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**From:** Scott Maddux [smaddux@agile.tv]  
**Sent:** 6/16/2003 11:07:21 AM  
**To:** Bill Keating [bkeating@nekei.com]  
**CC:** Dave Hanson [dhanson@agile.tv]; Paul Cook [pcook@agile.tv]  
**Subject:** AgileTV Research  
**Attachments:** AgileTV Research To Date.doc; Focus Group Results Summary.doc; In Home Results Summary.doc

Bill,

Here are three documents summarizing various aspects of usability and market research we've conducted. The document "AgileTV Research To Date" provides the best overview of all the studies conducted over the past two years. There is a great deal of material here and I would be happy to dig in to any of these areas with Alex if he's interested. The "Focus Group Results Summary" provides top-level findings from a large scale (n=184) focus group study completed late last fall. The "In Home Results Summary" provides top-level findings from our ongoing field alpha. There's also a great deal of back-end data we've captured from the field alpha which I'd be happy to review with Alex.

Best,

- Scott

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# AgileTV Usability & Market Research Summary

Approximately 715 subjects (end users) have participated in AgileTV's user centered design & development process. This document provides a summary list of studies divided into three sections including the ongoing field alpha, usability studies and market research.

## I. Marina, CA Field Alpha Trial – 08/02 to Present (13 Homes, ~35 Users)

## II. Usability Studies

- **Remote & Receiver (Total # Participants = ~133)**
  - Microphone Placement Study – March 2001 (15 Subjects)
  - Form Factor Study – April 2001 (est. 10 Subjects)
  - Remote Control Behavior Study – August 2001 (est. 10 Subjects)
  - Remote Angle Research – August 2001 (53 Subjects)
  - Remote Angle Follow-Up Study - January 2002 (est. 10 Subjects)
  - Ergonomics and Button Layout Study – August 2001 (est. 10 Subjects)
  - Qualitative IR Study – October 2001 (est. 10 Subjects)
  - Button IR Angle Study – October 2001 (est. 5 Subjects)
  - Sound Pressure Level Study – January 2002 (10 Subjects)
- **Product Usability & Pricing (Total # Participants = ~165)**
  - Prototype 2.0 User Experience & Design Study – May 2001 (20 Subjects)
  - TV Viewing Context (Observational In-Homes) – June 2001 (est. 10 Subjects)
  - Prototype 3.0 User Experience & Walled Garden Study – July 2001 (45 Subjects)
  - Pricing & Prototype 3.9/4.0 User Experience Study – December 2001 (59 Subjects)
  - Help/Instruction Design and Paper Test Navigation – September 2001 (20 Subjects)
  - Utterance Duration Study – July 2001 (6 Homes, 11 Users)
  - Prototype 5.0 In-Home Study – May 2002 (6 Homes, 11 Users)

## III. Market Research & Focus Groups

- **Focus Groups (Total # Participants = 417)**
  - Cheskin Voice Control Consumer Research Study
    - 235 Participants (129 from Atlanta GA & 106 from Columbus OH)
    - Subscribers from Insight, Time Warner, AT&T and Charter Cable Systems
  - Fall '02 Focus Groups
    - 182 Participants (79 DBS, 59 Digital, 49 Analog)
    - Subscribers from AT&T, DirecTV and DISH
- **Pricing Studies**
  - Prototype 3.0 Pricing Study - August 2001
  - Prototype 4.0 Pricing Study – December 2001

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### CONFIDENTIAL PRELIMINARY FOCUS GROUP RESULTS

AgileTV, with the use of contracted consumer research and marketing consultants, has been conducting Focus Groups of the Bay Area's DBS, Digital and Analog Subscribers to determine:

1. **Level of interest in voice control** of television viewing
2. **Willingness to upgrade** (or returning to cable) for the benefits of voice control
3. **Pricing** of the service and in-home consumer electronic equipment

#### WILLINGNESS TO SWITCH

Respondents were shown a demonstration of voice control for the following services:

- Full screen television navigation by channel number, name and program name
- Automatic scanning of channels by category: e.g. Sports, Movies, Shopping etc.
- Interactive Program Guide
- Video on Demand Programming
- "Walled Garden" application including: Weather, Stocks, Personalized Home Page, Entertainment News, Games etc.

Respondents were asked of their **willingness to switch for voice control of the services**.

	Definitely	Probably	"Top 2-Box Score"
<b>DBS</b> (Switch to Digital)	22%	31%	53%
<b>Digital</b> (Upgrade to Higher Tier)	8%	41%	49%
<b>Analog</b> (Switch to Digital)	12%	12%	24%

#### PRICING

Respondents were asked to write-in the amount they would be **willing to pay for one time purchase** of the in-home consumer electronic equipment and an **additional monthly fee for voice control**. Results are based on median calculations.

	Purchase Remote & Receiver	Additional Monthly Fee
<b>DBS</b>	\$50.00	\$6.25
<b>Digital</b>	\$35.00	\$5.00
<b>Analog</b>	\$40.00	\$6.48

Respondents were then asked how much they would be **willing to pay** per month for voice control in addition to their current service **if the in-home equipment were free** and then again **priced at \$39.00**. Results are based on median calculations.

	Monthly Fee w. Free Equip.	Monthly Fee w. \$39 Purch.
DBS	\$4.95	\$4.95
Digital	\$5.95	\$3.95
Analog	\$5.70	\$3.95

### **MOST COMPELLING FEATURES AND BENEFITS**

Respondents identified the most compelling features of the AgileTV service as:

- **VoiceScanning & VoiceSeeking**
- **Ease of use and convenience** of voice navigation
- Ease of access to **personalized Internet based information**

### **MOST DESIRED FEATURES**

Respondents requested the following features of the AgileTV service:

- **Searching** to find information on **programs not currently showing**
- **Voice control** of all their other **consumer entertainment equipment**

### **METHODOLOGY**

To meet the objectives outlined above, a series of quantitative interviews are being performed with Focus Groups comprised of current satellite subscribers who have been pre-qualified by age and hours of television viewing per week. The results above reflect responses from **74 DBS**, **59 Digital** and **49 Analog** subscribers.

Respondents are given an entrance survey that enables the Researcher to determine each participant's demographic profile, their television viewing habits, amount of satellite programming they are receiving and the cost of service.

A demonstration of AgileTV's fully functional voice-activated service is given to introduce the participants to consumer equipment, program and channel control, program guide, programming on demand and walled garden services.

After the a 20 minute demonstration of the service, there is a question and answer segment, then respondents are asked to complete a questionnaire on their interest in having the service, pricing of the service, the value of the in-home consumer equipment and if they switch back to cable to get the service.

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## **CONFIDENTIAL ALPHA TRIAL IN-HOME RESULTS**

### **OBJECTIVE**

The primary research goals of the Alpha Trial are as follows:

- Evaluate product acceptance
- Evaluate ease of set-up and first time usage
- Observe long-term usage patterns
- Identify primary benefits of the service
- Identify price/value relationships

### **THE ALPHA TEST SITE**

AgileTV has been able to use USA Media's cable system located in Marina CA as the Alpha test site. The Marina system has recently been rebuilt to meet state of the art specifications, with fiber to the node allowing for 2-way transmission of services. The service supports approximately 175 channels of programming including HITs digital programming feeds. The system is located directly adjacent to Monterey, CA and serves the old "Fort Ord" site, which now is home to California State University of Monterey Bay as well as residential communities. The Alpha Test has been the result of very close cooperation among USA Media, the University and AgileTV.

### **METHODOLOGY**

Working closely with both USA Media and University personnel, who have played major roles in supporting the project, AgileTV has been able to install 10 homes, with approximately 35 users, over the past month. AgileTV has hired experts in both consumer research and cable marketing to help implement the program. All aspects of each of the user's introduction to the product and initial use of the service have been video taped to insure that as much consumer data as possible is captured. An interviewer was used to capture the users' thoughts, as they were experiencing the set up and use of the product.

### **INITIAL RESULTS**

1. All users were able to set up and use the in-home equipment with little or no intervention from the interviewer.
2. The average time from opening the box that contained the voice enabled remote control and AgileLink (sidecar to the Motorola DCT 2000) to giving the first speech commands took 5-20 minutes.
3. The various instructional materials included in the consumer packaging served their purpose of communicating simple instructions on how to set up and use the service. As expected, the input received from the initial testers will help improve these materials prior to commercialization since the current materials are

prototypes. Using a variety of instructional materials including video, manual, and quick reference cards accommodated the tester's different styles of learning.

4. Being able to change channels and navigate the interactive program guide met or exceeded user's expectations, however, the ability to VoiceSeek and VoiceScan programming by category seemed to greatly surpass the user's expectations.
5. There is a known problem with lower recognition accuracy among women that was observed and verified in the in-home testing to date. This problem is being addressed by the technical staff and we will begin testing new software to improve accuracy within this demographic with our second set of testers. Recognition accuracy for adult females is expected to rise from 86% at present to 93% with the software upgrade.
6. Latency of between 1-3 seconds is consistent among users. Although we have a very clearly defined program to reduce latency prior to commercialization, those users who were most excited about voice control were also more accepting of this problem. No one has indicated that they would not use the service due to the latency currently experienced in the field.
7. Misrecognition of some short words that were said quickly was also noticed and has been the source of mild frustration, but again the more excited the users were about using voice commands, the more accepting they were of the problem. Again, there are both software and hardware upgrades planned to resolve this problem. Speaker ID is not part of the feature set in this Alpha Test.

## **USER ACCEPTANCE**

To date, user acceptance has exceeded our expectations. The price/value relationship is high and consistent with what we have experienced in our Focus Groups. We are continuing to find the more programming, products and services the cable operator is offering, the higher value the consumer places on their ability to easily navigate by voice.