

CASE HISTORIES

STEREO SOUND JOINS BROADCAST VIDEO AT WGBH

Boston's WGBH, first to use videotape recording for educational broadcasting, is probably also the first station to broadcast stereophonic FM sound synchronized with a video presentation. WGBH used a multichannel Ampex MM-1000-16 recorder/reproducer synchronized with an Ampex VR-2000 broadcast videotape recorder to produce a complete 80-minute opera that was successfully simulcast in March, 1970. WGBH's goal: to bring the excellence of stereo high-fidelity sound to television's major musical productions.

WGBH EDUCATIONAL FOUNDATION: Pioneer in Educational Broadcasting

Educational television, freed from commercial constraints, is synonymous in many minds with innovation and unhampered creative endeavor. Among the members of National Educational Television (NET), Boston's WGBH is one of the leading voices in innovative programming.

Formed shortly after World War II as the Lowell Institute Cooperative Broadcasting Council—essentially a consortium of universities interested in broadcasting—WGBH includes WGBH-TV Channel 2, WGBH-FM, and WGBX-TV Channel 44. Its multimillion annual operating budget is based on support from universities, grants, and sales of programs to other NET members. The Foundation established itself as a technological leader in 1958, when it acquired an Ampex VR-1000A and became the first NET member to use videotape recording techniques.

SIMULCASTING: Better Sound for Television

While the film and radio broadcast industries have made enormous strides in improving sound quality, the television industry has tended to concentrate more on advanced video techniques. One of the goals of WGBH is to marry the two technologies, combining FM radio's high-fidelity sound with the strong visual appeal of color video.

Disatisfaction with television audio techniques came to a head at WGBH after its staff produced NET's first opera broadcast, "From the House of the Dead," in 1969. The program was successful from the visual standpoint; but traditional audio recording techniques often muffled the fine work of the large orchestra, thus obscuring or weakening climactic moments. Limitations imposed by home television set amplifiers and speakers compounded the problem. WGBH engineers were painfully aware that their

audience—opera buffs—was essentially audiophiles accustomed to excellent audio quality from home stereo sound systems.

Under Tom Keller, Director of Engineering for the Foundation, the engineering staff at WGBH set out to develop a new technique that would permit high fidelity stereo sound from WGBH-FM to be broadcast synchronously (simulcast) with a video signal. After six months' preparation, the production staff and performers were ready to tape NET's "My Heart's in the Highlands," an 80-minute opera adapted from a play by Jack Bosson. It was an ambitious project. In fact, a more difficult medium than opera, with its complex staging and orchestration, is hard to imagine.



Director and singing cast on the set of "My Heart's in the Highlands," color videotaped on an Ampex VR-2000. Multitrack recording on an Ampex MM-1000-16 permitted WGBH engineers to produce high-fidelity, well-balanced sound.



Part of the 18-piece orchestra that provided the music for "My Heart's in the Highlands." Multitrack recording on the MM-1000-16 allowed for balancing the orchestra with voices for desired effect.

PRODUCTION: Audio/Video Synchronization with Ampex Equipment

The multichannel taping was done entirely in the 6,000 sq-ft main studio of WGBH's 65,000 sq-ft building near Cambridge. In addition to Keller, other members of the Foundation's technical staff participated: Will Morton, mixing supervisor; Ed Busick, radio supervisor; Dave Hutton, VTR supervisor; John LaBounty, maintenance supervisor; and Fean Abramowicz, chief engineer. They used 12 of the MM-1000's 16 audio tape tracks for recording sound, permitting them to record with clarity not only the small singing cast but the elements of the 15-piece orchestra as well. Later, the remaining four tracks were used for editing and control for the audio/video link.

Keller was pleased with the results. With 12 of the MM-1000's channels available for sound, his group achieved just the balance they wanted between instruments and voices, as well as between stereo broadcast channels — an accomplishment that would not have been possible with any other audio recorder. Says Keller: "The availability of audio equipment like the MM-1000 is what made this thing work. It gives us high quality multichannel sound, as well as the opportunity to synchronize with the audio signal."

THE PRESENT AND THE FUTURE: Operas, Rock, and the Boston Pops

NET's "My Heart's in the Highlands" was successfully presented in Boston March 17th, in New York March 18th, and on the NET network March 19th. It was simulcast on FM radio in 2-channel stereo sound for Boston and in 2-channel stereo for New York listeners — a landmark for the broadcast industry. Of course, it was possible for simulcast listeners to hear the FM broadcast without watching the video portion. There was even a notable improvement in the quality of the network's monaural broadcast sound, because WGBH engineers were able to exercise unusual control over sound balance in the final mix. Keller feels that the Ampex MM-1000, in addition to its ability to record 16 channels at once, is the finest audio recorder the Foundation has ever used.

"We've established a standard procedure for stereo sound/videotape recording as a result of this production," says Keller. "We now know that we can record stereo sound and broadcast it the way we want to. The remaining step is for manufacturers of home TV sets to develop equipment that will bring it into the home. We're confident that this will follow, and soon."



Dave Hutton, VTR supervisor for WGBH, at the controls of the MM-1000-16. Twelve channels were used to record sound; four were used for editing and for controlling the audio/video link.



Director of Engineering Tom Keller with WGBH's VR-2000's studying a playback from a taping session of "My Heart's in the Highlands." The broadcast, which was simulcast through FM radio and afforded two-channel stereo, was a landmark for the industry.

Keller has announced that WGBH will record 13 Boston Pops concerts in the near future, using the new technique. His group will post mix using the MM-1000-16 in each case. After that: three operas yearly and some rock concerts, as well as other local programming.

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