INTERACTIVE SPLIT SCREEN TELECONFERENCING

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ABSTRACT

Broadband interactive teleconferencing is a programming technique that can be interesting and enjoyable for both participants and viewers alike providing a useful feature to your cable communications system while enhancing the public's image of the cable firm. Briefly, this involves the interconnection of two or more remote locations anywhere along the cable television system allowing participants at these locations to carry on face-to-face conversations on a television screen.

While this method of programming may sound complicated, the technical configuration is actually quite simple and the required equipment is probably already available in your community programming studio. The procedures outlined will allow you to produce live, split screen teleconferencing with minimal problems.

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"Interactive cable" is a term which has come into wide use in recent years to describe the capability for a narrowband signal to be transmitted upstream from a computer terminal in a subscriber's home to a central computer, usually located at the headend.

Of course, cable also has the capability of providing broadband interactive services such as video teleconferencing among several locations although this service is not as highly publicized as narrowband consumer applications. However, broadband teleconferencing on a community level is perceived by educators, government officials, social service agenecies and others as being particuarly desirable when they are made aware of its possibilities.

The basic purpose of broadband teleconferencing is to permit two parties to an interaction, a speaker and listener, to be mutually present to each other while engaged in a dialogue. The capability for teleconferencing within a community can have significant social implications. It can break down the increasing isolation of the elderly, handicapped and institutionalized. It can open new channels of communication between individuals and groups who would, ordinarily, not have a common meeting ground. It can also increase the dialogue between elected officials and citizens and increase the perception of responsiveness of local government. It can also strengthen the position of the cable company in the community by providing a dynamic community communication network which can become the basis for community involvement. In other words, it can change the perception of the cable company from that of a marketer of programming services to that of a basic community resource.

The objective of providing a simultaneous image of the speaker and listener to each other can, of course, be accomplished by several means. However, research conducted by the Alternate Media Center of New York University in Reading, Pennsylvania under a national science Foundation grant in 1975[1] indicates that the most flexible configuration is a centralized switching point and combination of the speaker and listener's images on a split screen. If this switching point is located at the headend, the interactive objective is fulfilled using only one downstream channel. With appropriate headend equipment any number of interactive locations can be split on the downstream channel in any combination to effectively provide face-to-face communication between any two points.

Several technical problems are inherent in split screen, broadband teleconferencing. First, two cameras at locations which are several miles apart must be phased in order for the split screen image to hold. Second there must be sufficient return capacity to permit the most flexible combination of originating sites. Third, the potential for audio feedback is significant and must be provided for. Finally, easily portable live origination equipment must be available to permit the establishment of temporary interactive sites in neighborhood locations such as libraries, government buildings, schools, etc.

In addition to a cable system capable of two-way transmissions, the minimum equipment required for live, split screen teleconferencing is as follows:

2 Video Cameras
2 Directional Microphones
2 Television Receivers
2 Modulators for Upstream Transmission
2 Demodulators
2 Phasing Synchronizers
3 Video Monitors
1 Special Effects Generator
1 Audio Mixer
1 Modulator for Downstream Transmission

You may wish to include additional cameras, microphones, and television receivers. Additional modulators, demodulators and routing switchers will be required for more than two remote locations. A video tape recorder may also be included for a permanent record of the conference.

Fancier productions may be accomplished with full switching capabilities, chroma key generators, character generators, or other specialized production tools. But the object of this type of programming is the interaction of the parties involved and the lack of fancy production equipment should never stand in the way of that fundmental objective. The simplest of production equipment can provide quite adequate split screen programming.

The technical configuration and interconnection of equipment is actually quite simple[2] (see diagram below). The camera(s) and microphone(s) outputs are connected to the upstream modulator video and audio inputs at each remote location. This signal is transmitted to the system headend, usually on a sub low band channel, and demodulated. The demodulated video signals are then phase synchronized and fed into the special effects generator to achieve the split screen effect. Both of the upstream video signals and the combined split screen signal should be monitored with separate video monitors in the headend location.

The demodulated audio signals are routed to the audio mixer. The audio

EQUIPMENT INTERCONNECTION

HEADEND/STUDIO
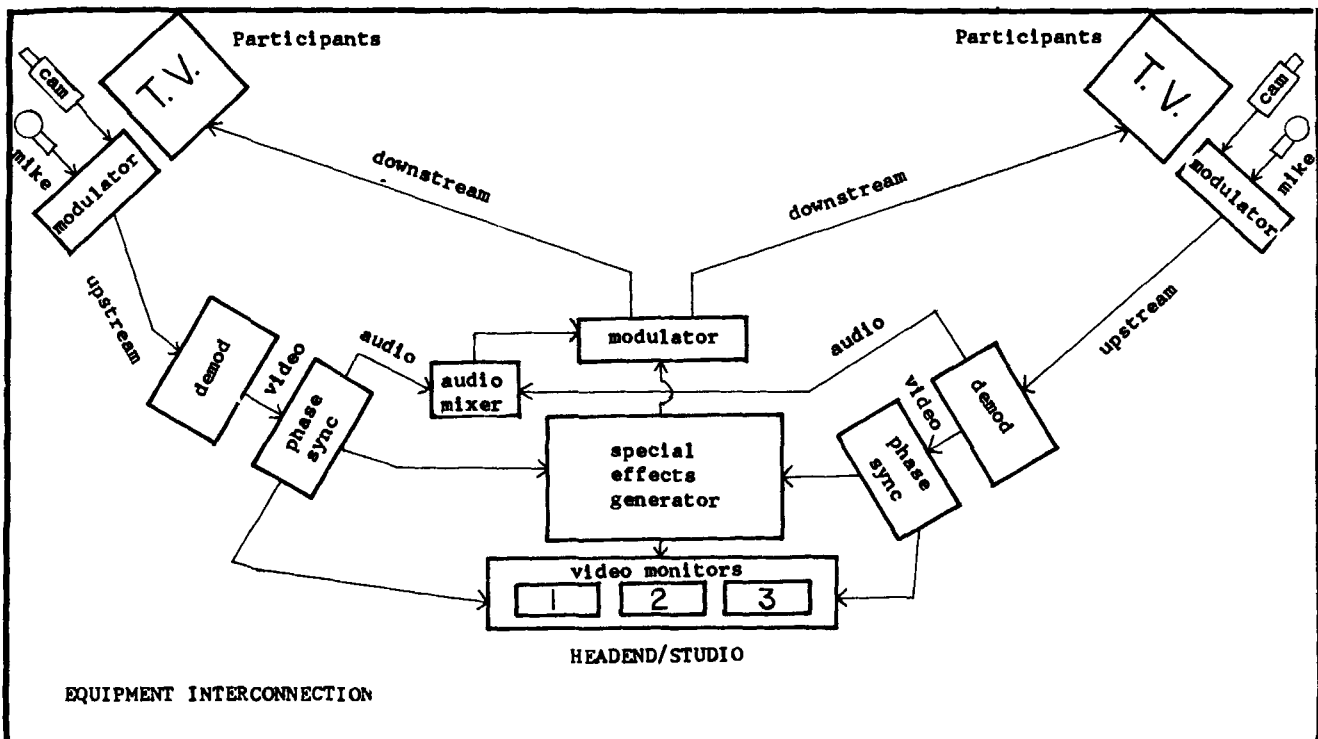
to each other's profiles rather than conducting a face-to-face conversation. In addition, the standard camera shot should be a medium close-up of the participants in order that all facial features are clear.

From a technical viewpoint, the audio portion of a split screen teleconference can present more problems than the video portion. In order to maintain the conversational aspects of the programming, it is important to keep microphones open to all participants. This allows the participants to interrupt each other as in a normal conversation. However, since the participants hear each other over the speaker of the television receiver, a potential for feedback exists.

The potential for feedback is directly related to the audio level of the television receiver; to the pick-up range of the microphone; and to the number of microphones or television receivers at the remote location. In order to minimize feedback problems a number of techniques are used. The audio level of the receiver should be loud enough for all participants to hear yet low enough to minimize feedback. All microphones should be of a directional type rather than the omni-directional type and participants should hold the micro phones close to their mouth rather than using table stands. If more than one speaker is present at a location, the speakers should share microphones as much as possible.

As long as the cable system return amplifiers are properly aligned and each remote location has a cable drop readily available, the set-up time for a split screen production should not require more than an hour or two depending on the number of locations involved (if additional lighting is required at the location, allocate more time for this purpose). Setting up for this type of production does require more coordination than a studio production however.

When setting up, audio should be installed first in order to have contact with the headend and/or other locations. Have the headend give a count and adjust the television receiver audio level at the remote location. Remember to keep the audio level as low as possible but yet audible throughout the remote location. Once this audio level is established, do not change it. Next, send a test tone to the headend and set the VU meter level on the audio mixer at 100. After removing the test tone, check each microphone with a test count from the location that it will be used.

This is when you will find out if feedback will be a problem. If feedback is a problem, work with the headend to correct it. Leave all microphones on and in place.

Adjust each camera to be used and check for proper camera angle and lighting for each possible shot. Once one camera is adjusted properly, it can serve as a "model" for the other cameras. Remember to have the cameras located adjacent to and shooting over or across the television receivers to reduce parallax.

With these procedures completed, you are ready to produce interactive, split screen programming. The following diagrams[3] illustrate alternative set-up positions and some important points relating to television placement and camera shots. An interactive program is more successful when all locations follow the same conventions.

Remember, this programming technique can provide an interesting diversion to your normal programming day as well as providing a beneficial communications tool for the community that you serve. Yet it does not require any extensive or unusual equipment and can be accomplished in a matter of hours. The next time you are looking for a new programming format, try an interactive, split screen program. Both you and your community will enjoy the results.

[1]Mitchell and Mose, "Two-way Cable Television: An evaluation of Community Uses in Reading, Pennsylvania." Final Report, National Science Foundation. (Reading, Pennslvania: NYU Reading consortium, New York University, The Alternate Media Center School of the Arts, Graduate School of Public Administration, 1978).

[2]Rice-Richter Associates, "Basic Techniques for Interactive Television." detailed description of set-up procedures based on copyrighted manuscript, 1981.

[3]"Ibid, redrawn from manuscript."

IMPORTANT POINTS

1. Camera must be positioned to get a face on shot when speaker is looking at the monitor.

2. All camera shots must clearly show speakers facial features.

3. Shots including more than two people are not useful since, at that point, facial recognition decreases: Show the group with a two shot pan.

4. If more than two people are involved at a site, seating should be arranged so that the group can be shown without excessive head and foot space or long panning distance.

5. Regard the monitor as another group of people to whom the people in your site will be speaking face-to-face.

   THE MONITOR IS THE FOCUS OF THE SET-UP.

Public Participants Only

B

25°

cam

T.V.

Public and Panel

C

B

Public

Panel

D

25°

25°

cam

A-B

A

25°

cam

C-D

T.V.

Traditional Classroom

T.V.

cam

cam

T.V.