:

- a) complete the transmission of the current frame, or
- b) terminate the assembly of the current frame by sending the current FCS and terminating flag, or

and start sending the frame of higher-priority data.

Handling of DLC with equal priorities should not favour one over the others.

5.2.3.2 Non-Error-Recovery Mode (non-ERM)

In non-ERM, information is conveyed using UI or UIH frames. The transmitter takes information from the convergence layer for the particular DLC and places it in the I-field of the transmitted frame. Once a UI or UIH frame has been correctly received, the contents of its I-field is passed to the convergence layer.

The frames sent by the initiating station have the C/R bit set to 1 and those sent by the responding station have the C/R bit set to 0. Both stations set the P-bit to 0.

The maximum length of the information field in UI or UIH frames shall be parameter N1 (see clause 5.5.2).

5.2.3.3 Error-Recovery Mode (ERM)

The error-recovery mode is optional and is intended for those cases where the quality of the TE-MS link can not be guaranteed and/or when the integrity of the data to be transmitted is critical. Some DLCs may use ERM and some use non-ERM on the same link.

ERM uses I frames to carry the data; the procedures used are defined below.

5.2.3.3.1 Frame state variables and sequence numbers

5.2.3.3.1.1 General

Each station shall maintain an independent send state variable V(S) for the frames it transmits and an independent receive state variable V(R) for the I frames it sends to and receives from another station.

5.2.3.3.1.2 Send state variable V(S)

The send state variable denotes the sequence number of the next in-sequence I frame to be transmitted. The send state variable can take the value 0 to 7 inclusive. The value of the send state variable shall be incremented by one with each successive I frame transmission, but shall not exceed N(R) of the last received frame by more than 7.

5.2.3.3.1.3 Send sequence number N(S)

Only I frames shall contain N(S), the send sequence number of transmitted frames. Prior to transmission of an I frame, N(S) shall be set equal to the value of the send state variable.

5.2.3.3.1.4 Receive state variable V(R)

The receive state variable denotes the sequence number of the next I frame expected to be received. The receive state variable can take the value 0 to 7 inclusive. The value of the receive state variable shall be incremented by one on receipt of an error-free I frame whose send sequence number N(S) equals the receive state variable.

5.2.3.3.1.5 Receive sequence number N(R)

All frames which contain N(R) (see Table 2) shall indicate the N(S) sequence number of the next expected I frame. Prior to transmission of a frame containing N(R), the N(R) shall be set equal to the current value of the receive state variable. The N(R) indicates that the station transmitting the N(R) has correctly received all I frames numbered up to N(R) - 1 inclusive.

5.2.3.3.2 Poll/final (P/F) bit

The poll (P) bit set to 1 shall be used by a station to solicit (poll) a response or sequence of responses from the other station.

The final (F) bit set to 1 shall be used by a station to indicate the response frame transmitted as the result of a soliciting (poll) command.

The poll/final (P/F) bit shall serve a function in both command frames and response frames. (In command frames, the P/F bit is referred to as the P bit. In response frames, it is referred to as the F bit.)

5.2.3.3.2.1 Functions of the poll bit

The P bit set to 1 shall be used to solicit a response frame with the F bit set to 1 from the other station at the earliest opportunity.

On a particular DLCI, only one frame with a P bit set to 1 shall be outstanding in a given direction at a given time. Before a station issues another frame with the P bit set to 1, it shall have received a response frame from the other station with the F bit set to 1. If no valid response frame is obtained within a system-defined time-out period, the retransmission of a command with the P bit set to 1 for error recovery purposes shall be permitted.

5.2.3.3.2.2 Functions of the final bit

A response frame with the F bit set to 1 shall be used by a station to acknowledge the receipt of a command frame with the P bit set to 1. The response shall be made at the earliest opportunity.

The station may transmit response frames with the F bit set to 0 at any opportunity on an asynchronous basis.

If a station receives a command with the P bit set to 1, transmission of a response with the F bit set to 1 shall take precedence over transmission of other commands, with the exception of the mode setting commands (SABM or DISC).

5.2.3.3.2.3 Use of the P/F bit to assist in error recovery (See also clause 5.2.3.3.5.2.1)

As the P and F bits set to 1 are always exchanged as a pair (for every P bit there shall be one F bit, and another P bit shall not be issued until the previous P bit has been matched with an F bit, and, similarly, another F bit shall not be issued until another P bit is received), the N(R) contained in a received frame with a P bit or F bit set to 1 can be used to detect that I frame retransmission is required. This capability provides early detection of I frames not received by the remote data station and indicates the frame sequence number where retransmission shall begin. This capability is referred to as checkpointing. The N(R) of a correctly received frame shall acknowledge previously transmitted I frames to N(R) - 1 inclusive.

The N(R) of a received I, RR or RNR response frame which has the F bit set to 1 shall cause the receiving station to initiate appropriate error recovery if the N(R) does not acknowledge at least all I frames transmitted by the receiving station previous to, and concurrent with, the last frame which was transmitted by the receiving station with the P bit set to 1.

5.2.3.3.3 Exchange of information (I) frames

5.2.3.3.3.1 Sending I frames

The control field format shall be as defined in clause 5.1.1.3 for an I frame, with $N(S)$ set to the value of the send state variable $V(S)$ and with $N(R)$ set to the value of the receive state variable $V(R)$. Following data link set-up, both $V(S)$ and $V(R)$ shall be set to zero. The maximum length of the information field in I frames shall be parameter $N1$ (see clause 5.5.2). The default value of $N1$ is 256 octets; other values may be negotiated by use of the multiplexer control channel.

If a station is ready to send an I frame numbered $N(S)$, where $N(S)$ is equal to the last received acknowledgement plus 7, the station shall not send the I frame but shall follow the procedures described in clause 5.2.3.3.4.

The decision whether to send an I frame as a command or as a response, i.e., to use the C/R bit to indicate a P or an F bit, respectively, shall depend on the need to acknowledge a received P bit set to 1 by transmitting a response with the F bit set to 1.

5.2.3.3.3.2 Receiving I frames

After a station receives correctly an I frame [i.e., $N(S)$ equals the value of the receive state variable $V(R)$] that it can accept, the station shall increment its receive state variable $V(R)$, and, at its next opportunity to send, take one of the following actions:

- if information is available for transmission and the other station is ready to receive, it shall act as described in clause 5.2.3.3.3.1 and acknowledge the received I frame(s) by setting $N(R)$ in the control field of the next transmitted I frame to the value of $V(R)$; or

- if information is not available for transmission, but the station is ready to receive I frames, the station shall send an RR frame and acknowledge the received I frame(s) by setting $N(R)$ to the value of $V(R)$; or

- if the station is not ready to receive further I frames, the station may send an RNR frame and acknowledge the received I frame(s) by setting the $N(R)$ to the value of $V(R)$.

If the station is unable to accept the correctly received I frame(s), $V(R)$ shall not be incremented. The station may send an RNR frame with the $N(R)$ set to the value of $V(R)$.

The I or supervisory frame transmitted will be either a command or a response depending on whether a P bit set to 1 or an F bit set to 1 transmission, respectively, is required. If the transmission of a P bit or F bit set to 1 is not required, the acknowledgement frames may be either commands or responses.

5.2.3.3.3.3 Reception of incorrect frames

If a frame is received with an incorrect FCS, it shall be discarded.

If an I frame is received with a correct FCS but with an incorrect $N(S)$, the receiving station shall ignore the $N(S)$ field and discard the information field in that frame. This shall continue until the expected I frame is received correctly. The receiving station shall, however, use the P/F and $N(R)$ indications in the discarded I frames. The station shall then acknowledge the expected I frame, when received correctly, as described in clause 5.2.3.3.2.2.

The P/F recovery (checkpointing) shall cause the retransmission of the I frames received incorrectly, as described in clause 5.2.3.3.2.3.

5.2.3.3.3.4 Station receiving acknowledgements

A station receiving an I, RR, or RNR frame with a valid $N(R) = x$ shall treat as acknowledged all previously transmitted I frames up to and including the I frame transmitted with $N(S)$ equal to $x - 1$.

5.2.3.3.4 Time-out considerations

In order to detect a no-reply or lost-reply condition, each station shall provide a response time-out function (T1). The expiry of the time-out function shall be used to initiate appropriate error recovery procedures.

The duration of the time-out function in the two stations shall be unequal in order to resolve contention situations.

The time-out function shall be started whenever a station has transmitted a frame for which a reply is required. When the expected reply is received, the time-out function shall be stopped. If, during the interval that the time-out function is running, other frames are sent for which acknowledgements are required, the time-out function may have to be restarted.

If the response time-out function runs out, a command with the P bit set to 1 may be (re)transmitted, and the response time-out function restarted.

5.2.3.3.5 Exception conditions and recovery

The following procedures are available to effect recovery following the detection/occurrence of an exception condition at the data link layer. The exception conditions described are those situations which may occur as the result of transmission errors, data station malfunction or operational situations.

5.2.3.3.5.1 Busy

The busy condition shall result when a station is temporarily unable to receive, or unable to continue to receive, I frames due to internal constraints; for example, receive buffering limitations. In this case, an RNR frame shall be transmitted with the N(R) number of the next I frame that is expected. Traffic awaiting transmission may be transmitted from the busy data station prior to, or following, the RNR frame. The continued existence of a busy condition shall be reported by retransmission of an RNR frame at each P/F frame exchange.

A data station receiving an RNR frame, when in the process of transmitting, shall stop transmitting I frames at the earliest possible time. The station shall wait for a duration of T2 before resuming transmission.

Indication that a busy condition has cleared and that I frames will now be acceptable shall be reported by the transmission of an RR, REJ, SABM, or UA frame with or without the P/F bit set to 1. Clearance of a busy condition at a station shall also be indicated by the transmission of an I frame with the F bit set to 1.

5.2.3.3.5.2 N(S) sequence error

An N(S) sequence error exception condition shall occur in the receiver when an I frame that is received error free (no FCS error) contains an N(S) that is not equal to the receive state variable at the receiver. The receiver shall not acknowledge (i.e., not increment its receive state variable) the frame causing the sequence error or any I frames which may follow until an I frame with the correct N(S) is received.

A station which receives one or more I frames having sequence errors, but which are otherwise error free, shall accept the control information contained in the N(R) field and the P/F bit to perform data link control functions; for example, to receive acknowledgement of previously transmitted I frames, or to cause a station to respond (P bit set to 1). Therefore, the retransmitted I frame may contain an N(R) field and/or P/F bit information that are updated and different from those contained in the originally transmitted I frame.

Following the occurrence of a sequence error, the following means are available for initiating the retransmission of lost I frames or those with errors.

5.2.3.3.5.2.1 Poll/final (P/F) bit (checkpoint) recovery (see also clause 5.2.3.3.2.3)

When a data station receives a frame with the P/F bit set to 1, it shall initiate retransmission of unacknowledged I frames previously transmitted with sequence numbers that are less than the V(S), send state variable, value that was current at the time of transmission of the last frame with the P/F bit, respectively, set to 1. Retransmission shall start with the oldest numbered unacknowledged I frame. I frames shall be retransmitted sequentially. New I frames may be transmitted if they become available. Such retransmission of I frames as a result of an exchange of P/F bits set to 1 is known as checkpoint retransmission.

Checkpoint retransmission shall not be initiated under the following conditions:

If a REJ command with the P bit set to 0 or 1, or a REJ response with the F bit set to 0, has been received and actioned while a P bit set to 1 was unanswered, checkpoint retransmission shall be inhibited on the next frame received with the F bit set to 1, if it would cause retransmission of the same particular I frame; i.e., same N(R) in same numbering cycle.

If a P/F bit set to 1 is received in an unnumbered format frame (SABM, UA, DISC, DM, UI or UIH), checkpoint retransmission shall be inhibited.

If, after sending a frame with the P/F bit set to 1, a data station receives an acknowledgement to that frame before receiving the corresponding frame with the P/F bit set to 1, checkpoint retransmission on the frame with the P/F bit set to 1 shall be inhibited.

If any frame with the P bit set to 1 is received, checkpoint retransmission shall be inhibited.

5.2.3.3.5.2.2 REJ recovery

The REJ command/response shall be used primarily to initiate an exception recovery (retransmission), following the detection of a sequence error, earlier than is possible by checkpoint (P/F bit) recovery; for example, if a REJ frame is immediately transmitted upon detection of a sequence error, then there is no requirement to wait for a frame with the P/F bit set to 1 in order to update V(R).

With respect to each direction of transmission on the data link, only one "sent REJ" exception condition from one station to another data station shall be established at a time. A "sent REJ" exception condition shall be cleared when the requested I frame is received or when the response/command time-out function runs out. When the data station perceives by time-out that the requested I frame has not been received, because either the requested I frame or the REJ frame was in error or lost, the REJ frame may be repeated.

A station receiving a REJ frame shall initiate sequential transmission (or retransmission) of I frames starting with the I frame indicated by the N(R) contained in the REJ frame. New I frames may be transmitted subsequently if they become available.

If retransmission beginning with a particular frame occurs due to checkpointing (see clause 5.2.3.3.5.2.1), and a REJ frame is received which would also start retransmission with the same particular I frame [as identified by the N(R) in the REJ frame], the retransmission resulting from the REJ frame shall be inhibited.

5.2.4 Multiplexer Control Channel

At the initiation of communication between the TE and MS a control channel is set up with DLCI 0 using the procedures of clause 5.2.1. This channel is used to convey information between the two multiplexers. The control channel may use either ERM or non-ERM procedures as defined by the +CMUX command (GSM 07.07). If ERM procedures are available they should be used.

5.2.4.1 Message format

All messages sent between the multiplexers conform to the following type, length, value format:

Type	Length	Value 1	Value2	...	Value n
------	--------	---------	--------	-----	---------

Each box in the diagram represents a field of minimum size one octet. The type and length octets have extension bits so those fields may contain more than one octet.

The first type field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	T1	T2	T3	T4	T5	T6

Subsequent type field octets have the following format:

Bit	1	2	3	4	5	6	7	8
	EA	T7	T8	T9	T10	T11	T12	T13

The EA bit is an extension bit. The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

The C/R bit indicates whether the message is a command or a response.

The T bits indicate the type coding. Each command has a unique pattern of bits. This means that a single-octet type field can encode 63 different message types. Only single octet message types are defined in this specification.

The first length field octet has the following structure:

Bit	1	2	3	4	5	6	7	8
	EA	L1	L2	L3	L4	L5	L6	L7

Subsequent length field octets have the same structure.

The EA bit is an extension bit. The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

The L bits define the number of value octets that follow. In the case of a single-octet length field L1 is the LSB and L7 is the MSB; this permits messages with up to 127 value octets to be constructed.

The contents of the value octets are defined for each message type in clause 5.2.4.3.

Multiple messages may be included in the same frame (as long as the maximum frame size is not exceeded). Messages may not be split over more than one frame.

5.2.4.2 Operating procedures

Messages always exist in pairs; a command message and a corresponding response message. If the C/R bit is set to 1 the message is a command, if it is set to 0 the message is a response. A response message has the same T bits as the command that provoked it.

If a command does not produce a response within a time T2 the command may be sent again up to N2 times. If no response is received on the N2 transmissions, the multiplexer control channel should be considered faulty and an alarm raised. Resolution of the error situation is implementation dependent.

5.2.4.3 Message types and actions

5.2.4.3.2 DLC parameter negotiation (PN)

Before a DLC is set up using the mechanism in clause 5.2.1, the TE and MS must agree on the parameters to be used for that DLC. These parameters are determined by parameter negotiation.

The parameter negotiation uses the following type field octet:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	0	0	1

The length field octet contains the value 8 and there follow eight value octets. The value octets contain the information in Table 3.

Table 3: Parameter Negotiation

Value Octet	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
1	D1	D2	D3	D4	D5	D6	0	0
2	I1	I2	I3	I4	CL1	CL2	CL3	CL4
3	P1	P2	P3	P4	P5	P6	0	0
4	T1	T2	T3	T4	T5	T6	T7	T8
5	N1	N2	N3	N4	N5	N6	N7	N8
6	N9	N10	N11	N12	N13	N14	N15	N16
7	NA1	NA2	NA3	NA4	NA5	NA6	NA7	NA8
8	K1	K2	K3	0	0	0	0	0

The various fields are coded as follows:

The D-bits define the DLCI that the other information refers to; Bit D1 is the least significant. The values coded are those in Table 8.

The I-bits define the type of frames used for carrying information in the particular DLC - See Table 4.

Table 4: Meaning of I-bits

Meaning	I1	I2	I3	I4
Use UIH frames	0	0	0	0
Use UI frames	1	0	0	0
Use I frames	0	1	0	0

Other values are reserved.

In the absence of negotiation the frame type used (for DLCI>0) is the same as used by the multiplexer control channel.

The CL-bits define the type of convergence layer to be used on the particular DLCI - see Table 5.

Table 5: Meaning of CL-bits

Meaning	CL1	CL2	CL3	CL4
Type 1	0	0	0	0
Type 2	1	0	0	0
Type 3	0	1	0	0
Type 4	1	1	0	0

Other values are reserved.

The P-bits define the priority to be assigned to the particular DLC. The range of values is 0 to 63 with 0 being the lowest priority. P1 is the least significant bit.

The T-bits define the value of the acknowledgement timer (T1) - see clause 5.5.1. The units are hundredths of a second and T1 is the least significant bit.

The N-bits define the maximum frame size (N1) - see clause 5.5.2. The parameter is a sixteen-bit number with N1 as the least significant bit.

The NA-bits define the maximum number of retransmissions (N2) - see clause 5.5.3. The parameter is an eight-bit number with NA1 as the least significant bit.

The K-bits define the window size for ERM (k) - see clause 5.5.4. The parameter is a three-bit number with K1 as the least significant bit.

The TE transmits a parameter negotiation command to the MS with the fields set to the values that the TE intends to use for the particular DLCI. The MS replies with a parameter negotiation response with its proposed set of values. The following rules must be observed by the MS in constructing its response:

The DLCI value may not be changed.

The use of I frames or UI frames is optional so an MS may respond with a UIH choice if it does not implement UI frames or I frames.

The MS may not change the convergence layer proposed by the TE.

The MS may not change the priority proposed by the TE.

The T1 value is the one that the TE will use and is not negotiable; the MS will insert its own T1 value. It is advisable that different T1s are used in each direction.

The MS may propose a smaller value for maximum frame size (N1) if it has insufficient memory to handle the size proposed.

The N2 value is the one that the TE will use and is not negotiable; the MS will insert its own N2 value.

The MS may propose a smaller value for window size (k) if it has insufficient memory to handle the size proposed.

If the TE considers the response from the MS to be acceptable the TE will start to establish the DLC in accordance with the procedures of 5.2.1. If the response is not acceptable the TE may initiate another parameter negotiation command with revised parameters or pass the failure information to a higher layer.

If an incoming call arrives at the MS from the network for which no DLC has been set up, the MS may initiate the parameter negotiation procedure and set up a DLC. This situation should not occur in practice since a TE will generally set up DLCs for all the functions it shares with the MS after the capabilities exchange. The indication of an incoming call will be through an 07.07 or 07.05 result code.

5.2.4.3.3 Power Saving Control (PSC) (see also clause 5.2.5)

The power saving control messages use the following type field octet:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	0	1	0

The length byte contains the value 0 and there are no value octets.

If a station wishes to enter a low-power state it transmits a power saving control command; the other station replies with a power saving control response.

If a station wishes to request that the other station enter a low-power state it sends a power saving control command; the other station replies with a power saving control response. The responding station may enter a low-power state but need not do so.

5.2.4.3.4 Multiplexer close down (CLD) (see also clause 5.6.2)

The multiplexer close down command is used to reset the link into normal AT command mode without multiplexing.

The multiplexer close down messages use the following type field octet:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	0	1	1

The length byte contains the value 0 and there are no value octets.

5.2.4.3.5 Test Command (Test)

The test command is used to test the connection between MS and the TE. The length byte describes the number of values bytes, which are used as a verification pattern. The opposite entity shall respond with exactly the same value bytes.

The type field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	1	0	0

5.2.5 Power Control and Wake-up Mechanisms

It is very important in many types of MS and some TE that the power consumed by the equipment is minimised. This aim is often achieved by entering various power-saving states under conditions of inactivity, for example. The multiplexer system must be able to close down cleanly if either TE or MS wish to enter a low-power state. This is achieved by the use of the multiplexer control channel.

If either TE or MS wishes to enter a low-power state a power saving control command message is sent to the other station on the multiplexer control channel. The station receiving the message will complete the transmission of any frames in progress, report a busy or power-down condition to higher layers, freeze all timers and transmit the power saving control response message. When the station that initiated the power saving control message receives the acknowledgement it is then free to enter the reduced-power state.

Either station may send a power saving control command requesting that the other station enters a low power state. The responding station must acknowledge this command with a power saving control response message but need not obey the command to enter a low-power state. If no response is received the commanding station may repeat the command but must first use the wake-up procedure.

Either station may initiate a wake-up from the reduced power state by the transmission of the wake-up signal which consists of continuous flag characters. When the other station receives the flag characters it will wake-up (if necessary) and start sending flag characters. When the first station receives these flag characters it will stop sending flags and start transmitting the first frame. When the second station detects a valid frame it stops sending flags. The stations unfreeze their timers and continue operation as before.

If no response (continuous flags) is received to the wake-up procedure within time T3, an alarm should be raised to the higher layers and transmission of flags stops.

5.3 Convergence Layers

Convergence layers are defined to permit data which has implied structure to be conveyed through the multiplexer without losing the structure or other parameters which are associated with the data stream. Common uses of convergence layers are to carry the state of V.24 control signals through a DLC or to ensure that the boundaries of a coded voice frame are preserved.

Convergence layers apply to data whether it is carried by ERM or non-ERM procedures.

The use of particular convergence layers is implicitly linked to the DLCIs used but may be negotiated away from these defaults by the use of the multiplexer control channel.

5.3.1 Type 1 - Unstructured Octet Stream

Data which consists of an unstructured sequence of octets, for example, 64 kbit/s uncoded voice or normal asynchronous data without V.24 control signals, is inserted directly into the I-field. In this case, it could be said that the convergence layer is null.

5.3.2 Type 2 - Unstructured Octet Stream with flow control, break signal handling and transmission of V.24 signal states

If it is desired to convey virtual V.24 control signals associated with a data stream the first octet of each I-field contains a representation of the state of the signals in accordance with Figure 4. The use of the extension bit allows other octets to be added to cater for other circumstances. At present, an optional second octet is defined for handling the transmission of break signals.

Bit No	1	2	3	4	5	6	7	8
Signal	EA	FC	DTR	RTS	CTS	DSR	RI	DCD
Direction	-	-	TE-MS	TE-MS	MS-TE	MS-TE	MS-TE	MS-TE

Figure 4: Format of V.24 control signal octet

The TE controls the DTR and RTS bits. The MS controls the CTS, DSR, RI and DCD bits. Each station reports the current state of the signals that it does not control.

The FC bit provides flow control for the DLC in non-ERM. The FC bit is ignored in ERM. If a station is unable to accept further frames, for example, because of buffer management issues, it shall set FC to 1. When the station is again able to receive frames it will set FC to 0. If a station receives a frame with FC set to 1 it shall cease transmitting frames until it receives a frame with FC set to 0.

If a station is unable to transmit frames because of flow control but wishes to stop accepting further frames itself, it may still send frames containing no user data (i.e. Only the control signal octet and, optionally, the break signal octet) in order to signal flow control.

The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

Bit No	1	2	3	4	5	6	7	8
Signal	EA	B1	B2	B3	L1	L2	L3	L4

Figure 5: Format of Break signal octet

The break signal octet carries information about a break signal detected in the data stream for the DLC. The meanings of the bits are shown in Table 6.

Table 6: Break signal octet meanings

Bit	Value	Meaning
B1	1	Octet encodes a break signal
	0	Octet does not encode a break signal
B2	1	Discard data in buffers
	0	Do not discard data in buffers
B3	1	Transmit break signal onwards as soon as possible
	0	Transmit break signal onwards in sequence
L1-L4	4-bit value	Length of break in units of 200ms

L1 is the least significant bit and L4 is the most significant bit of the break length.

When a station receives a break octet it shall process the information and pass it on in an appropriate way. This is outside the scope of this Specification.

The remaining octets of the I-field contain data for that DLC.

5.3.3 Type 3 - Uninterruptible Framed Data

An example of uninterruptible framed data is coded voice data made up of a sequence of voice frames. It is important that coded voice frames reach the voice decoder with the frame structure intact and with the shortest possible delay. The simplest way of ensuring this is to map one complete voice frame into one I-field. This frame must be not shortened during transmission even if data of higher priority is waiting.

At the transmitter each frame of data is inserted into the I field of an I frame, UI frame or UIH frame. The data must not be spread over more than one frame and data from other frames must not be included in the I field. The receiver handles the data as a complete frame and passes it on as a complete frame.

Coded voice data should be transmitted using UI frames or UIH frames because the delays associated with re-transmissions are usually unacceptable.

5.3.4 Type 4 - Interruptible Framed Data

This type of convergence layer is used might be used to convey data which has an implied structure but where the delay is not as important as Type 3. The structured data may be segmented across several frames and re-assembled at the other station. PPP-framed IP data is an example of the type of data that could be carried over a Type 4 convergence layer.

The first octet of every Type 4 frame is a control octet and is defined in Figure 6.

Bit No	1	2	3	4	5	6	7	8
Signal	EA	-	-	-	-	-	B	F

Figure 6: Format of Type 4 octet

The EA bit is for future expansion if more than one octet is needed. It is set to 1 in the case described here.

The B and F bits are used to indicate whether the frame is the first frame in a sequence, a middle frame or the last frame. The meanings of the bits are as shown in Table 7.

Table 7: Meaning of B and F bits

B	F	Meaning
1	0	First frame of a sequence
0	0	Middle frame of a sequence
0	1	Last frame of a sequence
1	1	Data is contained entirely within one frame

NOTE 1: PPP-framed IP data can be carried using a Type 1 convergence layer if other framing structures, such as a layer 2 protocol, have already been included in the data stream.

NOTE 2: If a frame is coded as being the last frame or that all the data is contained within one frame, that frame may then not be shortened because shortening would make the meaning of the header incorrect. It may be advisable to construct the last frame of a sequence such that it contains no data and avoid the use of the 11 code if frame shortening is desired.

5.4 DLCI Values

The DLCI values for specific purposes in the multiplexer are assigned as shown in Table 8. The priority specified is the default; the use of other priority values may be negotiated using the multiplexer control channel.

All DLCs use a type 1 convergence layer by default; the use of other layers may be negotiated using the multiplexer control channel.

Table 8: DLCI Assignments

Usage	DLCI number (decimal)	Default Priority
Multiplexer control channel	0	0
AT commands (07.07 and 07.05)	1-7	7
AT commands (07.07 and 07.05)	8-15	15
AT commands (07.07 and 07.05)	16-23	23
AT commands (07.07 and 07.05)	24-31	31
AT commands (07.07 and 07.05)	48-55	55
AT commands (07.07 and 07.05)	56-62	63
Reserved	63	

NOTE. DLCI value 63 is reserved and must not be allocated for ETSI purposes because of the special meaning in HDLC.

5.5 System Parameters

The following system parameters are defined for the multiplexer. T1, N1, N2 and k may be negotiated by use of the multiplexer control channel or the default values given here should be used. T2 and T3 are set with the AT+CMUX command.

5.5.1 Acknowledgement Timer (T1)

The acknowledgement timer governs the amount of time that a station will wait for an acknowledgement before resorting to other action (e.g. transmitting a frame). The two stations may operate with different values of T1.

The units are hundredths of a second. Times of up to 25.5 seconds may be used.

The default value is 100 ms and the minimum is 10 ms.

5.5.2 Maximum Frame Size (N1)

N1 defines the maximum number of octets that may be contained in an information field. It does not include octets added for transparency purposes.

The default value is 64 octets and the range is 1-128 (basic mode) and 1-512 (HDLC modes)

NOTE: The maximum frame size should be chosen carefully particularly if a Type 3 convergence layer is being used. The frame must be large enough to contain a complete protocol frame.

5.5.3 Maximum number of retransmissions (N2)

N2 defines the maximum number of times that a station re-attempt a procedure requiring a response. The two stations may operate with a different value of N2.

The default value is 3 and the range is 0-255.

5.5.4 Window Size (k)

The window size parameter (k) defines the maximum number of I frames that a DLC can have outstanding (i.e. unacknowledged). Identical values need not be used for each direction. The window size may not be larger than 7.

The default value is 2 and the range is 1-7

5.5.5 Response Timer for multiplexer control channel (T2)

The T2 timer is the amount of time the multiplexer control channel waits before retransmitting a command. T2 must be greater than T1. The units are hundredths of a second. Times of up to 25.5 seconds may be used.

The default value is 300 ms and minimum 20 ms.

5.5.6 Response Timer for wake-up procedure(T3)

The T3 timer is the amount of time the transmitting station of a power wake-up command waits before raising an alarm when no response is received. The units are seconds. Times of up to 255 seconds may be used.

The default value is 10 s and minimum 1 s.

5.6 Start-up and close-down of multiplexer

5.6.1 Start-up procedure

Multiplexer operation is started by the use of the +CMUX command (see GSM 07.07). This command instructs the multiplexer to start up the multiplexer control channel (see clause 5.2.4) using either ERM or non-ERM. The TE

multiplexer initiates the establishment of the multiplexer control channel by sending a SABM frame on DLCI 0 using the procedures of clause 5.2.1.

Once the multiplexer channel is established other DLCs may be established using the procedures of clause 5.2.1. The multiplexers may negotiate the parameters associated with each DLC prior to establishment of a DLC or may use the defaults.

5.6.2 Close-down procedure

Initiation of the close-down will come from higher layers in either the TE or MS and is outside the scope of this specification. Once the command to close down is received the multiplexer will close down each DLC in turn using the procedures of clause 5.2.2. When all DLCs (except the multiplexer control channel - DLCI 0) are closed down (disconnected mode) the multiplexer that initiated close-down procedure will send a close-down message on the multiplexer control channel. When this message is acknowledged both stations will revert to the non-multiplexed mode. If no response is received to the close-down command within time T2, the initiating station may retransmit it but must close down if no response message is received in time T3.

After closing of the multiplexer protocol, the MS and TE should revert to normal AT mode.

6 Basic Mode

This section describes the basic mode of operation. The main characteristics of the basic mode are given below:

- A simple set of procedures with no error recovery mechanism, for use on reliable connections.

- A multiplexer control channel which conveys management and control information between the MS and TE.

- A mechanism that permits either MS or TE to enter power-saving modes without compromising the integrity of the multiplexer.

- A single convergence layer with a length indicator. The indicator points out the length of the data field.

- No byte stuffing. The length indicator replaces byte stuffing, which reduces processing.

- Includes flow control mechanism on the aggregate link and on each channel.

- The basic mode is intended for use in situations where the HDLC transparency mechanism (byte stuffing) can not be implemented.

The basic mode is optimised for error free transmission environments. If the transmission is subject to errors, the optional HDLC procedures should be used, although, the basic mode includes very limited error detection functions such as CRC check of frame header.

The basic mode is optimised with focus on processing and memory consumption.

6.1 Frame Structure and Frame Types

All information transmitted between the TE and MS is conveyed in frames. The structure of the frames described in this document are in accordance with ISO/IEC 13239:1997.

6.1.1 Frame Structure

The frame structure is shown in Figure 7. Note that this structure does not include information added for synchronisation (i.e. Start and stop bits) or transparency purposes. The order of transmission is from left to right.

Flag	Address	Control	Information	FCS	Flag
0111 1101	1 octet	1 octet	Unspecified length but integral number of octets	1 octet	0111 1101

Note that the closing flag may also be the opening flag of the following frame.

Figure 7: Frame Structure

6.1.1.1 Flag Sequence Field

Each frame begins and ends with a flag sequence octet which is defined as the bit pattern 0111 1101 (7Dh).

6.1.1.2 Address Field

The address field consists of a single octet. It contains the Data Link Connection Identifier (DLCI), the C/R bit and the address field extension bit as shown in Figure 8.

Bit No.	1	2	3	4	5	6	7	8
	EA	C/R	D		L	C	I	

Figure 8: Format of Address Field

The DLCI is used to identify an individual user information stream as well as to identify connections between TE and MS. Multiple DLCIs shall be supported but the number is implementation-specific. The values used for specific DLCIs are given in clause 6.4

The C/R (command/response) bit is not used and set to 0.

According to the rules of ISO/IEC 13239:1997, the range of the address field may be extended by use of the EA bit. When the EA bit is set to 1 in an octet, it signifies that this octet is the last octet of the address field. When the EA bit is set to 0, it signifies that another octet of the address field follows. In this Specification there is only one address octet so the EA bit is always set to 1. Note that future amendments to this Specification may extend the address field and use the EA bit.

6.1.1.3 Control Field

The content of the control field defines the type of frame. The control fields of the frames used in this Specification are described in Table 9.

Table 9: Coding of Control Field

Frame Type	1	2	3	4	5	6	7	8	Notes
SABM (Set Asynchronous Balanced Mode)	1	1	1	1	P/F	1	0	0	used for connection establishment
UA (Unnumbered Acknowledgement)	1	1	0	0	P/F	1	1	0	used for connection establishment and release
DM (Disconnected Mode)	1	1	1	1	P/F	0	0	0	used for connection establishment and release
DISC (Disconnect)	1	1	0	0	P/F	0	1	0	used for connection release
UIH (Unnumbered Information with Header check)	1	1	1	1	P/F	1	1	1	Used for data transfer

The frame types SABM, UA, DM and DISC are only used in the DLC establishment and DLC release procedures.

6.1.1.4 Information Field

The information field is the payload of the frame and carries the user data and any convergence layer information. The field is octet structured. The information field is only present in UIH frames.

6.1.1.5 Frame Checking Sequence Field (FCS)

The FCS is calculated on the contents of the address and control fields only. This means that the I-field is not protected and does permit pre-calculation of the FCS for the repertoire of DLCIs that are to be used. The FCS is calculated in the normal manner for all other frames in Table 9.

The FCS shall be the ones complement of the sum (modulo 2) of

- a) the remainder of

$$x^k (x^7 + x^6 + x^5 + x^4 + x^3 + x^2 + x^1 + 1)$$

divided (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1,$$

where k is the number of bits in the frame existing between, but not including, the final bit of the opening flag and the first bit of the FCS, excluding start and stop elements (start/stop transmission), and bits (synchronous transmission) and octets (start/stop transmission) inserted for transparency, and

- b) the remainder of the division (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1$$

of the product of x^8 by the content of the frame existing between, but not including, the final bit of the opening flag and the first bit of the FCS, excluding start and stop elements (start/stop transmission), and bits (synchronous transmission) and octets (start/stop transmission) inserted for transparency.

As a typical implementation, at the transmitter, the initial content of the register of the device computing the remainder of the division is preset to all ones and is then modified by division by the generator polynomial (as described above) of the address, control and information fields; the ones complement of the resulting remainder is transmitted as the 8-bit FCS.

At the receiver, the initial content of the register of the device computing the remainder is preset to all ones. The final remainder after multiplication by x^8 and then division (modulo 2) by the generator polynomial

$$x^8 + x^2 + x + 1$$

of the serial incoming protected bits and the FCS, will be 1111 0011 (x^7 through x^0 , respectively) in the absence of transmission errors.

6.1.2 Format Conventions

All transmitted characters will be sent using one start bit, eight data bits, no parity bit and one stop bit.

In the field descriptions, bit 1 is transmitted first.

Addresses, commands, responses and sequence numbers shall be transmitted low-order bit first (for example, the first bit of the sequence number that is transmitted shall have the weight 2^0).

The FCS shall be transmitted to the line commencing with the coefficient of the highest term.

NOTE: The use of these conventions in this Specification means that octet values are often expressed in the reverse bit order from conventions used in many other standards. The conventions are used here because of the importance of the correct order of bit transmission; care should be taken during implementation.

6.1.3 Transparency

The length indicator field in the convergence layer achieves transparency in basic mode. Any data can follow the length indicator field up to the FCS. The length field indicates the number of bytes in the I-field excluding the first length indicator.

No byte stuffing is necessary.

6.1.4 Frame Validity

An invalid frame in the frame format is one which meets any one (or more) of the following conditions:

- is not properly bounded by two flags;
- does not have at least three octets between flags
- indicates presence of a transmission error in that the FCS check fails;
- contains an address field with more than one octet.

Invalid frames shall be discarded without notification to the sender. Actions taken by the multiplexer to indicate reception of an invalid frame to the MS or TE are left to implementors. However, an indication that a frame with an FCS error has been received may be of use when supporting DLCs for voice/audio.

6.1.5 Frame Abort

Frame abortion is not supported.

6.1.6 Inter-frame Fill

The time between frames shall be filled by sending continuous stop-polarity except in the case of the wake-up procedure (see clause 5.2.5). The receiver shall also operate correctly if the time between frames is filled with flag characters.

6.1.7 Frame Types

6.1.7.1 Set asynchronous balanced mode (SABM) command

The SABM command shall be used to establish a DLC and place the addressed combined station in the asynchronous balanced mode (ABM) where all control fields shall be one octet in length. The station shall confirm acceptance of the SABM command by transmission of a UA response at the first opportunity. Upon acceptance of this command, the DLC send and receive state variables shall be set to zero.

6.1.7.2 Disconnect (DISC) command

The DISC command shall be used to terminate a DLC established by the SABM command. It shall be used to inform one station that the other station is suspending operation and that the station should assume a logically disconnected mode. Prior to actioning the command, the receiving station shall confirm the acceptance of the DISC command by the transmission of a UA response.

6.1.7.3 Unnumbered acknowledgement (UA) response

The UA response shall be used by the secondary/combined station to acknowledge the receipt and acceptance of SABM and DISC commands.

6.1.7.4 Disconnected mode (DM) response

The DM response shall be used to report a status where the station is logically disconnected from the data link. When in disconnected mode no commands are accepted until the disconnected mode is terminated by the receipt of a SABM command. If a DISC command is received while in disconnected mode a DM response should be sent.

6.1.7.5 Unnumbered information with header check (UIH) command and response

The UIH command/response shall be used to send information. For the UIH command frame, the FCS shall be calculated over only the address and control fields.

6.2 Procedures and States

6.2.1 DLC Establishment

In most cases the establishment of a DLC will be initiated by the TE, however, the protocol is balanced and the initiation may come from the MS. The action taken by the higher layers of the TE upon the initiation of the establishment of a DLC from the MS is outside the scope of this specification.

The station wishing to establish a DLC transmits a SABM frame with the P-bit set to 1. The address field contains the DLCI value associated with the desired connection. If the responding station is ready to establish the connection it will reply with a UA frame with the F-bit set to 1. If the responding station is not ready or unwilling to establish the particular DLC it will reply with a DM frame with the F-bit set to 1.

Once a DLC has been established the stations are both said to be in a connected mode, for the particular DLC, and transfer of information by UIH frames may commence.

If no UA or DM response has been received after T1 the initiating station may retransmit the SABM. This action may be repeated until a response is obtained or action is taken by a higher layer.

6.2.2 DLC Release

The release of a DLC may be initiated by either station by the transmission of a DISC frame with the P-bit set to one. Confirmation of the DLC release is signalled by the other station sending a UA frame with the F-bit set to 1. Once the DLC has been released the stations enter disconnected mode for that particular DLC.

If the station receiving the DISC command is already in a disconnected mode it will send a DM response.

If no UA or DM response has been received after T1 the initiating station may retransmit the DISC. This action may be repeated until a response is obtained or action is taken by a higher layer.

6.2.3 Information Transfer

The multiplexer is transmitting information with the UIH frames only.

The use of UIH frames is appropriate since the link in basic mode is considered not to be subjected to errors. UIH frames are also suitable for voice data since delays inherent in error-recovery procedures are unacceptable.

6.2.3.1 Priority

Each data stream has a priority associated with it. The priority is a number in the range 0-63 with lower numbers having lower priority. DLCs have priorities according to Table 11. The transmitter is in control of which frames are transmitted and how they are constructed and it is not intended to specify precisely how this task is performed. Handling of DLCs with equal priorities should not favour one over the others. If two DLC with different priorities contains data to send, the data in the DLC with the higher priority should be sent first.

6.2.4 Multiplexer Control Channel

At the initiation of communication between the TE and MS a control channel is set up with DLCI 0 using the procedures of clause 6.2.1. This channel is used to convey information between the two multiplexers.

6.2.4.1 Message format

All messages sent between the multiplexers conform to the following type, length, value format:

Type	Length	Value 1	Value2	...	Value n
------	--------	---------	--------	-----	---------

Each box in the diagram represents a field of minimum size one octet. The type and length octets have extension bits so those fields may contain more than one octet.

The first type field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	T1	T2	T3	T4	T5	T6

Subsequent octets have the following format:

Bit	1	2	3	4	5	6	7	8
	EA	T7	T8	T9	T10	T11	T12	T13

The EA bit is an extension bit. The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

The C/R bit indicates whether the message is a command or a response.

The T bits indicate the type coding. Each command has a unique pattern of bits. This means that a single-octet type field can encode 63 different message types. Only single octet message types are define in this specification.

The first length field octet has a the following structure:

Bit	1	2	3	4	5	6	7	8
	EA	L1	L2	L3	L4	L5	L6	L7

Subsequent octets have the same structure.

The EA bit is an extension bit. The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

The L bits define the number of value octets that follow. In the case of a single-octet length field L1 is the LSB and L7 is the MSB; this permits messages with up to 127 value octets to be constructed.

The contents of the value octets are defined for each message type in clause 6.2.4.3.

Multiple messages may be included in the same frame (as long as the maximum frame size is not exceeded). Messages may be split over more than one frame.

6.2.4.2 Operating procedures

Messages always exist in pairs; a command message and a corresponding response message. If the C/R bit is set to 1 the message is a command, if it is set to 0 the message is a response. A response message has the same T bits as the command that provoked it.

If a command does not produce a response within a time T2 the command may be sent again up to N2 times. If no response is received on the N2 transmissions, the multiplexer control channel should be considered faulty and an alarm raised. Resolution of the error situation is implementation dependent.

6.2.4.3 Message types and actions

The multiplexer control channel commands specified in section 5.2.4.3; Power Saving (PSC), Multiplexer Close Down (CLD), and Test (Test) commands are valid also for basic mode. See section 5.2.4.3 for description.

6.2.4.3.3 Power Saving Control (PSC) (see also clause 5.2.5)

See clause 5.2.4.3.3

6.2.4.3.4 Multiplexer close down (CLD) (see also clause 5.6.2)

See clause 5.2.4.3.4

6.2.4.3.5 Test Command (Test)

See clause 5.2.4.3.5

6.2.4.3.6 Flow Control On Command (FCon)

The flow control command is used to handle the aggregate flow. When either entity is able to receive new information it transmits the this command.

The type field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	1	0	1

6.2.4.3.7 Flow Control Off Command (FCoff)

The flow control command is used to handle the aggregate flow. When either entity is not able to receive information it transmits the FCoff command. The opposite entity is not allowed to transmit frames except on the control channel (DLC=0).

The type field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	0	0	0	1	1	0

6.2.5 Power Control and Wake-up Mechanisms

It is very important in many types of MS and some TE that the power consumed by the equipment is minimised. This aim is often achieved by entering various power-saving states under conditions of inactivity, for example. The multiplexer system must be able to close down cleanly if either TE or MS wish to enter a low-power state. This is achieved by the use of the multiplexer control channel.

If either TE or MS wishes to enter a low-power state a power saving control command message is sent to the other station on the multiplexer control channel. The station receiving the message will complete the transmission of any frames in progress, report a busy or power-down condition to higher layers, freeze all timers and transmit the power saving control response message. When the station that initiated the power saving control message receives the acknowledgement it is then free to enter the reduced-power state.

Either station may send a power saving control command requesting that the other station enters a low power state. The responding station must acknowledge this command with a power saving control response message but need not obey the command to enter a low-power state. If no response is received the commanding station may repeat the command but must first use the wake-up procedure.

Either station may initiate a wake-up from the reduced power state by the transmission of the wake-up signal which consists of continuous flag characters. When the other station receives the flag characters it will wake-up (if necessary) and start sending flag characters. When the first station receives these flag characters it will stop sending flags and start

transmitting the first frame. When the second station detects a valid frame it stops sending flags. The stations unfreeze their timers and continue operation as before.

If no response (continuous flags) is received to the wake-up procedure within time T3, an alarm should be raised to the higher layers and transmission of flags stops.

6.3 Convergence Layers

The convergence layer is defined to permit data which has implied structure to be conveyed through the multiplexer without losing the structure or other parameters which are associated with the data stream. Common uses of convergence layers are to carry the state of V.24 control signals through a DLC or to ensure that the boundaries of a coded voice frame are preserved.

6.3.1 Convergence Layer Structure

The convergence layer consists of a header and a data field.

Convergence header	Convergence Data (<128)
--------------------	-------------------------

6.3.1.1 Convergence Header

The header includes some channel management information, such as priority, length and type. The header structure is shown below:

The header field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	C/D	L1	L2	L3	L4	L5	L6	L7

The C/D bit indicates whether the frame is a data frame or a command frame. If the C/D is set to 1, it is a command frame otherwise it is a data frame.

The L1 to L7 bits indicates the length of the following data field. The maximum length is 31 bytes. 0 length is not applicable, even though it is allowed.

6.3.1.2 Convergence Data

The convergence data can be either application data or multiplexer management data. The C/D bit in the header indicates the type. The length of the data field is variable and is indicated by the L1 – L7 bits.

Maximum length is 127.

6.3.1.3 Data frame

The data frame is used to transport application data and consists of a header (1 byte) and number of data bytes.

6.3.1.4 Command frame

Command frames are used to transport multiplexer management information, for instance v.24 signals. A command frame consists of a header and a command field. The header is almost identical with the header of the data frame, 1 byte, with the first bit set to 1. The length information field indicates how many bytes are following the header. This can vary depending on the command and is described for each command.

The priority of the command frame has always highest priority, that is the same as for the multiplexer control channel. The reason is to ensure that the flow control is always communicated as fast as possible in order to minimise the buffer sizes

The convergence header is always followed by one command byte, and optionally by command data bytes.

The command byte indicates the function of the frame.

Commands always exist in pairs; a command and a corresponding response. If the C/R bit is set to 1 the message is a command, if it is set to 0 the message is a response. A response message has the same T bits as the command that provoked it.

If a command does not produce a response within a T2 time, the command may be sent again up to N2 times. If no response is received on the N2 retransmissions, the DLC shall be considered as disconnected..

The command field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	T1	T2	T3	T4	T5	T6

6.3.1.4.1 Modem Status Command (MSC)

It is desired to convey virtual V.24 control signals to a data stream, this is done by sending the MCC command. The MCC command has one mandatory v.24 signal byte and an optionally break signal byte.

Command	V.24 signals	Break Signals (optional)
---------	--------------	-----------------------------

The command field octet has the following format:

Bit	1	2	3	4	5	6	7	8
	EA	C/R	1	0	0	0	0	0

The command field is followed by the V.24 signals field which contains a representation of the state of the signals in accordance with Figure 9. The use of the extension bit allows other octets to be added to cater for other circumstances. At present, an optional second octet is defined for handling the transmission of break signals.

Bit No	1	2	3	4	5	6	7	8
Signal	EA	0	DTR	RTS	CTS	DSR	RI	DCD
Direction	-	-	TE-MS	TE-MS	MS-TE	MS-TE	MS-TE	MS-TE

Figure 9: Format of V.24 control signal octet

The TE controls the DTR and RTS bits. The MS controls the CTS, DSR, RI and DCD bits. Each station reports the current state of the signals that it does not control.

Flow control per DLC basis is done with the RTS and CTS bits.

If a station is unable to transmit frames because of flow control but wishes to stop accepting further frames itself, it may still send frames containing no user data (i.e. Only the control signal octet and, optionally, the break signal octet) in order to signal flow control.

The EA bit is set to 1 in the last octet of the sequence; in other octets EA is set to 0. If only one octet is transmitted EA is set to 1.

Bit No	1	2	3	4	5	6	7	8
Signal	EA	B1	B2	B3	L1	L2	L3	L4

Figure 10: Format of Break signal octet

The break signal octet carries information about a break signal detected in the data stream for the DLC. The meanings of the bits are shown in Table 10.

Table 10: Break signal octet meanings

Bit	Value	Meaning
B1	1	Octet encodes a break signal
	0	Octet does not encode a break signal
B2	1	reserved
	0	reserved
B3	1	reserved
	0	reserved
L1-L4	4-bit value	Length of break in units of 200ms

L1 is the least significant bit and L4 is the most significant bit of the break length.

When a station receives a break octet it shall process the information and pass it on in an appropriate way. This is outside the scope of this Specification.

6.4 DLCI Values

The DLCI value is assigned when the DLC is allocated. DLCI value 0 is reserved for the multiplexer control channel.

The DLCI values for specific purposes in the multiplexer are assigned as shown in Table 11.

All DLCs use the same convergence layer by default as specified in clause 6..

Table 11: DLCI Assignments

Usage	DLCI number (decimal)	Priority
Multiplexer control channel	0	0
AT commands (07.07 and 07.05)	1-7	7
AT commands (07.07 and 07.05)	8-15	15
AT commands (07.07 and 07.05)	16-23	23
AT commands (07.07 and 07.05)	24-31	31
AT commands (07.07 and 07.05)	48-55	55
AT commands (07.07 and 07.05)	56-62	63
Reserved	63	

NOTE. DLCI value 63 is reserved and must not be allocated for ETSI purposes because of the special meaning in HDLC.

6.5 System Parameters

The following system parameters are defined for the multiplexer. T1, N1, N2, T2 and T3 are set with the AT+CMUX command.

6.5.1 Acknowledgement Timer (T1)

See section 5.5.1

6.5.2 Maximum Frame Size (N1)

See section 5.5.2

6.5.3 Maximum number of retransmissions (N2)

See section 5.5.3

6.5.4 Response Timer for multiplexer control channel (T2)

See section 5.5.4

6.5.5 Response Timer for wake-up procedure(T3)

See section 5.5.5

6.6 Start-up and close-down of multiplexer

6.6.1 Start-up procedure

Multiplexer operation is started by the use of the +CMUX command (see GSM 07.07). This command instructs the multiplexer to start up the multiplexer control channel.

With the AT+CMUX command, the system parameters, T1, N1, N2, T2, T3 and baudrate are negotiated.

Once the multiplexer channel is established other DLCs may be established using the procedures of clause 6.1.

6.6.2 Close-down procedure

Initiation of the close-down will come from higher layers in either the TE or MS and is outside the scope of this specification. Once the command to close down is received the multiplexer will close down each DLC in turn using the procedures of clause 5.2.2. When all DLCs (except the multiplexer control channel - DLCI 0) are closed down (disconnected mode) the multiplexer that initiated close-down procedure will send a close-down message on the multiplexer control channel. When this message is acknowledged both stations will revert to the non-multiplexed mode. If no response is received to the close-down command within time T2, the initiating station may retransmit it but must close down if no response message is received in time T3.

After closing of the multiplexer protocol, the MS and TE should revert to normal AT mode.

7. Advice to TE software implementors

The multiplexing protocol allows a number of virtual channels to be established between a TE and an MT. The TE is normally responsible for establishing and clearing down each virtual channel, although the MT may autonomously clear the entire multiplexing session.

Each channel will start life as an instance of GSM 07.07, and will allow the normal AT command procedures for both GSM 07.07 and GSM 07.05. Any changes made to the AT register settings will be valid within the virtual channel only. If registers are saved to non-volatile memory then the changes will apply to the defaults for the AT registers and will affect new channels from that point on. Such changes will only affect other active channels if they are reset with ATZ. Changes to the phonebook or to SMS messages will, of course, be on a global basis.

The software in the TE sitting above the multiplexing protocol is recommended to establish a virtual channel and leave it "idle" for the reception of incoming calls according to responses as defined in GSM 07.07. When an incoming call arrives the software may then cause an appropriate application to become active in order to receive the incoming call. The previously "idle" channel will then be occupied with this call and so the TE software is recommended to establish an additional channel to take over from the previously-idle channel in preparation for other incoming calls or indications.

Annex 1 [(informative)]: Bibliography

The following material, though not specifically referenced in the body of the present document, gives supporting information.

- <Publication>: "<Title>".

History

Document history		
<Version>	<Date>	<Milestone>

Source: SMG

Title: Response to LS from WAP Consortium

ETSI TC SMG welcomes the liaison statement from the WAP consortium. Within TC SMG, it is felt that there is benefit to the industry in the cooperation between TC SMG and the WAP Consortium.

In response to the suggestion by the WAP consortium, it is accepted that there could be formal contact between TC SMG and the WAP consortium.

For a more formal contact between TC SMG and the WAP consortium to be of mutual benefit, a number of areas need to be clarified:

- specific time scales for the opening of the WAP consortium to ETSI members
- the rules and procedures of the WAP consortium for the agreement and issueing of specifications
- the rights and obligations of the members of the WAP consortium
- the handling of IPR issues.

It is noted that there is considerable expertise available within the ETSI membership and that immediate help could be offered to address the open areas of: transport, session, security, and application protocol.

TC SMG asks the WAP consortium how best to bring this expertise to bear upon the issues before the planned completion of the initial phase of your work. We understand this completion is due end January 98.

SMG #24
15-19th Dec 97
Madrid

T Doc 1163/97
Replaces T Doc 1097/97

Draft Liaison statement to ERC TG1
in response to TG1 liaison statement T Doc 1078/97

Source: ETSI SMG

To: ERC TG1
(copied to ETSI TC ERM Chairman)

Subject: WRC-99 Agenda item on Global Radio Control Channel

Status: For SMG plenary final approval

ETSI SMG thanks ERC TG1 for its liaison statement on the above subject.

ETSI SMG has previously discussed the issue of Global Radio Control Channels and concluded that such channels, if required, should be voluntary from both the network and terminal perspectives, consume minimal spectrum resource, and be implemented as an overlay to the normal radio access.

ETSI SMG agrees that the Logical Global Radio Control Channel appears to meet these criteria, and will ask SMG1, SMG2, and SMG3 for more specific and detailed comments. ETSI SMG#25 will then be able to respond more fully to the ERC TG1 proposal.

ETSI SMG trusts that this time scale is compatible with ERC TG1's own schedules on this matter.

ETSI looks forward to close co-operation with ERC TG1 on UMTS and IMT-2000 issues.

Liaison Statement

Title: Definition of a Java enabled GSM terminal

To: MNCRS WG4

cc: JavaSoft

Source: ETSI/SMG

Contact: Mr. Jyrki Yli-Nokari (jyrki.yli-nokari@nmp.nokia.com)

Work has begun recently in ETSI on the provision of a platform independent execution environment on GSM terminals, which has identified the use of Java as a candidate technology.

As the working group responsible for small hand held devices, SMG4 considers that MNCRS WG4 is the appropriate body to establish a relationship with in order to progress this work.

The SMG4 group has identified the need for additions to the Java APIs to enable applications in Java to access the wider set of GSM's rich and varied functionality.

SMG proposes that SMG4 generates a technical report identifying the additional functionality required to Java in association with MNCRS, such that MNCRS may then proceed to incorporate the additions into the Java specifications. SMG4 would also welcome comment from MNCRS WG4 on other areas of standardisation that are not specific to GSM but could form a useful input to SMG's mexe work.

For the information of MNCRS WG4 the draft project plan for the SMG mexe work is attached to this liaison.

To facilitate an efficient working relationship between SMG4 & MNCRS WG4, SMG4 is pleased that Mr. Jyrki Yli-Nokari of Nokia (jyrki.yli-nokari@nmp.nokia.com) has agreed to perform the task of liaison officer between the two groups.

SMG would welcome MNCRS' views on the proposed relationship and the support it could provide to SMG4.

PT SMG

Permanent

Document

GSM 10.57

25.11.1997

Version 0.0.0

Source: PT SMG

Reference: PT SMG PD/GSM

Key words: Digital cellular telecommunications system, Global System for Mobile communications (GSM)



**Digital cellular telecommunications system (Phase 2+);
Project scheduling and open issues:
Mobile Station Execution Environment (MExE)
(GSM 10.57 version 0.0.0)**

European Telecommunications Standards Institute

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1 Scope

The purpose of this document is to describe the project plan for the Mobile Station Execution Environment (MEXE) work item standardisation.

This document is a 'living document' and permanently updated by PT SMG. Proposals for change shall be forwarded to PT SMG, where the latest version can be obtained any time. The MEXE specification rapporteurs should make sure that this document can always reflect the latest status of work.

1.1 References

1.2 Abbreviations

MNCRS WG4 Mobile Network Computer Reference Standard Working Group 4

2 General Considerations for MEXE

2.1 Support tools for specification work

ETSI FTP Server (docboc.etsi.fr or docbox.etsi.org):
SMG4 ../SMG/SMG4/WI_mexe .

Email distribution list: SMG4_mexe@list.etsi.fr (Subscription for contributors from SMG1, SMG4, SMG9 and SMG10)

2.2 Decisions at SMG

2.2.1 SMG#22

SMG#22 agreed to establish a small project team that elaborated a workitem description backed by a feasibility study on mobile station application execution environment.

2.2.2 SMG#23

SMG#23 agreed the workitem description and the feasibility study conditionally. The condition is that the relationship between the SMG work and the WAP consortium can be clarified before WAP is taken into account.

3 Co-operation with other groups

3.1 Co-operation with MNCRS-WG4:

Close working contact with MNCRS-WG4 should be established. Initially SMG4 shall contact MNCRS-WG4 informing them of SMG's proposed MEXE activities. SMG4 proposes that the work with MNCRS-WG4 is organised as follows:

SMG4 works with MNCRS-WG4 to produce an ETSI technical report on the additions required to Java to fully enable Java with GSM capabilities. It is envisaged that MNCRS-WG4 would then complete the necessary additions to Java standards. The technical report shall be actively maintained, in order that the Java standards can be kept up-to-date with new developments in GSM/UMTS.

Chairman of MNCRS-WG4: John Dykstra, Nortel (jdykstra@nortel.com, phone: +1-612-9328749)

Liaison officer to MNCRS: Jyrki Yli-Nokari, Nokia (jyrki.yli-nokari@nmp.nokia.com, phone: +358 400 834437)

3.2 Co-operation with JavaSoft:

JavaSoft, as the body with overall responsibility for Java, should be kept informed of SMG's work with MNCRS-WG4. It is expected that the MNCRS group would forward the GSM specific additions on JAVA to JavaSoft for endorsement..

3.3 Co-operation with other Java bodies:

As the need arises.

3.4 Co-operation with the WAP Consortium:

It is evident that a relationship with the WAP Consortium needs to be established as soon as possible in order to co-ordinate MEXE work and to avoid discontinuities between the two.

A LS has been sent from SMG#23 (Tdoc SMG 97-xxx).

4 Deliverables on MExE

4.1 MExE service definition (stage 1), GSM 02.57

Responsible Body: SMG1

Draft GSM 02.57	Rapporteur Mark Cataldo, Lucent		approved at SMG#25
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Scope of this document is the high level requirements for the MExE work item. The stage1 document will be restricted to cover the high level requirement but not imply an architecture or a realisation. The major input to the stage 1 is the requirements in the feasibility study. Though the requirements are independent of any technology, the SMG work will focus on the two complementary technologies identified in the feasibility study, i.e. WAP and JAVA. At the same time it is recognised that some work, e.g. on WAP is carried out outside SMG.

The requirements will be presented from the perspective of the user, network operator and the third part service provider. (The third party SP is understood as being a body that is not a GSM network operator but still offering services to subscribers with a MExE terminal)

High level charging requirements will be covered in the stage 1. Responsible for detailed elaboration future after stage 1 approval would be MoU SERG, CAGE2+ and SMG6.

High level Security requirements will be covered in the stage 1. Responsible for detailed elaboration future after stage 1 approval would be SMG10.

4.2 GSM enhanced Java environment

Responsible Body: SMG4

03.57	Contact person Mr. John Candish	presented for information at SMG#25	approved at SMG#26
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Scope of the deliverable will be:

1. Identify the necessary additions to the JAVA APIs to fully support GSM capabilities.
2. Propose the GSM reference profiles (e.g. personal, embedded JAVA and JAVA card) and the capabilities to be added as minimum capability set..
3. Propose a reference architecture of a mexe capable terminal, considering any possible relationships with WAP architecture, JAVA environment in the terminal, JAVA Card within the SIM card the SIM Toolkit, possible and possible GSM bearers.
4. Describe the additional functions in sufficient detail.

4.3 New specification: Support of multiple MExE technologies in GSM/UMTS

Responsible Body: SMG4

07.57	Contact person Mr. John Candish	presented for information at SMG#25	approved at SMG#26
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Scope of the deliverable:

Identify and propose a solution for the issues raised by the support of multiple mexe technologies in GSM/UMTS. In particular this means the specification of a common and evolvable protocol for terminal capability negotiation. The protocol itself will have to incorporate a version handling mechanism. Software download is envisaged as a negotiable capability of the protocol.

5 Project Plan for MExE

5.1 Scope of SMG meetings on mexe

	Date	Meeting	Scope	[expected] Input	[expected]Output
		E mail distribution of proposed stage 1	Joint SMG1, SMG4, SMG9 Ad hoc on requirements	Feasibility study, Requirements from other areas On the MOVE, etc.	Stage 1 first draft
	12-16 Jan 1998	SMG1 (Sophia Antipolis) + joint SMG1 & 4 adhoc	Review and approve stage 1	Stage 1 draft from workshop	Stage 1 Send output for information to SMG6 and MoU CAGE2+, SMG10.
	28-30 Jan 1998	mexe-adhoc (Nokia/Helsinki)	Ad hoc on architecture and transport mechanisms	WAP standard (if available) JAVA API standards	First draft TR .
	Jan/Feb	mexe stage 1 SMG1/4 adhoc (if required)	Finalise stage 1	Draft stage 1 from SMG 1	Finalised Stage 1
	9-13 Feb 1998	SMG4	Review output of mexe adhoc group. Review reply from MNCRS	dto.	Second draft.
	3-5 March 1998	mexe-adhoc	GSM/Java enhancements	second draft	Stable Draft. LS to MNCRS
	16-20/03/98	SMG#25	Approval of MEXE stage1	Stage 1	Stage 1 description
			to be planned: Progress of deliverable 07.57		
				
	22-26/06/98	SMG#26	Approval of MEXE stage2 Approval of MEXE stage 3		Stage 2 description; Stage 3 description LS to MNCRSWG4, copy JavaSoft on LS.
			Produce API specification, reference models, Profile of API		Output to JavaSoft, LS to SMG4 to check output.
			JavaSoft endorses the JAVA language extensions		
		SMG4	Check final output of MNCRS	Final output from MNCRS	Formal endorsement of JAVA GSM extensions
		SMG#28			Formal endorsement of JAVA GSM extensions.

5.2 Major Milestones for MExE

	Planned Date	Milestone	Status
1	26/11/97	Kick-off MExE at SMG4	
2	20/03/98	SMG#25: Approval of GSM 02.57 MExE stage 1	
3	26/06/98	SMG#26: Approval of GSM 03.57 MExE stage 2	
4	26/06/98	SMG#27: Approval of GSM 07.57 MExE stage 3	

5.3 Overview on meetings with relevance for MExE

[illegible]

ANNEX B

B.1 List of outstanding issues and action points for MExE

Item	Status	Subject	[Solution] [/ Due party/ due date]
9711-1	new	Type approval testing/ voluntary tests for mexe conforming terminals	
9711-2	new	Write a LS to WAP via SMG to inform on the progress of the mexe WI and the desirability of closer co-operation to avoid discontinuities developing.	
9711-3	new	Write LS to MNCRS This LS would also need to outline the project plan for SMG. At the same time SMG will be asked to empower SMG4 to contact MNCRS directly.	
9711-4	new	AP: Identify the Liaison officer between MNCRS and SMG4	
9711-5	new	Clarify how the final output standard would fit into the ISO model	

B.2 List of major decisions for mexe

History

Document history	
Note: Explicit changes in this document are not shown with revision marks	
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GSM/DCS STATUS LIST AFTER SMG#24

GSM NUMBER AND TITLE															
CURRENT VERSION (*)		RESPONSIBLE PT SMG / STCs		HISTORY						RAPPORTEUR + COMPANY		ETS VERSION + NR			
01.00 Working procedures for SMG and PT12															
5.1.1	AB	STF12	n.a.						---none---						
01.02 General Description of a GSM Public Land Mobile Network (PLMN).															
4.0.2	RT	SMG1	STF12	SMG2	SMG3	#7: 4.0.1	#8: 4.0.2	N.Jørgensen		Tele Denmark	ETR 099				
5.0.0	RT	SMG1	STF12	SMG2	SMG3	#17: 5.0.0			N.Jørgensen	Tele Denmark	GTS				
01.04 Abbreviations and Acronyms.															
4.1.2	RT	STF12	SMG1-4	SMG6-8	#8: 4.0.1		#9: 4.0.3	#10: 4.0.4	#11: 4.1.0	#12: 4.1.1	#14: 4.1.2	R.Tarazi	ETSI PT12	ETR 100	
5.0.1	RT	STF12	SMG1-4	SMG6-8	#17: 5.0.0		#20: 5.0.1			R.Tarazi	ETSI PT12	GTS			
REP	3.0.1	RT	STF12	SMG1	SMG2	SMG3			---		none ---	--			
01.05 Definitions.															
4.0.0	RT	STF12	SMG1	SMG2	SMG3	n.a.				---		none ---	ETR		
01.48 ISDN-based DECT/GSM interworking; Feasibility study															
5.0.1	RT	SMG1			#19: 5.0.0		#20: 5.0.1			I.Graetz	Siemens	GTS			
02.01 Principles of Telecommunication Services Supported by a GSM Public Land Mobile Network(PLMN).															
3.2.0	RT	SMG1							---		none ---	--			
4.6.0	RT	SMG1			#7: 4.2.1		#8: 4.3.0	#10: 4.4.0	#11: 4.4.1	#12: 4.5.0	#15: 4.6.0	---		none ---	300 500
5.3.0	RT	SMG1			#16: 5.0.0		#17: 5.1.0	#20: 5.2.0	#24: 5.3.0			---		none ---	GTS

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs						
02.02	Bearer Services (BS) Supported by a GSM Public Land Mobile Network (PLMN)						
3.2.0	RT	SMG1			D.Richards	AT&T NSI	--
4.2.2	RT	SMG1		#7: 4.1.1 #8: 4.2.0	D.Richards	AT&T NSI	300 501
5.3.0	RT	SMG1		#16: 5.0.0 #18: 5.1.0 #20: 5.2.0. #22: 5.3.0	D.Richards	AT&T NSI	GTS
02.03	Teleservices Supported by a GSM Public Land Mobile Network (PLMN).						
3.4.0	RT	SMG1			G.Schmidt	T-Mobil	--
4.3.1	RT	SMG1		#7: 4.2.2 #11: 4.3.0	G.Schmidt	T-Mobil	300 502
5.3.0	RT	SMG1		#17: 5.0.0 #19: 5.1.0 #20: 5.1.1 #21: 5.2.0 #22: 5.3.0	G.Schmidt	T-Mobil	300 905
02.04	General on Supplementary Services						
3.7.1	RT	SMG1			D.Richards	AT&T NSI	--
4.9.1	RT	SMG1		#7: 4.5.1 #8: 4.6.0 #10: 4.7.0 #12: 4.8.0 #15: 4.9.0 #16: 4.9.1	D.Richards	AT&T NSI	300 503
5.7.0	RT	SMG1		#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #22: 5.6.0 #23: 5.7.0	D.Richards	AT&T NSI	300 908
02.06	Types of Mobile Stations (MS).						
3.2.0	RT	SMG1			N.Hodgson I.Crawford	Vodafone	--
4.5.0	RT	SMG1		#7: 4.1.1 #8: 4.2.0 #14: 4.3.0 #16: 4.4.0 #22: 4.5.0	I.Crawford	Vodafone	300 504
5.1.0	RT	SMG1		#20: 5.0.0 #21: 5.1.0	I.Crawford	Vodafone	300 919
DCS 3.0.0	RT	SMG1			--- none ---		--
02.07	Mobile Station (MS) Features.						
3.4.1	RT	SMG1			I.Crawford	Vodafone	--
4.8.0	RT	SMG1		#7: 4.4.1 #8: 4.4.2 #10: 4.5.0 #11: 4.6.0 #15: 4.7.0 #22: 4.8.0	I.Crawford	Vodafone	300 505
5.4.0	RT	SMG1		#17: 5.0.0 #18: 5.1.0 #20: 5.2.0 #22: 5.3.0 #24: 5.4.0	I.Crawford	Vodafone	300 906

GSM NUMBER AND TITLE		CURRENT RESPONSIBLE		HISTORY		RAPPORTEUR + COMPANY		ETS VERSION + NR		
VERSION (*)	PT	SMG	SMG	SMG	SMG					
02.08	(Quality of Service). WITHDRAWN									
n.a.	RT	SMG1	SMG2	SMG3	SMG4	WITHDRAWN	---	none	---	ETR 101
02.09	Security Aspects.									
3.0.1	PA	SMG10	SMG1			#6b: 3.1.0	N.Renaud	France Telecom		- -
4.4.0	PA	SMG10	SMG1	SMG3		#7: 4.2.1 #12: 4.3.0 #22: 4.4.0	N.Renaud	France Telecom		300 506
5.1.0	PA	SMG10	SMG1			#20: 5.0.0 #22: 5.1.0	N.Renaud	France Telecom		300 920
02.11	Service Accessibility.									
3.7.0	RT	SMG1	SMG3	SMG2		#4: 3.7.0	P.Gaskell	One2One		- -
4.9.0	RT	SMG1	SMG3	SMG2		#7: 4.5.1 #10: 4.6.0 #16: 4.8.0 #17: 4.9.0	P.Gaskell	One2One		300 507
5.0.1	RT	SMG1	SMG3	SMG2		#20: 5.0.0	N.Renaud	France Telecom		300 921
DCS 3.0.1	RT	SMG1	SMG3	SMG2		#4: 3.1.0	---	none	---	- -
02.16	International Mobile Station Equipment Identities (IMEI).									
3.0.1	RT	SMG1					N.Renaud	France Télécom		- -
4.5.0	RT	SMG1				#7: 4.3.1 #12: 4.4.0 #13: 4.5.0	N.Renaud	France Telecom		300 508
5.0.0	RT	SMG1				#20: 5.0.0	N.Renaud	France Telecom		GTS
02.17	Subscriber Identity Modules, Functional Characteristics									
3.2.0	RT	SMG1	SMG9				K.Vedder	GAO		- -
4.3.3	RT	SMG1	SMG9			#7: 4.2.0 #8: 4.3.1	K.Vedder	GAO		300 509
5.0.1	RT	SMG1	SMG9			#20: 5.0.0	K.Vedder	GAO		300 922
02.22	Stage 1 for Personalisation of GSM ME									
5.3.0	RT	SMG1				#17: 5.0.0 #19: 5.1.0 #20: 5.2.0 #23: 5.3.0	P.Gaskell	One2One		GTS

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
02.24	Description of Charge Advice Information (CAI).					
4.5.0	RT	SMG1	#7: 4.1.1 #8: 4.2.0 #9: 4.2.1 #10: 4.3.0 #11: 4.4.0	I.Crawford	Vodafone	300 510
5.0.1	RT	SMG1	#20: 5.0.0	I.Crawford	Vodafone	300 923
02.30	Man-machine Interface (MMI) of the Mobile Station (MS).					
3.9.0	RT	SMG1 SMG3		I.Crawford	Vodafone	v.3.9.0 300 068
4.13.0	RT	SMG1 SMG3	#7: 4.9.1 #8: 4.10.0 #10: 4.11.0 #12: 4.12.0 #13: 4.13.0	I.Crawford	Vodafone	300 511
5.7.0	RT	SMG1	#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.3.1 #21: 5.4.0 #22: 5.5.0 #23: 5.6.0 #24: 5.7.0	I.Crawford	Vodafone	300 907
02.34	High Speed Circuit Switched Data (HSCSD) - Stage 1					
5.1.0	RT	SMG1	#21: 5.1.0	I.Crawford	Vodafone	
02.40	Procedures for Call Progress Indications					
3.2.0	RT	SMG1 SMG3		I.Crawford	Vodafone	- -
4.5.0	RT	SMG1 SMG3	#7: 4.2.1 #9: 4.3.0 #10: 4.4.0	I.Crawford	Vodafone	300 512
5.0.0	RT	SMG1 SMG3	#20: 5.0.0	I.Crawford	Vodafone	GTS
02.41	Operator Determined Barring					
4.5.2	RT	SMG1	#7: 4.4.1 #8: 4.5.0	I.Crawford	Vodafone	300 513
5.2.0	RT	SMG1	#16: 5.0.0 #21: 5.1.0 #24: 5.2.0	I.Crawford	Vodafone	GTS
02.42	Network Identity and Timezone (NITZ); Service Description, Stage 1					
5.1.0	RT	SMG1	#19: 5.0.0 #24: 5.1.0	L.Giles	BRT	GTS
02.53	Tandem Free Operation (TFO); Service description; Stage 1					
5.1.0	PU	SMG11	#24: 5.1.0			

GSM NUMBER AND TITLE								RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs		HISTORY								
02.60	General Packet Radio Service Stage 1 Description										
5.2.0	RT	SMG1	#21: 5.0.0 #23: 5.1.0 #24: 5.2.0			A.Conrad		T-Mobil			
02.63	Packet Data on Signalling channels Service (PDS) - Stage 1										
5.0.0	RT	SMG1	#19: 5.0.0			A.Conrad		T-Mobil		GTS	
02.67	Enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) - Stage 1										
5.0.4	PA	SMG1	#16: 5.0.0 #19: 5.0.1 #20: 5.0.2 #22: 5.0.4			D.Münning		Detecon		300 924	
02.68	Voice Group Call Service (VGCS) - Stage 1										
5.1.3	PA	SMG1	#16: 5.0.0 #17: 5.1.0 #20: 5.1.1 #21: 5.1.2 #22: 5.1.3			D.Münning		Detecon		300 926	
02.69	Voice Broadcast Service (VBS) - Stage 1										
5.1.3	PA	SMG1	#16: 5.0.0 #17: 5.1.0 #20: 5.1.1 #21: 5.1.2 #22: 5.1.3			D.Münning		Detecon		300 926	
02.72	Call Deflection Service description, Stage 1										
5.0.0	RT	SMG1	#19: 5.0.0			S.Habermann		T-Mobil		GTS	
02.78	Customized Applications for Mobile network Enhanced Logic (CAMEL); Service definition (Stage 1)										
5.4.0	RT	SMG1	#19: 5.0.0 #20: 5.1.0 #21: 5.1.1 #22: 5.2.0 #23: 5.3.0 #24: 5.4.0			P.Waerleus		Telia Mobitel		GTS	
02.79	Support of Optimal Routeing (SOR); Service definition (Stage 1)										
5.1.0	RT	SMG1	#19: 5.0.0 #20: 5.1.0			S.Frey		SFR		GTS	
02.81	Line Identification Supplementary Services - Stage 1.										
4.6.0	RT	SMG1	#7: 4.3.1 #10: 4.4.0 #11: 4.4.1 #12: 4.5.0 #16: 4.5.1 #24: 4.6.0			L.Larsson		Swedish Telecom		300 514	
5.1.0	RT	SMG1	#20: 5.0.0 #24: 5.1.0			L.Larsson		Swedish Telecom		GTS	

GSM NUMBER AND TITLE						RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs	HISTORY							
02.82	Call Forwarding (CF) Supplementary Services - Stage 1								
3.6.1	RT	SMG1				N.Renaud	France Telecom	--	
4.5.2	RT	SMG1	#7: 4.4.2	#10: 4.5.0	#16: 4.5.2	N.Renaud	France Telecom	300 515	
5.0.0	RT	SMG1	#16: 5.0.0			L.Larson	Swedish Telecom	GTS	
02.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 1								
4.6.7	RT	SMG1	#7: 4.6.3	#10: 4.6.5	#16: 4.6.7	N.Jørgensen	Tele Denmark Mobil	300 516	
5.0.0	RT	SMG1	#20: 5.0.0			N.Jørgensen	Tele Denmark Mobil	GTS	
02.84	MultiParty (MPTY) Supplementary Services - Stage 1								
4.4.7	RT	SMG1	#7: 4.4.2	#11: 4.4.5	#16: 4.4.7	E.Postmann	Siemens	300 517	
5.0.0	RT	SMG1	#20: 5.0.0			E.Postmann	Siemens	GTS	
02.85	Closed User Group (CUG) Supplementary Services - Stage 1.								
4.2.6	RT	SMG1	#7: 4.2.2	#16: 4.2.6			L.Larsson	Swedish Telecom	300 518
5.0.0	RT	SMG1	#20: 5.0.0			L.Larsson	Swedish Telecom	GTS	
02.86	Advice of Charge (AoC) Supplementary Services - Stage 1								
4.1.5	RT	SMG1	#7: 4.1.1	#16: 4.1.5			I.Crawford	Vodafone	300 519
5.0.0	RT	SMG1	#20: 5.0.0			I.Crawford	Vodafone	GTS	
02.87	User-to-User Signalling (UUS) Service Description, Stage 1								
5.3.0	RT	SMG1	#18: 5.0.0	#20: 5.1.0	#21: 5.2.0	#23: 5.3.0	S.Habermann	T-Mobil	GTS
02.88	Call Barring (CB) Supplementary Services - Stage 1.								
3.6.1	RT	SMG1				G.Schmidt	T-Mobil	--	
4.4.3	RT	SMG1	#7: 4.3.0	#8: 4.4.0	#16: 4.4.3	G.Schmidt	T-Mobil	300 520	
5.0.0	RT	SMG1	#20: 5.0.0			G.Schmidt	T-Mobil	GTS	

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
02.90	Stage 1 Decision of Unstructured Supplementary Service Data (USSD)					
4.1.0	RT	SMG1	#8: 4.0.1 #21: 4.1.0	A.Conrad	T-Mobil	300 625
5.1.0	RT	SMG1	#20: 5.0.0 #21: 5.1.0	A.Conrad	T-Mobil	GTS
02.91	Explicit Call Transfer (ECT)					
5.1.1	RT	SMG1	#16: 5.0.0 #17: 5.0.1 #19: 5.1.0 #21: 5.1.1	E.Postmann	Siemens	GTS
02.93	Completion of Calls to Busy Subscriber (CCBS) Service Description - Stage 1					
5.5.0	RT	SMG1	#16: 5.0.0 #19: 5.1.0 #20: 5.2.0 #22: 5.3.0 #23: 5.4.0 #24: 5.5.0	N. Jörgenen	Tele Danmark Mobile	GTS
02.95	Digital cellular telecommunications system (Phase 2+); Support of Private Numbering Plan (SPNP); Service description, Stage 1					
5.2.0	RT	SMG1	#16: 5.0.0 #18: 5.1.0 #19: 5.2.0	T. Sundbye		GTS
02.97	Multile Subscriber Profile (MSP) Service description, Stage 1					
5.2.0	RT	SMG1	#19: 5.0.0 #22: 5.1.0 #23: 5.2.0	S.Manning	Vodafone	GTS
03.01	Network Functions					
3.1.1	FP	SMG3		P.Gaasvik	Comviq GSM AB	--
4.0.4	FP	SMG3	#7: 4.0.1	P.Gaasvik	Comviq GSM AB	300 521
5.1.0	FP	SMG3	#17: 5.0.0 #18: 5.1.0	P.Gaasvik	Comviq GSM AB	GTS
03.02	Network Architecture					
3.1.4	FP	SMG3 SMG4		P.Gaasvik	Comviq GSM AB	--
4.2.1	FP	SMG3 SMG4	#7: 4.0.1 #17: 4.1.0 #18: 4.2.1	P.Gaasvik	Comviq GSM AB	300 522
5.3.0	FP	SMG3 SMG4	#17: 5.0.0 #18: 5.1.0 #23: 5.2.0 #24: 5.3.0	P.Gaasvik	Comviq GSM AB	GTS

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs				
03.03	Numbering, Addressing and Identification						
3.6.0	SA	SMG3	SMG4	#8: 3.6.0	P.Gaasvik	Comviq GSM AB	--
4.9.0	SA	SMG3	SMG4	#7: 4.5.0 #8: 4.6.0 #9: 4.8.0 #12: 4.9.0	P.Gaasvik	Comviq GSM AB	300 523
5.0.2	SA	SMG3	SMG4	#17: 5.0.0 #20: 5.0.1	P.Gaasvik	Comviq GSM AB	300 927
03.04	Signalling Requirements Relating to Routing of Calls to Mobile Subscribers						
3.1.0	SA	SMG3	SMG4	SPS	C.Vernhes	France Telecom	--
4.0.4	SA	SPS	SMG3	SMG4	#7: 4.0.1	--- none ---	300 524
5.0.0	SA	SPS	SMG3	SMG4	#20: 5.0.0	--- none ---	GTS
03.05	Technical Performance Objectives						
3.2.0	SA	SMG3			--- none ---		--
4.1.0	SA	SMG3		#7: 4.0.0 #19:4.1.0	--- none ---		ETR 102
5.0.0	SA	SMG3		#20: 5.0.0	--- none ---		ETR 351
03.07	Restoration Procedures						
3.2.1	SA	SMG3			I.Park	Vodafone	--
4.3.1	SA	SMG3		#7: 4.2.0 #10: 4.3.0	I.Park	Vodafone	300 525
5.1.0	SA	SMG3		#20: 5.0.0 #23: 5.1.0	I.Park	Vodafone	GTS
03.08	Organization of Subscriber Data						
3.7.0	SA	SMG3			R.Bauer	Alcatel Sel	--
4.8.0	SA	SMG3		#7: 4.5.0 #8: 4.5.1 #9: 4.6.0 #10: 4.7.0 #18: 4.8.0	R.Bauer	Alcatel Sel	300 526
5.2.0	SA	SMG3		#18: 5.0.0 #21: 5.1.0 #23: 5.2.0	R. Bauer	Alcatel Sel	GTS

GSM NUMBER AND TITLE																RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs			HISTORY													
03.09 Handover Procedures																			
3.2.1	FP	SMG3	SMG2													--- none ---		--	
4.6.0	FP	SMG3	SMG2			#7: 4.1.0 #8: 4.2.0 #9: 4.2.1 #10: 4.3.0 #11: 4.4.0 #12: 4.5.0 #17: 4.6.0										Ian Sayers	Wavelink Communications	300 527	
5.1.0	FP	SMG3	SMG2			#18: 5.0.0 #22: 5.1.0										I. Sayers	Wavelink Communications	GTS	
03.10 GSM Public Land Mobile Network (PLMN) Connection Types.																			
3.3.0	SA	SMG4	SMG1	SMG2	SMG3											M.Valo	Nokia	--	
4.3.1	SA	SMG4	SMG1	SMG2	SMG3	#7: 4.2.1 #8: 4.3.0										M.Valo	Nokia	300 528	
5.4.0	SA	SMG1				#16: 5.0.0 #21: 5.1.0 #22: 5.2.0 #23: 5.3.0 #24: 5.4.0										M.Valo	Nokia	GTS	
03.11 Technical Realization of Supplementary Services - General Aspects																			
3.1.1	PA	SMG3											S.Habermann T-Mobil		--				
4.10.1	PA	SMG3	#7: 4.4.0 #9: 4.5.0 #10: 4.6.0 #11: 4.7.0 #12: 4.8.0 #14: 4.9.0 #18: 4.10.1										S.Habermann T-Mobil		300 529				
5.0.1	PA	SMG3	#20: 5.0.0										S.Habermann T-Mobil		300 928				
03.12 Location Registration Procedures																			
3.3.0	SA	SMG3											P.Gaasvik	Comviq GSM AB	--				
4.4.2	SA	SMG3	#7: 4.3.0 #8: 4.4.0										P.Gaasvik	Comviq GSM AB	300 530				
5.0.0	SA	SMG3	#20: 5.0.0										P.Gaasvik	Comviq GSM AB	GTS				
DCS 3.0.1	SA	SMG3											--- none ---		--				
03.13 Discontinuous Reception (DRX) in the GSM System																			
3.0.2	PU	SMG2											M.Dolan	AT&T	--				
4.0.4	PU	SMG2	#7: 4.0.1										---none---		300 531				
5.0.0	PU	SMG2	#17: 5.0.0										---none---		GTS				

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR					
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs										
03.14	Support of Dual Tone Multi-Frequency Signalling (DTMF) via the GSM System										
3.0.2	FP	SMG3			--- none ---	- -					
4.1.1	FP	SMG3	#7: 4.0.0	#10: 4.1.0	---none---	300 532					
5.0.0	FP	SMG3	#20: 5.0.0		---none---	GTS					
03.15	Technical Realization of Operator Determined Barring										
4.3.1	SA	SMG3	#7: 4.2.0	#10: 4.3.0	I.Park	Vodafone	300 533				
5.1.0	SA	SMG3	#16: 5.0.0	#21: 5.1.0	I. Park	Vodafone	GTS				
03.16	Subscriber Data Management										
4.2.1	PA	SMG3	#14: 4.1.0	#16: 4.1.1	#18: 4.2.1	H.Dettner	Siemens	300 629			
5.2.0	PA	SMG3	#18: 5.0.0	#21: 5.1.0	#23: 5.2.0	H. Dettner	Siemens	GTS			
03.18	Basic Call Handling										
5.3.0	SA	SMG3	#21: 5.0.0	#22: 5.1.0	#23: 5.2.0	#24: 5.3.0	I.Park	Vodafone			
03.20	Security-related Network Functions										
3.3.2	PA	SMG10 SMG3 SMG2				R.Thomas	France Telecom	- -			
4.4.0	PA	SMG10 SMG3 SMG2	#7: 4.2.1	#10: 4.3.0	#17: .3.2	#21: 4.4.0	R.Thomas	France Telecom	300 534		
5.2.0	PA	SMG10 SMG3 SMG2	#20: 5.0.0	#21: 5.1.0	#23: 5.2.0		R.Thomas	France Telecom	300 929		
EXT	3.0.0	PA	SMG10 SMG3 SMG2	#7: 3.0.0			R.Thomas	France Telecom			
03.22	Functions Related to Mobile Station (MS)in Idle Mode.										
4.11.0	PU	SMG2 SMG3	#7: 4.4.0	#9: 4.5.0	#10: 4.6.0	#11: 4.7.0	#12: 4.8.0	#14: 4.9.0	#16: 4.10.0	---none---	300 535
			#17: 4.11.0								
5.2.0	PU	SMG2 SMG3	#20: 5.0.0	#21: 5.1.0	#22: 5.2.0					---none---	300 930

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs						
03.26	Multiband operation of GSM/DCS 1800 by a single operator						
4.3.0	PU	SMG2	SMG3	#18: 4.1.0 #22: 4.2.0 #23: 4.3.0			TC-TR 005
5.1.0	PU	SMG2	SMG3	#20: 5.0.0 #22: 5.1.0			ETR 366
03.30	Radio Network Planning Aspects.						
4.3.0	PU	SMG2		#7: 4.2.0 #9: 4.2.1 #13: 4.3.0	P.Stevens	One2One	ETR 103
5.0.0	PU	SMG2		#20: 5.0.0	P.Stevens	One2One	ETR 364
03.32	Universal Geographical Area Description (GAD)						
5.0.0	SA	SMG3		#23: 5.0.0			
03.34	GSM 03.34 HSCSD Stage 2						
5.0.1	FP	SMG3		#21: 5.0.0			
03.38	Alphabets and Language Specific Information for GSM						
4.0.1	SA	SMG4		#10: 4.0.0	I.Harris	Vodafone	300 628
5.6.0	SA	SMG4		#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #22: 5.6.0	I.Harris	Vodafone	300 900
03.39	Digital Cellular Telecommunications System (Phase 2) Interface Protocols for the Connection of Short Message Service Centers (SMSCs) to Short Message Entities (SMEs)						
4.0.0	SA	SMG4		#16: 4.0.0	---none---		ETR 243
5.0.0	SA	SMG4		#20: 5.0.0	---none---		ETR 365
03.40	Technical Realization of the Short Message Service (SMS) Point-to-point(PP)						
3.6.0	SA	SMG4	SMG3	#8: 3.6.0 #9: 3.7.0	K.Holley	BT	- -
4.13.0	SA	SMG4	SMG3	#7: 4.6.0 #8: 4.7.0 #10: 4.8.1 #11: 4.9.0 #15: 4.11.0 #16: 4.12.0 #18: 4.13.0	K.Holley	BT	300 536
5.8.0	SA	SMG4		#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #22: 5.6.0 #23: 5.7.0 #24: 5.8.0	K. Holley	BT	300 901

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR									
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs															
03.41 Technical Realization of Short Message Service Cell Broadcast (SMSCB).																
3.4.0	SA	SMG4	SMG2			D.Richards	AT&T	v.3.4.0	300 069							
4.11.0	SA	SMG4	SMG2	#7: 4.4.1 #16: 4.11.0	#8: 4.5.0	#9: 4.6.0	#10: 4.7.0	#11: 4.8.0	#12: 4.9.0	#13: 4.10.0	E.Daniel	AT&T NSI		300 537		
5.8.0	SA	SMG4	SMG2	#16: 5.0.0 #23: 5.7.0	#17: 5.1.0	#18: 5.2.0	#19: 5.3.0	#20: 5.4.0	#21: 5.5.0	#22: 5.6.0	#24: 5.8.0	P. Pike	Lucent Technologies		300 902	
03.42 SMS Compression																
5.2.0	SA	SMG4	#21: 5.0.0 #22: 5.1.0 #23: 5.2.0													
03.43 Support of Videotex.																
3.0.1	SA	SMG4					Di Tria	CSELT							- -	
4.1.2	SA	SMG4	#7: 4.1.1				Di Tria	CSELT							ETR 104	
5.0.0	SA	SMG4	#20: 5.0.0				Di Tria	CSELT							ETR 352	
03.44 Support of Teletex in a GSM Public Land Mobile Network (PLMN).																
3.0.1	SA	SMG4					---	none	---							- -
4.0.1	SA	SMG4	#7: 4.0.0				---	none	---							ETR 105
5.0.0	SA	SMG4	#20: 5.0.0				---	none	---							ETR 353
03.45 Technical Realization of Facsimile Group 3 Service - transparent																
3.1.0	SA	SMG4	#5: 3.2.0		#6: 3.3.0		Di Tria	CSELT	v.3.3.0						300 070	
4.5.0	SA	SMG4	#7: 4.2.1		#8: 4.3.0		#9: 4.3.1	#10: 4.4.0	#11: 4.4.1	#14: 4.5.0					300 538	
5.2.0	SA	SMG4	#20: 5.0.0		#21: 5.1.0		#5.2.0		Di Tria	CSELT					300 931	

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
03.46	Technical Realization of Facsimile Group 3 Service - non transparent					
3.2.1	SA	SMG4	#5: 3.2.1	G.Baumann	T-Mobil	v.3.2.1 300 071
4.1.2	SA	SMG4	#7: 4.0.1 #8: 4.0.2 #11: 4.1.0	G.Baumann	T-Mobil	300 539
5.0.0	SA	SMG4	#20: 5.0.0	G.Baumann	T-Mobil	GTS
03.47	Example Protocol Stacks for Interconnecting Service Centre(s) (SC) and Mobile Services Switching Centre(s) (MSC).					
4.4.0	SA	SMG4	#7: 4.1.0 #8: 4.2.0 #12: 4.2.1 #18: 4.4.0			ETR 106
5.0.0	SA	SMG4	#20: 5.0.0			ETR 354
03.49	Example Protocol Stacks for Interconnecting Cell Broadcast Centre (CBC) and Base Station Controler (BSC)					
4.6.0	SA	SMG4	#7: 4.1.0 #8: 4.2.0 #11: 4.3.0 #12: 4.4.0 #13: 4.5.0 #16:4.6.0	E.Daniel	AT&T NSI	ETR 107
5.7.0	SA	SMG4	#16: 5.0.0 #18: 5.1.0 #19: 5.2.0 #20: 5.3.0 #21: 5.4.0 #22: 5.5.0 #23: 5.6.0 #24: 5.7.0	P. Pike	Lucent Technologies	GTS
03.50	Transmission Planning Aspects of the Speech Service in the GSM Public Land Mobile Network (PLMN) System.					
3.4.0	PU	SMG11	#4: 3.2.2 #8: 3.3.0 #11: 3.4.0	P.Usai	ETSI	- -
4.3.0	PU	SMG11	#8: 4.0.0 #9: 4.1.0 #15: 4.2.0 #24: 4.3.0	P.Usai	ETSI	300 540
5.0.3	PU	SMG11	#17: 5.0.0 #20: 5.0.1 #24: 5.0.3	P.Usai	ETSI	300 903
03.54	High Speed Circuit Switched Data (HSCSD) - Stage 2					
5.2.0	FP	SMG3	#23: 5.1.0 #24: 5.2.0			
03.60	General Packet Radio Service (GPRS) Service description; Stage 2					
5.2.0	FP	SMG3	#23: 5.1.0 #24: 5.2.0			
03.63	Packet Data on Signalling channels service (PDS) Service description, Stage 21					
5.1.0	FP	SMG3	#16: 5.0.0 #18: 5.1.0	J.Baumann	T-Mobil	GTS

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY	ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs				
03.64	Overall description of the GPRS radio interface; Stage 2				
5.2.0	FP	SMG3	#23: 5.1.0 #24: 5.2.0		
03.67	Enhanced Multi-Level Precedence and Preemption Service (EMLPP) - Stage 2				
5.1.1	PA	SMG3	#16: 5.0.0 #20: 5.1.0	D. Münning Detecon	300 932
03.68	Voice Group Call Service (VGCS) - Stage 2				
5.4.0	PA	SMG3	#16: 5.0.0 #18: 5.1.0 #20: 5.1.1 #21: 5.2.0 #23: 5.3.0 #24: 5.4.0	D. Münning Detecon	300 933
03.69	Voice Broadcast service (VBS) - Stage 2				
5.3.0	PA	SMG3	#16: 5.0.0 #18: 5.1.0 #20: 5.1.1 #21: 5.2.0 #23: 5.3.0	D. Münning Detecon	300 934
03.70	Routeing of Calls to/from Public Data Networks (PDN).				
3.0.0	SA	SMG4		--- none ---	--
4.0.3	SA	SMG4	#7: 4.0.0 #8: 4.0.1	--- none ---	300 541
5.0.0	SA	SMG4	#20: 5.0.0	--- none ---	GTS
03.78	CAMEL Phase 1 (stage 2)				
5.3.0	SA	SMG3	#21: 5.0.0 #22: 5.1.0 #23: 5.2.0 #24: 5.3.0		
03.79	Support of Optimal Routing phase 1 (stage 2)				
5.2.0	SA	SMG3	#21: 5.0.0 #22: 5.1.0 #24: 5.2.0	I.Park Vodafone	
03.81	Line Identification Supplementary Services - Stage 2.				
4.7.0	PA	SMG3	#7: 4.1.0 #9: 4.2.0 #10: 4.3.0 #11: 4.4.0 #12: 4.5.0 #19: 4.6.0 #24: 4.7.0	--- none ---	300 542
5.1.0	PA	SMG3	#20: 5.0.0 #24: 5.1.0	--- none ---	GTS

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY			ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs						
03.82	Call Forwarding (CF) Supplementary Services - Stage 2.						
4.8.1	PA	SMG3	#7: 4.5.0 #8: 4.5.1 #10: 4.6.0 #12: 4.7.0 #18: 4.8.0	A.Poths	MMO	300 543	
5.0.0	PA	SMG3	#20: 5.0.0	A.Poths	MMO	GTS	
3.2.1	PA	SMG3		A.Poths	MMO	- -	
03.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 2.						
4.4.1	PA	SMG3	#7: 4.3.0 #11: 4.3.2 #12: 4.4.0	I.Sharp	Northern Telecom	300 544	
5.0.0	PA	SMG3	#20: 5.0.0	I.Sharp	Northern Telecom	GTS	
03.84	Multi Party (MPTY) Supplementary Services - Stage 2.						
4.4.1	PA	SMG3	#7: 4.1.0 #9: 4.2.0 #10: 4.3.0 #12: 4.4.0	S.Habermann	T-Mobil	300 545	
5.0.0	PA	SMG3	#20: 5.0.0	S.Habermann	T-Mobil	GTS	
03.85	Closed user Group (CUG) Supplementary Services - Stage 2.						
4.2.1	PA	SMG3	#7: 4.0.0 #8: 4.1.0 #15: 4.2.0	S.Frew	Vodafone	300 546	
5.0.0	PA	SMG3	#20: 5.0.0	S.Frew	Vodafone	GTS	
03.86	Advice of Charge (AoC) Supplementary Services - Stage 2.						
4.6.1	PA	SMG3	#7: 4.1.0 #8: 4.2.0 #9: 4.3.0 #10: 4.4.0 #11: 4.5.0 #12: 4.6.0	S.Frew	Vodafone	300 547	
5.0.1	PA	SMG3	#20: 5.0.0	S.Frew	Vodafone	300 935	
03.88	Call Barring (CB) Supplementary Services - Stage 2.						
4.6.1	PA	SMG3	#7: 4.4.0 #10: 4.5.0 #12: 4.6.0	L.Letellier	France Telecom	300 548	
5.0.0	PA	SMG3	#20: 5.0.0	L.Letellier	France Telecom	GTS	
3.2.1	PA	SMG3		L.Letellier	France Telecom	- -	

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
03.90	Unstructured Supplementary Service Data (USSD)					
4.1.1	PA	SMG3	#8: 4.0.0 #16: 4.1.0	S.Chotai	BT	300 549
5.0.0	PA	SMG3	#20: 5.0.0	S.Chotai	BT	GTS
03.91	Explicit Call Transfer (ECT) Supplementary Service - Stage 2					
5.0.2	PA	SMG3	#16: 5.0.0 #18: 5.0.1 #19: 5.0.2	S.Dzuban	Siemens	GTS
04.01	Mobile Station - Base Station System (MS - BSS) Interface General Aspects and Principles.					
3.0.1	FP	SMG3		R.Thomas	France Telecom	- -
4.0.4	FP	SMG3	#7: 4.0.1	R.Thomas	France Telecom	300 550
5.0.0	FP	SMG3	#20: 5.0.0	R.Thomas	France Telecom	GTS
04.02	GSM Public Land Mobile Network (PLMN) Access Reference Configuration.					
3.0.2	FP	SMG3 SMG2		P.Simmons	Nortel Matra Cellular	- -
4.0.4	FP	SMG3 SMG2	#7: 4.0.1	P.Simmons	Nortel Matra Cellular	300 551
5.0.0	FP	SMG3 SMG2	#18: 5.0.0	P. Simmons	Nortel Matra Cellular	GTS
04.03	Mobile Station - Base Station System (MS - BSS) Interface Channel Structures and Access Capabilities.					
3.0.3	PU	SMG2		R.Thomas	France Telecom	- -
4.1.1	PU	SMG2	#7: 4.0.1 #10: 4.1.0	R.Thomas	France Telecom	300 552
5.2.0	PU	SMG2	#18: 5.0.0 #21: 5.1.0 #22: 5.2.0 #24: 5.3.0	R. Thomas	France Telecom	GTS
04.04	Layer 1 - General Requirements.					
4.0.4	PU	SMG2	#7: 4.0.1	R.Thomas	France Telecom	300 553
5.1.0	PU	SMG2	#20: 5.0.0 #24: 5.1.0	R.Thomas	France Telecom	300 936
3.3.4	PU	SMG2		R.Thomas	France Telecom	v.3.3.4 300 078

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CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs							
04.05	Data Link (DL) Layer General Aspects.									
4.0.3	PU	SMG2		#7: 4.0.0	M.Sollner	PKI		300 554		
5.0.0	PU	SMG2		#20: 5.0.0	M.Sollner	PKI		300 937		
3.1.5	PU	SMG2			M.Sollner	PKI		--		
04.06	Mobile Station - Base Stations System (MS - BSS) Interface Data Link (DL) Layer Specification.									
4.4.0	PU	SMG2		#7: 4.2.0 #8: 4.3.0 #11: 4.4.0	M.Sollner	PKI		300 555		
5.1.0	PU	SMG2		#20: 5.0.0 #21: 5.1.0	M.Sollner	PKI		300 938		
3.9.0	PU	SMG2			M.Sollner	PKI	v.3.9.0	300 021		
04.07	Mobile Radio Interface Signalling Layer 3 - General Aspects									
3.3.3	FP	SMG3			A.Bergmann	T-Mobil		--		
4.3.1	FP	SMG3		#7: 4.1.1 #10: 4.2.0 #12: 4.3.0	A.Bergmann	T-Mobil		300 556		
5.3.0	FP	SMG3		#16: 5.0.0 #17: 5.1.0 #20: 5.1.1 #21: 5.2.0 #24: 5.3.0	A. Bergmann	ETSI PT12		300 939		
04.08	Mobile Radio Interface - Layer 3 Specification									
3.14.0	FP	SMG3	SMG2		A.Bergmann F.Courau R.Thomas	T-Mobil Telecom	France	v.3.13.	300 022-1	
4.21.0	FP	SMG3	SMG2	#7: 4.5.0 #8: 4.6.0 #9: 4.7.0 #10: 4.8.0 #11: 4.9.0 #12: 4.10.0 #14: 4.11.0 #15: 4.12.0 #16: 4.13.0 #17: 4.14.0 #18: 4.15.0 #19:4.16.0 #20: 4.17.0 #21: 4.18.0 #23: 4.20.1 #24: 4.21.0	A.Bergmann F.Courau R.Thomas	T-Mobil Telecom	France	300 557		
5.8.0	FP	SMG3	SMG2	#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #22: 5.6.0 #23: 5.7.0 #24: 5.8.0	A. Bergmann F.Courau R.Thomas	ETSI PT12 Telecom	France	300 940		
DCS	3.1.0	FP	SMG3	SMG2	---	none	---	v.3.1.0	31.12.91	
EXT	3.0.0	FP	SMG3	SMG2	#7: 3.0.0	n.a.		v.3.0.0	300 022-3	

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CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs		HISTORY										RAPPORTEUR + COMPANY		ETS VERSION + NR	
04.10 Mobile Radio Interface Layer 3 - Supplementary Services Specification - General Aspects																
3.2.3	PA	SMG3											I.Sharp	Northern Telecom	- -	
4.10.1	PA	SMG3	#7: 4.4.0 #8: 4.5.0 #9: 4.6.0 #10: 4.7.0 #11: 4.8.0 #13: 4.9.0 #14: 4.10.0										I.Sharp	Northern Telecom	300 558	
5.0.1	PA	SMG3	#20: 5.0.0										I.Sharp	Northern Telecom	300 941	
04.11 Point-to-Point (PP) Short Message Service (SMS) Support on Mobile Radio Interface																
3.3.0	FP	SMG3 SMG4	#5:3.3.0										P.Simmons	Nortel Matra Cellular	v.3.3.0	300 023
4.10.0	FP	SMG3 SMG4	#7: 4.3.0 #8: 4.4.0 #10: 4.5.0 #11: 4.6.0 #12: 4.7.0 #14: 4.8.0 #16: 4.9.0 #17: 4.10.0										P.Simmons	Nortel Matra Cellular	300 559	
5.2.0	FP	SMG3 SMG4	#16: 5.0.0 #17: 5.1.0 #20: 5.1.1 #21: 5.2.0										P.Simmons	Nortel Matra Cellular	300 942	
04.12 Short Message Service Cell Broadcast (SMSCB) Support on the Mobile Radio Interface																
3.2.1	FP	SMG3 SMG4											C.Pudney	Vodafone	v.3.2.1	300 024
4.6.0	PU	SMG2 SMG4	#7: 4.1.1 #10: 4.2.0 #11: 4.3.0 #12: 4.4.0 #16: 4.6.0										C.Pudney	Vodafone	300 560	
5.0.2	PU	SMG2 SMG4	#19: 5.0.0 #20: 5.0.1										C.Pudney	Vodafone	300 943	
04.13 Performance Requirements on Mobile Radio Interface																
4.2.0	FP	SMG3 SMG2	#10: 4.0.0 #14: 4.0.2 #15: 4.1.0 #16: 4.2.0										C.Pudney	Vodafone	300 561	
5.1.0	FP	SMG3 SMG2	#18: 5.0.0 #20: 5.1.0										C. Pudney	Vodafone	300 944	
04.21 Rate Adaption on the Mobile Station - Base Station System (MS-BSS) Interface.																
3.4.0	SA	SMG4											M.Valo	Nokia	v.3.4.0	300 025
4.6.0	SA	SMG4	#7: 4.2.1 #8: 4.3.0 #11: 4.4.0 #13: 4.5.0 #14: 4.6.0										M.Valo	Nokia	300 562	
5.4.0	SA	SMG4	#20: 5.0.0 #21: 5.1.0 #22: 5.2.0 #23: 5.3.0 #24: 5.4.0										M.Valo	Nokia	300 945	

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CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs		HISTORY						
04.22	Radio Link Protocol (RLP) for Data and Telematic services on the (MS-BSS) Interface and the Base Station System-Mobile-Services Switching Centre (BSS-MSC) Interface								
5.3.0	SA	SMG4	#16: 5.0.0 #20: 5.0.1 #21: 5.1.0 #22: 5.2.0 #23: 5.3.0			N.Klehn	Siemens	300 946	
4.4.0	SA	SMG4	#7: 4.2.2 #8: 4.3.0 #13: 4.4.0			N.Klehn	Siemens	300 563	
3.7.0	SA	SMG4				N. Klehn	Siemens	v.3.7.0	300 026
04.63	Packet Data on Signalling channels Service (PDS) Service Description, Stage 3								
5.0.0	FP	SMG3	#18: 5.0.0			Nazemann	T-Mobil	GTS	
04.64	Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification								
5.1.0	FP	SMG3	#24: 5.1.0						
04.65	Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SND CP)								
5.1.0	FP	SMG3	#24: 5.1.0						
04.67	Enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 3								
5.0.1	PA	SMG3	#20: 5.0.0			D.Munning	Detecon	300 947	
04.68	Group Call Control (GCC) Protocol								
5.0.2	PA	SMG3	#18: 5.0.0 #20: 5.0.1			A.Bergmann	ETSI PT12	300 948	
04.69	Broadcast Call Control (BCC) protocol								
5.0.1	PA	SMG3	#20: 5.0.0			A.Bergmann	ETSI PT12	300 949	
04.80	Mobile Radio Interface Layer 3 - Supplementary Services Specification Formats and Coding								
3.2.0	PA	SMG3				--- none ---		v.3.2.0	300 027
4.11.1	PA	SMG3	#7: 4.7.0 #8: 4.7.1 #9: 4.9.0 #12: 4.9.1 #16: 4.10.0 #17: 4.11.0			--- none ---		300 564	
5.1.0	PA	SMG3	#18: 5.0.0 #20: 5.0.1 #24: 5.1.0			--- none ---		300 950	

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
04.81	Line Identification Supplementary Services - Stage 3.					
4.4.1	PA	SMG3	#7: 4.2.0 #10: 4.3.0 #12: 4.4.0	--- none ---		300 565
5.0.1	PA	SMG3	#20: 5.0.0	--- none ---		300 951
04.82	Call Forwarding (CF) Supplementary Services - Stage 3.					
4.9.1	PA	SMG3	#7: 4.6.0 #11: 4.7.0 #12: 4.8.0 #17: 4.9.0	A.Poths	MMO	300 566
5.0.1	PA	SMG3	#20: 5.0.0	A.Poths	MMO	300 952
3.1.3	PA	SMG3		A.Poths	MMO	v.3.1.3 300 028
04.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 3.					
4.6.1	PA	SMG3	#7: 4.4.0 #9: 4.5.0 #17: 4.6.0	I.Sharp	Northern Telecom	300 567
5.0.1	PA	SMG3	#20: 5.0.0	I.Sharp	Northern Telecom	300 953
04.84	Multi Party (MPTY) Supplementary Services - Stage 3.					
4.3.2	PA	SMG3	#7: 4.2.0 #9: 4.3.0	S.Habermann T-Mobil		300 568
5.0.1	PA	SMG3	#20: 5.0.0	S.Habermann T-Mobil		300 954
04.85	Closed User Group (CUG) Supplementary Services - Stage 3.					
4.1.1	PA	SMG3	#7: 4.0.0 #18: 4.1.0	S.Frew	Vodafone	300 569
5.0.0	PA	SMG3	#20: 5.0.0	S.Frew	Vodafone	GTS
04.86	Advice of Charge (AoC) Supplementary Services - Stage 3.					
4.5.2	PA	SMG3	#7: 4.2.0 #8: 4.4.0 #11: 4.5.0	S.Frew	Vodafone	300 570
5.0.1	PA	SMG3	#20: 5.0.0	S.Frew	Vodafone	300 955

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs						
04.88	Call Barring (CB) Supplementary Services - Stage 3.						
4.7.1	PA	SMG3	#7: 4.6.0 #17: 4.7.0	L.Letellier	France Telecom	300 571	
5.1.0	PA	SMG3	#20: 5.0.0 #24: 5.1.0	L.Letellier	France Telecom	300 956	
3.1.3	PA	SMG3		L. Letellier	France Telecom	v.3.1.3 300 029	
04.90	Unstructured Supplementary Service Data (USSD)						
4.1.1	PA	SMG3	#8: 4.0.0 #12: 4.1.0	J.Bruss	Ericsson	300 572	
5.0.1	PA	SMG3	#20: 5.0.0	J.Bruss	Ericsson	300 957	
04.91	Explicit Call Transfer (ECT) Supplementary Service - Stage 3						
5.1.1	PA	SMG3	#16: 5.0.0 #17: 5.1.0 #20: 5.1.1	S. Dzuban	Siemens	300 958	
05.01	Physical Layer on the Radio Path (General Description)						
3.3.2	PU	SMG2		N.Andersen	Tele Danmark	--	
4.6.0	PU	SMG2	#7: 4.1.0 #8: 4.2.0 #10: 4.3.0 #13: 4.4.0 #14: 4.5.0 #16: 4.6.0	N.Andersen	Tele Danmark	300 573	
5.3.0	PU	SMG2	#18: 5.0.0 #20: 5.1.0 #21: 5.2.0 #22: 5.3.0	N.Andersen	Tele Danmark	GTS	
DCS 3.0.0	PU	SMG2		--- none ---		--	
6.0.0	PU	SMG2	#24: 6.0.0	N.Andersen	Tele Danmark		
05.02	Multiplexing and Multiple Access on the Radio Path						
3.6.1	PU	SMG2	#15: 3.7.0 #16: 3.8.0	D.Freeman	Motorola	v.3.7.0 300 030	
4.9.0	PU	SMG2	#7: 4.3.0 #9: 4.4.0 #15: 4.5.0 #16: 4.6.0 #17: 4.7.0 #20: 4.8.0 #22: 4.9.0	D.Freeman	Motorola	300 574	
5.4.0	PU	SMG2	#18: 5.0.0 #19: 5.1.0 #20: 5.2.0 #21: 5.3.0 #23: 5.4.0	D. Freeman	Motorola	300 908	
6.0.0	PU	SMG2	#24: 6.0.0	D. Freeman	Motorola		

GSM NUMBER AND TITLE														RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs	HISTORY													
05.03 Channel Coding																	
3.6.1	PU	SMG2		#12: 3.6.1										--- none ---		v.3.6.1	300 031/A1
4.5.0	PU	SMG2		#7: 4.1.0 #13: 4.2.0 #15: 4.3.0 #21: 4.4.0 #22: 4.5.0										--- none ---			300 575
5.4.0	PU	SMG2		#17: 5.0.0 #18: 5.1.0 #19: 5.2.0 #20: 5.2.1 #21: 5.3.0 #23: 5.4.0										--- none ---			300 909
05.04 Modulation																	
3.1.2	PU	SMG2												M.Reiner	AEG Mobile Com.	v.3.1.2	300 032
4.0.3	PU	SMG2		#7: 4.0.0										M.Reiner	AEG Mobile Communication		300 576
5.0.1	PU	SMG2		#20: 5.0.0										M.Reiner	AEG Mobile Communication		300 959
05.05 Radio Transmission and Reception																	
3.13.0	PU	SMG2		#4: 3.14.0 #6b: 3.15.0 #8: 3.16.0										J.P.Charles	France Télécom	v.3.16.	300 033-1/A1
4.21.0	PU	SMG2		#7: 4.6.0 #8: 4.7.0 #9: 4.8.0 #10: 4.9.0 #13: 4.10.0 #14: 4.11.0 #16: 4.13.0 #17: 4.14.0 #18: 4.15.0 #19: 4.16.0 #20: 4.17.0 #21: 4.18.0 #22: 4.19.0 #23: 4.20.0 #24: 4.21.0										J.P.Charles	France Telecom		300 577
5.7.0	PU	SMG2		#17: 5.0.0 #18: 5.1.0 #19: 5.2.0 #20: 5.3.0 #21: 5.4.0 #22: 5.5.0 #23: 5.6.0 #24: 5.7.0										J.P.Charles	France Telecom		300 910
DCS 3.1.0	PU	SMG2		#4: 3.2.0 #8: 3.3.0										--- none ---		v.3.3.0	31.12.91
6.0.0	PU	SMG2		#24: 6.0.0										J.P.Charles	France Telecom		

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs					
05.08	Radio Subsystem Link Control							
	3.7.0	PU	SMG2	#16: 3.8.0	P.White	Vodafone	v.3.7.0	300 034-1
	4.21.0	PU	SMG2	#7: 4.6.0 #8: 4.7.0 #9: 4.8.0 #10: 4.9.0 #11: 4.10.0 #12: 4.11.0 #13: 4.12.0 #14: 4.13.0 #15: 4.14.0 #16: 4.15.0 #17: 4.16.0 #18: 4.17.0 #19: 4.18.0 #19: 4.18.1 #21: 4.18.2 #22: 4.19.0 #23: 4.20.0 #24: 4.21.0	P.White	Vodafone		300 578
	5.6.0	PU	SMG2	#18: 5.0.0 #19: 5.1.0 #20: 5.2.0 #21: 5.3.0 #22: 5.4.0 #23: 5.5.0 #24: 5.6.0	P. White	Vodafone		300 911
DCS	3.0.0	PU	SMG2		--- none ---		v.3.0.0	31.12.91
	6.0.0	PU	SMG2	#24: 6.0.0	P. White	Vodafone		
05.10	Radio Subsystem Synchronization							
	3.5.1	PU	SMG2	#4: 3.5.1	H.Benn	Motorola	v.3.5.1	300 035
	4.9.0	PU	SMG2	#7: 4.2.0 #8: 4.3.0 #9: 4.4.0 #13: 4.5.0 #14: 4.6.0 #16: 4.7.0 #17: 4.8.0 #18: 4.9.0	H.Benn	Motorola		300 579
	5.2.0	PU	SMG2	#18: 5.0.0 #20: 5.1.0 #23: 5.2.0	H. Benn	Motorola		300 912
05.22	Radio link management in hierarchical networks							
	5.0.0	PU	SMG2	#20: 5.0.0				ETR 355
05.50	Background for RF Requirements.							
	4.2.0	PU	SMG2	#8: 4.0.0 #13: 4.1.0 #17: 4.2.0	--- none ---			TC-TR
	5.1.1	PU	SMG2	#20: 5.0.0 #21: 5.1.0 #23: 5.1.1	--- none ---			ETR 356
	6.0.0	PU	SMG2	#24: 6.0.0	--- none ---			
05.90	GSM Electro Magnetic Compatibility (EMC) Considerations.							
	4.3.0	PU	SMG2	#7: 4.1.0 #8: 4.2.0 #15: 4.3.0	--- none ---			ETR 108
	5.0.0	PU	SMG2	#20: 5.0.0	--- none ---			ETR 357

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
06.01	Full Rate Speech Processing Functions.					
4.0.6	PU	SMG11	#7: 4.0.2 #23: 4.0.6	P.Usai	CSELT	300 580-1
5.1.0	PU	SMG11	#20: 5.0.0 #23: 5.1.0	P.Usai	CSELT	300 960
3.0.0	PU	SMG11		P. Usai	CSELT	--
06.02	Half Rate Speech Processing Functions.					
4.0.2	PU	SMG11	#13: 4.0.0	S.Aftelak	Motorola	300 581-1
5.0.1	PU	SMG11	#20: 5.0.0	S.Aftelak	Motorola	300 966
06.06	Digital Telecommunications System Half Rate Speech - Part 7: ANSI-C Code for GSM Half Rate Speech Codec					
4.2.0	PU	SMG11	#13: 4.0.0 #16: 4.0.2 #17: 4.1.0 #23: 4.2.0	S.Aftelak	Motorola	300 581-7
5.1.0	PU	SMG11	#20: 5.0.0 #23: 5.1.0	S.Aftelak	Motorola	300 967
06.07	Digital Cellular Telecommunications Systems Half Rate Speech - Part 8: Test Sequence for GSM Half Rate Speech Codec					
4.2.0	PU	SMG11	#13: 4.0.0 #16: 4.0.2 #20: 4.1.0 #23: 4.2.0	S.Aftelak	Motorola	300 581-8
5.2.0	PU	SMG11	#20: 5.0.0 #22: 5.1.0 #23: 5.2.0	S.Aftelak	Motorola	300 968
06.08	Digital Cellular Telecommunications System; Half Rate Speech; Performance Characterization of the GSM half rate speech codec					
4.0.0	PU	SMG11	#16: 4.0.0	T.Salem	T-Mobil	ETR 229
5.0.0	PU	SMG11	#20: 5.0.0	T.Salem	T-Mobil	ETR 358
06.10	Full Rate Speech Transcoding					
3.2.0	PU	SMG11		D.Lorent	Philips Semi Conductors	v.3.2.0 300 036
4.1.0	PU	SMG11	#7: 4.0.0 #23: 4.1.0	D.Lorenz	Philips Semi Conductors	300 580-2
5.1.0	PU	SMG11	#20: 5.0.0 #23: 5.1.0	D.Lorenz	Philips Semi Conductors	300 961

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR		
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs							
06.11	Substitution and Muting of Lost Frames for Full Rate Speech Channels.							
3.0.1	PU	SMG11			W.Navarro	Matra	v.3.0.1	300 037
4.0.5	PU	SMG11		#7: 4.0.1 #23: 4.0.5	W.Navarro	Matra		300 580-3
5.0.1	PU	SMG11		#20: 5.0.0 #23: 5.0.1	W.Navarro	Matra		300 962
06.12	Comfort Noise Aspects for Full Rate Speech Traffic Channels							
3.0.1	PU	SMG11			D.Serenio	CSELT	v.3.0.1	300 038
4.0.4	PU	SMG11		#7: 4.0.1	D.Serenio	CSELT		300 580-4
5.0.1	PU	SMG11		#20: 5.0.0	D.Serenio	CSELT		300 963
06.20	Half Rate Speech Transcoding.							
4.3.0	PU	SMG11		#13: 4.0.0 #14: 4.1.0 #17: 4.3.0	S.Aftelak	Motorola		300 581-2
5.1.0	PU	SMG11		#20: 5.0.0 #22: 5.1.0	S.Aftelak	Motorola		300 969
06.21	Substitution and Muting of Lost Frames for Half Rate Speech Traffic Channels.							
4.0.2	PU	SMG11		#13: 4.0.0	S.Aftelak	Motorola		300 581-3
5.0.1	PU	SMG11		#20: 5.0.0	S.Aftelak	Motorola		300 970
06.22	Comfort Noise Aspects for Half Rate Speech Traffic Channels.							
4.1.1	PU	SMG11		#13: 4.0.0 #15: 4.1.0	S.Aftelak	Motorola		300 581-4
5.1.0	PU	SMG11		#20: 5.0.0 #22: 5.1.0	S.Aftelak	Motorola		300 971
06.31	Discontinuous Transmission (DTX) for Full Rate Speech Traffic Channels							
3.1.0	PU	SMG11			L.Vetrano	Italtel	v.3.1.0	300 039
4.0.5	PU	SMG11		#7: 4.0.1 #23: 4.0.5	L.Vetrano	Italtel		300 580-5
5.0.1	PU	SMG11		#20: 5.0.0 #23: 5.0.1	L.Vetrano	Italtel		300 964

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
06.32	Voice Activity Detection (VAD).					
3.0.0	PU	SMG11		P.Barrett	BT	v.3.0.0 300 040
4.3.0	PU	SMG11	#7: 4.0.1 #9: 4.0.3 #13: 4.1.0 #17: 4.2.0 #20: 4.2.1 #23: 4.3.0	P.Barrett	BT	300 580-6
5.0.2	PU	SMG11	#20: 5.0.0 #23: 5.0.2	P.Barrett	BT	300 965
06.41	Discontinuous Transmission (DTX) for Half Rate Speech Traffic Channels.					
4.0.2	PU	SMG11	#13: 4.0.0	L.Vetrano	Italtel	300 581-5
5.1.0	PU	SMG11	#20: 5.0.0 #23: 5.1.0	L.Vetrano	Italtel	300 972
06.42	Voice Activity Detection (VAD) for Half Rate Speech Traffic Channels.					
4.1.1	PU	SMG11	#13: 4.0.0 #15: 4.1.0	P.Barrett	BT	300 581-6
5.0.1	PU	SMG11	#20: 5.0.0 #22: 5.0.1	P.Barrett	BT	300 973
06.51	Enhanced full rate speech processing functions: General description					
4.0.0	PU	SMG11	#22: 4.0.0	K.Jarvinen	Nokia	301 243
5.1.2	PU	SMG11	#17: 5.0.0 #19: 5.1.0 #20: 5.1.1	K.Jarvinen	Nokia	300 723
06.53	ANSI-C code for the enhanced full rate speech codec					
4.0.1	PU	SMG11	#23: 4.0.1	K.Jarvinen	Nokia	301 244
5.1.3	PU	SMG11	#17: 5.0.0 #19: 5.1.0 #20: 5.1.1 #23: 5.1.3	K.Jarvinen	Nokia	300 724
06.54	Test sequences for the GSM Enhanced Full Rate (EFR)					
4.0.0	PU	SMG11	#22: 4.0.0	K.Jarvinen	Nokia	301 250
5.1.0	PU	SMG11	#20: 2.0.0 #22: 5.1.0	K.Jarvinen	Nokia	300 725
06.55	Performance characterisation of the GSM EFR Speech Codec					
4.0.0	PU	SMG11	#22: 4.0.0	T.Salem	T-Mobil	TR 010 085
5.0.0	PU	SMG11	#19: 5.0.0	T.Salem	T-Mobil	ETR 305

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
06.60	Enhanced full rate speech transcoding					
4.0.1	PU	SMG11	#23: 4.0.1	K.Jarvinen	Nokia	301 245
5.1.3	PU	SMG11	#17: 5.0.0 #19:5.1.0 #20: 5.1.1 #23: 5.1.3	K.Jarvinen	Nokia	300 726
06.61	Substitution and muting of lost frames for encanced full rate speech traffic channels					
4.0.0	PU	SMG11	#22: 4.0.0	K.Jarvinen	Nokia	301 246
5.1.2	PU	SMG11	#17: 5.0.0 #19: 5.1.0 #20: 5.1.1	K.Jarvinen	Nokia	300 727
06.62	Comfort noise aspects for Enhanced Full Rate (EFR) speech traffic channels					
4.0.1	PU	SMG11	#23: 4.0.1	K.Jarvinen	Nokia	301 247
5.1.3	PU	SMG11	#17: 5.0.0 #19: 5.1.0 #20: 5.1.1 #23: 5.1.2	K.Jarvinen	Nokia	300 728
06.81	Discontinuous Transmission (DTX) for encanced full rate speech traffic channels					
4.0.0	PU	SMG11	#22: 4.0.0	K.Jarvinen	Nokia	301 248
5.1.2	PU	SMG11	#17: 5.0.0 #19: 5.1.0 #20: 5.1.1 #22: 5.1.2	K.Jarvinen	Nokia	300 729
06.82	Voice Activity Detection (VAD) for encanced full rate speech traffic channels					
4.0.0	PU	SMG11	#22: 4.0.0	K.Jarvinen	Nokia	301 249
5.0.3	PU	SMG11	#17: 5.0.0 #20: 5.0.2 #22: 5.0.3	K.Jarvinen	Nokia	300 730
07.01	General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)					
4.10.0	SA	SMG4	#7: 4.5.0 #8: 4.6.0 #9: 4.6.1 #10: 4.7.0 #13: 4.8.0 #15: 4.9.0 #16: 4.10.0	J.Varaldi	Alcatel	300 582
5.7.0	SA	SMG4	#16: 5.0.0 #17: 5.0.1 #18: 5.1.0 #19: 5.2.0 #20: 5.3.0 #21: 5.4.0 #22: 5.5.0 #23: 5.6.0 #24: 5.7.0	J.Varaldi	Alcatel	300 913
3.13.0	SA	SMG4	#2: 3.14.0	J.Varaldi	Alcatel	v.3.14. 300 041

GSM NUMBER AND TITLE			HISTORY			RAPPORTEUR + COMPANY		ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs								
07.02	Terminal Adaptation Functions (TAF) for Services Using Asynchronous Bearer Capabilities								
3.8.0	SA	SMG4	#2: 3.8.0			P.Bertin	France Telecom	v.3.8.0	300 042
4.5.1	SA	SMG4	#7: 4.4.0 #9: 4.4.2 #11: 4.5.0			P.Bertin	France Telecom		300 583
5.5.0	SA	SMG4	#16: 5.0.0 #18: 5.1.0 #20: 5.1.1 #21: 5.2.0 #22: 5.3.0 #23: 5.4.0 #24: 5.5.0			P.Bertin	France Telecom		300 914
07.03	Terminal Adaptation Functions (TAF) for Services Using Synchronous Bearer Capabilities								
3.4.0	SA	SMG4	#5: 3.4.0			P.Edlund	Ericsson	v.3.4.0	300 043
4.5.1	SA	SMG4	#7: 4.4.0 #9: 4.5.0			P.Edlund	Ericsson		300 584
5.4.0	SA	SMG4	#18: 5.0.0 #20: 5.0.1 #21: 5.1.0 #22: 5.2.0 #23: 5.3.0 #24: 5.4.0			P. Edlund	Ericsson		300 915
07.05	Use of Data Terminal Equipment - Data Circuit Terminating Equipment (DTE-DCE) Interface for Short Message Service (SMS) and Cell Broadcast Services (CBS).								
4.8.1	SA	SMG4	#7: 4.2.1 #8: 4.3.0 #12: 4.4.0 #16: 4.5.0 #17: 4.6.0 #18: 4.7.0 #20: 4.8.0			I.Harris	Vodafone		300 585
5.5.0	SA	SMG4	#19: 5.0.0 #20: 5.1.0 #21: 5.2.0 #22: 5.3.0 #23: 5.4.0 #24: 5.5.0			I.Harris	Vodafone		GTS
07.06	Use of the V Series Data Terminal Equipment - Data Circuit Terminating Equipment (DTE-DCE) Interface at the Mobile Station (MS) for Mobile Termination (MT) configuration.								
4.2.0	SA	SMG4	#7: 4.1.0 #13: 4.2.0 #16: WITHDRAWN			I.Harris	Vodafone		300 586
07.07	Digital cellular telecommunications System (Phase 2) AT Command set for GSM Mobile Equipment (ME)								
4.2.0	SA	SMG4	#16: 4.0.0 #18: 4.1.0 #24: 4.2.0			P.Heinonen	Nokia		300 642
5.5.0	SA	SMG4	#19: 5.0.0 #20: 5.1.0 #21: 5.2.0 #22: 5.3.0 #23: 5.4.0 #24: 5.5.0			P.Heinonen	Nokia		300 916
07.08	GSM Application Programming Interface								
5.2.0			#20: 5.0.0 #21: 5.1.0 #24: 5.2.0						300 917
07.60	General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS								
5.1.0			#24: 5.1.0						

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs						
08.01	Base Station System - Mobile Services Switching Centre (BSS-MSC) Interface General Aspects.						
4.0.3	SA	SMG3	#7: 4.0.0		R.Davies	Motorola	300 587
5.0.0	SA	SMG3	#20: 5.0.0		R.Davies	Motorola	GTS
3.0.1	SA	SMG3			R.Davies	Motorola	- -
08.02	Base Station System - Mobile Services Switching Centre (BSS-MSC) Interface - Interface Principles.						
4.2.0	SA	SMG3	#7: 4.0.0 #10: 4.1.0 #13: 4.2.0		R.Davies	Motorola	300 587
5.1.0	SA	SMG3	#20: 5.0.0 #21: 5.1.0		R.Davies	Motorola	GTS
3.3.1	SA	SMG3			R.Davies	Motorola	- -
08.04	Base Station System - Mobile Services Switching Centre (BSS-MSC) Interface Layer 1 Specification.						
3.0.3	PU	SMG2			R.Davies	Motorola	- -
4.0.3	PU	SMG2	#7: 4.0.0		R.Davies	Motorola	300 588
5.0.0	PU	SMG2	#20: 5.0.0		R.Davies	Motorola	GTS
08.06	Signalling Transport Mechanism Specification for the Base Station System - Mobile Services Switching Centre (BSS-MSC) Interface.						
3.5.2	PU	SMG2			R.Davies	Motorola	- -
4.5.0	PU	SMG2	#7: 4.1.0 #8: 4.2.0 #9: 4.3.0 #10: 4.4.0		R.Davies	Motorola	300 589
5.1.0	PU	SMG2	#17: 5.0.0 #18: 5.1.0		R.Davies	Motorola	GTS
08.08	BSS-MSC Layer 3 Specification						
3.10.1	PU	SMG2			R.Davies	Motorola	- -
EXT 3.0.0	PU	SMG2	#7: 3.0.0		n.a.		
4.12.0	PU	SMG2	#7: 4.4.0 #8: 4.5.0 #9: 4.6.0 #10: 4.7.0 #13: 4.8.0 #15: 4.9.0 #16: 4.10.0 #17: 4.11.0 #23: 4.12.0		R.Davies	Motorola	300 590
5.8.0	PU	SMG2	#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #23: 5.7.0 #24: 5.8.0		R.Davies	Motorola	GTS

GSM NUMBER AND TITLE			HISTORY	RAPPORTEUR + COMPANY	ETS VERSION + NR	
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs					
08.20	Rate Adaptation on the Base Station System - Mobile Service Switching Centre (BSS-MSC) Interface.					
4.2.3	SA	SMG4	#7: 4.2.1 #13: 4.2.3	P.Bertin	France Telecom	300 591
5.3.0	SA	SMG4	#20: 5.0.0 #21: 5.1.0 #22: 5.2.0 #24: 5.3.0	P.Bertin	France Telecom	GTS
3.1.2	SA	SMG4		P.Bertin	France Telecom	- -
08.51	Base Station Controller - Base Tranceiver Station (BSC-BTS) Interface General Aspects.					
4.1.0	PU	SMG2	#7: 4.0.1 #13: 4.1.0	E.Lycksell	Televerket	300 592
5.0.0	PU	SMG2	#20: 5.0.0	E.Lycksell	Televerket	GTS
3.0.2	PU	SMG2		E.Lycksell	Televerket	- -
08.52	Base Station Controller - Base Tranceiver Station (BSC-BTS) Interface - Interface Principles.					
4.2.0	PU	SMG2	#7: 4.0.1 #13: 4.1.0	E.Lycksell	Televerket	300 593
5.0.0	PU	SMG2	#20: 5.0.0	E.Lycksell	Televerket	GTS
3.0.2	PU	SMG2		E.Lycksell	Televerket	- -
08.54	Base Station Controler - Base Transceiver Station (BSC-BTS) Interface Layer 1 Structure of Physical Circuits					
5.0.0	PU	SMG2	#16: 5.0.0	E. Lycsell	Televerket	GTS
4.1.0	PU	SMG2	#7: 4.0.1 #13: 4.1.0	E.Lycksell	Televerket	300 594
3.0.1	PU	SMG2		E.Lycksell	Televerket	- -
08.56	Base Station Controller - Base Tranceiver Station (BSC-BTS) Interface Layer 2 Specification.					
4.0.2	PU	SMG2	#8: 4.0.0	---none---		300 595
5.0.0	PU	SMG2	#20: 5.0.0	---none---		GTS
3.1.1	PU	SMG2		H.Andersen	Ericsson Telecom	- -

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR							
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs													
08.58	Base Station Controler - Base Transceiver Station (BCS-BTS) Interface Layer 3 Specification													
	5.6.0	PU	SMG2	#16: 5.0.0	#17: 5.1.0	#19: 5.2.0	#21: 5.3.0	#22: 5.4.0	#23: 5.5.0	#24: 5.6.0	E. Lycsell	Televerket	GTS	
EXT	3.0.0	PU	SMG2	#7: 3.0.0							n.a.			
	4.9.0	PU	SMG2	#7: 4.3.0	#8: 4.4.0	#9: 4.5.0	#10: 4.6.0	#13: 4.7.0	#15: 4.8.0	#16: 4.9.0	E.Lycksell	Televerket	300 596	
	3.6.0	PU	SMG2	#10: 3.6.0							E.Lycksell	Televerket	- -	
DCS	3.0.0	PU	SMG2							--- none ---		- -		
08.59	BSC-BTS O&M Signalling Transport													
	3.1.0	MS	SMG6	SMG2							--- none ---		- -	
08.60	Inband Control of Remote Transcoders and Rate Adaptors													
	3.3.1	PU	SMG2							L.Cruchant	Alcatel MC	- -		
	5.1.0	PU	SMG2	#17: 5.0.0	#19: 5.0.1	#20: 5.0.2	#22: 5.1.0				A. Katle	Norwegian Telecom Mobile	300 737	
	4.4.0	PU	SMG2	#7: 4.1.0	#13: 4.2.0	#22: 4.3.0	#23: 4.4.0				L. Cruchant	Alcatel	300 597	
08.61	Inband Control of Remote Transcoder and Rate Adaptors;(Half Rate)													
	4.0.2	PU	SMG2	SMG3	#13: 4.0.0							P.Jacob	Siemens	300 598
	5.0.1	PU	SMG2	SMG3	#20: 5.0.0							P.Jacob	Siemens	300 979
09.01	General Network Interworking Scenarios													
	3.0.1	SA	SMG3							--- none ---		- -		
	4.0.1	SA	SMG3	#8: 4.0.0	#9: 4.0.1							--- none ---		ETR 109
	5.0.0	SA	SMG3	#20: 5.0.0							--- none ---		ETR 359	

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR				
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs										
09.02	Mobile Application Part (MAP) Specification										
	5.8.0	SA	SMG3	SPS2	#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #22: 5.6.0 #23: 5.7.0 #24: 5.8.0	JMEG		300 974			
	6.0.0	SA	SMG3	SPS2	#24: 6.0.0	JMEG					
	4.18.0	SA	SMG3	SPS2	#7: 4.4.0 #8: 4.5.0 #9: 4.6.0 #10: 4.7.0 #11: 4.8.0 #12: 4.9.0 #13: 4.10.0 #14: 4.11.0 #16: 4.12.0 #17: 4.13.0 #19: 4.14.0 #20: 4.15.0 #21: 4.16.0 #22: 4.17.0 #23: 4.18.0	JMEG		300 599			
	3.8.0	SA	SMG3	SPS2	#9: 3.9.0 #12: 3.10.0 #14: 3.11.0	JMEG		v.3.11. 300 044-1			
DCS	3.0.0	SA	SMG3	SPS2		JMEG		v.3.0.0 31.12.91			
09.03	Requirements on Interworking between the ISDN or PSTN and the PLMN										
	3.0.1	SA	SPS1	SMG3	SMG4	---	none ---	--			
	4.0.3	SA	SMG3	SMG4	SPS1	#8: 4.0.0 #9: 4.0.1	---	none --- 300 600			
	5.0.0	SA	SMG3	SMG4	SPS1	#20: 5.0.0	---	none --- GTS			
09.04	Interworking between the PLMN and the CSPDN										
	3.0.1	SA	SMG4			---	none ---	--			
	4.0.2	SA	SMG4		#7: 4.0.0 #8: 4.0.1 #9: 4.0.2	---	none ---	300 601			
	5.0.0	SA	SMG4		#20: 5.0.0	---	none ---	GTS			
09.05	Interworking between the PLMN and the PSPDN for PAD Access										
	3.2.2	SA	SMG4			---	none ---	--			
	4.4.2	SA	SMG4		#7: 4.3.0 #8: 4.4.0 #9: 4.4.1	---	none ---	300 602			
	5.0.0	SA	SMG4		#20: 5.0.0	---	none ---	GTS			
09.06	Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated										
	5.0.2	SA	SMG4		#19: 5.0.0 #20: 5.0.1	A.Braun	Alcatel SEL	300 975			
	4.5.0	SA	SMG4		#7: 4.3.0 #9: 4.4.0 #12: 4.5.0	A.Braun	Alcatel SEL	300 603			

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs				
09.07	General Requirements on Interworking between the Public Land Mobile Network (PLMN) and the Intergrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)						
3.7.1	SA	SMG4	SMG3	#5: 3.8.0 #9: 3.9.0 #14: 3.10.0	N.Klehn	Siemens	--
4.12.1	SA	SMG4	SMG3	#7: 4.4.0 #8: 4.5.0 #9: 4.6.0 #10: 4.7.0 #13: 4.8.0 #14: 4.9.0 #16: 4.10.0 #18: 4.11.0 #20: 4.12.0	N.Klehn	Siemens	300 604
5.6.0	SA	SMG4	SMG3	#16: 5.0.0 #17: 5.0.1 #18: 5.1.0 #19: 5.2.0 #20: 5.2.1 #21: 5.3.0 #22: 5.4.0 #23: 5.5.0 #24: 5.6.0	N.Klehn	Siemens	300 976
09.08	Application of the Base Station System Application Part (BSSAP) on the E-Interface.						
4.1.1	PU	SMG2	SMG3	#9: 4.0.0 #13: 4.1.0	R.Bodin	Ericsson	300 626
5.1.0	FP	SMG3		#20: 5.0.0 #21: 5.1.0	R.Bodin	Ericsson	GTS
09.09	Detailed Signalling Interworking within the PLMN and with the PSTN/ISDN						
REP	3.0.0	PA	SMG3		J.Vainikka	Nokia	--
09.10	Information Element Mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MCS) Signalling Procedures and the Mobile Application Part (MAP)						
4.4.0	SA	SMG3	SMG2	#8: 4.0.0 #9: 4.1.0 #10: 4.2.0 #17: 4.3.0 #23: 4.4.0	--- none ---		300 605
5.2.0	SA	SMG3	SMG2	#17: 5.0.0 #18: 5.1.0 #23: 5.2.0	--- none ---		GTS
3.0.2	SA	SMG3	SMG2		--- none ---		--
DCS	3.0.0	SA	SMG3	SMG2	--- none ---		--
09.11	Signalling Interworking for Supplementary Services						
3.0.1	PA	SMG3			L.Letellier	France Telecom	--
4.6.1	PA	SMG3		#7: 4.1.0 #8: 4.2.0 #9: 4.3.0 #12: 4.4.0 #13: 4.5.0 #19: 4.6.0	L.Letellier	France Telecom	300 606
5.1.0	PA	SMG3		#18: 5.0.0 #19: 5.1.0	L. Letellier	France Telecom	GTS
09.12	Application of ISUP Version 2 for the ISDN-PLMN (GSM)Signalling						
4.1.0	PA	SPS1	SMG3	#17: 4.0.0	P.Haendig	Telia Mobitel AB	

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CURRENT VERSION (*)	RESPONSIBLE PT	SMG	/ STCs							
09.78	CAMEL Application Part phase 1 (stage 3)									
5.3.0	SA	SMG3	#21: 5.0.0 #22: 5.1.0 #23: 5.2.0 #24: 5.3.0							
09.90	Interworking between Phase 1 Infrastructure and Phase 2 Mobile Stations (MS).									
4.9.0	FP	STF12	#7: 4.0.0 #8: 4.1.0 #9: 4.2.0 #10: 4.3.0 #11: 4.4.0 #15: 4.5.0 #16: 4.6.0 #18: 4.7.0 #19: 4.8.0 #22: 4.9.0			n.a.	ETR 111			
5.0.0	FP	STF12	#17: 5.0.0			n.a.	GTS			
09.91	Interworking Aspects of the SIM/ME Interface Between Phase 1 and Phase 2									
4.0.1	RT	SMG9	#10: 4.0.0			K.Vedder	GAO	ETR 174		
5.0.0	RT	SMG9	#20: 5.0.0			K.Vedder	GAO	ETR 360		
09.94	Recommended Infrastructure Measures to Overcome Specific Phase 1 Mobile Stations Faults									
4.4.0	FP	STF12	#14: 4.0.0 #15: 4.1.0 #16: 4.2.0 #19: 4.3.0 #23: 4.4.0			---none---	ETR 200			
5.0.0	FP	STF12	#20: 5.0.0			---none---	ETR 361			
10.00	Digital Cellular Telecommunication System Feature Description									
5.2.0	AB	STF12	#19: 5.0.0 & 5.1.0 #20: 5.2.0			ETR 362				
10.20	Lawful Interception requirements for GSM									
5.0.1	PA	SMG10	#19: 5.0.0 #20: 5.0.1			ETR 363				
11.10	Mobile Station Conformity Specification (DCS 1800)									
DCS	3.1.0	JJD	STF12	SMG2	SMG3	#2: 3.2.0 #3: 3.3.0 #4b: 3.4.0 #5: 3.5.0 #6: 3.6.0 #7: 3.7.0 #8: 3.8.0 #9: 3.9.0 #10: 3.10.0 #11: 3.11.0 #12: 3.12.0 #13: 3.13.0	W.Legrand	Hutchison-Microtel	v.3.14.	- -
	3.7.0	JJD	STF12	SMG2	SMG3	#2: 3.8.0 #3: 3.9.0 #4b:3.10.0 #5: 3.11.0 #6: 3.12.0 #7: 3.13.0 #8: 3.14.0 #8: 3.15.0 #9: 3.16.0 #10: 3.17.0 #11: 3.18.0 #12: 3.19.0 #13: 3.20.0 #15: 3.21.0 #16: 3.22.0	--- none ---		v.3.18.	300 020-1

GSM NUMBER AND TITLE			CURRENT RESPONSIBLE		HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR		
VERSION (*)	PT	SMG / STCs								
11.10-1 Conformance Specification										
4.21.0	JJD	SMG7 PT48V STF12 SMG2 SMG3			#16: 4.13.0 #17: 4.14.0 #18: 4.15.0 #19: 4.16.0 #20: 4.17.0 #21: 4.18.0 #22: 4.19.0 #23: 4.20.0 #24: 4.21.0		---none---		300 607-1	
5.4.0	JJD	SMG7 PT48V STF12 SMG2 SMG3			#18: 5.0.0 #21: 5.1.0 #22: 5.2.0 #23: 5.3.0 #24: 5.4.0				GTS	
11.10-2 Protocol Implementation Conformance Statement Proforma Specification										
4.15.0	JJD	SMG7 PT48V STF12 SMG2 SMG3			#16: 4.13.0 #17: 4.14.0 #18: 4.15.0		---none---		300 607-2	
11.10-3 Layer3 (L3) Abstract Test Suite (ATS)										
4.21.0	JJD	SMG7 PT48V STF12 SMG2 SMG3			#16: 4.13.0 #17: 4.14.0 #18: 4.15.0 #19: 4.16.0 #20: 4.17.0 #21: 4.18.0 #22: 4.19.0 #23: 4.20.0 #24: 4.21.0		---none---		300 607-3	
5.0.0	JJD	SMG7 PT48V STF12 SMG2 SMG3			#18: 5.0.0				GTS	
11.11 Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface.										
3.10.0	MS	SMG9			#2: 3.11.0 #3: 3.12.0 #8: 3.13.0 #9: 3.14.0 #11: 3.15.0 #12: 3.16.0		K.Vedder	Giesecke & Devrient	v.3.16. 300 045-1/A1	
4.19.0	MS	SMG9			#7: 4.8.0 #8: 4.9.0 #9: 4.10.0 #10: 4.11.0 #11: 4.12.0 #12: 4.13.0 #13: 4.14.0 #15: 4.15.0 #16: 4.16.0 #18: 4.17.0 #19: 4.18.0 #20: 4.18.1 #21: 4.18.2 #22: 4.19.0		K.Vedder	Giesecke & Devrient	300 608	
5.8.0	MS	SMG9			#16: 5.0.0 #17: 5.1.0 #18: 5.2.0 #19: 5.3.0 #20: 5.4.0 #21: 5.5.0 #23: 5.7.0 #24: 5.8.0		K.Vedder	Giesecke & Devrient	300 977	
DCS 3.1.3	MS	SMG1 SMG9			#2: 3.2.0 #4: 3.3.0 #8: 3.3.1 #9: 3.3.2 #11: 3.3.3 #12: 3.3.4		--- none ---		v.3.3.1 31.12.91	
11.12 Specification of the 3 Volt Subscriber Identity Module Equipment (SIM-ME) Interface										
5.0.0	MS	SMG9			#16: 5.0.0 WITHDRAWN		R.Lindholm	Nokia	300 978	
4.2.0	MS	SMG9			#15: 4.0.0 #17: 4.1.0 #19: 4.1.2 #21: 4.2.0		R.Lindholm	Nokia	300 641	
11.14 Specification of Subscriber Identity Module - Mobile Equipment (SIM - ME) Interface for SIM Application Toolkit										
5.6.0	MS	SMG9			#18: 5.0.0 #19: 5.1.0 #20: 5.2.0 #21: 5.3.0 #22: 5.4.0 #23 5.5.0 #24: 5.6.0				GTS	

GSM NUMBER AND TITLE			CURRENT RESPONSIBLE		HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR
VERSION (*)	PT	SMG / STCs						
11.20	GSM DCS 1800 Base Station Specification							
DCS	3.1.0	JJD	STF12	SMG2	SMG3	#2: 3.2.0 #3: 3.3.0 #4: 3.4.0 #5: 3.5.0 #6: 3.6.0 #7: 3.7.0 #8: 3.8.0 #9: 3.9.0 #10: 3.10.0 #11: 3.11.0 #12: 3.12.0 #17: 3.13.0	--- none ---	--
	3.6.0	MS	SMG8	SMG2	SMG3	#2: 3.7.0 #3: 3.8.0 #4: 3.9.0 #5: 3.10.0 #6: 3.11.0 #7: 3.12.0 #8: 3.13.0 #9: 3.14.0 #10: 3.15.0 #11: 3.16.0 #12: 3.17.0 #14: 3.18.0 #17: 3.19.0	A. Howell Motorola	--
11.21	GSM Radio Aspects Base Station System Equipment Specification							
	4.9.0	MS	SMG8	#11: 4.0.0 #12: 4.1.0 #13: 4.2.0 #15: 4.3.0 #16: 4.4.0 #17: 4.5.0 #18: 4.6.0 #20: 4.7.0 #22: 4.8.0 #23: 4.9.0			S.Pike Lucent Technologies	300 609-2
	5.1.0	MS	SMG8	#23: 5.1.0			S.Pike Lucent Technologies	
11.22	GSM Base Station and Ancillary Equipment, Physical and Electronical Parameters, Application of Standards and Guidance Notes							
	4.1.3	MS	SMG8	#11: 4.0.0 #14: 4.1.0 #18: 4.1.1 #20: 4.1.2 #21: 4.1.3			M.Perry Motorola	300 609-3
11.23	GSM Signalling Aspects Base Station System equipment Specification							
	4.8.0	MS	SMG8	#11: 4.0.0 #14: 4.1.0 #15: 4.1.0 #16: 4.2.0 #17: 4.3.0 #18: 4.4.0 #19: 4.5.0 #21: 4.6.0 #22: 4.7.0 #23: 4.8.0			---none---	300 609-4
11.24	GSM Transcoding and Rate Adaptation: Base Station System Equipment Specification							
	4.1.0	MS	SMG8	#14: 4.00 #20: 4.1.0			V.Fernandez Motorola	300 609-5
11.26	GSM Repeater Equipment Specification							
	4.2.2	MS	SMG8	#15: 4.0.0 #17: 4.1.0 #18: 4.2.0 #20: 4.2.2				300 609
	5.1.0	MS	SMG8	#23: 5.1.0				
11.30	Mobile Services Switching Centre							
REP	3.2.1	PA	STF12	SMG3	SMG1	--- none ---		--
11.31	Home Location Register Specification							
REP	3.2.1	PA	STF12	SMG3	SMG1	--- none ---		--

GSM NUMBER AND TITLE						HISTORY	RAPPORTEUR + COMPANY		ETS VERSION + NR								
CURRENT	RESPONSIBLE																
VERSION (*)	PT	SMG	/ STCs														
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11.32	Visitor Location Register Specification																
REP	3.2.1	PA	STF12	SMG3	SMG1			---	none ---		--						
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11.40	DCS 1800 System Simulator Conformity Specification																
DCS	3.1.0	JJD	STF12	SMG2	SMG3	#4: 3.2.0	#11: 3.3.0		---	none ---	--						
	3.5.0	JJD	STF12	SMG2	SMG3	#2: 3.6.0	#11: 3.7.0	P.Zollman	Vodafone	v.3.7.0	300 020-2						
<hr/>																	
12.00	Objectives and Structure of GSM Public Land Mobile Network (PLMN) Management.																
	4.6.0	MS	SMG6			#7: 4.0.0	#8: 4.1.0	#11: 4.2.0	#15: 4.3.0	#16: 4.4.0	#17: 4.5.0	#23: 4.6.0	---	none---		300 612-1	
<hr/>																	
12.01	Common Aspects of Public Land Mobile Network (PLMN) Management.																
	4.4.1	MS	SMG6	SMG3		#7: 4.0.0	#8: 4.1.0	#9: 4.1.1	#10: 4.2.0	#11: 4.3.0	#17: 4.4.0		---	none---		300 612-2	
<hr/>																	
12.02	Subscriber, Mobile Equipment (ME) and Services Data Administration.																
	4.6.1	MS	SMG6	SMG1		#7: 4.0.0	#8: 4.1.0	#9: 4.2.0	#11: 4.3.0	#15: 4.4.0	#16: 4.5.0	#17: 4.6.0		---	none---		300 613
	5.0.0	MS	SMG6	SMG3		#22: 5.0.0								---	none---		
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12.03	Security Management.																
	4.2.1	MS	SMG6	SMG1	SMG3	#11: 4.0.0	#14: 4.1.0	#17: 4.2.0						---	none---		300 614
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12.04	Performance Management and Measurements for a GSM Public Land Mobile Network (PLMN).																
	4.3.1	MS	SMG6	SMG1	SMG3	#8: 4.0.0	#11: 4.1.0	#13: 4.2.0	#17: 4.3.0					---	none---		300 615
<hr/>																	
12.05	Subscriber Related Call and Event Data.																
	4.3.0	MS	SMG6	SMG1		#8: 4.0.0	#11: 4.1.0	#15: 4.1.1	#17: 4.2.0	#22: 4.3.0				---	none---		300 616
	5.0.0	MS	SMG6	SMG1		#23: 5.0.0											
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12.06	Network Configuration Management and Administration.																
	4.1.1	MS	SMG6	SMG3		#11: 4.0.0	#12: 4.0.1	#17: 4.1.0						---	none---		300 617

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CURRENT VERSION (*)	RESPONSIBLE PT	SMG	STCs					
12.07	Public Land Mobile Network (PLMN) Quality of Service.							
n.a.	MS	SMG6	SMG1	SMG3	work stopped	---none---		300 612
12.08	Subscriber and Equipment trace							
4.5.0	MS	SMG6	SMG3		#12: 4.0.0 #14: 4.1.0 #16: 4.2.1 #18: 4.3.0 #20: 4.4.0 #22: 4.5.0	B.Szelazek	Lucent	300 627
5.0.0	MS	SMG6	SMG3		#23: 5.0.0	B.Szelazek	Lucent	
12.11	Maintenance of the Base Station System (BSS).							
4.1.0	MS	SMG6	SMG1	SMG2	#22: 4.1.0	M.Cataldo	Lucent	300 619
12.20	Base Station System (BSS) Management Information.							
4.2.1	MS	SMG6	SMG3		#9: 4.0.0 #11: 4.1.0 #13: 4.1.1 #17: 4.2.0	---none---		300 622
12.21	Network Management (NM) Procedures and Messages on the A-bis Interface.							
4.6.0	MS	SMG6	SMG2		#7: 4.1.0 #8: 4.2.0 #9: 4.3.0 #11: 4.4.0 #13: 4.5.0 #16: 4.5.2 #21: 4.6.0	A.Yuhan	Omnipoint	300 623
5.0.0	MS	SMG6	SMG2		#21: 5.0.0	A.Yuhan	Omnipoint	
12.22	Interworking of GSM Network Management (NM) Procedures and Messages at the Base Station Controller (BSC).							
4.1.4	MS	SMG6			#11: 4.0.0 #13: 4.1.0 #16: 4.1.2	A.Yuhan	Omnipoint	300 624
12.30	ETSI Object Identifier Tree; Mobile Domain O&M							
4.2.0	MS	SMG6			#10: 4.0.0 #11: 4.1.0 #15: 4.2.0	---none---		ETR 128
22.01	Universal Mobile Telecommunications System (UMTS): Service aspects; Service principles							
3.3.0					#22: 3.1.0 #24: 3.3.0			
30.03	Selection procedures for the choice of radio transmission technologies of the UMTS							
3.1.0	PU	SMG2			#23: 3.1.0			

GSM NUMBER AND TITLE				HISTORY	RAPPORTEUR + COMPANY	ETS VERSION + NR			
CURRENT VERSION (*)	RESPONSIBLE PT SMG / STCs								
33.20 Security principles for the UMTS									
3.1.0					#24: 3.1.0				
TBR 5	General Attachment Requirements for GSM Mobile Stations								
3.0.0	JJD	SMG7 SMG4	SMG1 SMG2 SMG3	#4: 1.0.0 #4b: 3.0.0 #8: Ed1 #12: Ed2	D.Freeman Motorola	- -			
TBR 9	Attachment Requirements for GSM Terminal Equipment (Telephony)								
3.0.0	JJD	SMG7 SMG4	SMG1 SMG2 SMG3	#4: 1.0.0 #4b: 3.0.0 #8: Ed1 #12: Ed2	D.Freeman Motorola	- -			
TBR19	General Attachment Requirements for GSM Mobile Stations								
4.2.1	JJD	SMG7 SMG4	SMG1 SMG2 SMG3	#14: Ed1 #16: 4.0.0 #17: 4.1.0 #18: 4.2.0	H.Banken Sigos PT64V	TBR 19			
TBR20	Attachment Requirements for GSM Terminal Equipment (Telephony)								
4.0.2	JJD	SMG7 SMG4	SMG1 SMG2 SMG3	#14: Ed1 #16: 4.0.0 #17: 4.0.1	H.Banken Sigos PT64V	TBR 20			
TBR31	General Attachment Requirements for DCS Mobile Stations								
4.0.2	JJD	SMG2		#17: 4.0.0	---none---	TBR 31			
TBR32	Attachment Requirements for DCS Terminal Equipment (Telephony)								
4.0.2	JJD	SMG2		#17: 4.0.0	---none---	TBR32			

**ETSI SMG Plenary
Madrid, 15-19 December 1997**

**Tdoc SMG 1150 / 97
Agenda Item: 5.2**

Source: PT SMG

Title: **Road map for GSM phase 2+ and UMTS
Work Items - Version 24.0**

Date: December 19, 1997

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Note: Road-Map here-in contained is based upon inputs received from SMG STC Chairmen during SMG#24.

Following SMG#24, STCs and PT SMG may propose revisions of this paper which will be reflected in intermediate versions 24.x

This document (RdMap240.doc) is extracted from the WI Data Base and has the same version number as the Work Item Data Base (WI-24-0.mdb).

1. GSM Phase 2 - Finalized at or before SMG#15

These Work Items were introduced in GSM Specifications V4.X.Y Series.

WORK ITEM TITLE
BSS Repeaters (RPT)
DCS1800 4 Watt mobile power class
Operation of Multi-band GSM/DCS by a single Operator
SMS concatenation
Three Volt Technology SIM
Display of Service Provider Name by the ME

2. GSM Phase 2+ Before R96

WORK ITEM TITLE
Compression of User Data
DECT access to GSM networks
SIM I/F data Transfer Speed Enhancement
Special SMS Message indication
Transparently supporting UPT phase 1

3. GSM Phase 2+ R96 - As finalized at SMG#21

WI Title	Prime responsible STC
Network Identity and Time Zone	SMG01
Explicit Call Transfer (ECT)	SMG01
High Speed Circuit Switched Data (HSCSD)	SMG01
Radio Local Loop (RLL) using GSM - This is a Report -	SMG01
CAMEL phase 1	SMG01
Enhanced Full Rate Speech codec (EFR)	SMG01
Support of Optimal Routeing (SOR)	SMG01
ME Personalisation	SMG01
Barred Dialling Numbers	SMG01
Support of additional call set-up MMI procedures	SMG01
Second SMS broadcast channel	SMG01
Handsfree MS	SMG02
Enhanced Multi-Level Precedence and Pre-emption Service - phase 1	SMG03
Voice Group Call Service (VGCS) - phase 1	SMG03
Voice Broadcast Service (VBS) - phase 1	SMG03
Improved Transcoder Handling (First Alternative)	SMG03
Packet Data on Signalling Channels	SMG03
Concurrent SMS/CB and data transfer in 07.05	SMG04
Extensions to the SMS alphabet	SMG04
SMS Interworking Extensions	SMG04
Support of Restricted Digital Information and V.120 rate adaptation in GSM	SMG04
Inclusion of deferred tracing capabilities in GSM 12.08	SMG06
Service Dialling Numbers	SMG09
SIM Application Toolkit	SMG09
14.4 kbit/s User Data Rate	T1P1

4. GSM Release 97 - At SMG#24

	Date due SMG	Prime	WI rapporteur
Network Indication of Alerting in the MS (Calls&NW initiated USSD)	S24	SMG01	Nicolas Renaud
CAMEL phase 2	S25	SMG01	Stefan Kleier
SMS enhancements phase 1	S24	SMG01	Nicolas Renaud
Support of Private Numbering Plan (SPNP)	S23	SMG01	Ms T.Sundbye
Completion of Calls to Busy Subscriber (CCBS)	S25	SMG01	Mr N.Jorgensen
General Packet Radio Service Phase 1 (GPRS) - radio part	S24	SMG02	J.Hamalainen
BTS performance requirements for very small cell scenarios	S24	SMG02	Howard Benn
Mobile Assisted Frequency Allocation (MAFA)	S24	SMG02	Mr B.Persson
MS Antenna Test Method	S24	SMG02	Olle Edvardsson
General Packet Radio Service Phase 1 (GPRS) - network part	S24	SMG03	Hans Petter Naper
ASCI Phase 2	S24	SMG03	PT SMG
Overload control enhancement for Location Registers	S23	SMG03	Required
Interworking with Mobile Satellite Systems	tbd	SMG03	NN
New Multiplexing Protocol on the ME-TE Interface	S24	SMG04	Lars Novak
SMS Mobile Busy	S25	SMG04	Mr P.Edlund
Support of Shared Interworking Function (SIWF)	S24	SMG04	Mr S.Ouvrier
Modeling of Fault Management Services	S26	SMG06	Mark Cataldo
A-bis Management of Alarms/faults on the BTS site	S26	SMG06	Mr. A. Yuhan
A-bis Management of reconfiguration of BTS site	S26	SMG06	Mr. A. Yuhan
A-bis Management of Measure on the BTS site	S26	SMG06	Mr. A. Yuhan
Security mechanisms for the SIM Toolkit feature	S24	SMG09	Nigel Barnes
Characteristics and test methods for handsfree mobile station	S24	SMG11	Mr J-Y Monfort
Calling Name Presentation (CNAP)	S24	T1P1	Sonia Doshi
North American Equal Access	S23	T1P1	Stephen Hayes
Service Provider Number Portability (USA)		T1P1.5	

5 GSM Release 98 Snap-Shot at SMG#24

WI Title	Releas	Date due	Prime	WI rapporteur	WI Rapp
Technical Enhancements/improvements for phase 2	tbd	unknown	All STCs	PT12	
Call Deflection	98	S28	SMG01	Mr A.Conrad	T-Mobil
FOLLOW ME	98	S28	SMG01	Erwin Postmann	Siemens
Forwarding of SMSs	98	S26 ?	SMG01	Nicolas Renaud	France Telecom
GSM Cordless Telephony System CTS ("Home Base Station")	98	S26	SMG01	Mikael Dahlkvist	Ericsson
GSM Mobile Number Portability (EURO)	98	tbd	SMG01	Willem Levelt	KPN
ISDN-based DECT/GSM interworking - ph 1 and Ph 2 R98	98	S23	SMG01	Ms I.Graetz	Siemens AG
Localized Service Area (SoLSA) Renamed from "Home Area Priority"	98	S28	SMG01	Tommy Kokkola	Nokia
Multiple Subscriber Profile (MSP)	98	S25 ?	SMG01	Ian Crawford	Vodafone
Network Indication of Alerting in the MS (Mobile Terminated Short message)	98		SMG01		
User-to-User Signalling (UUS)	98	S28	SMG01	Mr A. Conrad	T-Mobil
USSD Enhancements	98		SMG01	Olle Eriksson	L M Ericsson
General Packet Radio Service Phase 2 (GPRS) - radio part	98	S28	SMG02	J.Hamalainen	Nokia
Improved Data Rates through Optimised Modulation	tbd	tbd	SMG02	Johan Sköld	Ericsson
Service to GSM Handportables in trains	tbd	unknown	SMG02	Required	
Calling line identification enhancements	tbd	unknown	SMG03	Required	
Efficient cellular support of new services in GSM network service areas	tbd	tbd	SMG03	Required	
Exchange of network capabilities information	tbd	unknown	SMG03	Required	
General Packet Radio Service Phase 2 (GPRS) - network part	98	S28	SMG03	H.Kari	Nokia
Generic signalling mechanism for service support	tbd	unknown	SMG03	Required	
Idle mode classmark	tbd	unknown	SMG03	Required	
LAPDm performance enhancement	98	S26	SMG03	None	
Tandem Free Operation of speech codecs in Mobile-to-Mobile Calls (MMCs)	98	S26 >	SMG03/11	W.Navarro	Nortel
MS Application Execution Environment	98	S28	SMG04	John Candish	Nortel
Enhancements of Fault Management Services	98	S26	SMG06	Mark Cataldo	Lucent
GSM 1900 Conformance Testing (Handsets)	98 Pending	tbd	SMG07	Carl Warfel	BellSouth
Development of the SIM test specification (GSM Phase 2)	tbd	S25	SMG09	Gary A. Waite	Aspects Software Ltd.
Interworking with non-GSM applications on the SIM	98	S23 ?	SMG09	Mr W.Mohrs	T-Mobil
Low Voltage SIM/ME Specification	tbd	S30	SMG09	Rune Lindholm	Nokia
Mutual Authentication	98 ??	S23	SMG09	Ms S.Manning	Vodafone
Fraud Information Gathering System(FIGS)	98	S23	SMG10	Tim Wright	Vodafone
Lawful Interception	98	S25	SMG10	David Miles	Cellnet
Adaptive Multi-Rate (AMR)	98	S28	SMG11	Kari Jarvinen	Nokia
Test methods for handset and headset mobile station	98	S25	SMG11	Ian Goetz	Cellnet
GSM / AMPS Roaming	98 ?	unknown	T1P1.5	Ed Ehrlich (Contact)	Nortel
Harmonization of the PCS1900 Standards with the GSM Base Specification	98	S26	T1P1.5	Kerry Weaver	Nokia
Requirements for equipments/systems interfacing GSM	tbd	tbd	tbd		

6. GSM Phase 2+ and UMTS Release 99 and beyond

Work Items for UMTS will be introduced in the next version of this document.

7. GSM Phase 2+ New Work Items being prepared

WI Title	Prime responsible	WI rapporteur	WI Rapp company
GSM 1900 Conformance Testing (Handsets)	SMG07	Carl Warfel	BellSouth

8. Work Items deleted by SMG

WI Title
Adaptions for deregulated networks
Advice of Charge on Special Services (AoCSS)
Call Forward Enhancements (CFE)
Completion of Calls to Subscriber when No Reply (CCNRy)
Completion of Calls to Subscriber when Not Reachable (CCNRc)
Direct Subscriber Access and Restriction (DSAR)
Exchange of network capabilities information
Fault and Configuration Management for Other Elements
Fault and Configuration Management of OA&M Capabilities
IMEI Security Enhancements
Inter operation with UPT phase 2
Malicious Call ID (MCID)
Mobile Access Hunting (MAH)
Network level Management
New Barring Services
Overload control enhancement for Location Registers
Payphone Services
Premium Rate Services
Standard access SMS, SC-SMES
Subscriber Class for AoC
Transmission of date/time via CB
Unified SMS CB scheduling algorithm
Universal access to freephone numbers

9. Work Items proposed for deletion by STC's

WI Title	Comments
Emergency Call TS12 with additional Data Transfer	No progress
Enhancement of MAP Extensibility Mechanisms	
Provisions for Hot Billing	No input received from MoU- BARG/TADIG's WI "Near real time Record transfer" ?

10. Work Items renamed

WI Title	WI RENAMED
Location Services	Wireless Mobile Station Location
Support of Home Area Priority	Support of Local Service Area (SoLSA)
Network control of ringing tones (Renamed)	Network Indication of Alerting in the MS

Source	:	SMG2
Subject	:	Summary of the concept description of the Beta concept
Allocation	:	Agenda Item 4.1

1. Introduction

This documents outlines the basic system characteristic of OFDMA which is proposed for UTRA selection. It describes the basic concept behind the OFDMA proposal and its advantages and features which is the most advanced of its kind present today.

The OFDMA supports the RTT structure which includes physical as well as network protocol layers (Layer 1, 2, 3) and efficient Radio Resource Management mechanisms.

The OFDMA concept is unique in its approach to resolve the problem of interference averaging, combat multipath effect efficiently and increase capacity and spectral efficiency which are of a magnitude higher than any 2nd generation system available commercially today.

One of the main features of the proposed air-interface, OFDMA, is its flexibility in terms of operational matters, allocation of bandslot in a manner has not seen before, and also its service allocation flexibility (mix service in one cell).

It also provides the best guard band requirements of any system under study, of order of KHz rather than MHz. In OFDMA, the minimum guard band is 200 KHz.

The system structured in such a way which is backward compatible with the existing 2nd generation systems.

The implementation of low cost dual mode/band terminal is realistic.

OFDMA System Description Summary

2. Key technical characteristic of the basic system

The following table summarises the key technical parameters and characteristics of the OFDMA UTRA proposal.

Multiple Access Scheme	SFH-TDMA and OFDM (BDMA)
Duplex Method	FDD (and TDD)
OFDM carrier spacing	100kHz/24 = 4.17kHz
OFDM symbol duration	240µs
Modulation time/Guard time	278µs/38µs
Timeslot Length	288µs
Bandslot Width (Minimum BW)	100kHz (24 subcarriers)
Data frame length	4.615ms (16 slot/frame)
Bandwidth	100kHz, 200kHz, 400kHz, 800kHz, 1.6MHz (flexible)
Frequency Hopping	1 (hop/burst) = 867 hop/s (no hopping option)
Channel Coding	Convolution coding, rate 1/3-2/3, Optional outer RS coding (rate: 4/5)
Interleave	typical 18.46ms for speech
Subcarrier modulation scheme	Frequency Domain DQPSK, Frequency Domain D8PSK, Coherent modulation schemes are supported
Bit rates	typical 11.6kB/s per timeslot/bandslot (coding=1/3)
Frequency Reuse	1 (fractional load=30%), 3 (load=100%)
Maximum use bitrate	no limitation (depends on system BW)
Power Control	Open loop & closed loop
Power Control step, period	1dB, 1.153ms/control
Frequency deployment step	100kHz
Services	Connection oriented and packet oriented services are supported
Handover	Hard handover, Soft handover not required
GSM backwards compatibility	Time and frequency structure is compatible to GSM

3. Performance Enhancing Features

The flexibility of the OFDM proposal (only the time and frequency grid structure has to be defined) allows the adoption of many performance enhancing features. Some of them are:

- **Transmitter Diversity**
To increase decrease signal fluctuation by fast fading Tx antenna diversity is supported, a simmlar effect can be achieved by transmission of the same signal twice with a small delay from the same antenna (BS needs only single antenna).
- **Adaptive Antennas**
The concept supports adaptive antennas (smat antennas) to support SDMA (spatial division multiple access) to increase range, coverage and capacity.
- **Advanced Modulation/Coding Schemes**
New modulation schemes can be applied (adaptive modulation) on the subcarrier domain (actual C/I based). Improved coding schemes (e.g. Turbo coding) can also be used.
- **Multi user detection/Interference cancellation**
Is supported in synchronous networks
- **Dynamic Channel allocation**
Advance DCA scheme can be applied to avoid the interference and maximises the capacity.
- **Bandwidth expansion**
Higher bandwidth allocation to support higher data rate beyond 2 Mb/s.

4. System Description

The OFDMA concept utilises OFDM modulation which has excellent performance in all multipath radio channels. A variable number of subcarriers is assigned to a user according to the required service. Additionally the number of timeslots is adjusted according to the required service. Variable bandwidth (frequency) and TDMA hopping pattern are supported, to achieve frequency, interference, and time diversity. The time and frequency structure is compatible to GSM. FDD and TDD modes are supported. The basic concept is depicted in Figure 1.

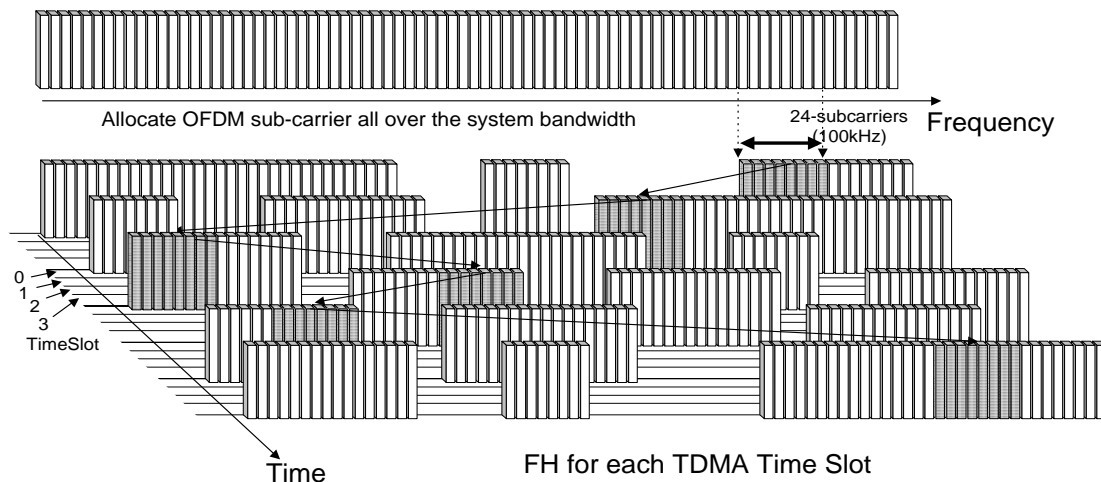


Figure 1: OFDMA Outline (SFH-TDMA)

The TDMA structure is aligned with GSM, one timeslot is $288.46\mu\text{s}$ (half of GSM timeslot). To support a wide variety of services flexible TDMA structures are supported in the FH pattern generator, the basic frame length is equivalent to the GSM frame length of 4.6ms.

Figure 2 shows the mapping of subcarriers into bandslots. One bandslots consist of 24 subcarriers (=100kHz) which is half of the GSM channel bandwidth.

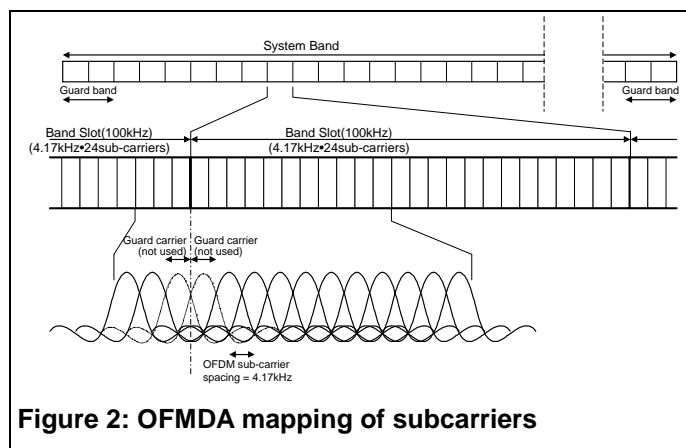


Figure 2: OFDMA mapping of subcarriers

Logical Channel are defined in the OFDMA concept:

Initial Acquisition Channel (IACH for initial time and frequency acquisition), Broadcast channel (BCCH) and Random Access Channel (RACH), Paging Channel (PCH). Dedicated Control Channels (DCCH), Access Grant Channel (AGCH) and traffic channels are prepared.

Efficient quality based power control is achieved in the up- and downlink in order to minimise interference and maintain the link quality in the multipath environment.

A frequency reuse of 1 is supported which simplifies cell planning, the overall system shows soft capacity (allows capacity enhancement). Uncoordinated operation of base stations is supported.

The OFDM concept is optimised for efficient transmission of variable bitrates for connection oriented and packet oriented services.

The following diagram depicts the harmonised utilisation of the proposed (OFDMA) RTT basic

OFDMA System Description Summary

resources for common operation in different environments.

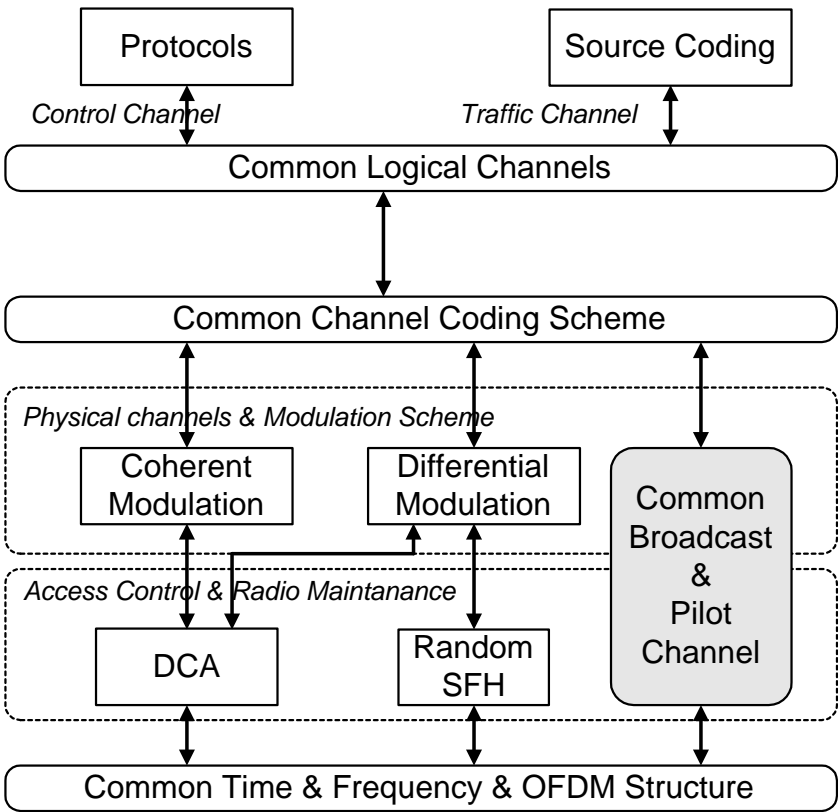


Figure 3: Harmonised RTT platform

5. Summary and main system features

The following summary shows the key advantages of the OFDMA UTRA proposal.

- Single core PHY layer minimising hardware costs with 2 software driven MAC options
- SFH TDMA based MAC for majority of UMTS services
- TDD DCA MAC for unpaired spectrum allocations, asymmetrical services & unlicensed usage
- Adaptive Modulation schemes for different channels
- Robustness against multi-path and Doppler spread
- Low computational overheads
- Simple low cost low-bit rate only terminals feasible
- Straightforward and efficient high bit rate support
- Small guard band requirements ~ 100 kHz
- High Spectral Efficiency achievable - 2 Mbits/s in 1.6 MHz feasible
- No frequency planning is required - effective re-use factor of ~1
- GSM Backwards Compatibility
- Minimum Bandwidth Requirements for system deployment only 1.6 MHz (or less) and deployment possible in steps of 100kHz
- Standard TDMA cellular planning and system enhancement techniques (smart antennas, hierarchical cell structures) can be supported
- Support of connection and packet oriented services
- Hard Handover, no soft handover required

ETSI SMG#24
Madrid, Spain
December 15-19, 1997
Source: SMG2

TDoc SMG 897 / 97

Concept Group Delta WB-TDMA/CDMA:
System Description Summary

Introduction

In the procedure to define the UMTS Terrestrial Radio Access (UTRA), the WB-TDMA/CDMA concept group developed and evaluated a multiple access concept based on frequency, time, and code division.

The WB-TDMA/CDMA design rational is as follows:

- **CDMA component:** To offer interferer diversity, to provide fine granularity of user data rates without high peak to mean powers.
- **TDMA component based on GSM timing structure:** To build UTRA directly on top of proven GSM technology, to ensure easy handover between GSM and UMTS, to reduce the number of codes to be processed at the same time and hence make multi-user detection feasible from day 1 of UMTS. To take advantage of orthogonal partitioning of radio resources to avoid instability.
- **Benefit from near-far resistant multi user-detection (MUD):** Cancellation of intra cell interference, to achieve stability without fast and accurate power control. To avoid soft handover.
- **Wideband carrier:** To support high user bit rates required in UMTS, and to take advantage of frequency diversity.

Key technical characteristics of the basic system

Table 1 - WB-TDMA/CDMA key technical characteristics

Multiple Access Method	TDMA and CDMA (FDMA inherent)
Duplex Method	FDD and TDD
Channel Spacing	1.6 MHz
Carrier chip / bit rate	2.167 Mchip/s
Time slot structure	8 slots / TDMA frame
Spreading	Orthogonal, 16 chips/symbol
Frame length	4.615ms
Multi-rate concept	multi-slot and multi-code
FEC codes	$R = 1/8 \dots 1$ (convolutional, punctured)
Interleaving	inter-slot interleaving
Modulation	QPSK / 16QAM
Burst types	2 different burst types: - burst 1: for long delay spread environments - burst 2: for short delay spread environments
Pulse shaping	GMSK basic impulse $C_0(t)$
Detection	coherent, based on midamble
Power control	slow
Handover / IF handover	mobile assisted hard handover
Channel allocation	slow and fast DCA supported
Intracell interference	suppressed by joint detection
Intercell interference	like in other clustered systems

Performance enhancing features (according to network operator choice)

- BTS antenna hopping,
- frequency hopping,
- directive and/or adaptive antennas,
- time slot hopping,
- cell synchronization,
- interference based DCA,
- faster power control (for slow moving mobiles),
- quality based power control,
- co-channel multi-user detection (synchronized cells),
- relaying and advanced relay protocols such as ODMA.

As in GSM: In order to ensure that frequency hopping can be utilized in an operating system at any time, the frequency hopping capability shall be mandatory in all mobile terminals.

In addition, future enhancements of UTRA could include performance improving features which could take advantage of software configurable mobile station concepts, e.g. Turbo codes and improved link adaptation.

WB-TDMA/CDMA Support for Relaying and ODMA: A feasibility study conducted by the Delta and Epsilon concept groups concluded that WB-TDMA/CDMA can support relaying and the ODMA protocol with negligible increase in mobile complexity or cost. The ODMA protocol breaks difficult radio paths into a sequence of shorter hops which enables lower transmit powers or higher data rates to be used. It is the goal of the protocol to choose the least cost route through the relaying system when the relays are moving and the radio paths are dynamically changing. Simulations have shown that relaying has the potential to improve coverage and flexibility and may also increase capacity by lowering transmission powers and associated intercell interference. Further details are provided in part 6 of the WB-TDMA/CDMA Evaluation Report.

System description

Figure 1 depicts the multiple access of WB-TDMA/CDMA. For comparison reasons the multiple access of GSM is depicted in Figure 1, too. In WB-TDMA/CDMA up to 8 traffic channels (TCH) are supported in a time slot and a frequency band of width 1.6 MHz. However, the number of 8 traffic channels (CDMA codes) is not sharp. It is also feasible to assign 9 or even more CDMA codes within a time slot. The traffic channels are separated at the receiver based on TCH specific CDMA codes. As can be seen from Figure 1 in both WB-TDMA/CDMA and GSM a TDMA frame consists of 8 time slots. The duration of the TDMA frame as well as time slots is exactly the same for both GSM and WB-TDMA/CDMA. This identical frame and time slot structure allows to build WB-TDMA/CDMA easily on top of proven GSM technology and ensures an easy handover between GSM and UMTS.

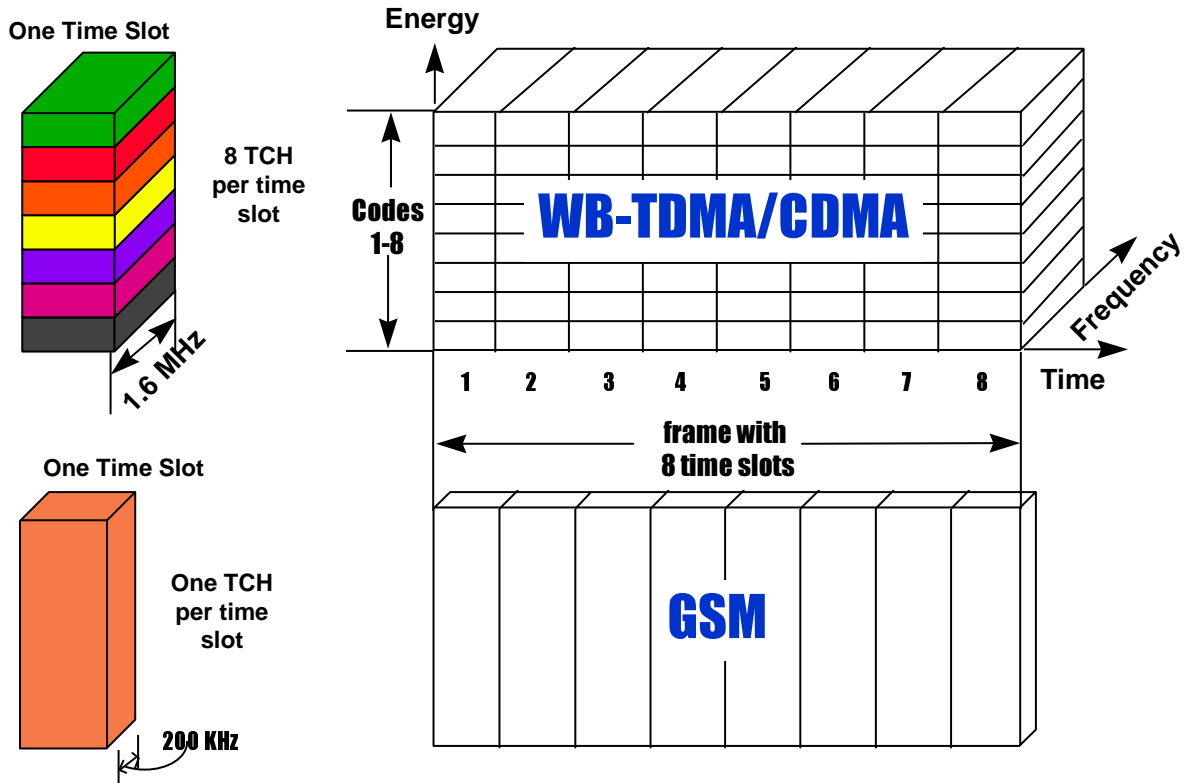


Figure 1: Multiple access of WB-TDMA/CDMA and GSM

In Figure 2 the uplink, i.e. the link from K (e.g. equal to 8) mobiles to the base station, of WB-TDMA/CDMA is depicted. At the mobile k ($k = 1, \dots, K$) the data of the traffic channel k is spread with the traffic channel specific CDMA code k . After spreading, the data of the traffic channel k is put into 2 data blocks. As in GSM a WB-TDMA/CDMA transmitted burst consists of 2 data blocks and a midamble which is used for channel estimation. At the base station the received signal is the superposition of the bursts transmitted from all K mobiles. At the base station receiver, first the different channels are estimated. This channel estimation uses as input the midambles assigned to the K mobiles. Input for joint detection are the estimated K radio channels as well as the K CDMA codes assigned to the K traffic channels. Then, in a single step multi-user / joint detection (JD) of data belonging to all K traffic channels is performed. Intersymbol interference (ISI) and cross interference between data symbols of different traffic channels are eliminated. Due to the joint detection the requirements on uplink power control are quite relaxed and the benefits of CDMA without the intra-cell interference can be utilized. Furthermore, soft handover, which means additional infrastructure costs, is not needed.

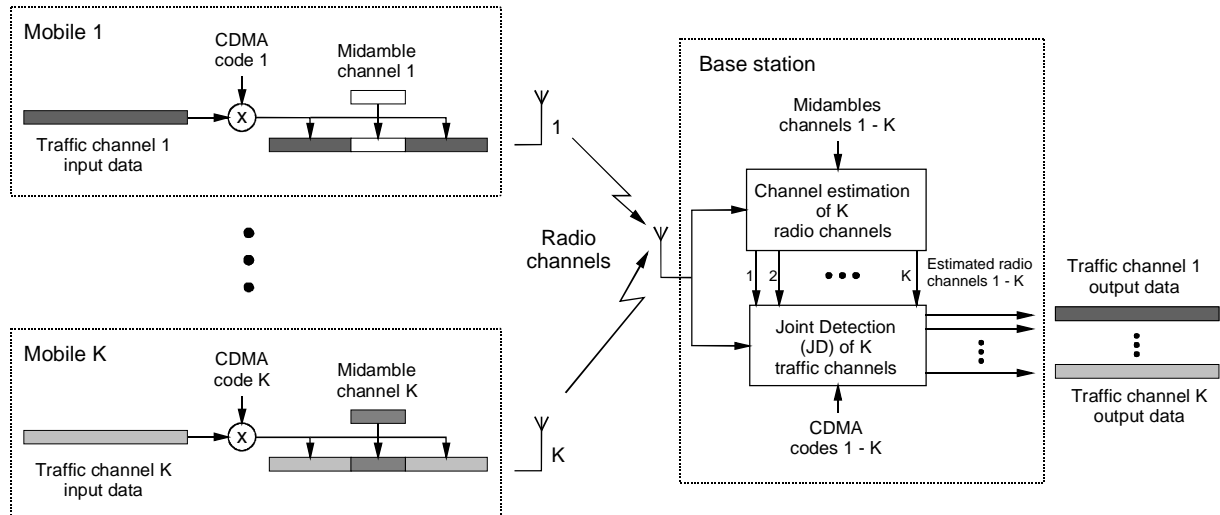


Figure 2: Uplink of WB-TDMA/CDMA

In the WB-TDMA/CDMA proposal user data rates from 8kbit/s up to 2Mbit/s with fine granularity can be adapted by

- assigning to a single user up to 8 time slots (multi-slot option),
- assigning to a single user up to 8 CDMA codes per time slot (multi-code option),
- adapting FEC coding rate (convolutional, punctured),
- adapting order of modulation (16QAM or QPSK).

For 16QAM data modulation the flexibility of data rates that can be provided to a single user is depicted in Figure 3. In Figure 3 the user data rate per CDMA code and per time slot is 32kbit/s.

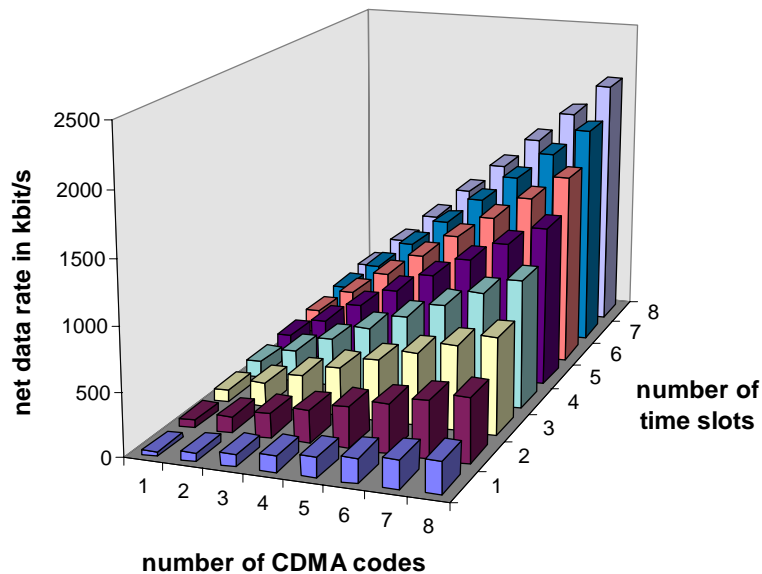


Figure 3: Flexibility of data rates in WB-TDMA/CDMA

Summary

The concept group delta WB-TDMA/CDMA proposal fulfills the UMTS requirements described in ETR 0401.

The main features can be summarized as follows:

- Support of hierarchical cell structures.
- Flexibility of user data rates by assigning different number of CDMA codes and time slots, adaptation of FEC code rate and used modulation type.
- Due to the moderate carrier bandwidth gradual introduction of UMTS islands on top of GSM networks is feasible.
- Stability of power control schemes guaranteed thanks to Multi User Detection.
- The WB-TDMA/CDMA proposal is an evolution towards wideband of the field proven GSM technology, i.e. keeping the same timing structure, and thus guarantees the robustness of the future UMTS system.
- Soft handover is not needed.
- Supports seamless handover between GSM and UMTS.
- The WB-TDMA/CDMA air interface used in unregulated frequency allocation for residential and business applications allows the use of uncoordinated systems through DCA techniques used in existing cordless systems.
- Some future enhancements are already foreseen to be introduced: adaptive antennas, new channel coding schemes, new receiver technologies, and ODMA.

ETSI SMG#24

TDoc SMG 900 / 97

Madrid, Spain

Agenda item 4.1: UTRA

December 15-19, 1997

Source: SMG2

Concept Group Gamma -

WB-TDMA:

System Description Summary

1 Introduction

The WB-TDMA concept described here constitutes a candidate Radio Transmission Technology (RTT) which includes the physical carrier structure, the radio dependent protocol layers from layer 1 to layer 3 as well as the related radio resource management algorithms. The flexibility and efficiency is provided by sophisticated multiple access means, which include adaptive mechanisms to optimise the performance of the physical layer. Further, it is not the efficient protocols or the physical layer techniques alone, which will provide an advanced radio transmission solution, rather the complete radio interface including effective radio resource management algorithms. These aspects have been fully considered as part of the work of the Gamma concept group.

The present document summarises the main system features. More detailed information can be found in the Gamma Group Evaluation Document (ETSI SMG2#24, Tdoc SMG2 365/97).

2 Key Technical Characteristics of the Basic System

Main MA parameters	WB-TDMA
Multiple access method	TDMA
Duplexing method	FDD and TDD
Channel spacing	1.6 MHz
Carrier bit rate	2.6 Mbit/s / 5.2 Mbit/s
Physical structure layer	
Time slot structure	16 or 64 slots/TDMA frame
Frame length	4.615 ms
Multirate concept	Multislot
FEC codes	Rate Compatible Punctured Convolutional codes, Turbo Codes, Reed Solomon codes
ARQ scheme	Type II hybrid ARQ
Interleaving	Inter-slot and intra-slot interleaving
Modulation	B-OQAM / Q-OQAM
Pulse shaping	Root Raised Cosine, roll-off = 0.35
Detection	Coherent, based on midamble

3 Performance Enhancing Features

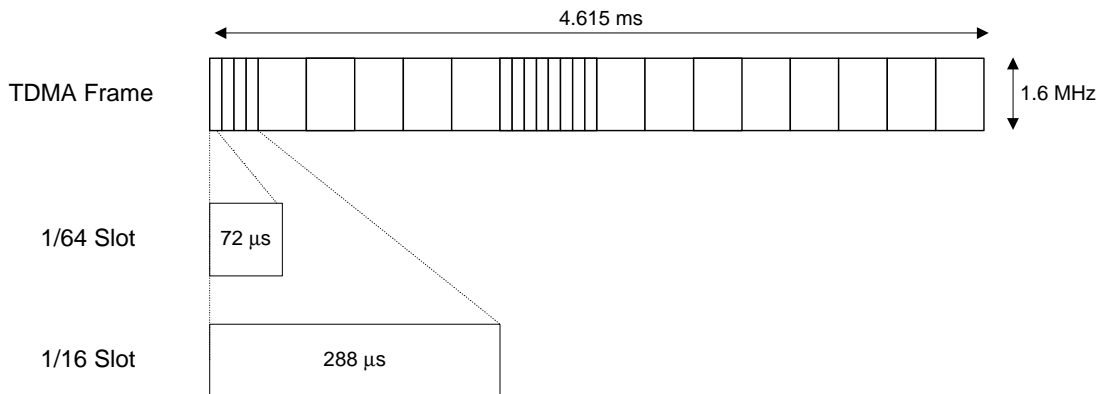
Feature	Description	Comments
Frequency diversity	Frequency hopping per frame or slot	Also provides interference diversity
Time diversity	Time hopping within frame	Provides interference diversity without increasing total bandwidth
Path diversity	Antenna diversity	BS antenna diversity assumed MS antenna diversity expected for high rate terminals.
Burst structure	Additional burst formats	Multiplexed burst for downlink efficiency Bursts optimised for specific conditions (eg large delay spreads)
Modulation	Flexible modulation format	Any modulation/coding scheme meeting emission mask (including OFDM) can be used within a flexible burst structure
Bandwidth	Multi-band structure	Supports larger cells (narrow band) or higher bit rates (wide band)
Power control	Slow power control	50 dB dynamic range Fast power control could be used if frequency hopping is not viable (eg single carrier)
Handover	Mobile assisted hard handover	Inter-frequency handover supported Soft handover (i.e. two simultaneous connections) is possible
Interference cancellation	Joint detection	Optional feature suited to suppression of small number of dominant interferers
Interference reduction	Directional antennas	Cell sectorisation is supported Adaptive antenna techniques could be applied.
Channel allocation	Slow and fast DCA supported	Allows interference avoidance

The features in the above table are not essential to the operation of WB-TDMA, but are generally considered highly desirable.

In addition, Link Adaptation in response to changes in channel conditions is considered essential for achieving high spectral efficiency.

4 System Description

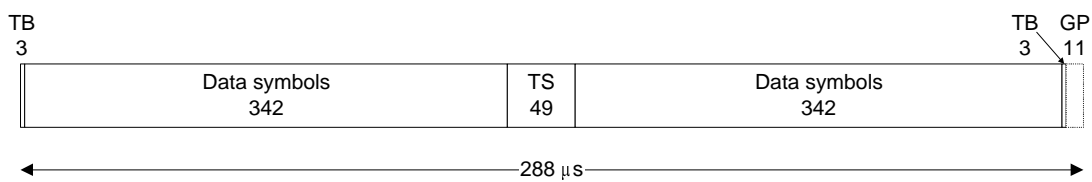
The frame duration is chosen to be 4.615ms for compatibility with GSM. A similar multi-frame structure to GSM could also be adopted.



FDD frame structure of WB-TDMA.

The frame is divided into slots of relative size 1/16 and 1/64. The same frame duration is applied in both FDD and TDD modes, except that in TDD mode an adjustable switching point determines the fraction of capacity devoted to uplink and downlink.

A number of different transmission bursts are defined for WB-TDMA. As an example, the diagram below shows a data burst for a 1/16th slot.



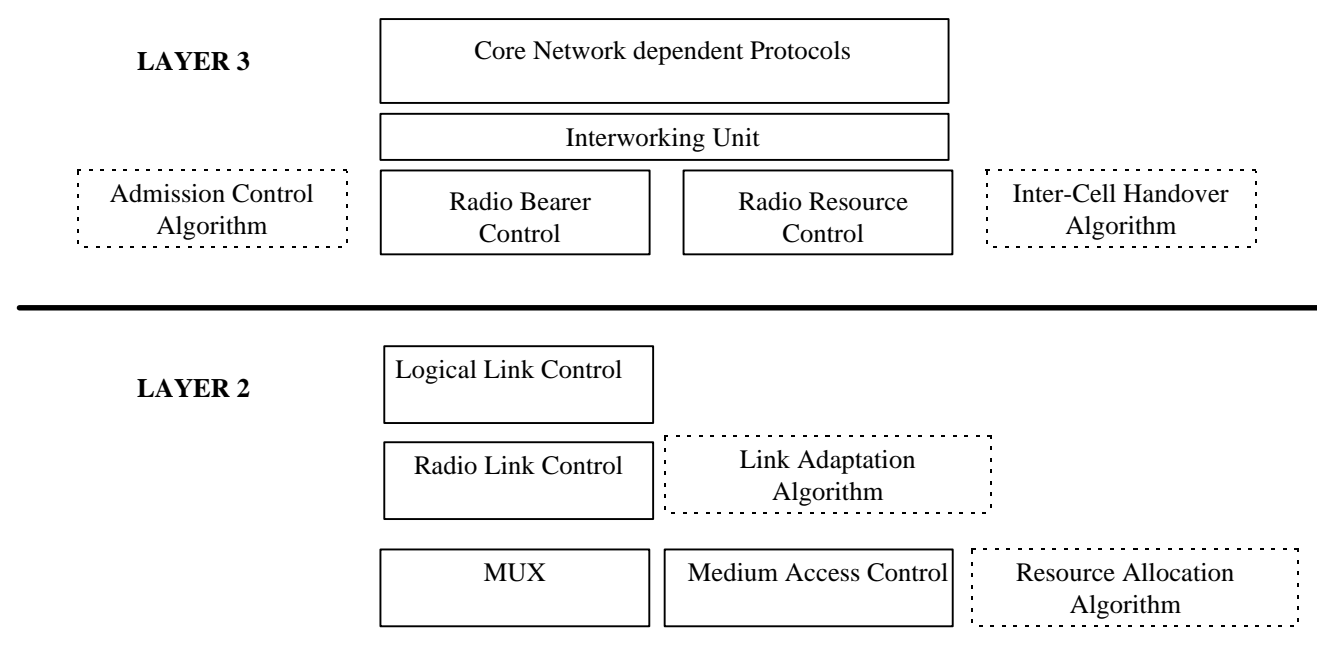
Data burst structure. TB=tail symbols, TS=training sequence and GP= guard period.

The basic modulation scheme is Binary Offset Quadrature Amplitude Modulation (B-OQAM) with a symbol rate of 2.6Msymbols/s. For higher bit rates Quaternary-OQAM is used. The corresponding carrier spacing is 1.6MHz.

Different user bit rates can be achieved by allocating different numbers of slots.

Examples of service mappings for WB-TDMA

Required user bit rate (kbits/s)	Code rate	Slot type	Burst type	Modulation	Number of basic physical channels per frame
8	0.5	1/64	Nonspread Speech ₂	BOQAM	0.5
64	0.5	1/64	Nonspread Speech ₂	BOQAM	4
144	0.5	1/16	Nonspread Data	BOQAM	2
384	0.5	1/16	Nonspread Data	BOQAM	5
1024	0.5	1/16	Nonspread Data	BOQAM	14
2048	0.5	1/16	Nonspread Data	QQQAM	14



LAYER 1

WB-TDMA Radio interface Protocols

The above diagram represents the layer structure and the protocols and algorithms of the WB-TDMA radio interface. Algorithms are represented in dashed boxes. For example, link adaptation is applied in response to different channel conditions by adjusting the code rate, making it possible to achieve a given quality of service independently of the C/I.

5 Summary

The WB-TDMA concept has been developed as a cost-effective flexible platform for implementation of the UTRA, which can easily adapt to a variety of operating environments and application requirements. It offers a high degree of backwards compatibility with GSM, while at the same time is "future proof" because it allows enhancement by application of technological developments. WB-TDMA could also be used in combination with other techniques, for example as a complement to CDMA for provision of high bit rates over short ranges.

ETSI SMG#24

Madrid, Spain

December 15-19, 1997

Source: SMG2

TDoc SMG 903 / 97

Agenda item 4.1: UTRA

**Concept Group Alpha -
Wideband Direct-Sequence CDMA:
System Description Summary**

Concept Group Alpha - Wideband Direct-Sequence CDMA

System Description Summary

Introduction

Within the Alpha concept group in SMG2, a UTRA proposal based on wideband direct-sequence CDMA has been developed. The WCDMA concept is described in the Alpha group's evaluation document (Tdoc SMG2 359/97), that contains a system description section. This document presents a summary of the WCDMA system description.

The WCDMA system includes:

- Wideband CDMA carrier to offer a high degree of frequency diversity and high bit-rates
- Flexible physical layer for implementation of UMTS services, with support for large range of varying bit-rates with high granularity
- Built in support for co-existence and efficient handovers with GSM
- Feasible implementation from day one of UMTS, with possibility for performance enhancement using more demanding features like adaptive antennas and multi-user detection in the future

Key technical characteristics of the basic system

Table 1 below summarises the key technical characteristics of the WCDMA radio-interface.

Multiple-access scheme	DS-CDMA
Duplex scheme	FDD / TDD
Chip rate	4.096 Mcps (expandable to 8.192 Mcps and 16.384 Mcps)
Carrier spacing (4.096 Mcps)	Flexible in the range 4.4-5.2 MHz (200 kHz carrier raster)
Frame length	10 ms
Inter-base station synchronisation	FDD mode: No accurate synchronisation needed TDD mode: Synchronisation needed
Multi-rate/variable-rate scheme	Variable-spreading factor and multi-code
Channel coding scheme	Convolutional coding (rate 1/2-1/3) Optional outer Reed-Solomon coding (rate 4/5)
Packet access	Dual mode (common and dedicated channel)

Table 1. WCDMA key technical characteristics.

Performance enhancing features

There exist a number of ways to enhance the performance of the WCDMA system. In general in CDMA, it is very easy to get immediate quality, coverage and capacity gains directly from link improvements. This is due to the single-cell reuse and the fact that power is the only shared resource. If one user's link is improved the transmit power can be lowered on that link, and all users in the system will benefit from this since they are sharing the same power resource.

Listed below are some performance enhancing features that can be applied to the WCDMA system:

- **Downlink antenna diversity.** Antenna diversity in the mobile station is not required in the concept. However, since antenna diversity gives a gain of around 3 dB in performance it can be employed in the terminal for better quality and system capacity.
- **Transmitter diversity.** Orthogonal transmit diversity, where the data stream is split into several streams and sent through different antennas, can be used in the downlink to get quality and capacity gains. This is a good way to get diversity gains in the downlink without increasing the mobile station complexity.
- **Receiver structures.** WCDMA is designed to work without requiring receivers for joint detection of multiple user signals. However, the potential capacity gains of such receivers in a WCDMA system have been recognised and taken into account in the design of the concept. In the uplink the possibility to use only short codes facilitates introduction of more advanced receiver structures with reasonable complexity.
- **Adaptive antennas.** Adaptive antennas are recognised as a way to greatly enhance capacity and coverage of the system. Solutions employing adaptive antennas are already supported in the WCDMA concept through the use of connection-dedicated pilot bits on both uplink and downlink. Moreover, adaptive antenna issues have been included in the design of the downlink common physical channels.
- **Support for relaying and ODMA.** A feasibility study conducted by the Alpha and Epsilon concept groups concluded that WCDMA can support relaying and the ODMA protocol with negligible increase in mobile complexity or cost. ODMA is an intelligent relaying protocol that sits upon the WCDMA radio sub-system. The protocol breaks difficult radio paths into a sequence of shorter hops which enables lower transmit powers or higher data rates to be used. It is the goal of the protocol to choose the least cost route through the relaying system when the relays are moving and the radio paths are dynamically changing. Simulations have shown that relaying has the potential to improve coverage and flexibility and may also increase capacity by lowering transmission powers and associated inter-cell interference.

System description

Physical channel structure, spreading and modulation

There exist two basic physical channels in WCDMA: the dedicated physical data channel and the dedicated physical control channel. The data channel is used to carry dedicated data generated at layer 2 and above, i.e. the dedicated logical channels. The control channel carries control information generated at layer 1. The control information consists of known pilot bits to support channel estimation for coherent detection, transmit power-control commands, and optional (variable-length) rate information. The rate information informs the receiver about the instantaneous rate of the different services and how services are multiplexed on the dedicated physical data channels.

The frame length on the physical channels is 10 ms, and each frame is divided into 16 slots of 0.625 ms each, corresponding to one power-control period. In the downlink the dedicated physical control and data channels are time-multiplexed within the slots, with one power-control command per slot. In the uplink control and data are code-multiplexed and transmitted in parallel.

In both uplink and downlink, the dedicated physical control and data channels are spread to the chip-rate using orthogonal variable rate spreading factor codes. These channelization codes have varying spreading factors to carry varying bit-rate services, i.e the channelization codes are of different lengths to match different user bit rates, with spreading factors from 4 up to 256. Using different channelization codes, several data and control channels of different rates can be spread to the chip-rate and still be orthogonal after spreading. Hence, multi-code transmission can be employed for the highest bit-rates, typically above 384 kbps, and several services of different rates can be transmitted in parallel with maintained orthogonality.

Spreading with the channelization codes is followed by scrambling. In the downlink the scrambling code is base-station specific 10 ms segment of a Gold code of length $2^{18}-1$. The number of available scrambling codes is as high as 512, making code planning trivial. In the uplink, the primary scrambling code is a complex code, built from extended VL-Kasami sequences of length 256. This short code facilitates the introduction of advanced receiver structures, such as multi-user detection. For cells without such receivers, a long secondary scrambling code is used for improved cross-correlation properties and interference averaging. The secondary scrambling code is a 10 ms segment from a Gold code of length $2^{41}-1$.

In uplink and downlink QPSK modulation is used, with root-raised cosine pulse-shaping filters (roll-off 0.22 in the frequency domain).

Channel coding and service multiplexing

WCDMA offers three basic service classes with respect to forward error correction coding: standard services with convolutional coding only ($\text{BER} \approx 10^{-3}$), high-quality services with additional outer Reed-Solomon coding ($\text{BER} \approx 10^{-6}$), and services with service-specific coding where WCDMA layer 1 does not apply any pre-specified channel coding. The latter class can be used to enable other coding schemes such as e.g. turbo-coding. Rate 1/2 or 1/3 convolutional codes are used, with block interleaving over one or several frames depending on delay requirements. The additional Reed-Solomon code employed is of rate 4/5, and is followed by symbol-wise inter-frame block interleaving.

Multiple services belonging to the same connection are, in normal cases, time multiplexed. Time multiplexing takes place both after possible outer coding and inner coding. After service multiplexing and channel coding, the multi-service data stream is mapped to one or several dedicated physical data channels. A second alternative for service multiplexing is to treat parallel services completely separate with separate channel coding/interleaving and map them to separate physical data channels in a multi-code fashion. With this alternative scheme, the power and consequently the quality of each service can be more independently controlled.

After channel coding and service multiplexing, the total bit rate is almost arbitrary. Rate matching is used to match the coded bit-rate to the limited set of possible bit-rates of a dedicated physical data channel. In the uplink puncturing and repetition is employed to match the rate, while in the downlink puncturing and repetition for the highest rate is used together with discontinuous transmission for the lower rates.

Using the above mentioned coding, interleaving and rate matching techniques the WCDMA concept has shown that rates of at least 2 Mbps can be achieved using a 4.096 Mcps carrier. Also, low bit-rates as well as high bit-rates can be supported efficiently, with high bit-rate granularity.

Radio resource functions

A fast and efficient random access procedure has been defined. The random access is based on slotted Aloha transmission of a random access burst. The burst contains a preamble part, where a base station specific preamble code is used to transmit a preamble sequence randomly picked by the mobile station. The preamble sequence is detected in the receiver using a matched filter, and tells the receiver what scrambling code has been used for the data part of the burst. Using this scheme, the base station may receive up to 80 random-access attempts within one 10 ms frame using only one matched filter for the preamble code.

The WCDMA system operates with a frequency re-use of one. Soft handover enables this, and gives capacity and coverage gains compared to hard handover. Seamless inter-frequency handover is needed for operation in hierarchical cell structures and handover to other systems e.g. GSM.

A key requirement for the support of seamless inter-frequency handover is the possibility for the mobile station to carry out cell search on a carrier frequency different from the current one, without affecting the ordinary data flow. For a mobile station with receiver diversity, there is a possibility for one of the receiver branches to temporarily be reallocated from diversity reception and instead carry out reception on a different carrier. A single-receiver mobile station uses slotted downlink transmission to do inter-frequency measurements. In the slotted mode, the information normally transmitted during a certain time, e.g. a 10 ms frame, is transmitted in less than that time, leaving an idle time that the mobile can use for measurements on other frequencies.

The FDD mode assumes asynchronous base stations. To enable asynchronous operation a fast cell search scheme has been defined. In the cell search procedure the mobile station acquires two synchronisation codes broadcasted by the base station, from which the mobile can determine the scrambling code and frame synchronisation of the base station.

Packet access

Due to the varying characteristics of packet data traffic in terms of packet size and packet intensity, a dual-mode packet-transmission scheme is used for WCDMA. With this scheme, packet transmission can either take place on a common fixed-rate channel or on a dedicated channel, with an adaptive choice of method based on the packet traffic characteristics. Small infrequent packets are typically transmitted on the common channel, while larger more frequent packets are transmitted on a dedicated channel.

Summary

In the development of the WCDMA concept a prerequisite has been to fulfil the UMTS requirements described in ETR-0401. To summarise, the following key features are included in the WCDMA concept for flexible and efficient support of UMTS service needs:

- Support for high data-rate transmission with 384 kbps wide-area coverage and 2 Mbps local area coverage. This can be achieved in a bandwidth of 5 MHz, including guardbands.
- High service flexibility, i.e. good support of multiple bearers and variable bit rates. This is achieved using a physical channel structure that allows multiple bearers on the same physical channel and supports changed user bit-rate on a frame-by-frame basis with very high granularity.
- High capacity and coverage in the basic system without the need for multi-user/joint-detection receivers, dynamic radio-resource-management algorithms and link adaptation, frequency planning etc. However, for future performance enhancements, features like multi-user detection, adaptive antennas, OFDMA etc. are supported within the concept.
- Fast and efficient packet access using a dual mode access scheme (common or dedicated channel transmission) with adaptive mode selection based on packet traffic characteristics, together with an efficient random-access mechanism.
- Flexible system deployment with asynchronous base station operation in FDD mode, and spectrum-efficient deployment of hierarchical cell structures.
- Support for inter-frequency handover for operation with hierarchical cell structures, and inter-system handover with second generation systems like GSM.

15th - 19th December 1997

Extraordinary T1P1 / SMG Co-ordination Meeting on UMTS - draft 1

24-25 November 1997, Frankfurt/Main, Germany

Participants: Gunnar Sandegren, Chris Wallace, Gary Jones, François Grassot, Michel Mouly, David Williams, Ansgar Bergmann, Fred Hillebrand, Alan Cox

1. Report from other activities

1.1 SMG-CG 23bis

See Tdoc 1. The scope of the project “UMTS services with derived GSM services” was discussed.

1.2 Telephone conference with TIA

See Tdoc 2. The telephone conference discussed organisation of information exchange between the regional standards organisations, the dialogue TIA/T1P1/SMG and the multilateral discussions T1P1/TIA/SMG/ARIB/TTC.

1.3 SMG3

The contribution from FH was presented and discussed in SMG3 SA (Td 5). A revised version incorporating comments of SA will be provided for further discussion in SMG3. The contents of section 3 should be proposed as a section in Q.FIN, however aspects of inter-region discussion should be taken out.

1.4 GA

Votes for associate members: Was not accepted. The necessary majority was missed by some percents only. Resistance mainly from France and Germany.

By this, associate members will not have voting rights on technical issues at least until the next GA. On the other side, the path to become associate members in order to participate at decision processes, e.g. for the UTRA definition, was not really exploited until now.

The GA also approved a task force (chair: Steve Hearndon) to review responsibilities on UMTS.

The proposal to limit contracts for project teams (“STFs” in ETSI’s new terms) to ETSI members was rejected at GA.

1.5 Preparation of SMG#24

FH presented Td 3, the revised agenda and schedule for SMG#24. There will be a paper from Fred and Helene on procedural questions, with the general approach to use the GA procedures where the procedures for Technical Bodies have gaps. No IPR declaration for UTRA has been received so far, this will be discussed in SMG#24, also in the SMG2 meetings.

AP AB	to edit the revised agenda and to distribute it in SMG, also to indicate once more that Monday, 15 th will start at 13:00 h.
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2. UMTS activities in T1P1

GJ presented examples of competitive advertising in North America.

The family concept, the time plans, the emphasis on regional detailed specifications are well agreed in T1P1.

GJ presented Td 6, proposing the GSM platform as the model for 3rd generation family members.

GJ presented Td 7 and Td 8 with requirements for the IMT-2000 Core Network and Td 9 on services and applications of UMTS phases.

3. UMTS RAN

Td 4 from George Schmitt, Omnipoint, asks for a revision of the UTRA definition process, leaving more time and better participation at decision processes. The paper is supported by some 20 member companies of GSM NA, others did not yet respond [correct?]. It seems that, despite the fact that SMG has done all possible information exchange via the established communication channels with GSM MoU, evaluation of the process has started very slowly at many MoU members.

Elements for a reaction:

- provide more information on the ETSI processes to MoU members
- provide more information on the proposals to MoU members
- to clarify that decisions are made at appropriate times to meet the ITU schedules
- to decide on the next steps in SGM#24.

Field tests are requested in the paper. The role of such field tests and the feasibility within the UTRA time plans were discussed. In JTC, field tests were requested and performed. The view of SMG is that members are adult enough to organise their evaluations based on the results from SMG2 and information exchange with the proponents.

FH will draft a letter in response.

Also, Gary Jones mentioned a questionnaire of the GSM-MoU on the UTRA asking members for their position.

4. Services

The working methods in T1P1 and SMG1 leads to some ping pong, which could in certain cases be avoided by use of joint meetings; but in many cases this ping pong discussion is necessary in order to establish a well-accepted basis. For CNAP, SMG1 has sent their final comments to T1P1. On SIM lock, co-ordination is going on, and common results are foreseen for SGM#24. Number portability has different requirements in Europe and America, and this has simply to be accepted. Of course, commonalities should be sought. The word “tandem” in TFO leads to mis-

understandings in US. For location services, some requirements of the US FCC for backward compatibility of a solution might restrict the possibilities.

Work on the reports on UMTS started. Alan will draft some work items on UMTS for the SMG1 meeting on UMTS, so that they can be presented to SMG#24. The idea of further development of GSM services within the UMTS services was well received in SMG1.

The understanding of T1P1 is to apply the same philosophy of common specifications to UMTS.

5. GSM-UMTS Core Network aspects

Comparing the UMTS and GSM service requirements as far as the core network is concerned, there is no reason why the UMTS services should not be supported in the GSM Core Network specifications. On the other side, the required compatibility between the GSM phase 2+ evolution core networks and the GSM-UMTS core networks entails that GSM phase 2+ services must be supported in the GSM-UMTS core networks. (The basic idea is that the UMTS radio access and the GSM radio access can be connected to the same core network.) In other words, the GSM core network evolution should now be done within the GSM-UMTS core network evolution. Proposals in this sense will be made to SMG#24.

6. Future work in T1P1 and SMG on 3rd generation

6.1 Family concept, Q.FIN

Td 5 is a contribution from FH to the IMT2000 family concept. It was presented and discussed in SMG3 SA. A revised version incorporating comments of SA will be provided by FH for further discussion in SMG3, see 1.3.

Td 12 was elaborated first by Alan Cox and Neil Lilly and incorporates further contributions of SMG1 and the Briggs group. It was commented that contributions to ITU(-T) on the family concept should contain direct change requests to Q.FIN. On the other hand, SMG also needs papers elaborating - for SMG - its own thinking. The document was intended for internal discussions, and not as a document for ITU.

DW presented Td 13, the updated work plan for SMG contributions to ITU. Some editorial modifications were proposed.

The definition of Family Concept in Td13 is taken from a TG8/1 temporary document, *Working document Towards a New Draft Recommendation on IMT-2000 Family Concept* (see file imtfam.doc). That definition should be proposed for Q.FIN, hence a paper must be proposed to SMG3.

AP DW

Change request to introduce the definition of TG8/1 for family concept into the definition section of Q.FIN.

See Td 17.

The understanding until now was that ITU recommendations could point to regional standards (e.g., for definition of IMT-2000 radio access systems). But there was a paper from Netherlands, proposing that this should not be sufficient.

AP DW	<p>To provide a paper for SMG#24 on the handling of standards in ITU:</p> <p>There should be ITU recommendations on all IMT-2000 family members giving at least a general description; detailed specifications of IMT-2000 components may be pointers to regional standards.</p>
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As a result of this action point, DW presented Td 16 proposed as an input paper to ITU-T and ITU-R clarifying the family concept and responsibilities for specifications. With the addition of “including facilitating roaming between members of the IMT 2000 family where commercial interests require it” after “interoperability between IMT-2000 systems”, the paper should go to SMG#24 for approval as input to ITU-T and ITU-R.

GJ presented Td 10 with proposed modifications to Q.FIN. The role of table 1 with the phases of development could be to bar inappropriate IMT-2000 proposals or to be used as a work item list. At the moment, Q.FIN contains an empty table and says:

phase 1 contents are those capabilities which are to be standardised in the first approved version of Q.FNA, Q.FIF.

It should be modified to define the scope of the table as minimum requirements. GJ and CW will check the table in Td 10 against the new definition. GJ will draft a change request for T1P1 next week and communicate it to SMG1 next week via DW. The scope of UMTS phase 1 is given in UMTS 30.01 (it was presented to ITU). Another paper on the same issues is Td 14, source ETSI Task Force on ITU-T SG11, which has another proposed table. This table seems to be less in line with minimum requirements, and was found less suitable as a basis of discussion than Td 10.

DW presented Td14, a possible contribution to ITU on service capabilities of IMT2000. It was questioned whether early ideas in SMG(1) on potential features for UMTS should be propagated in other fora before some results have been reached in SMG.

IMT 2000 services, source Lucent (USA), will be presented to ITU-T SG11. It contains a lot of services proposed for inclusion into Q>FIN, Q.FNA and Q.FIF; for example, it proposes a mandatory feature for complete download of subscriber profile to the terminal.

MM presented Td15, a change request to Q.FIN elaborating the sections (indicated as to be refined in Q.FIN) to reflect the family concept. Two changes were suggested: to refer to ISO for the physical characteristics of the UIM-Terminal interface; in section 8.6, to change the second sentence as: “However, for the cellular radio access within one family member, the aim is to have a single set of specification.” See Td 15 r1.

Td 11 was presented by GJ. It is a proposed contribution to Q.FNA. Conflicts with SMG positions were not identified.

6.2 Strategic goals in ITU

Different approaches were discussed.

One point is the level of mandatory requirements, in particular mandatory support of services, for IMT-2000 family members. The SMG position is not to require inclusion of all services planned for UMTS, but rather to develop an own competitive profile.

Another point is the degree of detailed specifications carried out in ITU. The SMG position is to restrict the ITU specifications to frame work definition.

A third point is the level of roaming to be guaranteed when roaming to/from other IMT-2000 systems. An SMG position is that a two tiers degree of roaming support (first class: within GSM / GSM-UMTS, second class inter-systems) is the realistic goal.

Arguments:

- No proponent of an IMT-2000 candidate would not be a sufficient majority in ITU.
- ITU cannot provide the necessary environment to develop protocols like MAP in the required speed.
- UMTS should compete against other IMT-2000 systems by offering better services to the user.

FH offered some SMG officials to discuss the matters further with T1P1 and GSM NA.

On 15th December morning, 9:00 - 11:30, there will be a meeting SMG - GSM NA on these issues.

Annex: List of documents

No.	Title	Source
1	Meeting report of SMG-CG23bis	AB
2	Summary of a telephone conference TIA/SMG, 6 th November, 1997	AB
3	Revised Td SMG 880/97, agenda and schedule for SMG'24	FH
4	Letter to GSM MoU on UTRA	George Schmitt, Omnipoint
5	IMT 2000 Family of Systems Concept	FH
6	Why use the GSM Network as the Model for a 3 rd Generation Family Member	GJ
7	IMT-2000 Core Network Requirements	GJ
8	3 rd Generation Network requirements	GJ
9	IMT2000 family Network Phase 2 and beyond	GJ
10	Proposed Changes to Q.FIN V1.0	GJ
11	Global Roaming	GSM NA
12	Family Concept	AC et alii
13	Work plan for SMG contributions to ITU	PT SMG
14	Proposed list of service capabilities for members of the IMT2000 family	ETSI Task force on ITU-T SG11
15	Interfaces for study	MM
16	IMT-2000 standardisation	DW
17	Change request to Q.FIN	DW

SMG-CG 23BIS

Bonn, 30th October, 1997

Source: Ansgar Bergmann

Meeting Report

An extraordinary SMG Co-ordination Group (SMG-CG) meeting was convened on 30th October, 1997, in Bonn to discuss work planning for the GSM-UMTS Core Network specification work.

Participants:

Fred Hillebrand

Michel Mouly

Ansgar Bergmann

Alan Cox

Kevin Holley

Simon Pike

Temporary Documents: see Annex

0. GSM-UMTS Core Network aspects

0.1 Status of work in SMG3 (SA)

The work is making little progress. The identification of the I_u and U_u interface in the architectural description seems stable, and some contributions on UMTS 23.20 (dealing with the GSM evolutionary aspects) have been received. No specification/report seems ready for approval at SMG#24.

0.2 Analysis

A possible explanation is the lack of clear requirements to the GSM-UMTS Core Network exceeding the requirements to the GSM phase 2⁺ evolution network. One such requirement is clearly the transport of higher rates (>64 kbit/s) data in the Core Network. Others might be a cheaper operation and Maintenance and the availability of more open interfaces. Requirements like Virtual Home Environment (VHE) would be useful and applicable for GSM networks as well. But even a requirement for higher rates data transport in the Core Network would find its application in GSM networks (with the future development of higher data rates on the GSM radio interface).

0.3 Possible ways ahead to be submitted to the STCs and SMG for discussion and approval

0.3.1 Work item oriented approach

The present working methods in SMG1 and SMG3 are more based on the generation of reports than on defined work items. This leads to missing information on responsibilities between STCs and to less efficient progress monitoring. The application of work item descriptions (WIDs) - which has been decided in SMG#22 and SMG#23 - should be encouraged.

Michel Mouly intends to propose WIDs to SMG3, among others on

- Iu interface

- Transport Network.

Alan Cox intends to present WIDs to SMG1, among others. on

- multi-media,
- intra/internet access,
- automatic establishment of roaming,
- advanced addressing.

0.3.2 GSM-UMTS CN pivoting GSM CN

The GSM-UMTS Core Network is planned as the evolution of the GSM Core Network (GSM CN); high roaming capabilities and an integrated operation of GSM and UMTS radio accesses are required. Obviously, it is not sufficient to maintain the compatibility with the existing GSM CN: it is necessary to avoid to introduce divergence for the further GSM phase 2+ CN evolution.

Also, an engagement of the market oriented GSM developers in the UMTS work should be enforced.

It should therefore be proposed to SMG#24, to understand (after a short transition period) all Core Network related work items as GSM-UMTS CN work items with derived results for the GSM Phase 2+ CN.

More exactly, work items should be relevant for and restricted to one of the following SMG projects:

- UMTS services with derived GSM results/restrictions
- UMTS Radio Access
- GSM Radio Access
- GSM-UMTS Core Network.

If necessary, work items related to several projects would have to be split, and linked work items to be expressed. A work item for the GSM phase 2+ CN only would no more be accepted (as it would introduce possible incompatibilities). From the GSM-UMTS CN specifications, the GSM Phase 2+ CN specifications could be derived.

This scheme should become effective after a transition period, and at least for all R99 and later work items. For the R98 work items, it would be decided on a case by case basis whether to apply the scheme.

1. ITU contributions

ITU contributions approved by SMG#24 should be normally go through the STCs as agreed in SMG#23. For SG11 (e.g., on Q.FIN), the responsible group in SMG should be SMG3 (SA); this means that SMG1 would liaise with SMG3 on issues like family concept. For TG8/1, the responsible group is SMG2. The ITU Co-ordinators should prepare (and present) some input to SMG3 (SA) and SMG2.

2. Preparation of meetings

2.1 Meeting with TTC

The planned 2nd technical meeting with TTC can realistically not take place in this year, as the period between SMG#23 and SMG#24 is so short. It will be proposed to TTC to hold the meeting on 3rd to 4th February 1998 in Tokyo, before the meeting with ARIB (5th-6th) and the tri-lateral meeting (9th-10th).

2.2 Meeting with T1P1/UMTS on 24th/25th November, 1997

The meeting should deal with GSM-UMTS CN aspects, roaming aspects, evolution aspects, ITU co-ordination.

2.3 SMG#24 preparation

Fred Hillebrand presented a draft schedule and agenda for SMG#24. The draft was discussed and revised. The final draft will be distributed in the next days. The meeting would focus on UTRA and GSM R97.

Annex: Document list

Tdoc	Author	Title
0	Fred Hillebrand	Draft agenda
1	Michel Mouly	Contribution to UMTS network SMG-CG ad hoc
2	Alan Cox	Comments to 3 rd generation family concept
3	Fred Hillebrand	The different emerging IMT-2000 Systems
4	Fred Hillebrand	Draft agenda and schedule for SMG#24

ETSI TC SMG

ETSI/SMG(97)5 Part B Annex 9

Meeting n°24

Madrid, 15 - 19 December, 1997

Source: PT SMG

Title: PT SMG Status Report to SMG#24

Status: Approved

Main activities-1: Maintenance of specifications

- *SMG2 request to prepare major specifications within 1 week after a plenary*
 - ? *Priority STC support <-> new versions of specifications*
 - ? *When are specifications requested after SMG#24? Proposal: Some days before the first WP meeting*

Main activities - 2:

- *Support of SMG#22bis and SMG#23*
- *Preparation of SMG#24*
- *Support for STCs*
- *Support for SMG-CG*
- *Program management GSM*
- *Program management UMTS*

Main activities - 3: Interface to ETSI secretariat

- *New severe problems arising every 1-2 months*
 - *New travel rules August 97*
 - *Proposal to reduce the payment for STF contracts*
 - *Limitation of experts' contracts to 18 months*
- *Negotiation on conditions of GSM MoU funding for GPRS security algorithms*

Main activities - 4: Type approval matters

- *Preparation of consultation meeting with EC on type approval issues early 98*
- *Letter to ACTE for justification of phase 2+ test efforts: see Tdoc SMG 1033/97*
- *Project plan fo phase 2+ MS type approval: see Tdoc SMG 1034 (Agenda Item 5.5)*

Main activities - 5: Special funded work

- *Funded work on ASCI: test purposes were discussed in SMG7; some development for ASCI phase 2; see SMG3 report*
- *BSS half-rate tests: Outstanding are the signalling tests. Test purposes have been discussed in SMG8.*

Main activities - 6: Information

- *Newsletter: After SMG#22. Next one after SMG#24*
- *CD ROM: see annex 1*
- *Earlier SMG plenary documents: Are available in electronic form from Tdoc SMG 175/94 onwards*
- *Participation in Seminar for GA#29*

Main activities -6: liaisons - 1

- *Liaison with American T1P1: Preparation of working procedures which were approved in October 1997*
- *Support of meetings/radio workshop with Japanese TTC/ARIB*
- *Meetings with Chinese MPT before and during SMG#23*
- *Information exchange with Korean MPT*
- *Telephone Conferences with American TIA*

Main activities - 7: liaisons - 2

- *Liaison to GSM MoU: discussions with GSM MoU officials on co-operation on GSM and UMTS*
- *Organisation and co-ordination of ITU contributions*
- *Meeting with SES on Mobile Satellite Systems standardisation:
see Tdoc SMG 1039/97 (agenda item 5.6)*

Main activities - 8: ITU co-ordination

- *Co-ordination of contributions in SMG3 and SMG1*
- *Updated ITU work program for SMG*
- *See agenda item 4.6*

Status of specifications

- *SMG specifications status list (to be distributed with the meeting report)*
- ➔ *Actions for OAP and TAP:
Tdoc SMG 993/97*

Status of work items

- *GSM work items: New version of GSM 10.00 will be distributed after SMG#24*
- *GSM roadmap and the WI data base: Tdoc SMG 1150/97 (WI data base only in electronic form)*
- *UMTS work items: UMTS 30.00*

Version management of specifications

- *Discussions in the STCs and WPs*
- *Progress report in Tdoc SMG 1135/97 - to be discussed under AI 5.6*

Resources

- ***Budget usage 1997, budget plan 1998:***
See Tdoc SMG 934/97, Tdoc SMG 935/97
- ***Additional full time members needed.***
See Annex 2

Annex 1: CD Rom

- *Trade-off between time and availability of most recent information*
 - *How many new versions of specifications?*
 - *Meeting report: Proposal: Only 1 week after availability on the server for comments; 3 days after availability on the server for severe corrections to final draft*

SMG#24
Madrid, 15th - 19th December, 1997

Tdoc SMG 8/98
replaces Tdoc SMG 1110/97 and Tdoc SMG 1159/97

Source: SMG Chairman

IMT-2000 co-ordination

Background

In continuation of the meeting SMG - TTC/ARIB in August 1997, it was agreed in SMG#23 to have a meeting SMG - ARIB/TTC in February 1998, followed by a multilateral meeting SMG - T1P1 - ARIB/TTC - TIA. Also it was agreed to have a meeting SMG(3) - TTC on IMT-2000 network issues; it was originally planned for October 1997, but this schedule was impossible due to work overload.

Korean TTA has also expressed their wish to participate in the inter-region co-ordination activities.

Telephone conferences SMG/T1P1/TIA have taken place, see Tdoc SMG 936/97.

Planned activities:

4 February 1998: Proposed for meeting TTC - SMG on network issues.

5-6 February 1998: SMG - ARIB/TTC. Draft agenda: see Annex 2.

8 February 1998 (18:00): meeting SMG - T1P1 - TIA. Draft agenda: see Annex 1.

9-10 February 1998: meeting SMG - T1P1 - ARIB - TIA - TTA. Draft agenda: see Annex 3.

UMTS delegation: representatives from SMG, UMTS Forum, GSM MoU 3GIG, ECTEL TMS

Meeting T1P1, TIA, UMTS Delegation¹

8 February 1998

Japan

3rd Generation co-ordination

Proposed agenda items

1 Standardisation status in UMTS community

1.1 Air interface

1.2 Core network

2 Standardisation status in T1P1

2.1 Air interface

2.2 Core network

3 Standardisation status in TIA

3.1 Air interface

3.2 Core network

4 Status in ITU

4.1 ITU-R

4.2 ITU-T

4.3 Spectrum issues

5 Identification of commonalities

6 Cooperation methods

7 Way forward

¹ UMTS Delegation: SMG, UMTS Forum, GSM MoU 3GIG, ECTEL TMS

Meeting ARIB/TTC - UMTS Delegation²

5-6 February 1998

Japan

3rd Generation co-ordination

Proposed agenda items

- 1. Standardisation status in SMG**
 - 1.1. Air interface
 - 1.2. Core network
- 2. Standardisation status in ARIB and TTC**
 - 2.1. Air interface
 - 2.2. Core network
- 3. Status in ITU**
 - 3.1. ITU-R
 - 3.2. ITU-T
 - 3.3. Spectrum issues
- 4. Identification of commonalities**
- 5. Cooperation methods**
- 6. Way forward**

²UMTS Delegation: SMG, UMTS Forum, GSM MoU 3GIG, ECTEL TMS

Meeting with ARIB - TTC - T1P1 - TIA - TTA - UMTS Delegation³

9-10 February 1998

Japan

3rd Generation co-ordination

Proposed agenda items

1. Standardisation status in Japan

1.1. Air interface

1.2. Core network

2. Standardisation status in SMG

2.1. Air interface

2.2. Core network

3. Standardisation status in T1P1

3.1. Air interface

3.2. Core network

4. Standardisation status in TIA

4.1. Air interface

4.2. Core network

5. Standardisation status in TTA

5.1. Air interface

5.2. Core network

6. Status in ITU

³UMTS Delegation: SMG, UMTS Forum, GSM MoU 3GIG, ECTEL TMS

- 6.1. ITU-R
- 6.2. ITU-T
- 6.3. Spectrum issues
- 7. Identification of commonalities**
- 8. Way forward**