CCITT SGXV
Working Party XV/1

Document # 538
June 12, 1989

Specialists Group on Coding for Visual Telephony

SOURCE: VideoTelecom, Bellcore, AT&T, PictureTel, CLI
TITLE : USA Flexible Hardware Status

Document #488 described the USA Flexible Hardware plan. AT&T Bell Labs is implementing the ISDN interface, audio codec, FEC and the interface to the video codec. Bellcore is providing a software implementation of the H.221 protocol. This is all being implemented on an 80386 PC/AT.

VideoTelecom, PictureTel and CLI are each providing video codecs which will interface to the AT&T/Bellcore PC/AT. QCIF will be addressed initially, and FCIF will be tested if time permits.

An RS-449 interface is used between the video codec and the PC/AT. The data at this interface contains the picture start codes, but does not have FEC framing. However, the packets transferred between the video codec and the PC/AT are 246 bytes in length, which is exactly 4 FEC frames of video data.

The general schedule is as follows:

1) June - Check out RS-449 interface between the codecs and the PC/AT

2) July-Aug. - Begin the USA field tests

3) September - Perform the international tests with Japan and the U.K.

The USA field tests will be performed using T1 lines. The international tests will be performed at AT&T's location in Lincroft, New Jersey using an ISDN link.

The individual company's status reports follow:

VIDEOTELECOM

VideoTelecom's flexible hardware system is based on our CS-300 video codec, which uses several DSPs operating in parallel. The system is currently running only the encoder algorithm at QCIF resolution.

The encoder is implemented up to the point where the number of generated bits is counted and a rate buffer is simulated. The actual variable length codes are not generated at this time. Since the CS-300 normally displays 240x256 resolution, the QCIF

image is currently displayed as a 144x176 window within a 240x256 display. This will be changed to a full screen display by September.

The hardware will be initially tested without motion compensation in July. Motion compensation will be added later and tested in September.

We have completed the development of the RS-449 interface to the AT&T/Bellcore box. This interface should be fully tested later this month.

BELLCORE

The following aspects of H.221 has been implemented by Bellcore.

1. It is assumed that data I/O will be done through buffers and some interface will be put into the program to keep these buffers full.

2. A subset of H.221 has been written in C which allows audio and video transmission to take place using up to 2B channels. These include:
   a) 56 Kbps audio and 62.4 Kbps video (2B channels)
   b) 124.8 Kbps video (2B channels)
   c) 16 Kbps audio and 46.4 Kbps video (1B channel)
   d) 16 Kbps audio and 108.8 Kbps video (2B channels)

3. Channel error and loss of frame alignment are not currently addressed, but we intend to do reinitializing (e.g., our version of mode 0 forcing) in case these types of errors occur. The program now only handles the "steady state condition" where it is assumed that call set up, synchronization and exchange of capability has taken place. With some modifications, the program will handle logical 56 Kbps channels as well.

4. Because H.221 is still evolving, Bellcore intends to provide a "workable subset" which may involve our own interpretation of "cloudy issues.

5. A block diagram of the H.221 interface is included.

PIKTURETEL

Picturetel plans to participate in the field trials with a fully functional QCIF encoder and decoder running on the C-3000 video codec in September.

AT&T BELL LABS

The RS-449 interface is working back-to-back at 64 Kbps.

CLI

CLI's flexible hardware system is a DSP based architecture. We expect to have a complete system operating in September with the aid of the AT&T/Bellcore PC/AT. We will be operating in QCIF only.

Block Diagram of H.221 Interface