



A pair of co-phased 4.5-m receive-only satellite antennas were set up adjacent to the IREECON exhibition building at the Sydney Showgrounds.

By Joseph Roizen

Australia's largest biennial electronics show is a unique combination of mainly broadcast television technology interspersed with a variety of electrotechnical fields that span a wide range of devices, from computers through radio paging, electroluminescent panels, and components.

The equipment exhibit and technical conferences were held at the Sydney Showgrounds on September 5-9, 1983, in buildings adjacent to the main athletic stadium just ten minutes away from the downtown area, where most of the hotels are located. Television broadcast hardware dominated the exhibit areas, with most major TV equipment manufacturers participating, either with their own booths or through local distributors. Ampex, Fernseh, Philips, RCA, and Sony were among the companies with their own displays, manned by local and headquarters staff. Magnatechtronics,

Quantum, Pacific Engineering, AWA, and Broadcast Video represented some of the local, well-known distributors, who carried all the other popular TV hardware lines.

To cater to the very wide variety of technical papers that were selected for the conference sessions, as many as four parallel sessions were in progress at times. Most delegates attended lectures in their field of interest in the assigned lecture hall; however, an attendee with expertise in more than one electronic discipline, had to rely on the preprinted *Proceedings* manual that contained all of the papers given at IREECON. This publication ran to a hefty 682 pages, and reflected the great variety in Australian electronics research and development work.

The major problem facing the equipment suppliers to the Australian broadcast television market, at the present time, is the poor state of the general economy, and the low exchange rate for the Australian dollar. At this time it was being traded at 90 to 92 cents against the U.S. dollar, a very severe drop compared to only two

years ago at the last IREECON meeting. While the television industry as a whole seemed healthy and vigorously competitive, the local video marketing experts rated the current business situation as being on a low plateau, waiting for a general economic recovery before it could take off. In general, it was being equated with the situation in the U.S. about two years ago, before the country began experiencing its slow recovery from the recession.

The two Australian TV broadcast groups, the ABC (national network) and the FACTS (Federation of Australian Commercial Television Stations) also use the IREECON period to organize meetings for their technical staffs to discuss standardization issues, new technology, and government regulations affecting studio operations. As with SMPTE meetings in the U.S., the topics were about the same, dealing with such matters as stereo audio on TV, teletext, DBS potentials, crowded microwave channels, RF interference, and the like. The large metropolitan centers in Australia (Sydney, Mel-

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bourne, Adelaide, Brisbane, etc.) seem to have the same problems as New York, Chicago, and San Francisco. ENG units and TV helicopters abound, and satellite earth stations are everywhere. Watching TV on the local channels in Sydney gives the impression that every station has an Ampex ADO or a Quantel DVE unit, and that every station identification or logo was put together for the maximum visual impact. Picture quality for local origination is very good, and technical standards are high.

The Equipment Exhibit

The newest equipment on display at IREECON this year, which had not been present in 1981, was the current range of computer-assisted graphics systems that are beginning to sprout in North America, Europe, and Japan. All of the large system manufacturers (Aurora, Bosch Fernseh, Dubner, and Quantel) had displays, and there was even a local Australian product in this field called Conjure, made by Vision Control. Quantel had its Paint Box system in operation at the Quantum booth, where an artist demonstrated the graphic capabilities of this system. By the end of the show, Quantum had announced that this unit, and additional Quantel digital equipment, had been sold to QTQ in Brisbane for a major updating project at that station.

The Aurora 100 Digital Videographics system capabilities were demonstrated at the Magnatech stand through the use of a multistandard U-Matic player, a standards converter, and NTSC and PAL monitors. In addition, private demonstrations were made at ABC headquarters and at ATN7 in Sydney.

The Dubner system was in the Pacific Engineering booth and was operated by Ms. Dubner, the daughter of the developer of this unique device. The Bosch Fernseh FGS-4000 was also demonstrated by a graphic artist at their stand. It was evident that there was considerable interest in this new technology, by the constant parade of delegates to these displays.

Color cameras and 1-in. helical VTRs ran the same gamut as elsewhere, all operating in PAL and all showing excellent quality images. Type-C recorders are far more prevalent than Type-B, but the BCN format has some avid users in Australia.

The company that has had the largest growth in Australia in recent years is Sony. Their exhibit occupied

SMPTE Australian Section's Conference-Exhibit Sydney, June 7-9, 1984

The SMPTE Australian Section will hold its first international conference and equipment exhibit from June 7-9, 1984, at the Sydney Showgrounds, Sydney, Australia. The conference will have as its theme "Sound & Vision '84: The International View of Sound & Vision Communication Technology."

The three-day papers presentation will cover the latest developments in sound and vision technology. A tentative program for the papers sessions has now been set, subject to revision as the papers come in.

A total of 54 papers is now planned, together with two panel discussions. One session, for sound papers, is planned to run in a commercial theater to ensure first-class sound reproduction. As of October 7, 1983, the topics are expected to include the following: Trends in Image Production; Film and Production Technology; New TV Technology (Broadcast); Film and Video Special Effects; Sound (in alternate venue); TV Technology and Operation (Production); Video Post-Production; Laboratory Practices: Film and Tape Interface; Theatrical Presentation, and Computer Graphics. A speakers' panel on TV Technology is scheduled for Thursday, and a speakers' panel on Laboratory Practices for Friday afternoon.

In addition to the technical presentations, an exhibit will be held on June 7, 8, and 9. It will feature the latest in film, video, and sound-reproduction equipment. Over 50 local and international companies are planning to participate.

The chairmen for the conference are as follows:

Chairman, Australian Section: John Donovan
Conference Co-Chairmen: John Barry, Murray Forrest
Papers Chairmen: Dominic Case, Ross Thyer
Registration Chairmen: Frank White, Bruce Robertson
Publicity Chairmen: Allan Kealy, Frank White
Social Chairmen: John Barry, John Donovan
Ladies' Committee: Judy Barry, Georgia Forrest
Secretary/Treasurer: Jeff Deal, Bruce Harrell

All members of the Society are encouraged to attend the conference. Arrangements are being made to obtain air travel and hotel accommodations at special rates for guests from other countries. For further information, inquiries should be directed to Keith Blunsden, World Trade Promotions, 291 Sussex Street, Sydney, NSW 2000, or Chairman John Donovan, Atlab Australia, Television Centre, Epping, N.S.W.

one of the largest areas, and they showed not only the usual broadcast products, but quite a range of interactive audiovisual equipment using their SMC70 microcomputer, their laser disk player, and a wide range of accessories to these modern teaching devices.

A new Sony product, exhibited for the first time, was a very compact video projector built into a portable housing about the size of a two-suitcase, complete with casters to roll on. On a curved high-gain screen it produced a five-foot image of exceptional brightness, and even on a flat movie type screen the picture was very acceptable. Coupled with a good BVU player or the RGB output of the SMC70, the images displayed were

excellent. Sony also showed their Super BVU machine with enhancement circuitry developed in a joint venture with Faroudja Laboratories. U-Matics are widely used by broadcasters in Australia, and this development was of particular interest.

In this same category, the Quantum booth had a pair of stand-alone Faroudja Labs products that can be used to enhance PAL color images. The newest product in this category is called the ColorEx, and provides significant color noise-reduction and correction of chroma/luma displacement. A special switch on the front can be used to move the chroma/luma displacement window as much as .5 μ sec to accommodate worst case conditions of 500-nsec displacements that

have been noticed on Italian soccer players' red-banded socks. German and British soccer players never seem to exceed 250 nsec of error in this category.

The Ampex booth had the full range of their audio/video products, including a see-through VPR3 Type-C recorder, to show some of the unusual features of this top-of-the-line machine. Don Kleffman and Charles

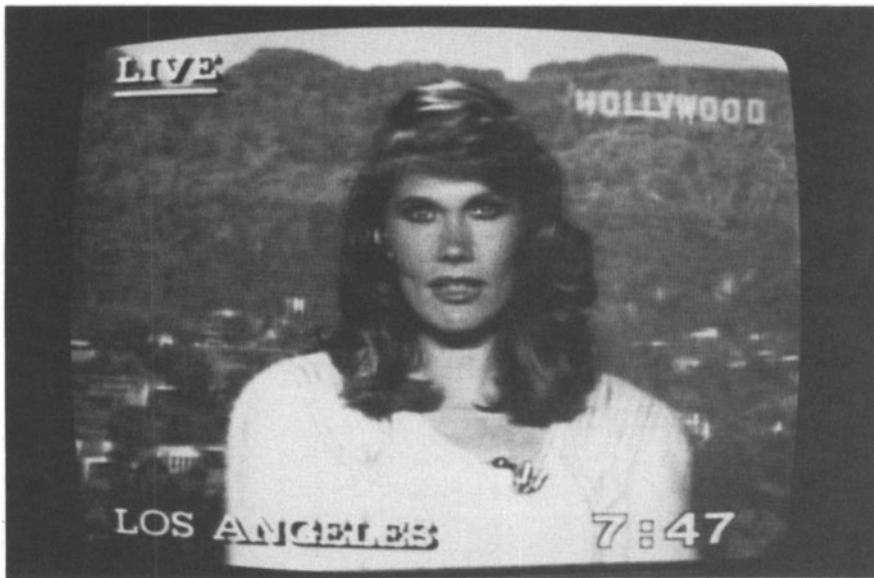
Anderson from Ampex headquarters were on hand to help the local staff, headed by Howard Lilley, demonstrate their gear. Eye-catching demonstrations of the ADO digital effects system were the highlight at the very attractive Ampex booth, which also included live demonstrations of their latest production switcher and the ACE touch-sensitive VTR editing system.

In editing equipment, Orrox/CMX

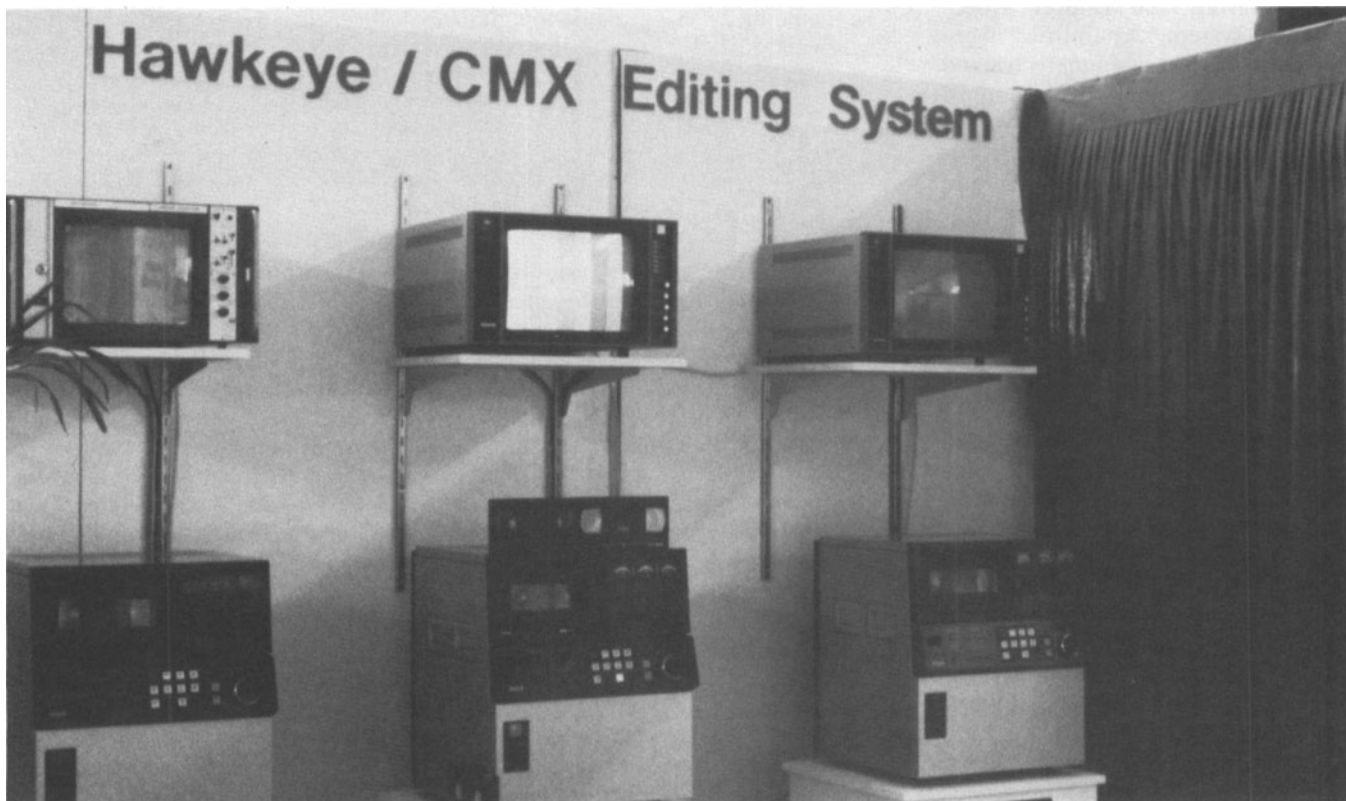
had an extensive display of their top-of-the-line 3400 series, and a few Edge editors, one of which was part of the RCA Hawkeye display in an adjacent pavillion. The CMX equipment was in the Magnatech booth, and three people from company headquarters in Santa Clara, led by Ward Gebhart, the marketing director, were on hand during the show. A demonstration tape and a series of slides on the CMX 3400+ editor, unveiled at NAB, were shown privately to various engineering and production groups.

The Thomson-CSF stand had a very unusual display of a twin satellite feed going through a Vidiplex system, handling two video signals over a single transponder. This was particularly interesting, because several major Australian broadcasters use Vidiplex systems to bring in dual channels from the U.S. via Intelsat. They then standards-convert the NTSC signals and insert them live into local programming. Colin Wright, senior systems design engineer of ATN7, gave a very interesting paper on the technical details of how this is done.

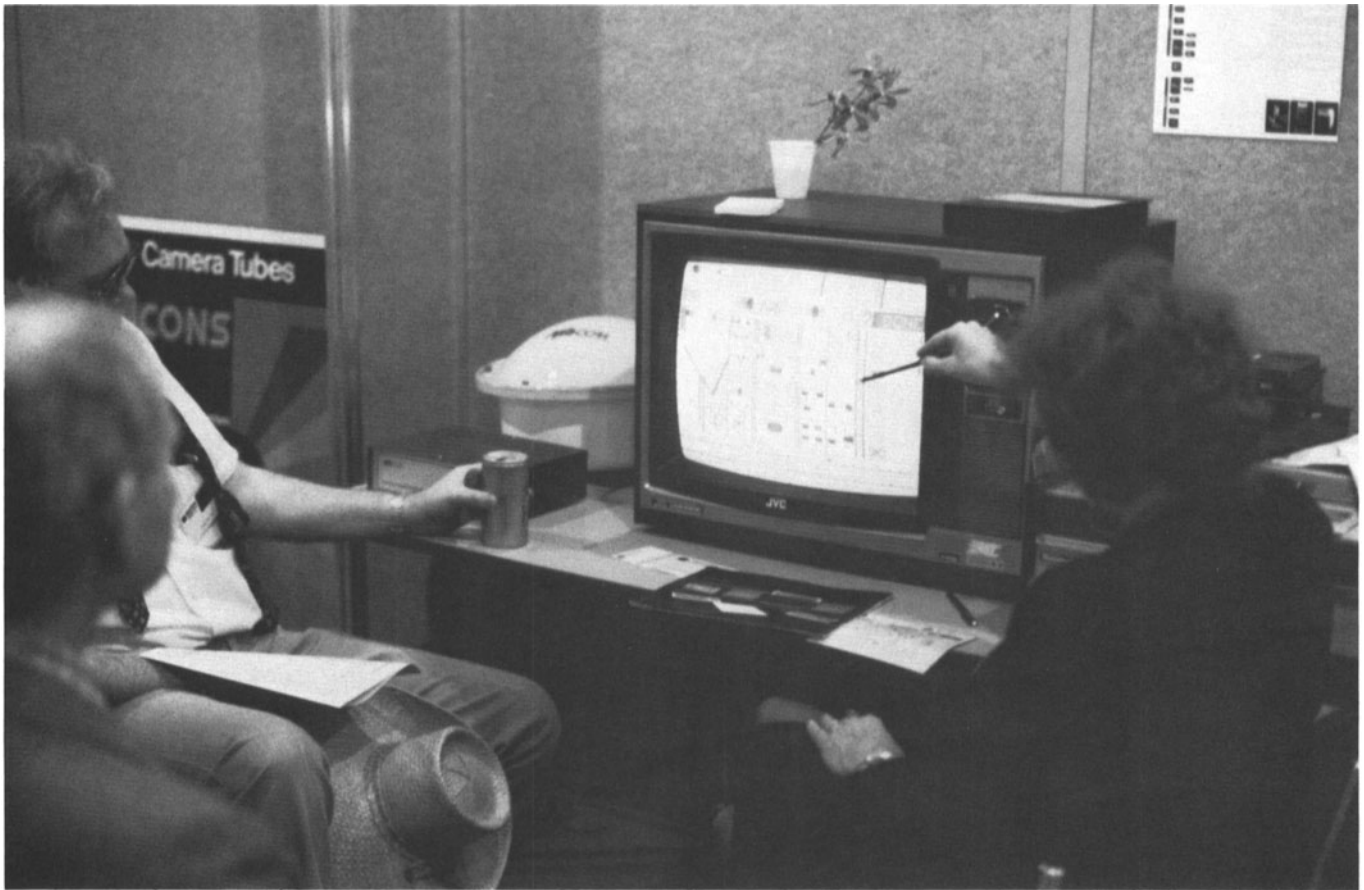
Several small, relatively medium-priced standards converters were on display at several stands. As this equipment becomes smaller and cheaper, it is finding its way into more general use in television studios and post-production centers.



Morning television in Sydney includes live pictures from Los Angeles over ATN7's permanent satellite link that handles both CNN and NBC channels over a Vidiplex system. Pictures converted from NTSC to PAL at ATN7 show good on-air quality.



RCA Hawkeye exhibit at IRECON included editing system that featured the Edge from another American supplier, CMX/Orrox.

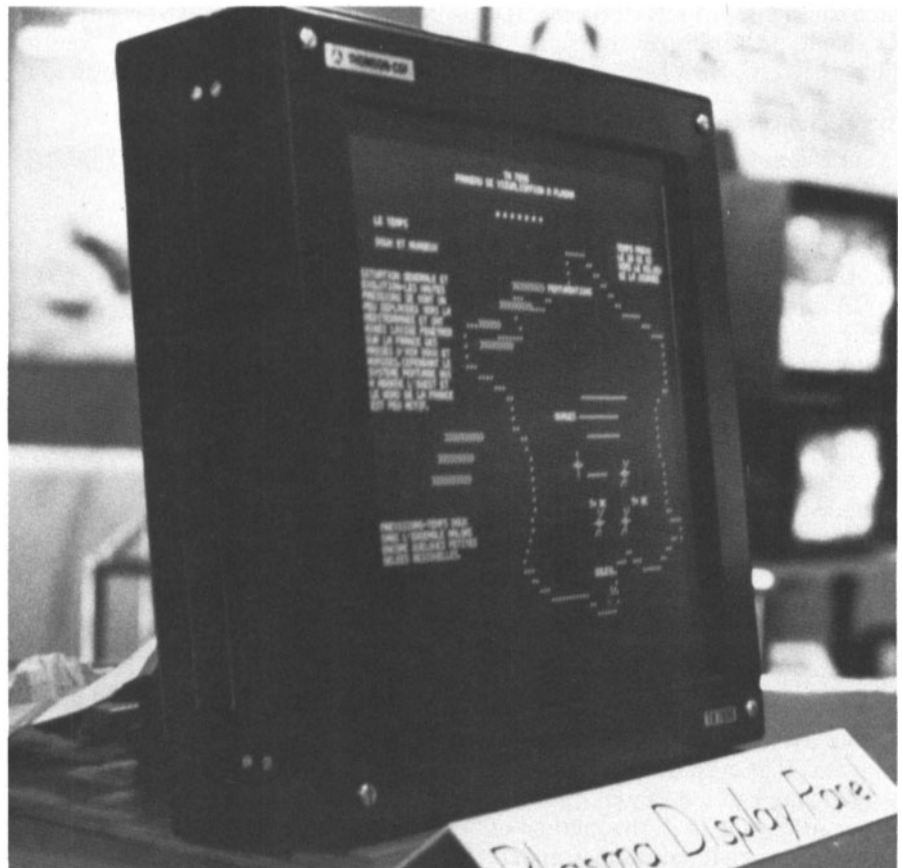


The Aurora 100 digital videographics system being demonstrated to Australian broadcasters by Donna Foster-Roizen at the Magna Techtronics booth.

Improved sound on television is of great current interest in Australia, and a stereo audio service on TV appears imminent. The West German system appears to be the front runner at this time. Audio exhibits included the Nagra line of high-quality audio recorders, and the Dolby Labs noise reduction modules for Type-B and Type-C VTRs, among the many other audio products on display. Even AM stereo was being demonstrated and promoted by Harris.

The 3M tape exhibit had a very interesting set-up this year. In addition to the usual assortment of tapes and playback machines of almost every format, 3M had set up an elaborate tape testing rack of equipment. With this they could do on-the-spot measurements of such tape characteristics as dropout counts, signal-to-noise ratios, RF envelope (output), and many others. With special test signals recorded on the sampled tapes, positive quality checks could be made instantly for any visitor to their booth.

The first satellite project in Australia, called AUSSAT, also had displays, both under the Hughes banner and their own. The first two AUSSAT direct broadcasting satellites are



Thomson-CSF showed a unique thin screen plasma display for data or monochrome images. Resolution of system is quite high and brightness is also good.



The 3M exhibit at IRECON included an elaborate tape-testing setup to prove conclusively the quality of their tapes in various formats.

scheduled for launch in mid- to late-1985, and should provide much-needed communications services to remote locations on this vast and sparsely populated continent, in addition to adjacent offshore islands and other territories. Several of the manufacturers, including Toshiba, were showing a small dish TVRO to receive the KU-band, 12-GHz transmissions of the planned AUSSAT satellite.

The Technical Conference

The video section of the technical conference opened with some very interesting papers reflecting the problems facing television broadcasting in the rest of this decade — namely, HDTV and digital VTRs. Dr. Kerns Powers of RCA presented a powerful argument against rushing into the spectrum-gobbling 1125-line, 60-field HDTV system before examining all of the alternatives to better utilization of current NTSC and PAL systems at normal scanning standards.

Powers impressed the audience with a slide of a television image that contained a digitized female portrait in which the pixelized individual was not readily identifiable. By optically defocusing the slide projector, the image on the screen became instantly recognizable as Marilyn Monroe. Kerns' point was that even though this defocused image had less actual information or resolution in it, the method of presentation rendered it more understandable. RCA is obviously doing a lot of research in how to enhance the

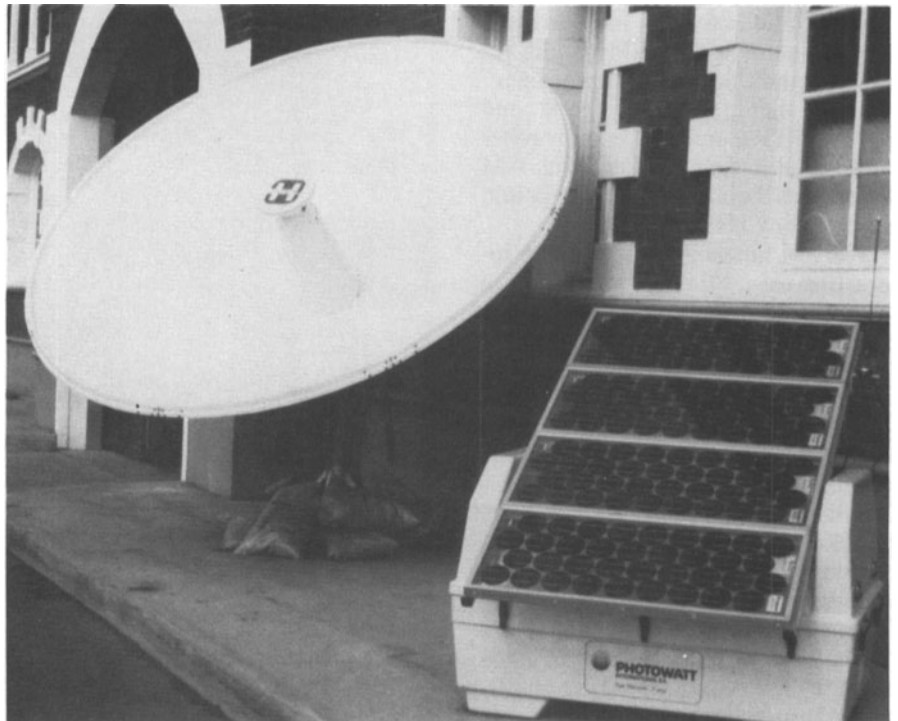
current NTSC system by improved transmission and reception circuitry, rather than by jumping to a new line standard.

In Powers' view, based on sampling theory work done at the RCA Sarnoff Research Center in Princeton, N.J., the resolution already available in NTSC, PAL, or SECAM is not fully observable, and much could be done to improve it. Sampling adds noise to a

picture, so it has been suffering from an interference effect. This interference compounds the sampling problem, but there are ways around it. When inexpensive frame stores are incorporated into home receivers, and comb filters are added, the results, according to Powers, can be spectacular. Powers admitted that current CCD technology still requires some eight chips, with serial memory, to hold a frame, which is a little expensive, but he expects single chips to do this job in the near future.

Powers went on to demonstrate, with a series of specially prepared quadrant slides, that resolution alone was not the answer to better TV images. He explained how other approaches, such as two-channel or synchronous spot wobble (demonstrated by Blumlein in 1937) could improve images without altering scanning standards. Powers predicted that within three years the home TV receiver will display much better NTSC pictures, and that within one year RCA will show a bandwidth compression system capable of a 2:1 ratio for video. In summary, he felt that HDTV on a non-compatible line structure would not occur soon, for mainly economic reasons.

In another area of television technology, C. P. Clark of the Grass Valley Group linked his paper on post-production switchers with new editing



Harris Corp. displayed a TVRO that is completely sun-powered by the solar-cell array in the foreground.



The Intelsat signals from the U.S. coming in on the Andrew 4.5-m dishes were displayed at the Thomson-CSF stand.

needs in sophisticated TV facilities. The GVG Series 300 switcher, of which more than 200 are in use worldwide, can interface well with computer editing systems using distributive processing. The CMX-computerized editors established a *de facto* standard in the early 1970's, according to the author, and now the use of a serial interface technique has brought the total video production system under frame-accurate control by the computerized editor.

The most modern systems use RS422, ASCII interfacing, and can keep six machines under control with an edit decision list on a disk. The edit decision lists can be expanded, more control is available for all functions, and constant status reporting is done by the system, even in the manual mode. All this is accomplished by the distributed microprocessor architecture of the new production system, which incorporates a single serial port into the computer.

Charles Anderson of Ampex Corp. gave a status report on digital recording and future formats. Unfortunately, no clear set of standards is emerging, even though a digital coding format has been available for over two years. Anderson pointed out that digital

VTRs continue to be more expensive than the analog type, and that the latest series of component recorders (Hawkeye, Betacam, Quartercam) further diminish the attractiveness of the digital VTR at this time.

One of the most interesting papers given, about a local television development, was the one mentioned earlier on the ATN7 satellite link to Los Angeles. The paper was presented by Colin Wright, who claimed a number of firsts for this system. This is supposed to be one of the longest full-time satellite hook-ups between America and Australia. It operates on a 7.5-MHz bandwidth, using half a transponder on the Pacific Ocean Intelsat IVA, and it brings two simultaneous video channels and four sound channels into ATN7 for distribution on the Seven network. The two video feeds carry the CNN (Cable News Network) and NBC-Burbank. While in Sydney, I saw live transmissions from Hollywood and Newport that looked very good.

ATN has a studio in Century City (Los Angeles) that packages and relays programs to Sydney. A unique feature at the receiving site is the use of a pair of co-phased Andrews 12-m antennas operating at 4 GHz, with the

LNAs on the backs of the dishes. The NTSC signals out of California are put into a Thomson-CSF Vidiplex multiplexer which sends alternate fields from both sources. These are reassembled in Sydney by using a frame store and interpolation, so that the two separate images are reproduced as interlaced full frames. The conversion to PAL and color correction are done on site in Epping, where ATN7 is located.

Conclusion

Both the exhibit and the technical conference attested to the advanced state of video technology in TV and radio broadcasting in Australia. Many stations are now transmitting teletext, including a healthy amount of program captioning required by the Australian Government. It is also apparent that other communication services, using SCA techniques and DBS, are being planned. The Australian TV networks have strong links with the U.S., and such events as the America's Cup sailboat race get massive and instant coverage "down under." Plans for relaying the Los Angeles Summer Olympics next year are also well in hand, and Channel 10 in Sydney has obtained these rights.