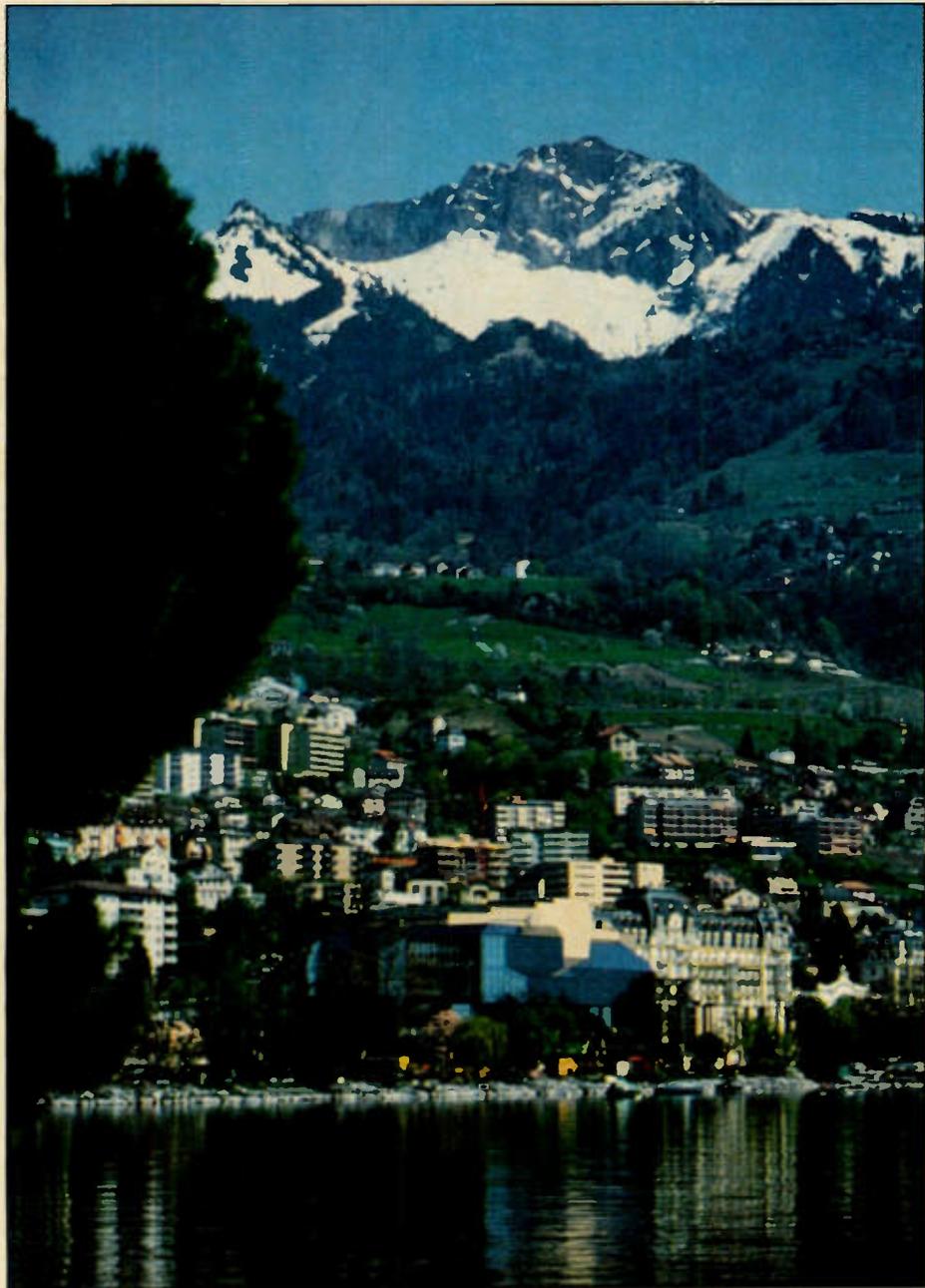


# TV TECHNOLOGY

International Edition

## Montreux Symposium Broadens Its Reach

### *Show Hopes to Unite Creative And Technical Professionals*



**MONTREUX, Switzerland** Organizers of the biennial Montreux International Television Symposium predict this year's event, 10-15 June, will spark interest from the creative and business side of the industry as well as the technical side.

The conference sessions and special programs this year will broaden their focus to include all aspects of the industry.

"In the past, we tried to have sessions just for creative people, but they weren't well attended, because what they really wanted was to talk to the technical people about what they needed and wanted," said Rupert Stow, press officer for the Montreux ITS. "So this year in the sessions we're introducing people from the creative world so they can (interact with) the technical world."

This effort to unite the creative, engineering and business aspects of new technology includes a Weekend Forum, 11-12 June. Focusing on high definition, the Forum will include such topics as HD in Cinema Productions, New Panoramas in Creativity, Strategies and Economics, as well as a session and demonstration on multimedia.

#### **The digital impact**

Also, the sixth International Electronic Cinema Festival will run concurrently with the Symposium, presenting pro-

grams that were made possible by the use of digital and high definition technology.

In fact, the emerging digital technologies, particularly digital processing and compression, are much of the reason behind the convergence of the broadcast, cable and production communities, a fact recognized by the Montreux ITS.

"The digital invasion is not only in transmission but in production equipment," said ITS Director Michel Ferla. "We are opening up and trying to be a bridge between the technological world and the creative one."

"The trend is that there is a welding together of cable and broadcast—creative and technical—because when you are talking about digital compression and processing, they share many of the same problems," added Stow.

#### **Preparing for the future**

In addition to the Weekend Forum, equipment exhibition and a host of broadcast and cable sessions, there will be a "Future Technology Day," to be held 14 June. This new concept was designed to provide broadcast and cable executives with an overview of the potential applications of imminent technology, and of their economic

(continued on page 16)

**Amidst the Alps** overlooking Lac Lemman, Montreux provides a dramatic backdrop for the International Television Symposium, 10-15 June.

## A Dream Launches STAR-TV

### *Part One*

by Morris Lee

**HONG KONG** The more you learn about it, the more it seems like a fantasy, but the fantasy already became TV technology reality once and is about to do so a second time. Decide for yourself. Here were the original parameters:

Start with a satellite that failed to achieve its intended orbit. Add a dream to reach a potential audience of some three billion people, who speak and read the world's most diverse range of languages. To serve those people, create five full-time broadcast networks. And now the technology:

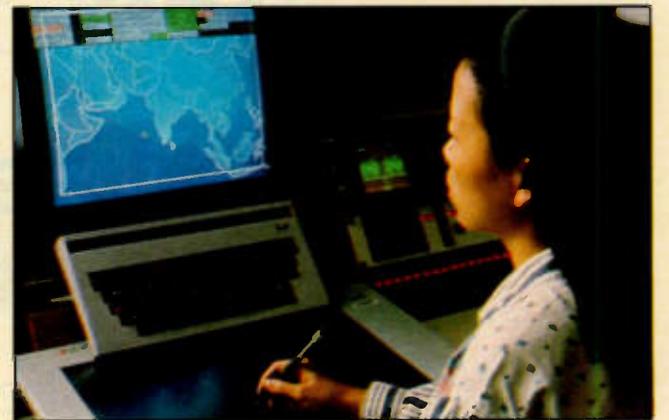
Present each network simultaneously in both NTSC and PAL. Put the production and origination facilities,

including studios and advanced graphics and post production, into the heart of one of the most densely populated sites on earth, where there is no room for anything. Draw your staff from the local population where there is overemployment and few available TV professionals. Design for expansion and future technology; in fact, since technology is changing so rapidly, design for equipment that does not yet exist. Do not waste money. Get on the air on time and never go off. Oh, yes. One more thing: Do it all within about three months. Give up?

#### **No quitter**

Luckily for STAR-TV, Phil Braden did not. STAR is an acronym for Satellite Television Asia Region, and Braden is its vice president of broadcast operations and engineering.

The satellite in question was originally called Westar



**Hong Kong's new STAR-TV network is a showcase of new and emerging technologies.**

6, when it was launched by a U.S. space shuttle in 1984. Alas, it failed to achieve geosynchronous orbit and was

(continued on page 4)

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**BUSINESS**

**FOR.A Corporation Terminates Patent Litigation**

NATICK, Massachusetts FOR.A Corp. of America and its Japanese parent, FOR.A Company Ltd., have terminated litigation that was filed in July 1991 by Video Patents Ltd. (Vid Pro). Vid Pro's claims targeted a number of companies that have played a leading role in the manufacture and marketing of basic video signal processing technology, and singled out FOR.A for litigation in the context of a campaign to license the entire industry that is involved in the distribution of equipment used in video and television broadcast.

The patents involved in the litigation included four specifically in the area of time base correction and video frame synchronization which had originally been developed by various engineers who had worked at Consolidated Video Systems, Inc. (CVS) in the 1970s. Two other patents involved video noise reduction for which Vid Pro principal J. Carl Cooper had made Vid Pro his exclusive licensing agent.

FOR.A contends the litigation was "nothing more than an attempt by Vid Pro to use a 'strike suit' against the industry as leverage to exact high payments wholly disproportionate to the value of the underlying patent claims," according to a press release issued by the company. FOR.A challenged the invalidity or lack of applicability of the various patents in suit and a settlement was obtained.

"We were totally opposed to having a member of the industry that had worked

with the video technology for decades be badgered into paying huge sums for patents that were not relevant to today's technology," said FOR.A Corp. of America President David E. Acker.

Acker, who led the defense effort, said that fighting the patent claims was "almost a full-time job in its own right."

"One of the things that made this entire effort tolerable was the immense cooperation which I received from people throughout our industry, both in the U.S. and in England, as well as Japan, in helping to deal with the issues raised by Vid Pro in its lawsuit," Acker added.

**Magni, Great Valley Products Create Joint Venture**

BEAVERTON, Oregon Magni Systems Inc. and Great Valley Products (GVP) have created a joint venture to enter the desktop video market.

Under the agreement, Magni's new GLock-VGA+, a VGA-to-video graphics card, will be marketed under a GVP label.

The card, based on Magni's VGA Producer series, will list at US\$1,200 and will be available from GVP in PAL and NTSC versions and will work on DOS- and Windows-based PCs.

"This agreement reflects the strategic decision by Magni to align with key partners in developing and delivering its products," said Victor L. Kong, Magni's CEO.

**Comark to Provide Transmitters For Indonesian Network**

COLMAR, Pennsylvania Comark

Communications has been selected to provide eight UHF TV transmitters for a new network in Indonesia.

Comark will provide seven EEV IOT-equipped 40 kW transmitters operating in alternate main-standby mode, and one IOT-equipped 80 kW system with two 40 kW amplifiers.

Deliveries for the contract, valued at more than US\$7 million, are scheduled to be completed by the end of the year.

The transmitters will be outfitted with Inductive Output Tubes (IOTs) operating in common amplification mode, meaning they draw power in relation to the power requirements of a particular signal. This eliminates the need to continuously operate the transmitter at a power level higher than what is necessary to cover the broadcast peak.

For more information, contact Comark at telephone +1-215-822-0777; FAX +1-215-822-9129, or circle Reader Service 99.

**NEW TECHNOLOGY**

**Texas Instruments Demonstrates Micromirror Device**

DALLAS, Texas Texas Instruments (TI) has demonstrated a new video projection system that could revolutionize current technology and have a tremendous impact on HDTV displays.

The projector is based on a digital micromirror device (DMD), a microchip-sized spatial light modulator containing thousands of tiny reflecting mirrors that tilt on and off to control the amount of light that is passed through an imaging lens and onto a large screen. Each mirror corresponds to a single pixel.

At a demonstration before the Defense Advanced Research Projects Agency

(DARPA) in February, TI projected NTSC video approximately 12 feet onto a 60-inch screen using a single DMD containing 307,200 mirrors. The projector obtained a contrast ratio of 50:1, and TI is currently working on an HDTV display that utilizes three DMDs, each containing 2.3 million mirrors.

The technology was developed as part of a four-year contract under DARPA's \$9.8 million High Definition Display (HDD) program.

TI claims its DMD projectors are flicker-free and are brighter than CRT displays. They also display more life-like colors and less visual noise, according to the company.

Quick development of the DMDs may be possible because they can be mass produced using TI's existing semiconductor production equipment.

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**SHOW LISTINGS**

Upcoming conventions, meetings and exhibitions:

**1-5 October 1993**

**International Broadcast '93**

Jakarta, Indonesia. A broadcast-only exhibition to be held in Jakarta at the Kemayoran Exhibition Center. Exhibition planner is PT MultiMedia Promo.

**18-21 August 1993—KOBIA '93**

Seoul, Korea. The 1993 Korea International Broadcast & Audio Equipment Show will be held at Koex Center in Seoul. Organizers are The Hankook Ilbo, The Seoul Kyungje and The Korean Broadcast Engineers & Technicians Association. For more information contact The Hankook Ilbo at +82-2-738-1048.

**10-14 October 1993—VISION '93**

Olympia, U.K. A new broadcast, film and video equipment show for the U.K., VISION '93 is the result of a collaboration between the IABM, the BKSTS, Single Market Events and Philbeach Events. For information contact Orlando Kimer: +44-71-830-8447/8.

**18-20 October 1993**

**European Cable Communications '93**

London, England. Following the success of the 1992 show, the Cable Television Association is expanding the size of the 1993 show. To be held at Olympia 2, London. For more information contact Sharon Chapman, Manager ECC '93, The Cable Television Association, 5th Floor Artillery House, Artillery Row, London, SW1P 1RT, England. Telephone: +44-71-222-2900; FAX: +44-71-799-1471.

**25-28 October 1993**

**Broadcasting, Cable & Satellite India '93**

Pragati Maidan, New Dehli. India's 1st International Broadcasting, Cable & Satellite India '93 exhibition and conference. One-hundred and fifty exhibitors from India, Europe, the U.S., Asia and Australia are expected to exhibit. A three-day technical conference will focus on trends in broadcasting, hardware and software, emerging technologies and non-governmental broadcasting. For information contact Broadcast Engineering Society (India): Room No. 410, Research Dept., All India Radio and Doordarshan. J.P. Estate., 14-B, Ring Road, New Dehli-110002, or Exhibitions India: telephone +91-4622710; FAX +91-11-4633506.

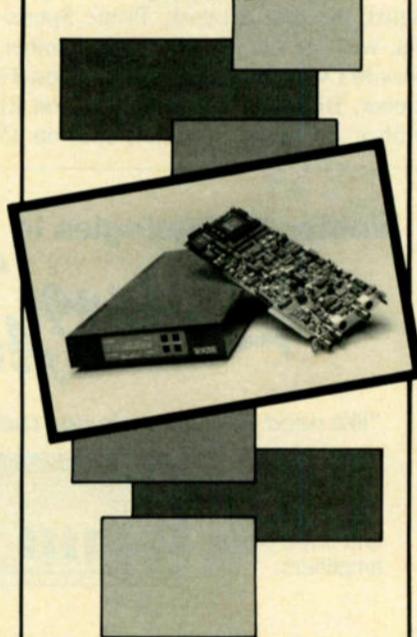
**16-18 November 1993**

**International Broadcast Equipment Exhibition '93 (InterBEE '93)**

Chiba City, Chiba Prefecture, Japan. Japan's premiere technology and equipment exhibit, sponsored by the Electronic Industries Association of Japan (EIAJ). To be held at the Nippon Convention Center, Makuhari (Makuhari Messe) 2-1, Nakase, Mihama-ku, Chiba City, Chiba Prefecture, Japan. Admission free; visitors register at entrance. For information contact Sumi Kato, Manager, Japan Electronics Show Association, FAX: +81-3-3284-0165.

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# Dreams Become Reality: Twice

(continued from page 1)

retrieved by another shuttle mission in 1985. After refurbishment, the satellite was sold to the AsiaSat consortium, which launched it, successfully this time, in April 1990, on a Chinese Long March rocket.

One member of the consortium was the Hong Kong conglomerate Hutchison-Whampoa, which, in turn, formed STAR-TV later the same year.

By the beginning of 1991, a couple of weeks after receiving a non-exclusive broadcasting license from the Hong Kong government, STAR-TV consisted of six people and a dream. By the beginning of April, it had established a temporary, test uplink, near the border between Hong Kong and China, and two weeks later began transmitting a preview channel to its service area. Its service area, incidentally, seems to extend roughly from Cyprus to Japan.

## Devising a plan

After the National Association of Broadcasters (NAB) equipment exhibition in Las Vegas later that month, Braden and his staff began planning broadcast facilities in earnest. By 26 August, the first network, Prime Sports-Asia, went on the air. On 15 September, it was MTV-Asia music television; on 14 October, BBC World Service TV; on 21 October, a Chinese channel; and, on 15

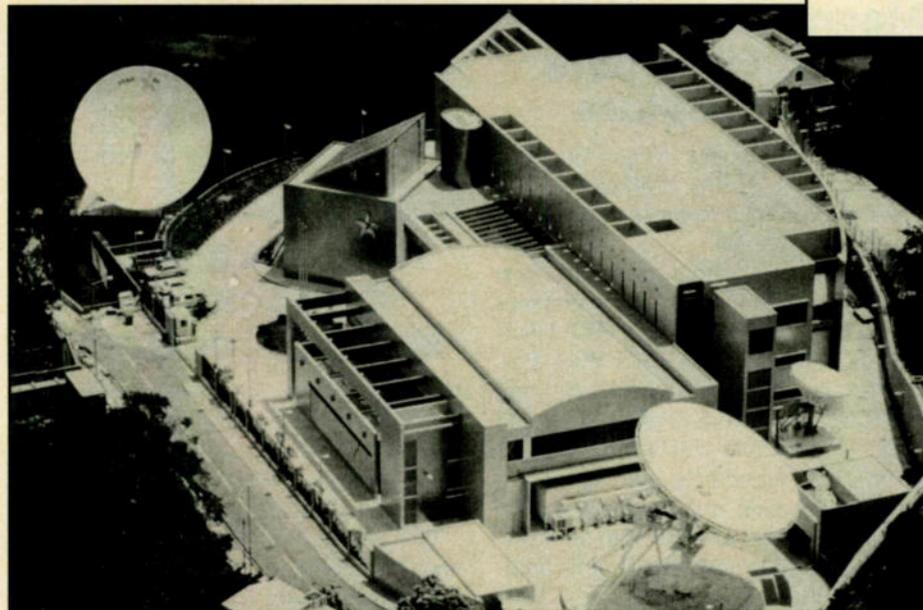
December, StarPlus entertainment.

AsiaSat is divided into so-called north and south beams (actually skewed so the dividing line runs from northwest to southeast). Within the coverage zone of the north beam are Japan, the Philippines, South Korea and Taiwan, all countries with NTSC broadcasts. Therefore, the north

beam carries broadcasts in NTSC and the south in PAL, for a total of 10 transponders (number 11, ZEE-TV, consists of Hindi-language programming aimed at India).

All are advertiser-supported and transmitted without any encryption. That may be why a study conducted just a few months after STAR-

**STAR-TV broadcasts are picked up directly by homes equipped with satellite downlinks, but they are also carried by cable TV systems, hotels and SMATV systems.**



of the harbor, in Hunghom (HH).

Studios were the first problem. Both MTV-Asia and Prime Sports-Asia required extensive shooting of presenters, while the other three services needed somewhere to shoot promotional and other studio material. Superb studios were under construction at CWB, but they would not be available in time for the service launch. The solution was to take as much room as possible from the

already small origination and post production space and create one shared studio, with scheduling that makes aircraft traffic control seem simple! An Ultimatte 6, allowing presenters to be placed over

any background, helps.

MTV is also known for some of the most advanced graphics seen on TV. STAR-TV currently operates the largest Quantel Picturebank/Picturynet network in the world (with multiple Pictureboxes and Paintboxes), and its size will probably double with the transmission of the subscription service. To this are added Dynatech's DP/MAX, four Quanta Delta character generators (two with Chinese character sets) and quite a few other character and graphics generators, most tied together with Ethernet data connections (which extend between CWB and HH, too).

Graphics are further manipulated by Grass Valley Kaleidoscope and Kadenza systems, multiple Abekas A66 disk recorders, and D-1 VTRs in just one of seven post production suites (others offer Ampex ADO).

## Making the connection

With no view of anything but the next building from the HH facility, the satellite teleport was established at CWB as soon as possible. In addition to dealing with AsiaSat (with horizontal and vertical polarizations), the facility had to be able to receive the BBC World Service transmissions via Intelsat (circular polarization) and other inbound feeds.

Despite the short physical distance between CWB and HH, however, the links between them were trickier. The very protection that the nature preserve offered made it difficult, if not impossible, to establish a microwave link to the harbor.

Hong Kong Telecom provided fiber optic links between the two sites, using a combination of FM and gently-compressed digital modulation. When all production and origination took place at HH and all transmission at CWB, signals were encoded into NTSC and PAL at HH, so the link quality was more than adequate.

The additional channels of the subscription service, however, are beyond the spatial capacity of HH site. Therefore, this year, origination facilities are being moved from HH to the newly completed CWB building. That means NTSC and PAL encoding will take place at CWB, and the links between the two need higher quality than the encoded links offered.

In addition to the Ethernet image links noted earlier, therefore, STAR-TV located and is now operating the first long-distance 270 Mbps serial digital interface fiber optic links. The facilities they connect to on either end comprise a whole different story.

Next month, the STAR-TV story will continue, with such details as how to build a 270 Mbps serial digital facility without 270 Mbps serial digital equipment, why it is not a good idea to floss a rat's teeth, and what happens when things go bump in the night.

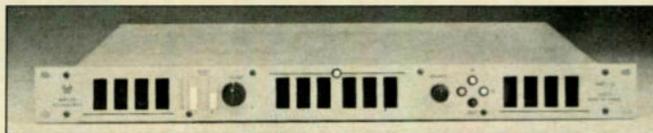
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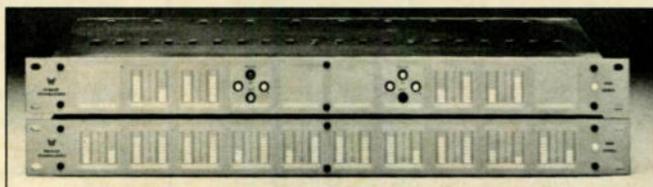
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1991

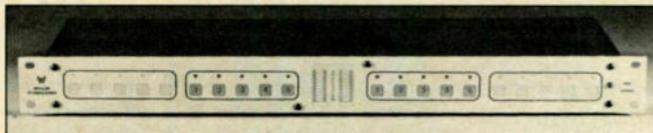
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stereo) inputs.



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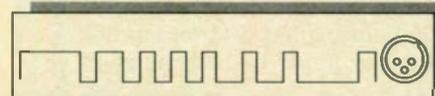
1992

SOLUTION:  
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1993

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# BSkyB Relies on RTS Intercom System

by John L. Andrews

IPK Broadcast Systems is the trading name of Ian P. Kinloch and Company Ltd., the U.K. distributor for RTS/Telex CS9500 digital matrix intercom systems. IPK's first CS9500 sale was to Britain's satellite broadcasting channel, SKY Television—now British Sky Broadcasting—and now, three years later, BSkyB is set to double the size of its intercom system from the original 50 x 50 capacity to a 100 x 100 capability.

BSkyB operates from a site in West London with a full-time staff of nearly 800, supplemented by an average of 400 temporary and free-lance staff. An additional staff of 450 operates the company's advanced subscriber management center in Livingston, near Edinburgh. Programs are distributed via the Astra satellite using the Videocrypt system which employs 'smart card' technology and was developed jointly by News Datacom and BSkyB.

## Reaching the limit

The original equipment specification was based on a requirement for three production studios, four transmission suites and a master control room, and resulted in separate 'stand-alone' talkback systems in each of the three studio areas and a Philips M100 intercom installation for inter-area communication. This combination provided a cost effective solution to the basic requirement, but the limitations soon became increasingly frustrating as the station expanded at a much faster rate than had been foreseen and the operational staff demanded greater flexibility and ease of operation.

The importance of a talkback system

with expansion capability became apparent recently when, within 18 months of start-up, it became obvious that a larger and more flexible system was required. BSkyB's Head of Sound Vaughan Rogers began to investigate the alternatives.

"We wanted a system based on a central matrix which could be configured quickly and easily without closing down, and not involving the use of hundreds of patch cords," explained Rogers. "There were really only two contenders, and having spent equal amounts of time (about half a day in each case) studying them, I realized that I could readily understand how to use the CS9500 but I was still uncertain and therefore unhappy with the other one."

The CS9500 system is based on a 3U card-frame housing up to 25 crosspoint cards (each 2 x 50) and a processor card with an EEPROM (electrically-erasable programming memory), which retains



produce the desired result.

"In a live broadcast situation you need to have absolute confidence that the system will do what you want it to do," said Rogers. "If you hit a talkback key in a hurry, you don't want to worry whether it's going to latch on or not depending on how long you hold it down; it can be very embarrassing to have your microphone live without realizing it, and potentially disastrous if it isn't on when you think it is!"

## Going for the best

BSkyB decided on the top-of-the-range RTS KP97 series keypanels, which have

applied to any talk/listen key or programming function and protects it from alteration by any operator via a keypad.

"This feature gives me total control of the system," said Rogers. "It's extremely useful for operators to be able to alter their own keypad setups according to program requirements but it's very reassuring to know that whatever they do will not affect the basic setup unless they specifically request me to save the changes."

"If this happens, I can store the revisions in a new program for future use and revert to the original setup for the next booking. It's also very important to ensure that any casual user with time on his hands who scrolls through the intercom destinations can't disrupt a transmission by speaking to the presenter's earpiece—either accidentally or maliciously!"

## Useful features

Another invaluable feature is the ability to identify a specific keypad if a key is left latched on—an infuriating situation if someone has to walk around the studios to find the offending panel. Using the CS-EDIT on-line, the matrix can be quickly interrogated and the panel located. The only drawback, according to BSkyB, is not being able to physically unlatch the key by remote control!

New configurations for the matrix system are programmed off-line and stored on floppy disk; special configurations are usually made for elections, budget, etc., and also for moving programs to different studios. BSkyB has four studios in full operation; Studio One is a general purpose studio, Two is dedicated to Sky News, and Three and Five are used for Sky Sport (Studio Four is not yet in service.) Occasionally there may be a requirement for control rooms and studios to be 'cross-connected', i.e. Studio One control may work to Studio Two's floor.

By downloading the appropriate software, the matrix can be reprogrammed for the required new configuration in a matter of seconds without interrupting any current users. This feature is also invaluable when the 24-hour news program must be moved to Studio One to allow planned maintenance of Studio Two.

Since the original installation in 1990 the system has been extended into a fourth production studio, two more transmission suites and the VTR/dubbing area, and the original 50 x 50 frame is stretched to its limits.

Future plans include additional transmission suites, the completion of Studio Four and the setting up of more comprehensive dedicated production talkback configurations when additional crosspoints are available. The expansion capability of the CS9500 is an important factor; additional card-frames can be wired up without disturbing the existing installation, and new keypanels require only a three-pair cable terminating in 9-pin 'D-type' connector—quite a difference, as Rogers pointed out, from the 56-way Varelco connectors required for the original hard-wire studio systems.

John L. Andrews is director of sales and marketing for IPK Broadcast Systems in the U.K.



British Sky Broadcasting's Studio 5 Control Room boasts four RTS/Telex KP97 keypanels.

the latest configuration during power-down. Initializing the system requires an MS-DOS PC that runs the proprietary CS-EDIT software; once the system names have been entered, the PC is not required unless a configuration change is required.

## Written for broadcast

Rogers was "very impressed" by the CS-EDIT software. "I found it very intuitive to use, and the help system is excellent—it was obviously written by someone who is familiar with the system from a broadcaster's point of view, not just a computer software expert."

A further factor in favor of the CS9500 was the design of the keypanels, which use three-way lever-keys for call/speak, enabling the operator to use either momentary (press down) or latching (up) action. Although not as cheap as PCB-mounting push-buttons, lever-keys are preferred by many operators for their positive action and unambiguous result; the electronically latched momentary push-button (latching on if touched and released, 'momentary' if held down longer than a pre-set time) is an elegant attempt at producing a three-way action from a two-way key, but does not always

TMC (BPO-style) lever-keys and alphanumeric displays. Fifteen-way panels were specified for all areas, with 16-way expansion panels for the two MCR positions. Programming keypads were specified for most positions, though with hindsight Rogers would have had them anywhere except the sound control rooms and MCR. "The keypads are used quite a lot by the sound operators but not by anyone else. Although the directors' panels all have keypads, no director would dream of using one—they all scream for help if they want any changes made!"

The CS9500 keypad programming keypad allows the operator access to virtually all the operational features of the system, including the ability to scroll through all the source/destination names, copy setups to any keys on the panel, assign IFBs and ISOs and also to dial out onto PSTN lines via a Telex telephone interface unit. This freedom of access could be a problem if it were not for the programming restrictions which can be imposed by the system manager using the PC.

The CS-EDIT software enables any of the system setups to be interrogated on-line and has an inhibit feature that can be

## TV TECHNOLOGY

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# Much in Store for Today's DAW

by Arthur Cole

New and upgraded digital audio workstations (DAWs) are taking advantage of the advances in microprocessors, storage media and networking capabilities that are sweeping the computer industry.

A number of systems are touting new and improved processing capabilities.

Lexicon, for example, has introduced a new CPU to the OPUS that has doubled the speed to 16 MHz. Although that might sound slower than the 33 MHz, 50 MHz and higher computer workstations that are available, the OPUS utilizes a number of coprocessors—a PC-based unit for the front end, as well as multiple digital signal processors and edit processors—that give the machine backup and restore speeds five times real time.

"Some of the folks doing backup and restore are stressing the host processor," said Bob Reardon, OPUS product manager. "(With a single processor) there is a real technological limit to how far and how fast you are going to go. When you are doing backup, everything in the foreground stops."

Other systems that have their own processors, such as the Studer Revox Dyaxis and Dyaxis II, are upping their speeds by tying into faster display platforms.

"With the new Mac Quadra 900 and the corresponding video cards, the graphics are faster, which makes the traffic display faster, and the whole unit seems faster," said Thomas Jenny, vice president/general manager at Studer. "The Dyaxis machines work with the Apple II/ci, but it is a bit slower."

Going hand-in-hand with faster machines is increased storage, both on hard drives and optical discs, as users discover that they can seize and manipulate greater amounts of data efficiently.

"We're in the process of adding some additional storage capabilities; we're approaching 100 GB," said Mack Leathurby, product manager for Avid Technology's AudioVision.

The OPUS, too, is adding to its disk storage capabilities. Reardon said that while standard units can store seven-and-a-half hours of 48 kHz audio, that can be increased to 26 hours without losing sound quality.

Along with faster, more powerful workstations, many users are beginning to look for greater networking capabilities.

This ability has emerged as a major endeavor at Solid State Logic, which has tied its ScreenSound recorder and Scenaria workstation to the SoundNet digital audio network.

According to Colin Pringle, marketing director at SSL, SoundNet provides a central storage area from which users call up actual sound files, rather than mere data.

"It actually allows there to be multiple working disks," he said. "If you have someone who has prepared a multi-channel prelay of material, he can then instantly release that material to another operator, who can take that material and add to it in another way." Avid is another company looking to increase networking options. The Apple 950 Quadra that houses AudioVision already includes Ethernet hardware for transferring data files. Leathurby said the company is examining full networkability using Fiber Distributed Digital Interface (FDDI) technology.

**A number of systems are touting new and improved processing capabilities.**

"Our vision is to have Macs and AudioVision linked together over FDDI so you can finish a session on a Mac and pick it up on AudioVision," he said. "We are testing FDDI cards now."

Leathurby said Avid is also working toward other networking options in keeping with the company's Open Media Framework. Among the technologies cur-

rently being examined are microprocessors based on TimeLine Vista Inc.'s Lynx time code module for greater machine control, and a chip design by DigiDesign for a 256-channel audio bus for the Mac NuBus slot.

Still other manufacturers are looking at network capabilities extending beyond a single facility.

Adrian Weidmann, director of marketing for Siemens/AMS, said the company is "diligently working on ISDN (Integrated Services Digital Network)," which is currently being examined by telephone

companies, cable operations and others for such things as video dialtone.

However, Weidmann said that once a facility begins to embrace networking, whether internal or external, the issue of security is bound to come up.

"We are putting together a rather sophisticated directory able to lock out various sections, or trees, through passwords, numeric codes, etc.," said Weidmann.

In addition to the new system capabilities, 1993 will also see a newcomer to the field of digital audio workstations, although one with a lot of experience in the desktop video field.

With its recent purchase of WaveFrame and several other audio companies, Digital F/X has formed a new audio division to complement its Composium and Video F/X desktop video systems.

The company has renamed WaveFrame's AudioVision workstation to the WaveFrame Digital Compact Studio and has added a number of features, including 16-track capability, a new software package that adds music-style editing, surround sound mixing, and built-in waveform editing.

"It's a little different from what people are used to," said Chez Bridges, associate product marketing manager for Digital F/X's audio division.

## Australia Embroiled in Pay-TV Debate

by Max Thrower and Phil Muscatello

Australia has a new Minister for Communications in the wake of the Keating-Labor Government's victory in the March election. David Beddall has taken on the troubled revolving-door ministry, the eleventh individual to do so since 1983 and the sixth since Christmas 1991.

The new minister is not on the front bench, thus putting the portfolio very much into the background. This is an unusual move for a government who only last year decided to drag Australia into line with the rest of the world on the pay-TV issue after years of procrastination.

### No license

An auction was to be held for satellite and multipoint microwave distribution system (MDS) licenses. The then-minister, Senator Bob Collins, abandoned the process in January despite there being up to 150 tenders already lodged.

At the time the department argued that

"MDS delivery... would jeopardize the integrity of the system... The government's decision will return MDS technology to its rightful role as a secondary provider of pay-TV."

The decision has thrown the industry into uncertainty, undermining investor confidence.

With the potentially huge market in TV-loving Australia up for grabs, powerful media interests were not at all enamored of the potential fragmentation that MDS would allow. The government's actions have been interpreted as Labor again giving in to the interests of the current free-to-air players.

There have been legal challenges from the MDS corner. Businessman Kerry Stokes has already found success with the Federal Court's finding that the government did not have the power to ditch the tender process.

### Taking action

Broadcom's Steve Cosser owns a number of microwave frequencies. His court action is aimed at overturning the govern-

ment's decision. He argues that the technology is available now at a very low cost. Waiting for digitally compressed satellite delivery will only increase the costs and slow the process.

All this is to achieve an arguable increase in quality. According to Cosser, digitally compressed video in PAL designed for Australia is not yet available so there is no way of comparing the quality with off-the-shelf MDS systems. The more a signal is compressed, the greater the loss in quality. There is also never any mention of weather interference problems inherent in satellite delivery.

The satellite delivery advocates point to MDS's dependence on line-of-sight, saying that large areas of hilly cities like Sydney will miss out.

The debate is all about a technology that is already available and can be implemented immediately at low cost and with only tiny receivers versus a system that will deliver a high quality signal at a higher cost with much larger receiving equipment sometime in the future.

Pay-TV will require large amounts of money up front, and potential investors are finding it increasingly difficult to read the signs coming from Australia.

The uncertainty resulting from the court actions is in two areas. First, if MDS delivery is allowed, there will be more channels available, fragmenting the potential audience. Second, increased demand of program material will push up the costs of programming.

All of this devalues the satellite licenses from which the government was hoping to raise several hundred million dollars.

There are many who wonder if this government will be able to handle the future legislative challenges of the converging information technologies if this is the way they handle the relatively simple concept of pay-TV.

*Max Thrower and Phil Muscatello are co-owners of Really, Really Big Productions in Surry Hills, Sydney, Australia.*

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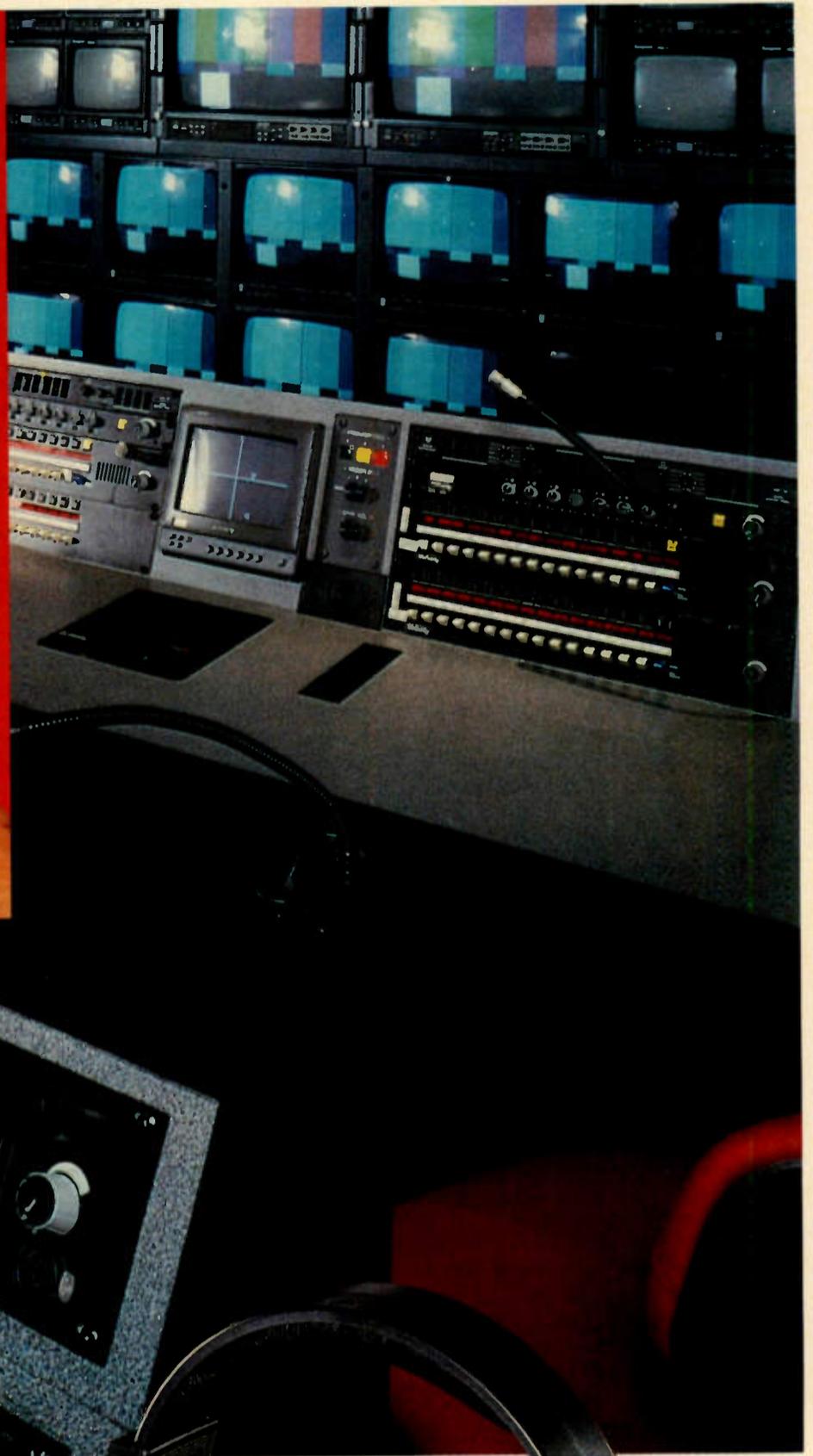
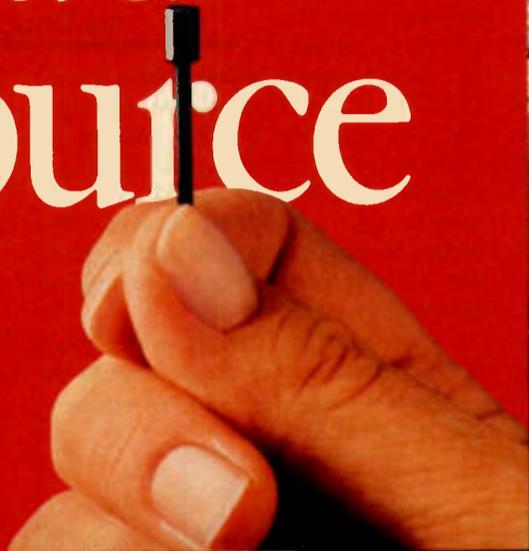
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# Compression and Isolation Amplifiers

This month I got a chance to look at Scientific Atlanta's video compression system for satellite transmission. I learned some interesting things about video compression during the visits. This month I will talk about some of them. Read on for details on a way for you to try out the Broadcaster's forum on CompuServe free. Finally, I relate data on Analog Devices' low cost isolation amplifiers.

A recent visit to Scientific Atlanta and an earlier visit to General Instrument gave me an idea of what sort of video gives compression systems problems. Static test signals should not have any problem with video compression—look at how many test signals you can cram into the ROM chips on a test generator. Video compression depends on redundancy and the way the eye perceives objects. A wide shot of a play on a football field, with the crowd in focus waving their hands in the background, is tough. A compression algorithm might give up most of the data available to the crowd, while letting the grass on the field lose resolution ("blocking") or the little football in the air disappear.

I also noticed that individual events which, by themselves, are handled with no problem, have the potential to cause problems when combined. Most TV action moves horizontally, with detail moving across the screen rather than changing. Vertical motion, like the movie promo clips with individual moving images in individual fake film frames moving up or down the screen, challenges compression techniques. Combine this with some random hue changes and a quick change to a detailed scene and you have the potential for problems.

The test tape from CableLabs demonstrates some of these problems. If you are testing a compression system, I strongly recommend you obtain a copy of the CableLabs compression test tape. It is one of the best I have seen.

If you are located in a major TV market,

you probably have a chance to get together with other TV engineers regularly to swap ideas and collect information. Or maybe you do not—too much work! There is a gathering place where TV engineers from all over the United States and the rest of the world can get together. It is the Broadcast Professional's Forum on CompuServe. I've been able to obtain a special offer for readers of this column to get on CompuServe and try it out for free.

Many engineers I have talked to about joining other broadcasters on CompuServe generally say it is too expensive and too complicated. CompuServe has recently revised its pricing. The standard pricing plan costs US\$8.95 per month. While many services are included in this price—weather and airline reservations for two—forums like the Broadcast Professionals Forum are not.

For this and most other forums, an extra charge applies based on connection time.

countries CompuServe has its own networks and applies the surcharges only during prime time (during the day). Exact details on pricing are available on CompuServe by typing GO RATES or calling them at +1-614-457-8650.

One of the things that makes CompuServe seem complicated compared to a local computer bulletin board service (BBS) is the huge number of messages and files available. It is not unusual for there to be several thousand messages available. CompuServe sells a slick software package called "CompuServe Information Manager" that makes navigating the various forums and information sources easy.

You could say the package is free, since it includes an on-line credit equal to the

meter running. You can find out about this software once you get on-line.

What will you find on the Broadcaster's Forum on CompuServe? First, you will

find all the software I have written for this column there. Because of my real job, it can take me a long time to get around to copying the disks and mail-

ing the listings you request. Using CompuServe Mail, you can leave me questions and get answers back much faster than via the postal service. Under the monthly plan, some mail credit is included in the monthly charge.

## Available programs

My programs are all available on the forum. These include PWRCAL.EXE, a calorimetric RF power calculation and logging programming and the main and accessory programs for my cheap remote control (RMTCTL.BAS and RMTACC.BAS). I will be describing these programs in future columns.

You will find a lot of other interesting software there. There are numerous programs for calculating satellite dish look angles, a satellite sun outage prediction program and toolboxes, including RFS.ARC, a collection of handy programs for engineers.

More manufacturers are using CompuServe for product support. Tektronix has been active on the Broadcaster's Forum. When necessary, Jeff Noah, the main Tektronix representative on the forum, has been able to get replies from the key designers of products like the VM-700 test set.

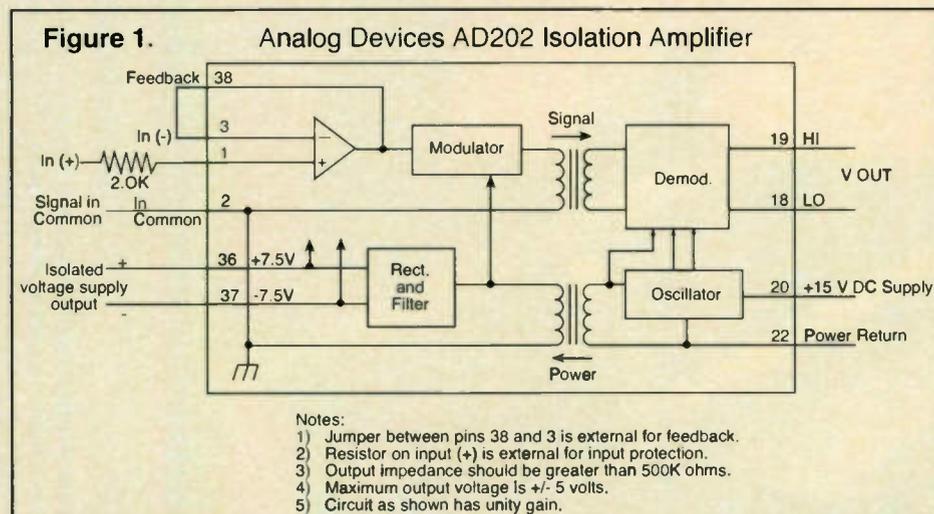
By the time you read this, Grass Valley Group should be set up in the Tektronix portion of the forum as well. I have not seen much representation from TV transmitter manufacturers, however, there are many experienced engineers ready to help. One of the things that impresses me about the Broadcaster's Forum is the amount of technical help available. Ask a question about a tower location problem, for example, and you are likely to get replies from other engineers and consultants who have solutions.

I do not have the space here to describe how to use CompuServe. The best way is to try it yourself. Thanks to John Hoffman, the chief system operator (SYSOP) on the Broadcast Professional's Forum, I can offer readers a free sign-up kit with US\$15 of on-line time to try it out. Visit the forum, download my files, look at the other offerings. The monthly plan offers access to airline reservations, weather information (including satellite photos) and more at no extra charge.

To obtain the sign-up kit, call +1-614-457-8650. I should point out here that I have no financial interest whatsoever in your joining the forum. I think it is a valuable tool for all broadcast engineers and particularly RF engineers, which you may have noticed are becoming scarce.

## Isolating voltages...

Last month I promised information on an inexpensive way to measure voltages that are not referenced to ground. Some remote control systems float both wires for analog voltage readings. Most have one side grounded. Even those systems that have



The rates for this vary depending on the speed of the connection. As I write this, the current rate for 2400 baud access is under US\$25 a minute. If you are accessing the CompuServe network from outside the U.S., extra charges may apply, depending on the time of day and the location. In some

cost of the package. It is a good way to get started, although not the most efficient for forum messaging. Most active forum members use some sort of automatic software to retrieve, read and reply to messages. They work off-line, so the reading and reply writing can be done without the

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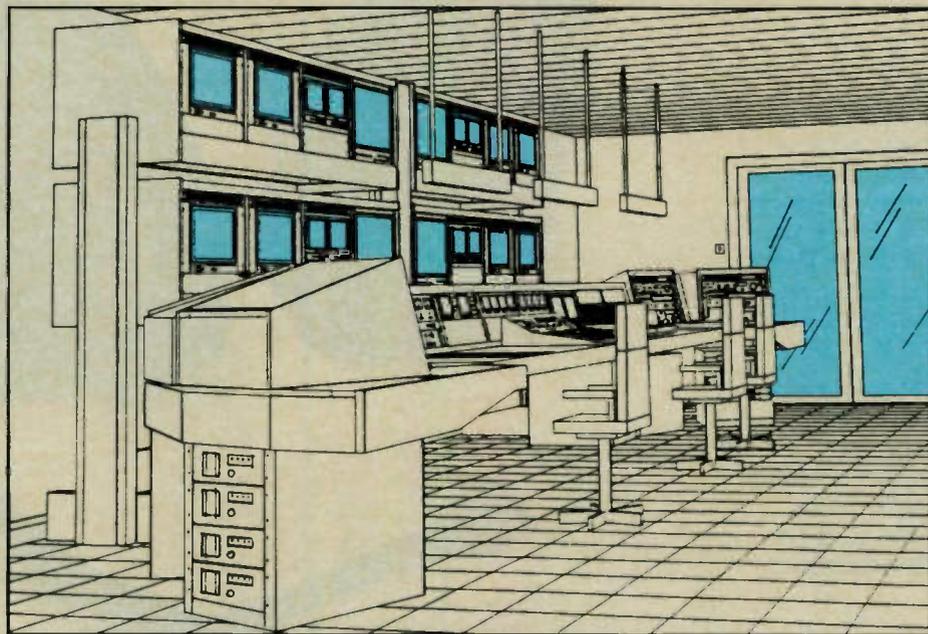
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differential inputs have limitations. In many high voltage supplies for tube amplifiers (conventional and klystron), the low side of the supply is often elevated above ground with a resistor. This provides a convenient way to protect the transmitter from high voltage arcs. Any arcs that occur to ground will cause current to flow in this resistor, which can be sensed and used to shut off the voltage. In such circuits, the shunt resistor used for sensing the current through the tube must not be connected to ground.

Analog Devices has developed a line of low cost, miniature isolation amplifiers. There are various types of amplifiers. The AD202 series operates directly from a 15 volt DC supply, while the AD204 series is powered by an external, isolated clock (the AD246). If you plan to use several of these, the AD204 series offers some cost savings, lower power consumption and higher bandwidth. The AD202 series is simpler to use. That is the one I will describe here.

The isolation amplifiers work by using an input op amp to drive an amplitude modulator, which drives an isolation transformer. The secondary side of the transformer is connected to a demodulator, which provides up to +/- 5 volts peak output. The input op amp has all terminals available, so it can be used to amplify, offset and/or invert the input voltage. The AD202 has an internal oscillator that is used to supply AC power to an internal power isolation transformer. An isolated voltage is available on the other side, however, it is limited to +/- 7.5 volts at 5 milliamperes.

**AD202 diagram**

Figure 1 shows a functional diagram of the AD202 along with the pin connections for the DIP package.

Operation of the isolation amplifier should be self-evident from Figure 1. Analog Devices does have a few tips for designs. Remember that voltages in and out cannot exceed +/- 5 volts. Negative voltage can cause current to flow through the input if the power is removed to the isolator. For that reason, use a 2,000 ohm resistor on the input to prevent the current from damaging the isolator or preventing the oscillator from starting. If the source cannot deliver more than a few milliamperes, this resistor is not needed.

For unity gain applications, pins 3 and 38 are shorted. If gain is needed, a feedback resistor (Rf) can be inserted between pins 3 and 38 with a resistor (Rg) from pin 3 to input common (pin 2). Analog Devices says that Rf should be 20,000 ohms or more. If gain exceeds 5, add a 100 pf capacitor from pin 38 to input ground pin 2. The resistors needed for a given gain can be determined from the equation: Gain = 1 + (Rf / Rg). Other standard operational amplifier circuits can be used around the op amp in the AD202. Just keep in mind that

Rf must be 20,000 ohms or more and a cap may be needed.

When designing circuits using the AD202, ground everything well and be sure that wiring or PC traces do not reduce the up to 2000 volt isolation. The AD202 family includes both SIP and DIP packaged units with isolation up to 2,000 volts. The AD202JY is in a SIP package with 1000 volt isolation and +/- 0.05 percent linearity. The AD202JN is the same unit in a DIP package. For 2000 volt isolation, replace the J with a K in the part number. The 2000 volt model

has better linearity— +/-0.025 percent. Allied Electronics stocks the AD202JN, under part number 630-0265. The last catalog price I saw on it was US\$45.00. For other distributors or distributors outside the U.S., contact Analog Devices at telephone +1-617-329-4700 or Telex 924491. The address is One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106 U.S.A.

The Analog Devices data sheet on the AD202/AD204 has physical details, pin outs for all versions and application examples. A final warning! These ampli-

fiers isolate up to 2000 volts—they will not isolate the output from the full plate voltages used in most transmitters. Take care in how they are installed and make sure that if they should fail, they do not place dangerous voltages where they could harm someone.

That's it for this month. Next month, I will be finishing up this column at NAB. Look for information and comments on the show gathered from the show floor, the technical sessions and my colleagues.

As always, I welcome your

comments and questions. My schedule makes it somewhat difficult to reach me, so MAIL via CompuServe is best—my ID is 70255.460. My mailing address is 2265 Westwood Blvd, Suite 553, Los Angeles, CA 90064 U.S.A. Telephone numbers are +1-818-502-5739 and +1-305-884-9664. Because of my travels it may take a day or more to return calls if I am on the road.

*Doug Lung is vice president and director of engineering for the Telemundo Group of stations.*

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# The Affair Between Two Companies

**SOMEWHERE OUT THERE** You might not have noticed that Panasonic and Sony have a love/hate relationship. You probably have noticed that they hate each other; it's their secret passionate love affair that they usually hide from prying eyes.

I don't blame you if you don't believe me, but it's true. I mean, wouldn't you call it a sweet gesture for Sony to promote D-3 and D-5? Or how about Panasonic touting Digital Betacam? I know it sounds crazy, but I am *not* making this up.

Hey—it ain't just Panasonic and Sony. You want to see some strange bedfel-

lows? Go take a look at the latest wedding in international TV news. Let me see if I can keep this straight:

## Wedded bliss?

ABC and NBC are competitors in the U.S., right? And the BBC and ITN compete in the U.K. And NBC and the BBC have a forty-year marriage, sharing facilities and footage. And ABC and ITN have a similar arrangement to use each other's tape. And, now, without either marriage breaking up, ABC News and BBC News have decided to team up. I don't think I'll ever understand the new morality, but it isn't just humans and

news bureaus—now it's VTR formats, too.

What were Sony's three hottest video recording products at NAB? Digital Betacam, the front-end that turns a D-2 VTR into a component recorder, and the front-end that turns a D-1 recorder into something very much like *two* D-1 recorders. I'll get back to Digital Betacam in a bit (pun intended), but for now I want to take a closer look at those front-ends.

(Truthfully, I really *do* want to take a closer look at those cute little compressors. The space-time warp of trade press publishing being what it is, I'm writing

this post-NAB piece with snow still on the ground. It'll be months yet before you get to read this deathless prose and threaten to riot unless I get the Pulitzer Prize).

Anyhow, the idea behind the first front-end is supposed to be that you take a 10-bit 270 Mbps serial digital component signal, squish it by a factor of 2:1, and record it on a modified D-2 machine. I heard one Sony official make it sound so complicated that he said it not only wouldn't work on Panasonic's D-3, but might not work even on competitors' D-2s or even first generation Sonys. Yeah, right.

Heck, if that was what was really going on, it'd sure enough be magic, all right. Half of 270 Mbps is 135 Mbps, and I'd give a week's loan of my false teeth to

*... wouldn't you call it a sweet gesture for Sony to promote D-3 and D-5?*

see that get recorded on an NTSC D-2 machine recording 8-bit 4fsc digital video, which, if the batteries in my calculator are still good, comes to around 114.5 Mbps, all inclusive. Nah, I don't think so.

## Error concealment

I figure there's some compression in excess of 2:1 taking place—probably closer to 3:1—and the machine is just recording what it thinks is a normal 4fsc 8-bit signal. Where the problem comes in is in the fact that DVTRs aren't perfect. Even after the machine's error correction, there are going to be errors, and those normally get concealed.

Now, in your garden-variety, run-of-the-mill D-2 tape, a pixel that's in error just gets concealed by the values of the pixels around it, just like in a dropout compensator in an analog VTR. Only who knows what the pixels around something are when you're dealing with compressed, 10-bit, frequency-domain signals in a machine designed for uncompressed, 8-bit, time-domain?

That's where the machine modification comes in. You have to get rid of the error concealment in the machine and let the front-end (now a rear-end on playback) do its own error correction and concealment. The end.

I can't think of a D-2 machine that's ever been built that I can't get rid of the error concealment on (stick a pair of dikes and a soldering iron in my hand, and I can get rid of one whole heck of a lot). That means Sony's D-2 front-end compressor will work not only on their own first generation machines but also on every machine Ampex or Hitachi have ever built. Heck, I think it'd be a neat challenge to try to come up with a compatible D-2 machine it *won't* work on.

## All the same?

Oh yeah, one more thing. Since, on a baseband digital video signal level, what gets recorded on a D-3 machine is identical to what gets recorded on a D-2, unless I'm being particularly stupid this month, the same front-end will also work on a JVC or Panasonic D-3 machine. Let

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me see if I can put that a bit more succinctly: Sony is selling products that turn D-3 machines into component recorders. I don't think I'm making this up.

Second canto: Sony's D-1 front end takes 540 Mbps (4:4:4:4 at 10-bits or even two completely different 4:2:2 10-bit signals) and records them on a single, 216 Mbps machine. Once again, 2:1 won't hack it. Once again, error concealment is a problem. Once again, I can't think of any good reason it won't work on Panasonic's D-5 VTR. Yes, I do believe I have just listed two products Sony is selling that will enhance Panasonic's product line.

Like I said, I haven't made it to NAB yet ("Mario! It's May, already!"), so I haven't heard what Sony officially has to say about those devices, but, whatever it is, I've learned to take it with a grain of salt. I tend not to believe things till I see them. Let me see... Somewhere in the nether regions of my memory I've managed to dredge up the time Sony said it would never manufacture S-VHS machines. Heck, if you go back far enough in Sony history you come to the time they made special shirts so their "shirt-pocket-sized" transistor radios would fit and the time they sold heating cushions under the name "Ginza Heating Company" so no one would know it was

### Or how about Panasonic touting Digital Betacam?

them (okay, so that last one was before they changed the company name from Totsuko to Sony).

Hey—I'm not saying Panasonic is some paragon of virtue, either. Let me see... I seem to recall one Panasonic ad that added up features in an S-VHS editing deck, came up with a price, and then told you in fine print that the price didn't include everything that got added up.

#### Multichannel processing

Anyhow, I think I've ranted about this kind of stuff before. This month, I have to give examples of the secret Panasonic love affair for Sony.

Panasonic, back in the days when a D-3 machine couldn't operate without a rack of life-support equipment hidden behind a curtain, promulgated a schedule for D-3-related products. First would be D-3, then a D-3 camcorder, then a component version (D-5) and a multitrack audio recorder based on the same deck. They've delivered D-3 and the camcorder, and I think they're right on schedule for D-5, but there aren't any D-3-based multitrack audio recorder I've seen.

What there is is Panasonic's new multichannel processing unit. This is a box that accepts eight audio channels (analog or digital), compresses them, and squirts them out on a two-channel AES/EBU connection. Two boxes means 16 channels in and four channels out.

That means that an ordinary D-3 or D-5 machine becomes a 16-channel multitrack audio recorder without giving up any video. Pretty hot patooties, eh? My Japanese isn't what it used to be (and it didn't used to be any great shakes), but, as best I can decipher the documents I've seen, the system allows individual channel editing and cross-fading and maybe

even audio in stunt modes. It uses sub-band ADPCM to squish down to 192 kbps per channel.

#### A ridiculous example

Yeah, I can just see someone wandering around with a D-3 camcorder with 16 wireless diversity receivers hanging off it. Heck, let me hypothesize the most ridiculous case: make it a D-5 camcorder

ness in the audio in jog mode without the remote interface, but that's about it. Translation: Panasonic is building products to extend the range of Sony equipment (and Ampex, BTS and Hitachi).

That was the nitty. Here's the gritty: Panasonic's campaign against Digital Betacam is based on the mantra that Compression Is Bad For You (unless it's really heavy-duty compression and buys you a lot—like the 50:1 ratios used in the HDTV broadcast schemes). The Panasonic folks I ask about the arrival

sors. I also don't think you'll have found Sony comparing its uncompressed audio to Panasonic's uncompressed video nor Panasonic comparing its compressed audio to Sony's compressed video.

I've said it before, and I'll say it again: Compression Is It. But with Panasonic and Sony blowing secret kisses back and forth across the NAB show floor, what it is getting more confusing than ever.

Oh, and did you hear that Sony will be manufacturing D-5 decks for Panasonic and that Panasonic will be taking a Digital Betacam license from Sony to sell machines with a Panasonic label in Europe? Me, neither.



by Mario Orazio

## Masked Engineer

and keep the 16 diversity receivers, but add a second camera. Sony's D-1 front-end, and two of these Panasonic 8-channel audio compressors. And you thought the PCP-70 was heavy?

I admit it: the last paragraph was downright silly, but I've since slapped myself, and I'm feeling better. Now to the nitty-gritty. Panasonic's 8-channel audio compressor formats the results of its compression to look like a two-channel AES/EBU digital audio signal. That means it'll plug right into a D-3 or D-5 machine. It'll also plug right into D-1, D-2, Digital Betacam or even DCT. There might be some trick-

of the *uncompressed* multichannel audio recorder hem and haw a lot and tell me it's still on schedule. Meanwhile, they're selling this *compressed* system for their top-of-the-line recording products. Is it just me? Does anyone else find it strange that Panasonic is simultaneously promoting and decrying compression?

I don't think you will have found signs at Sony's booth promoting their front-ends as products that enhance Panasonic's line nor Panasonic's sales force directing you to Sony's booth to find recorders for their multichannel proces-



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# A Lesson in Arm-Waving Math

## First in a Series

The expression "arm waving math" deserves explanation. "Arm waving" is a derogatory term often used by mathematicians and physicists to describe derivations which are not absolutely complete and rigorous. Several steps may have been skipped and/or approximations made during the derivation.

The goal of this series of articles is to show that you already know how to solve more problems than you realize. Here's the first:

Given: Height of a tower. What is the distance to the horizon, from tower top?

The distance to the horizon from the top of

a tower is easily determined. Inert knowledge and some arm waving are used in the demonstration below. This tower height, for

this example, is  $t$  feet. It will be assumed that the earth is a smooth sphere. (The equations published in handbooks do this.)

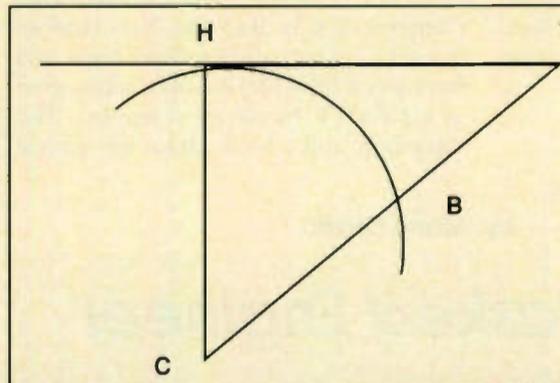


Figure 1.

B = Base of Tower  
C = Center of Earth  
H = Horizon  
T = Top of Tower  
BT = Tower Height is  $t$  feet



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Draw a circle, representing the earth. Now add a tall tower at some point. A line passing through the top of the tower and tangent to the earth determines the horizon, at point of tangency. (This figure is not included.)

We are only concerned with a small segment of the earth, located between your tower and the horizon. Redraw, using only an arc segment of the earth. (See Figure 1.)

We want to find the distance from the

## TECH TIP

by Larry Albert

tower to point H. The straight line distance and the arc distance along the surface will be very nearly the same for any physical tower. We will solve for length of straight line HT.

Known:

CHT is a right triangle ( $CH \perp HT$ )

Earth circumference is 25,000 miles.

$a^2 + b^2 = c^2$   $c = \pi x d$   $d = 2x r$

Calculation:

$\pi x d = 25,000$  miles

$d = 25,000 \div \pi$

( $\pi \approx 3.14$ )

$d \approx 8,000$  miles

$CH \approx 4,000$  miles

$a^2 + b^2 = c^2$

$CH^2 + HT^2 = CT^2$

$4,000^2 + HT^2 = (4,000 + (t/5280))^2$

$4,000^2 + HT^2 =$

$4,000^2 + 2x4,000x(t/5280) + (t/5280)^2$

$HT^2 = 2x4,000x(t/5280) + (t/5280)^2$

$(t/5280) \ll 2x4,000$

$HT^2 = 2x4,000x(t/5280)$

$HT^2 = (8,000/5280)xt$

$8,000/5280 \approx 1.6$

$HT^2 \approx 1.6xt$

$HT = \sqrt{1.6xt}$

$HT = (\sqrt{1.6})(\sqrt{xt})$

$HT \approx 1.25x\sqrt{xt}$

Using a calculator to check this solution, without rounding off, the answer would be:

$$HT = 1.22766x\sqrt{xt}$$

Using actual earth diameter of 7926 miles the answer is:

$$HT = 1.2252087x\sqrt{xt}$$

NAB Engineering Handbook, Eighth Edition, page 2.6-163, gives this formula:

$$HT = 1.23\sqrt{xt}$$

With a little arm waving we have calculated a value within 2 percent of the handbook formula. NOTE: This is the OPTICAL horizon. For the radio horizon frequently it is assumed that the earth's size is increased by 4/3 to calculate the distance. This 4/3 Earth factor allows for some beyond-the-horizon coverage.

NAB Engineering Handbook, page 2.6-163, the formula for the RADIO horizon, (no ratio specified), is given as:

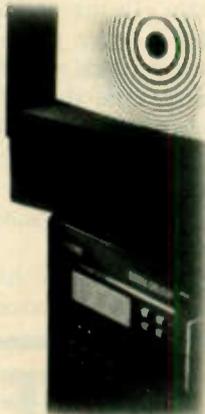
$$HT = 1.41\sqrt{xt}$$

You already knew everything used to solve this problem, except perhaps for the page number to find the formula in the handbook. Inert knowledge applied with arm waving approximations achieved a solution which gives an answer having an error of less than 2 percent.

Larry Albert is a television engineer at Murray State University in Murray, Kentucky. He may be reached at +1-502-762-4664.

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# EL VALEROSO MUNDO DE VIDEO

En la industria cinematográfica, el avance de la tecnología nueva ha sido siempre a paso de tortuga. Máxime éste desarrollo, los cinematógrafos han tenido al tiempo y a la tradición de su parte al perfeccionar su oficio. Los técnicos de video no han tenido la misma suerte.

Desde el año 1975, cuando se realizó la industria del video portátil, la tecnología ha cambiado tan rápidamente que la única manera de mantenerse al tanto de las herramientas y técnicas nuevas ha sido de primera mano. En aquellos días de fracasos catastróficos de equipo que ocurrían casi a

diario, la habilidad mecánica estilo "Rube Goldbergesque" solía ser el arma más valiosa para la supervivencia económica.

Este mes, fijemos nuestra atención en ciertas tendencias que creo están cambiando o cambiarán la técnica de producción de video en la década de 1990. No es posible decir con certeza cual será el desenlace de todo este movimiento. Pero sí sabemos que el técnico de video, si desea explotar ésta oleada de cambio, tendrá que aprender nuevas técnicas y adiestrarse en artes de producción que no se pensaban importantes.

He aquí las tendencias más importantes que enfrentaremos:

Tendencia #1: La televisión y la computadora personal se están uniendo. Esto podría ser el titular tecnológico de la década de 1990. Lo que significa es esto: El control y preparación de la televisión pasará a manos del televidente. Gracias a la computadora personal, la televisión interactiva es una realidad inminente. La época de video por solicitud, o de "medio personalizado" está por empezar.

El efecto que ha tenido la computadora personal ya se siente en el proceso de

producción de video. La mayoría de fabricantes de equipo de video pronostican que la computadora personal trasladará el proceso de producción de video al escritorio de oficina. Algunos profetizan que la gran parte del proceso profesional de montaje de video y de post-producción será hecho en computadoras personales al cabo de cinco años.

Para el técnico de video, esta situación crea un imperativo: Aprender como fun-

## EL ARTE DE VIDEO

por Frank Beacham

ción una computadora. No es necesario graduarse de ingeniero digital o de experto de ciencias de computación, pero sí es necesario tener una idea conceptual de como se están empleando las computadoras en el campo de producción de video.

Tendencia #2: La televisión digital avanzada (DATV) ha reemplazado a la televisión de alta definición (HDTV). No puedo exagerar la importancia y las consecuencias de esta transición o alejamiento de la HDTV. La DATV será de más alta calidad que la HDTV, otorgará más capacidad, a la vez que usará el espectro de radio con más eficacia. La DATV será mucho más flexible que el presente sistema de televisión analógica. El sistema proveerá para la transcodificación más barata y sencilla entre los varios formatos visuales.

La DATV proveerá a los televidentes más control y mejor selección de lo que verán, cuando lo verán, y de que manera recibirán la programación. Esto podría llevarnos a la televisión programada por cada individuo.

La importancia de este cambio de filosofía en la tecnología televisiva es significativo para los productores de video de las casas de producción más pequeñas. Por una parte, la tecnología de HDTV favorece a los proyectos de gran escala, tipo "Hollywood" que son producidos en película de 35mm, pero la DATV ofrece mejor selección a los televidentes. Las nuevas tecnologías de satélite de emisión directa (DBS) y tono de marcar de video (telco "video dialtone") tendrán un alcance de millones de televidentes.

Tendencia #3: Los sistemas de "multimedia" aumentarán los usos para el video. Según con quien se hable, los sistemas de "multimedia" son o la tecnología revolucionaria del mundo de comunicaciones, o simplemente otra tecnología hipermencionada buscando puesto en el mundo real.

Sea el que sea el desenlace final, los sistemas de "multimedia" tendrán mucho efecto en la producción de video en ésta década. Los gigantes de la industria de computadoras (Apple, IBM, etc.) se están uniendo a los gigantes de los medios de comunicaciones (Time-Warner, Sony, etc.) para fomentar normas y programación (software) interactiva que integra al video con el audio digital, el texto y la animación.

Asesorando únicamente éstas tres tendencias se puede marcar el cambio en como produciremos el video en los años de 1990. Todo aspecto de la empresa necesitará nuevos métodos—desde como se escriban y relaten las historias hasta como se manejen las imágenes, el sonido y el texto al integrarlas en los programas de "multimedia." Es una frontera valerosa.

Frank Beacham es director y productor basado en Nueva York.

# "It's all in there!"

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# Laserdisc Players for Pay-Per-View

One of the most interesting things about working in cable these days is watching the beginning of the end of videotape. In order to make effective use of revenue-generating opportunities such as pay-per-view, video-on-demand and ad insertion, modern cable facilities are requiring more and more video sources. It is not uncommon for a large cable system to have more than 100 VTRs in service.

Each facility has to deal with three problems relating to VTRs. First, VTRs are complex electromechanical devices that require a lot of maintenance and repair, which have to be performed by a highly skilled technician. The cost of parts and labor can be enormous.

Second, the cost of the VTRs themselves dictates that industrial-grade VTRs be used in most cable applications. This presents a serious quality issue. The format choices are limited to 3/4" U-matic, S-VHS and Hi8. Each has its benefits, but none can be considered "broadcast quality," especially after the multiple generations frequently needed for ad insertion systems.

The third problem with VTRs is tape cost. The cost for the videotape needed to feed large cable systems can be substantial. Also, in many repetitive applications, tape wear can be a major problem.

## Problem solvers

Until recently, there were no solutions to these problems. A cable system simply had to live with the limitations of videotape. Two technologies are rising to meet the challenge: hard-disk-based digital storage and videodiscs. Each has a different application in a modern cable facility.

Digital storage systems are used primarily for ad insertion. These systems store video information as compressed digital data on computer hard drives. The data is accessed by a controller and converted to video, which is then inserted in the local availabilities of cable networks. With this method, all of the drawbacks of VTRs are eliminated. Computer hard drives are not mechanically complex and can be changed easily in the event of a failure (assuming the data is backed up!).

And because the video is stored as digital data, there is no generation loss and the technical quality is roughly as good as the source. I say "roughly" because computer-stored video is compressed, and digitally-compressed video exhibits a different kind of degradation than that accompanying multigenerational analog video. Compression artifacts tend to show up as pixelation or large blocks of color, particularly in scenes with lots of movement or detail.

Compression is usually achieved by tracking the changes in successive frames. If there are too many changes or too much detail for the system to handle, it breaks down. Different levels of compression have different levels of degradation. A big question surrounding compression is "how much is too much?" The trade-off is that the more compression used, the more visible the degradation. At the same time, though, higher compression levels mean there is less data to

store, so more program material can be stored for a given hard drive.

With hard drives replacing so many playback VTRs, a cable system will be able to afford to use top-quality source VTRs to get outside video into its system. Naturally, tape costs, with such a system, are dramatically reduced. Eventually, commercials will be downloaded in a digital format, eliminating tape altogether.

A number of companies are in the process of developing digital storage systems and they are being beta tested at several locations.

## Enter the laserdisc

The new digital storage systems should work very well to replace VTRs for ad insertion, but they have a major drawback that limits their use for the other two cable revenue sources requiring VTRs, video-on-demand and pay-per-view. Current storage algorithms allow only about 15 minutes of active video to be stored on a 1GB hard drive. This is fine for the storage of 30-second commercials, but it is not effective for storing two-hour movies.

Enter video laserdiscs. This is not new technology, but it is technology in the right place at the right time.

Many cable systems have discovered how lucrative pay-per-view can be. Pay-per-view allows a subscriber to order and pay for a one-time showing of a given program. Pay-per-view programming includes sporting events, concerts and movies. The NBC Summer Olympics Triplecast and big-dollar boxing matches have made pay-per-view well known to the public.

Movies constitute by far the largest number of pay-per-view events. In cable systems, movies are usually played back from tape on industrial format VTRs.

Most of the problems with videotape associated with ad insertion also apply to pay-per-view. As video-on-demand becomes a more of a possibility, the number of playback machines required increases dramatically.

## A new Plus

Pioneer Communications has a solution to the pay-per-view VTR problem called "Plus." Plus is similar to other program

*Pioneer Communications has a solution to the pay-per-view VTR problem called "Plus."*

automation systems except that instead of using VTRs it uses LDV-8000 laserdisc players. There are tremendous advantages to using laserdiscs for this purpose. First, the machines are very simple and, therefore, reliable. They require almost no maintenance, and because there is no contact between the media and guides, rollers and heads, the discs last virtually forever. Video quality is approximately on a par with industrial videotape, but there is no dubbing required, so there is no generational loss. Audio is high-quality digital. (The improvement in audio alone is worth changing to laserdisc!)

Pioneer's LDV-8000 has a built-in time base corrector and can be synced to house black for clean switches. One of the most frequent comments made by operators familiar with tape, when they first sit down in front of a laserdisc player, is: "How long does it take to shuttle from first to last video?" The answer, of course, is less than one second, since that is the amount of time it takes the laser diode assembly to move from the outside to the inside of the disk.

Pioneer even offers an auto-changer, the LC-V330, which is like a laserdisc juke-

box that holds up to 72 discs. Other companies besides Pioneer also offer interfaces that allow their automation systems to control disc players.

Quite a few systems are operating in the field now, with more starting up every week.

Of course, as with any new technology, there are trade-offs. Laserdisc recorders are very expensive and the discs they use are not rewritable, so local cable systems

are not likely to be making their own discs. This eliminates laserdiscs from consideration for commercial insertion, since a major characteristic of commercial insertion systems is a high turnover of ads.

Another issue concerning laserdiscs is how much movie product is available on disc.

Because current distribution systems are set up for videotape, it is sometimes difficult to get a title pressed to disc, particularly with low-budget and adult titles. Big box office titles are usually distributed on laserdisc as well as tape, and if availability through normal channels becomes a problem, a pay-per-view manager can frequently go down to the local video store and pick up a copy. Still, a certain number of VTRs have to remain in service for now.

The future is here. Videotape is going the way of other pieces of television technology such as vacuum tubes and film chains.

The exact direction new technology will take is not yet clear, but non-tape technology is already being used extensively to replace tape in cable plants.

*Jon Hazell is master control operations supervisor for Paragon Cable in Portland, Oregon. Write to him care of TV Technology.*



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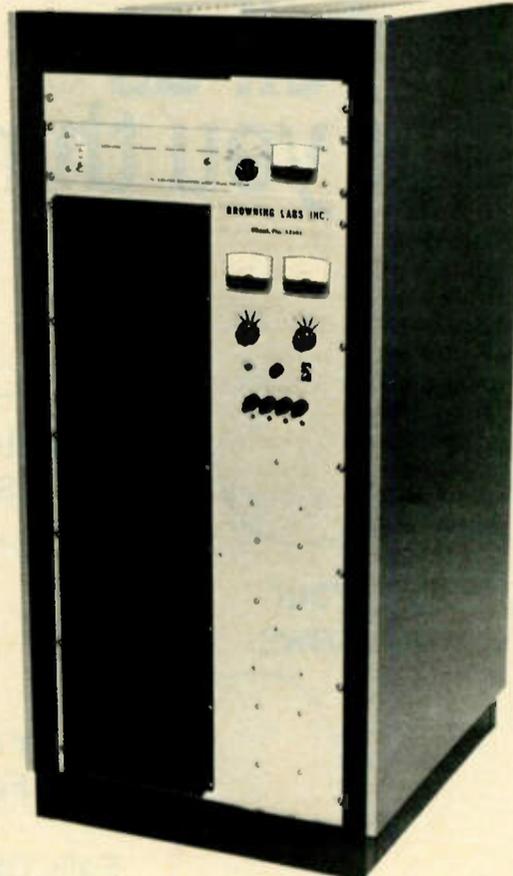
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# Montreux International Television Symposium Exhibitor Directory

The 1993 Montreux Exhibitors Directory is a listing of information provided by exhibitors who responded to a Montreux ITS questionnaire. Exhibitors were asked about new products scheduled to be shown at Montreux this year.

Information from questionnaires returned by deadline are included here.

3M Europe SA, Pro A/V Prod. Div.

625 and Beyond

ABE Elettronica SPA

Abekas Video Systems Ltd.

ABS Aquila Broadcasting

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*New products:* Lynx2000-MA satellite news gathering vehicle. AVR 3950 satellite receiver. Trailer-based uplink systems.

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For more information, circle Reader Service 59

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*On Display:* The DCT CCIR-601 digital component post production system, which consists of a new format 19mm digital component tape drive (DCT 700d), companion tape cartridges (DCT 700t series), post production switcher (DCT 700s), computerized edit controller (DCT 700e), digital effects system (500a) and interconnect devices. Also video-tape products.

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For more information, circle Reader Service 113

AMS Industries PLC

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*New products:* The Logic Series Digital battery system. The Automatique on-camera light control circuit that senses a VTR "record" signal to automatically turn on the camera light. Ultralight 2 on-camera light system. The MP-4D Logic Series microprocessor four-position fast charger. The DM-4 discharge module/battery evaluator/microprocessor-based diagnostic accessory module.

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Aston Electronic Designs Ltd

B181

*New products:* Motif ESP character generator, with full range of Motif functions, plus an additional full color and fully featured static plan. Upgraded options to Motif, including Digital Video Grab and Version 3 software.

*Also:* Wallet Two with digital interfaces.

(continued on next page)

## Montreux Broadens Horizons

(continued from page 1)

impact. An all-day session and a policymakers' roundtable discussion featuring well-known industry, economic and political personalities is scheduled. Also on the slate is a special future technology exhibition, where attendees will get a chance to see what might be in their futures.

"There will be a bit of string and sealing wax there, I expect," said Stow. The exhibit will be financed and organized largely by non-profit organizations and research institutes.

### Montreux and/or IBC?

Recently, Montreux has come under increasing fire from some in the industry who feel it is lacking in suitable accommodations, parking and facilities for such a large international show. In response, organizers of the International Broadcasting Convention (IBC) show in Amsterdam have considered making their show an annual event, rather than switching off with the Montreux ITS every other year. That idea, however, has met with less than unanimous support from both exhibitors and broadcasters.

ITS officials believe they have now addressed many of the concerns, and said they will continue working toward a better show.

Logistically, Montreux ITS attendees and exhibitors should have an easier time getting around (and staying in) Montreux. Ferla noted that there are two new parking garages and two refurbished hotels in Montreux to accommodate 600 more people.

And, for exhibitors, the good news is that the convention center *really* is finished.

"We kept saying it was finished, and it kept getting more and more finished," said Stow. Inauguration of the new center is to take place 20 April.

"We know we have some weakness, but we also know where our trumps are—particularly the politically neutral setting of Montreux where the pros and cons of technology can be exposed," said Ferla.

As for a "competing" annual IBC, Ferla said he was "nicely informed" by IBC Chairman John Wilson that "at this stage, the IBC has no intention of doing an annual show."

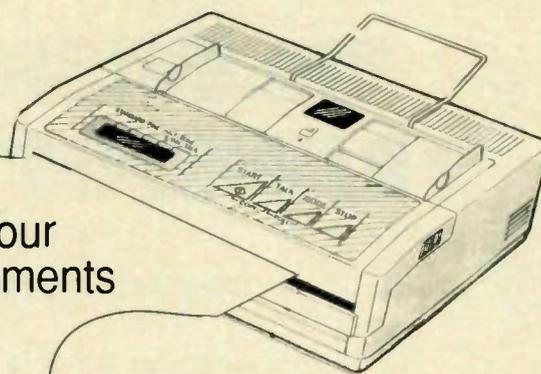
The sessions will begin Thursday, 10 June and run through Tuesday, 15 June. The Technical Exhibition will be open from 10 a.m. to 6 p.m. from Friday, 11 June through Tuesday, 15 June. For more information, contact the Montreux ITS at telephone +41-21-963-32-20 or FAX +41-21-963-88-51.

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125-127 Deepcut Bridge Road  
Deepcut, Camberely  
Surrey, GU16 6SD  
United Kingdom  
T: +44-252-836221  
F: +44-252-837923

For more information, circle Reader Service 45

**Astrodesign Inc.**

**Audio-Technica Corp.**

**Audio Kinetics Ltd.**

**Audio Follow**

**Audio Processing Technologies**

**Audio Ltd.**

**Audio Export Georg Neumann**

**Audio Engineering Ltd.**

**Audio Systems PAS AG**

**Augereau Audio Video**

**Autocue Ltd.**

**Avexco SA**

**Avid Technology Inc.**

**Avitel Electronics Ltd.**

**AVS Broadcast**

**B331**

**AVS Graphics Ltd.**

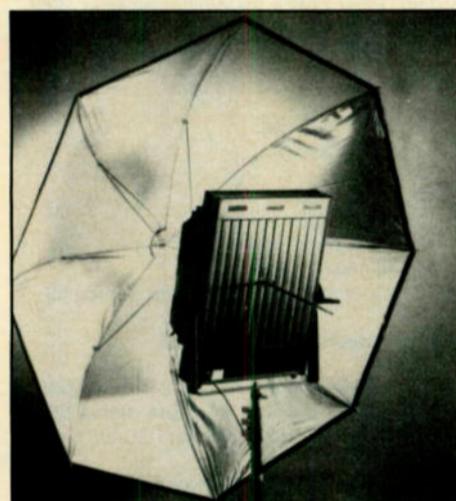
**B331**

*On Display:* OmniBus network system for connecting and operating a wide range of video equipment from many manufacturers; its heart is the OmniBus Station, a dedicated user interface for controlling equipment ranging from character generators to Betacam players to routing switchers. Also FloatingPoint, Manuscript 500 and Manuscript Junior character generators.

Contact: Rima Sisalem  
5 Mead Lane  
Farnham  
Surrey, GU9 7DY  
United Kingdom  
T: +44-252-717151  
F: +44-252-717073

For more information, circle Reader Service 123

**BAL UK Ltd.**



**Balcar Zebra**  
Umbrella mounted on Fluxlite

**Balcar SA** **13836**

*On Display:* FLUXLITES, which are high frequency/high intensity fluorescent light-boxes, suitable for TV new sets, location interviews, large cyclo-rama areas, still-life production sets, teleconferencing rooms and people. Each FLUXLITE draws only 220 W (2A @ 110V, 1 A @ 220V) while producing more light than most 1000 W or 2000 W standard Tungsten fixtures, according to the company.

Contact: Patricia Baliozian  
32, bd Flandrin 75116  
Paris, France  
T: +33-1-45 03 00 30  
F: +33-1-45 03 12 48

For more information, circle Reader Service 72

**Barco NV International** **B117**

*On Display:* High definition broadcast monitors; high definition large screen projectors; LCD projector; established range of auto setup monitors

for measurement, control and viewing; digital interfaces to BARCO monitors. Cable and satellite equipment, including a remotely controlled head-end configuration for cable TV systems and networks. Retrovision 8000 HDTV projector.

Contact: Kristien Verhaeghe  
Th Sevenslaan 106  
B-8500 Kortrijk  
Belgium  
T: +32-56-233-211  
F: +32-56-233-461

For more information, circle Reader Service 26

**BASF Magnetics GmbH**

**BASYS Automation Systems Ltd.**

**BDL Autoscript Ltd** **B169**  
*New products:* +NewsPlus+, +StudioPlus+, and +LocationPlus+ PC-based prompting systems that are multitasking and offer dual screen editing. +NewsPlus+ can be connected to a host newsroom computer and is BASYS compatible. Listec A6000 prompting system. ScrollBuddy dual screen, pocket-sized prompter.  
*Also:* On-camera prompters.

Contact: Chris Lambert  
Unit A8, Poplar Business Park  
10 Prestons Road  
London, E14 9RL  
United Kingdom  
T: +44-71-538-1427  
F: +44-71-515-9529

For more information, circle Reader Service 54

**Beijing Broadcast Equip. Factory**

**Bell Carter Elliot Richards**

**BES Electronics Ltd.**

**beyerdynamic**

**BFE AG**

**BIB Ltd.**

**BLT Italia SRL**

**Boffi Audio Rack HI-Fi SPA**

**Bosch Mobile Kommunikation**

**Broadcast Store/BCS-Europe**

**Broadcast Technology Ltd.** **B190**

*New products:* The Juggler routing matrix, available with video, audio, time code and RS-422 switching capability. Model TG4000 ITS generator. Model TG4025 Performer test generator. SHOWMAN off-air tuner.

Contact: David Drew  
Walworth Enterprise Centre  
Andover  
Hampshire, SP10 5AP  
United Kingdom  
T: +44-264-832633  
F: +44-264-334509

For more information, circle Reader Service 35

**Broadcast Video Systems Ltd.**

**Broadcast Developments Ltd.**

**Broadcast Technology Ltd.**

**Broadcast Video Eng. Ltd.**

**BTS Broadcast TV Systems**

**C-Cor Europe BV**

**Cable-Con A/S**

**Cablerie**

**Cables Cortailod SA**

**Calrec Audio Ltd.**

**Cambridge Animation Systems**

**Canare Electric Co. Ltd.**

**Canford Audio**

**Canon**

**Carey Howells Jeans & Spira**

**Cartoni SRL**

**Catec AG**

**B318**

*On Display:* Head end equipment from Hirschmann (fully computer-controlled head end "Karin"), the Dutch manufacturer J&S, and the Danish Arcodan product line. The latest DFB-lasers from Philips Broadband Networks. Cheetah monitoring system from Superior Electronics. PC-based teletext equipment from Teleworld. Salora pay-TV systems from Nokia. Sweep systems and field strength meters from Calan and Sadelco. A range of 1 GHz broadband distribution equipment from Philips Broadband Networks and Arcodan.

Contact: Markus Estermann  
Luzernerstrasse 147  
Postfach, CH-6014 Littau, Switzerland  
T: +41-57-82-57  
F: +41-57-82-19

For more information, circle Reader Service 42

**CEL Broadcast**

**Central Dynamics**

**CES International Corp.**

**Ceta Electronic Design.**

**Charles Bell Advertising Ltd.**

**Chilton Audio Ltd.**

**China Radio and TV Co.**



**DAR SABRE Optical disk-based digital audio workstation**

**Chromatek Video Products Ltd.**

**Chromatek Inc.**

**Chunan Radio Factory**

**Cinekinetic Pty. Ltd.**

**Cinema Products** **B131**  
*New products:* Steadicam Video SK. Steadicam EFP.

Contact: Marcel Gross  
CH-1162 St-Prex, Switzerland  
T: +41-21-8060505  
F: +41-21-8060559

For more information, circle Reader Service 83

**Clear-Com**

*New products:* PRO-40 headsets, comprised of CC-85 single muff and CC-250 double muff, with broadcast quality audio response and balanced mic output. Also SPORTSCASTER, combination headphone amplifier and cough button; it boasts the ability to add gain to the announcer's mic to overcome line noise.  
*Also:* MATRIX PLUS point-to-point multiprocessor-controlled intercom system that features digital control combined with fully digitized audio, permitting full station operation over a single unshielded twisted pair.

Contact: Marketing Manager  
P.O. Box 302  
Walnut Creek, CA 94597-0302  
T: +1-510-932-8134  
F: +1-510-932-2171

For more information, circle Reader Service 109

**Colby Video SRL**

**Columbine Systems Inc.**

*On Display:* Master Control Automation sys-

tem, a PC-based system. PC 2000 traffic system. Credit Management accounting system. Program Management file management system.

Contact: Diane Sabo  
1707 Cole Boulevard  
Golden, CO 80401-3296  
T: +1-303-237-4000  
F: +1-303-237-0085

For more information, circle Reader Service 55

**Continental Microwave Ltd.**

**Coreco/Amber Electro Designs**

**Courtyard Electronics Ltd.**

**CSO International Inc.**

**CTE International**

*New products:* Synthesized microwave link. Exciters. Studio links. Transposers.

Contact: Enrico Antoniazzi  
Via R. Sevardi, 7  
42010 Zona. Ind. Mancastale  
Reggio Emilia  
Italy  
T: +39-522-526660  
F: +39-522-921248

For more information, circle Reader Service 76

**Daiwa Corp**

**DAR Ltd.**

*New products:* Sabre eight-channel optical disk-based audio recorder and editor. SoundStation Delta range of digital audio production systems.  
*Also:* SoundStation Sigma disk-based digital audio workstation. WordFit automatic dialogue synchronization system. DASS 100 multifunction digital audio interface, sampling frequency converter and processor.

Contact: Jeff Bloom  
2 Silverglade Business Park  
Leatherhead Road  
Chessington  
Surrey KT9 2QL  
United Kingdom  
T: +44-372-742848  
F: +44-372-743532

For more information, circle Reader Service 87

**Dasto**

**David Watson Associates**

**David Hughes & Company Ltd.**

**dB Elettronica Telecom SPA**

**DCE Satellite Communications**

**DDA Ltd.**

**Delta System Studioanlagen**

**Dentsu Inc.**

**DES el SRL**

**DeSisti Lighting SRL**

**Desktop Video SRL**

**DGH Communication Systems Ltd.**

**Die Studio Box**

**Digi-tel**

**Digi-grade Systems Ltd.**

**Digiline**

**Digital Processing Systems Inc. B202**  
*New products:* DPS-CC7 color corrector for both off-line and on-line situations, and the DPS-CC8 color corrector for smaller production suites. Improved specifications for the DPS-365 Universal Synchronizer. RC-3000 remote control. RS-2800 video switcher card. ES-3200 and ES-3000 expansion systems. New animation recorder.

Contact: Brad Nogar  
 55 Nugget Avenue, Unit #10  
 Scarborough,  
 Ontario M1S 3L1  
 Canada  
 T: +1-416-754-8090  
 F: +1-416-754-7046

For more information, circle Reader Service 40

**Digital Audio Technologies SA**

**Digital Vision**

*New products:* DVIS digital image stabilizer, which corrects unwanted 2-D movements of video images down to 1/8 of a pixel. ASC film dirt concealment. CDK chroma light & dark, an option to the DV base system. DSD digital scene detection option for use with color correction, noise reduction and dirt concealment. HD-1000 TV/HDTV codec. MSP control environment. DVCSP1000 color signal processor. Also: DVNR1000 video noise/film grain reducer and picture processor. DVCC1000 digital YRGB primary and secondary color corrector.

Contact: Michael Reichel  
 Upplagsvägen 1-5  
 S-11743 Stockholm  
 Sweden  
 T: +46-8-18-24-65  
 F: +46-8-18-24-66

For more information, circle Reader Service 63

**Digital Video Systems**

**Digitell Technologies PTE Ltd.**

**Dolby Laboratories Inc.**

**DTL Broadcast Ltd.**

**Dwight Cavendish Developments**

**Dynair Electronics Inc.**

**Dynatech Video Group B403**  
 Comprised of seven technology companies: ALTA Group/Calaway Editing, Colorgraphics, da

Vinci, NewStar, Quanta, Utah Scientific and Alpha Image.  
 Into: Utah Scientific's MC-601 digital master control mixer.  
 Also: Alta Group's SSR-1 still store. AP-30 component analog production system. Pegasus composite production mixer. Calaway Editing's CE-400 editing system. Colorgraphic's DP/MAX video workstation enhancements and the DP/Mosaic digital disk recorder. da Vinci's Renaissance 8:8:8 component digital correction system. Newstar's Multimedia automation with digital disk storage system. Quanta's Macintosh interface to the Delta text and image generator. Utah Scientific's multichannel automation systems.

Contact: Pat Noble  
 T: +44-734-890111  
 F: +44-734-892022  
 For more information, circle Reader Service 91

**E Beyer Elekt Fabrik Gmbh**

**Eastman Kodak TV Division**

**EAV Technology Pty Ltd.**

**Echo Japan Corp.**

**EDS Portaprompt Ltd.**

**EEA**

**EEIG Vision 1250**  
*New products:* HD-MAC transmissions using TCI+, MCCI+, DATV and E7E.  
 Also: HDTV and MULTI-MAC presentations.

Contact: Peter Elbers  
 Eureka Com. Committee  
 Eindhoven  
 The Netherlands  
 T: +31-40-755819  
 F: +31-40-757319

For more information, circle Reader Service 21

**EELA Audio B573**  
*New products:* S24 Reportophone Plus, suitable for four-wire applications.  
 Also: S340 broadcast utilities desk, which is software configurable. CAPS (computer assisted play system). S120 mixer range for post production. EA 944 audio level inserter, PPM and correlation display for preview or monitoring.

Contact: Fred Van Eijk  
 P.O. Box 57016  
 5605 AA Eindhoven  
 Netherlands  
 T: +31-40-510484  
 F: +31-40-570482  
 For more information, circle Reader Service 46

**EEV Ltd.**

**Egripment BV**

**Eidos**

**Eizoshimbun**

**Elber SRL**

**Elca SRL**

**Elec Digital Innovations Pty.**

**Electro-Voice Inc.**

**Electrocrafft Laboratories Ltd.**

**Electrohome Projection Systems**

**Electronic Visuals Ltd.**

**Eletro Equip Ltda.**

**Elettronica**

**Elettronika SRL**

**Elpro Broadcast SRL**

**Elrad**

**Elta SAT Ltd.**

**EMS Inc.**

**Eurodec**

**Eurotel SRL**

**Evertz Microsystems Ltd.**

**EVS Systems SA A102**

*New Products:* All based on RAM technology: Video Paint 7.0 digital graphics system; Live Slow Motion digital system; Video digital delay. RAM recorders with up to four non-linear channels, RS-422 editor control, Ethernet and instant access.

Contact: Yves Rolus  
 Rue Courtois, 22  
 4000 Liège  
 Belgium  
 T: +32-41-22-0070  
 F: +32-41-22-2298  
 For more information, circle Reader Service 17

**Fairlight ESP Pty Ltd.**

**Faraday Technology Ltd.**

**Faroudja Laboratories B300**  
*New products:* LD100-U PAL/NTSC multi-standard line doubler to assist projectors, data grade monitors and large TV sets to display a PAL or NTSC source with excellent image quality, according to the company.

Contact: Isabell Faroudja  
 675 Palomar Avenue  
 Sunnyvale, CA 94086  
 T: +1-408-735-1492  
 F: +1-408-735-8571  
 For more information, circle Reader Service 53

**Fast Electronic Gmbh**

**Fischer W.W. SA**

**Focus Business Systems Ltd.**

**Focusrite Audio Eng.**

**FOR.A**

**Foray 272 Ltd.**

**Formula Creative Consultants**

**Fostex Corporation**

**Fougerolle A/V**

**FSL International Ltd.**

**Fuji Photo Film Co Ltd. A113**  
*On Display:* H621E/EB 1" videotape. M321SP and H321E Betacam videocassettes. H471S 1/2" S-VHS, D2001 D-2, D-3001 1/2" digital, M401MII 1/2" metal, 1/2" VHS, and 8mm videocassettes. DAT audio cassettes.

Contact: M. Morishige  
 Fujistraße 1  
 D-4190 Kleve  
 Germany  
 T: +49-2821-509-0

F: +49-2821-509-183  
 For more information, circle Reader Service 12

**Fuji Photo Optical Co Ltd.**

**Fuji Magnetics Gmbh**

**Fujinon Gmbh**

**Fumeo SPA**

**Future Film Developments**

**GEC-Marconi Communications**  
*On Display:* 30 kW IOT TV transmitter. Eddystone Radio low-power FM transmitters.

Contact: Peter Turrall  
 Marconi House  
 New Street  
 Chelmsford  
 Essex, CM1 1PL  
 United Kingdom  
 For more information, circle Reader Service 75



**Graham-Patten Systems' D/ESAM 400 Digital Edit Suite Audio Mixer**

**GEE Broadcast Systems Ltd. B546**  
*New products:* Marvin desktop VTR remote controller. VMAXX with composite/YC/RGBS & K/YUV and optional D-1 output. Reformer image metamorphosis system for the PC. Also: Inscribe character generator and presentation system. AT Vista and Targa+ graphics boards. Pinnacle Prizm 3D DVE and DVEator option, FlashFile networkable still store. Eurocard DAs and switchers. Digital intercom system. Fiber optics transmitter/receiver. VIM-CAS/VISCAS for carrying audio in the vertical interval. Videotek BTG-100P handheld color bar generator.

Contact: Sarah Gee  
 Unit 9, Grafton Way  
 Basingstoke  
 Hants, RG22 6HY  
 United Kingdom  
 T: +44-256-810123  
 F: +44-256-810061  
 For more information, circle Reader Service 56

**General Advertising Agency Inc.**

**Gennum Corporation B435**  
*New products:* GF9101 multirate digital filter. GENLIX serial digital chipset. GS4881 sync separator. Also: GX4201 wideband crosspoint switch. Signal processing products.

Contact: Brenda Johnston  
 P.O. Box 489  
 Station A  
 Burlington, Ontario  
 L7R 3Y3  
 Canada  
 T: +1-416-632-2996  
 F: +1-416-632-2055  
 For more information, circle Reader Service 115

**Georg Neumann Gmbh**

**Geritel SPA**

**Getris Images**

**Ghielmetti AG**

**Global Adv. Co.**

**GML Ltd.**

**Graham-Patten Systems Inc. A125**  
*New products:* D/ESAM 400 digital edit suite

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- H. Medical TV facility
- I. Government TV facility
- J. Educational TV facility
- K. Recording studio
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 Falls Church VA, 22041 USA

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audio mixer, which handles up to 32 analog and digital inputs, routing via a flexible Virtual Matrix to four analog program, four digital program and four monitor outputs.  
 Also: D/ESAM 800 digital edit suite audio mixer audio delay function. Processing loop module. DATS digital interface converters.

Contact: Tim Prouty  
 11288 Ventura Blvd., Suite 462  
 Studio City, CA 91604  
 T: +1-818-753-9510  
 F: +1-818-753-9320

For more information, circle Reader Service 15

#### Grass Valley Group

#### Greenway Ltd.

#### Gretag Eldophor Ltd.

#### Gruppo Manfrotto

#### gbc Broadcast

#### GTE Plus SA

#### Guicar Television

#### Gujarat Comm. & Electronics Ltd.

#### Gunther, Dr. W.A. AG

#### H Schulz Camera Support System

#### Hamlet Video International Ltd. **B166**

*New products:* PC-SCOPE full spec board level NTSC/PAL waveform and vectorscope that plugs into any Amiga, IBM PC and Macintosh. MICRO SCOPE hand held portable shingle channel composite, combined waveform/vector unit. 301 VIDEO SCOPE three-channel composite, component, S-VHS combined waveform/vectorscope. VICAL battery-operated video calibration system. LOGGA portable logging device with time code and idents.

Contact: Steve Nunney  
 Oak House, 266 Chartridge Lane  
 Chesham, Bucks., HP5 2SG England  
 T: +44-494-775850  
 F: +44-494-791283

For more information, circle Reader Service 81

#### Hantarex SPA

#### Harris-Allied Europe

#### Harris TVT Ltd.

#### Harrison by GLW Inc. **A104**

*New Products:* MPC, the motion picture version of its line of digitally controlled analog consoles. SeriesTen-B automated console.

Contact: Naoma Shipley  
 437 Atlas Drive  
 Nashville, TN 37211  
 T: +1-615-331-8800  
 F: +1-615-331-8883

For more information, circle Reader Service 102

#### Heiwa Selki Kogyo Co. Ltd.

#### HES Electronics NV SA

#### Hewlett Packard T&M

#### Heynen International BV

#### Hitachi Denshi

#### Hitachi Maxell Ltd.

#### HI-Tech Systems Ltd.

*On Display:* HT770 VTR remote controller. HT660 VTR emulator/monitor. HT880 RS-422 matrix. HT1700 Tektronix 1741A remote control. HT440 VTR audio mixer. VM4 color video monitoring system. VH1 video headphone. Auto cable scheduler scheduling software for AutoCAD. Systems engineering services. Design, installation, commissioning and training.

Contact: Tom Favell  
 Beech House  
 58 The Vale  
 Oakley  
 Basingstoke  
 Hampshire, RG23 7LD  
 United Kingdom  
 T: +44-256-780880  
 F: +44-256-782600

For more information, circle Reader Service 49

#### Hughes Aircraft

#### I-DEN Corp.

#### Ikegami Elec (Europe) Gmbh

*On Display:* HK-377, HK-355/HK-355/P, and the D-version of CCD studio cameras. HC-340 and HL-43 portable color cameras. HL-V55 camcorder. HL-57 digital camera. Monitors. Link equipment. Data graphic video projector. Hi-Vision equipment.

Contact: A. Pohl  
 Ikegamistraße 1  
 4040 Neuss 1  
 Germany  
 T: +49-2131-123-0  
 F: +49-2131-10-28-20

For more information, circle Reader Service 64

#### Ikon Video Ltd.

#### Image Video Ltd.

#### Imagination SRL

#### IMP Electronics

#### Indelt SPA

#### Industrial Acoustics Co.

#### Infoleisure Ltd.

#### Innovision Ltd.

#### Intelfax Developments Ltd. **B194**

*New products:* Wide range of teletext equipment including Windows-based PC editing terminal and a low cost teletext inserter.  
 Also: Teletext equipment. Data bridges. Subtitle archiving and transmission systems. In-Vision teletext generation equipment.

Contact: John Crandley  
 142 Lower Marsh  
 London, SE1 7AE  
 United Kingdom  
 T: +44-71-928-3044  
 F: +44-71-928-1836

For more information, circle Reader Service 60

#### International Tapetronics Corp.

#### Intl Microwave Dist. System Ltd.

#### IPK Broadcast Systems

#### IRT Electronics Pty. Ltd.

#### IRTE SPA

#### Italiana Ponti Radio SRL

#### Itelco SPA

#### Ivitec SRL

#### J-Lab Company

#### J B Promociones Publicitarias

#### Japan Radio Co. Ltd.

#### Jerrold Communications

*On Display:* Digital Cable Radio satellite-delivered digital audio service with 28 channels of digital music and a Song ID remote. Digicipher digital compression technology. Personal XChange

G E C - M A R C O N I  
**TELEVISION**  
 T R A N S M I T T E R S

*and sound*  
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*Over the past few years GEC-Marconi have been investing in the future.*

*A future where the old rules of television transmitter design are changing and new technologies are becoming today's new standards.*

*A future with solid state UHF transmitters that are liquid cooled for device longevity, transmitters a fraction of the size only imagined a few short years ago. Transmitters which cover the whole UHF band with one edition, which offer graceful degradation of power during failure, on-power maintenance and virtually silent operation.*

*A future where high power UHF transmitters now consume almost half the power of their predecessors thanks to the new IOT final amplifier.*

*High power common amplifier transmitters with a level of performance once thought near impossible to achieve. Transmitters that are simpler, more reliable and cheaper than the klystron designs of yesterday.*

*The future belongs to GEC-Marconi, why not let them share it with you?*

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**GEC-Marconi**   
 Communications

*GEC-Marconi Communications Limited,  
 Marconi House, New Street,  
 Chelmsford CM1 1PL  
 Telephone: +44 245 353221  
 Facsimile: +44 245 287125*

# SONY®

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# Digital "Drea



- ◆ PAL Model—Debut at "Montreux TV '93", Montreux
- ◆ NTSC Model—Debut at "NAB '93", Las Vegas

Contact your local Sony Distributor, or write to:

**[HONG KONG]**  
SONY CORPORATION OF HONG KONG LTD.:  
Level 26, Two Pacific Place,  
Queensway, Hong Kong  
Tel.: 5330222

**FOOK YUEN ELEC.CO.,LTD.:**  
Flat B&C, 9th Floor, ACME Building 22 Nanking  
Street, Yaumatei Kowloon, Hong Kong  
Tel.: 783-0733

**[KOREA]**  
DONGYOO TRADING CO.,LTD.:  
3rd FL., Silk Center, 17-9, Yeouuido-Dong,  
Youngdeungpo-ku, Seoul, Korea  
Tel.: 783-6431

**[TAIWAN, R.O.C.]**  
CINCHY CORPORATION:  
Rebar Building, 3rd Fl., No.372, Lin Sen North Road,  
Taipei Taiwan, Republic of China  
Tel.: 563-3811

**[THAILAND]**  
SONY THAI CO.,LTD.:  
4th Floor, Kromadir Bldg., 2126 New Petchburi Rd.,  
Bangkapi Huaykwang, Bangkok 10310, Thailand  
Tel.: 2318 8777

**[PHILIPPINES]**  
SOLID CORPORATION:  
SOLID House Building 2285 Lumbang Street  
Corner Pasong Tamo Extension Makati,  
Metro Manila, Philippines  
Tel.: 886561

# DIGITAL HISTORY

# BETACAM



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#### [INDONESIA]

**P.T. GALVA CORPORATION:**  
Waskita Building 3rd Floor, Jalan Biru Laut X,  
Kaveling 10 Cawang, Jakarta 13340 Indonesia  
Tel.: 850-8533

#### [SRI LANKA]

**SIEDLES (PVT.) LTD.:**  
150/3, Ward Place, Colombo 8, Sri Lanka  
Tel.: 697952

#### [SINGAPORE]

**SONY SINGAPORE PTE. LTD.:**  
401 Commonwealth Drive #03-03  
Haw Par Technocentre, Singapore 0314  
Tel.: 4730300

#### [MALAYSIA]

**SONY (MALAYSIA) SALES & SERVICE  
SDN. BHD.:**  
Lot 4, Jalon SS 13/5 Subang Jaya 47500  
Petaling Jaya Selangor Darul Ehsan, Malaysia  
Tel.: 37333333

#### [INDIA]

**NEW VIDEO LTD.:**  
X-7, Okhla Industrial Area, Phase-II  
New Delhi-110 020 India  
Tel.: 011-6830972

**TELERAD (DIVISION OF ASE LTD.):**  
89-92, Industrial Area Naroda-382330  
Dist. Ahmedabad, India  
Tel.: 0272-813017

#### [PAKISTAN]

**FORTE PAKISTAN (PVT.) LTD.:**  
9-A, Mohammad Ali Society, Karachi, Pakistan  
Tel.: 21-448761

*For more information please contact  
International Marketing Group, Sony Corporation  
4-10-18, Takanawa, Minato-ku, Tokyo, 108, Japan  
Telephone: 03-5448-3450*

digital telephone service. MMDS systems. Fiber optic, distribution and head end products.

Contact: Cathi Ulsenheimer  
General Instrument (U.K.) Ltd.  
Worton Court East, Worton Grange  
Imperial Way, Reading  
Berkshire, RG2 0TD  
United Kingdom  
T: +44-734-755555  
F: +44-734-753933

For more information, circle Reader Service 118

JVC Prof. Products

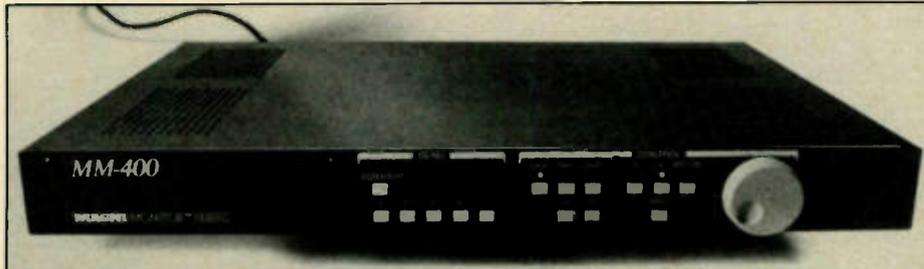
K&H Products Ltd.

K&L Inc.

Kabelmetal Electro/RFS Div.

Kaleidoscope Ltd.

Kathrein-Werke KG



Magni Monitor Series MM-400

Kolbe Hans & Co.

Kowa Co. Ltd./Optical Dept.

Larcam Comm Equipment Inc.

Leader

Leitch Video Int'l. Inc.

New Products: DigiBus composite analog to D1 frame synchronizer. DigiKit serial component

generator. PROM-Slide serial digital logo generator. AD, DA, serial-to-parallel and parallel-to-serial converters. Serial DAs and serial video routers. AES/EBU digital audio routers. Still File enhancements. Master PAL SPG and time code clock system driver. Time code/time of day/PAL video synchronizer. Wideband routing switchers for the graphics environment. Wide band distribution amplifiers. Remote gain distribution amplifiers. New control panels for HEDCO video and audio routing switchers.

Contact: David Strachan  
220 Duncan Mill Rd, Suite 301  
Don Mills  
Ontario, M3B 3J5  
Canada  
T: +1-416-445-9640  
F: +1-416-445-0595

For more information, circle Reader Service 132

Lemo SA

Lexicon Inc.

New products: OPUS digital audio workstation with Version 3.10 software.  
Also: The 300 digital effects system with new version 3.0 software.

Contact: Marketing Manager  
100 Beaver Street  
Waltham, MA 02154-8425  
T: +1-617-736-0300  
F: +1-617-891-0340

For more information, circle Reader Service 19

Lightworks Ole Ltd.

Linear SNC

Linfair Engineering & Trading

Link Comunicaciones SA

Logica Space & Comm. Ltd.

Lowel-Light Manufacturing

New products: Rifa-Lite collapsible softlight system. Tiny L-light accent light.  
Also: Complete line of portable lighting instruments and grip equipment.

Contact: Bonnie Schwartz  
140 58th Street  
Brooklyn, NY 11220-2516  
T: +1-718-921-0600  
F: +1-718-921-0303

For more information, circle Reader Service 9

Lys Electronic Ltda.

Maddox Engineering

Magni Systems

New products: MM-400 Series waveform/vector monitors, which produces a video picture of the waveform or vector of the input signal, allowing easy display on any picture monitor, according to the company. Designed for desktop video users.  
Also: Signal Creator programmable generator. Model WV561 waveform monitor/vectorscope. VGA Producer Pro VGA-to-video conversion device.

Contact: Steve Talley  
9500 SW Gemini Drive  
Beaverton, OR 97005  
T: +1-503-626-8400  
F: +1-503-626-6225

For more information, circle Reader Service 8

Mainframe Graphics Ltd.

Manfrotto Trading

Marconi Instruments Ltd.

Maser Technology Group Ltd.

Matra Communication

Matrox Electronic Systems Ltd.

On Display: New non-linear editing module, 3-D DVE add-on board, A/B roll system, CMX compatible EDL, fast cuts editor, D-1 and analog component (Y, R-Y, B-Y) support for the Matrox Studio video post production suite for the EISA PC. Personal Producer editing system for Illuminator-16. Illuminator-PRO 32-bit video-graphics boards. Matrox Marvel multimedia controller.

Contact: Maureen McConnell  
1055 St. Regis Blvd.  
Dorval, Quebec  
H9P 2T4  
Canada  
T: +1-514-685-2630 ext 2548  
F: +1-514-685-2853

For more information, circle Reader Service 48

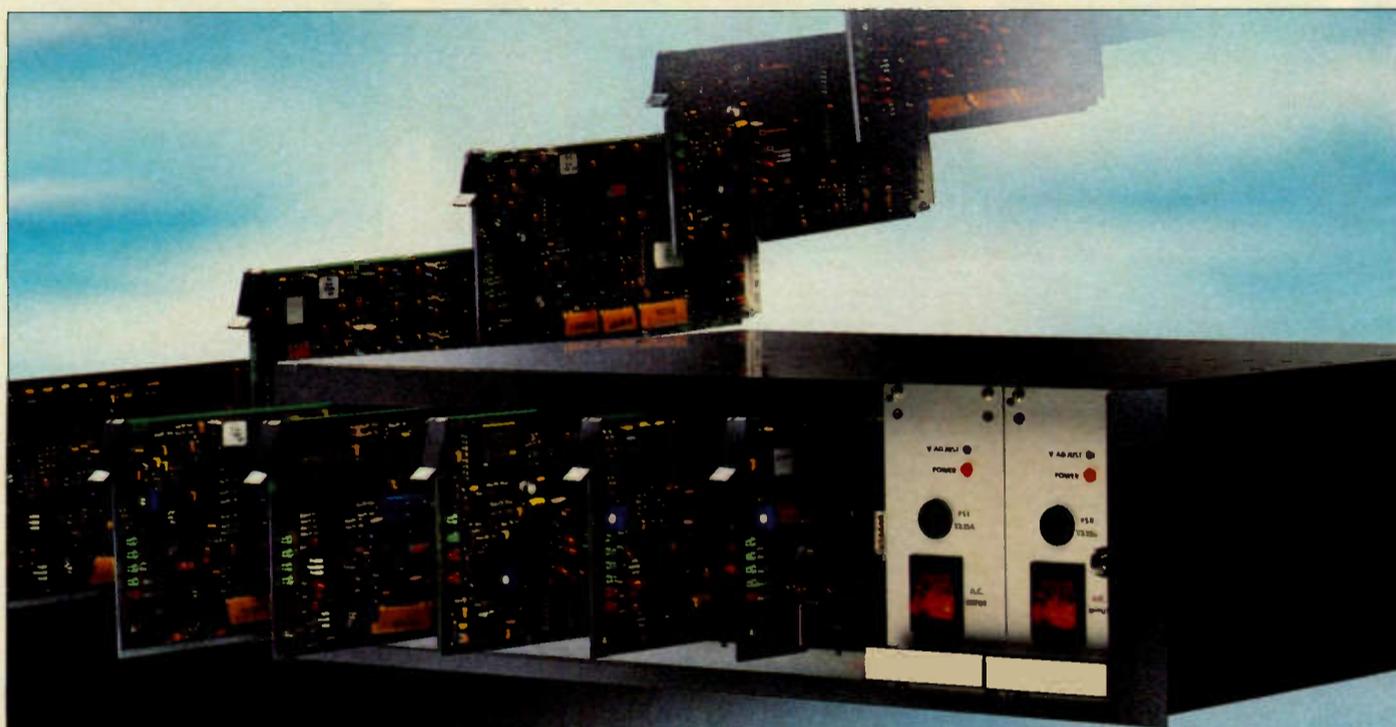
Matsushita Electric Ind. Co. Ltd.

Matsushita Audio & Video Systems Div.

Matthey Electronics

New products: NV Series switchable delay boxes for both baseband video and 11 MHz band-

B175



# Genesis takes off

The addition of a series of new products within digital interfacing and conversion elevates the Genesis 6000 range far beyond anything yet seen.

The already comprehensive Genesis range now includes:-

- 50 kilometre Fibre Optic Transmitters and Receivers
  - 10-bit Analogue to Serial Digital and Serial Digital to Analogue Convertors
  - Multiplexers and De-multiplexers
  - 10-bit Serial Digital to Composite Encoders with DA's
- These are just the latest in the ever expanding range of over thirty interfacing and conversion products within the Genesis 6000 range.

These represent Tekniche's commitment to leading edge technology at the highest quality of broadcast specification and show that GENESIS really is taking off....



TEKNICHE LIMITED 19/22 GOLDSWORTH ROAD  
GOLDSWORTH INDUSTRIAL EST WOKING SURREY GU21 1RU  
TELEPHONE: 0483 771663 FAX: 0483 750358

New Products: VHF/FM and DAB transmitters.

Contact: Barthel Malek  
Sickingenstraße 20-28  
W-1000 Berlin 21  
Germany  
T: +49-30-3463-2417  
F: +49-30-3463-2419

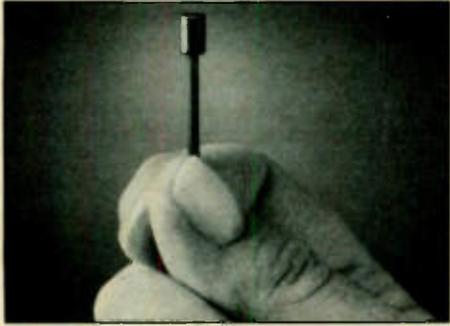
For more information, circle Reader Service 69

**Telesia Microelettronica**

**Teleste Antenna Ltd.**

**Television Systems Ltd.**

**Television Technology Corporation (TTC)**



**Telex ELM-22**  
omnidirectional electret mic

**Telex** B502

New products: TIF 951 RTS telephone interface system. Radio mics.

Also: RTS two-wire intercom systems. Four-wire digitally controlled matrix systems. Audiocom intercoms. Radio microphone systems. Headsets. Monitor earsets. Miniature lapel microphone.

Contact: Dan Dantzler, Pro Video Division  
9600 Aldrich Avenue S.  
Minneapolis, MN 55420  
T: +1-612-887-4051  
F: +1-612-884-0043

For more information, circle Reader Service 37

**Tellumat Ltd.**

**Tennaplex Systems Ltd.**

**The Ideasmiths Co.**

**The Malcolm Clark Consultancy**

**Thomson Broadcast**

**Thomson Tubes Electroniques**

**Thomson-LGT**

**Thomson Digital Image**

**Thomson CSF/LER**

**Toko Inc.**

**Tonna Electronique**

**Torpey Controls & ENG Ltd.**

**Toshiba Bdct. Systems Division**

**Total Audio Concepts Ltd.**

**Tri-Link Electronics Ltd.**

**Trident Audio Developments Ltd.**

**Trilogy Broadcast Ltd.**

**Tritec Marketing Ltd.**

**tsm gesellschaft für angewandte studioteknik GmbH**

**Turbosound Ltd.**

**Ultimate Corporation**

**United Video Ltd.**

**Ushio U-Tech Inc**

**Varian International AG**

**Velec SA**

**Verband Schweizerischer Kabelfernsehbetriebe**

**Verity Systems Ltd.**

**VG Electronics Ltd.**

**Victor Company of Japan Ltd.**

**Video Int'l. Development GmbH**

**Video Plus**

**Videoedit SAS**

**Videologic Ltd.**

**Videomedia Europe**

**Videotek Inc.**

**Videotron SRL**

**Viewtronics Ltd.**

**Vinten Broadcast Ltd.**

*On Display:* Vision SD22 pan & tilt head. Model MK7B feature. Lightweight dolly. ELU servo-elevation unit. Data back-up facility. XY joystick control. Pan bar relative control. Anton Bauer products. MP-4D Series.

Contact: Suzanne Walker-Robinson  
Western Way  
Bury St. Edmunds

Suffolk, IP33 3TB

United Kingdom

T: +44-284-752-121

F: +44-284-750-560

For more information, circle Reader Service 65

**Vistek Electronics Ltd.**

**Vitec**

**Vortex Communications Ltd.**

**VXL India Ltd.**

**W Steenbeck & Co. GmbH**

**Ward-Beck Systems**

**Wavefront Technologies**

**Weathernews Inc.**

**Weircliffe International Ltd.**

**Winsted Ltd.**

**WMD GmbH**

**Wood & Douglass**

**Yamashita Engineering Mfg. Inc.** B423

New Products: Model CVS-980H PAL high resolution auto scan converter converts high resolution computer images to broadcast video signals. Model CVS-970B HDTV automatic scan converter. Model EDEC-3000 digital EDTV decoder using motion adaptive line scanning interpolation process. Model DA-950B super wideband video distribution amplifier.

Contact: Tadashi Shinbashi

1-3-33 Okata

Atsugi-shi

Kanagawa 243

Japan

T: +81-462-28-8883

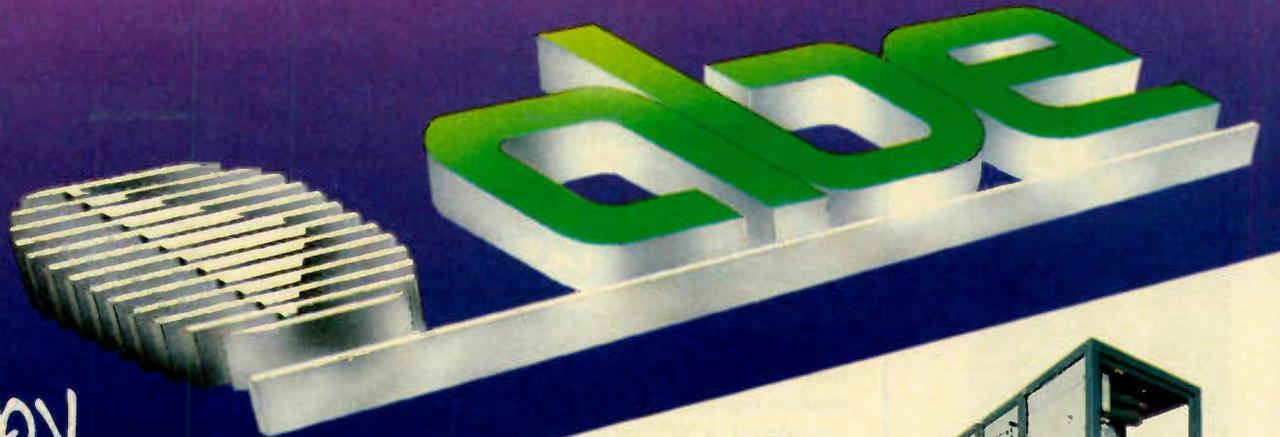
F: +81-462-29-1944

For more information, circle Reader Service 4

**Z&B Video AG**

**Zhejiang Chunan Radio Factory**

# TV BROADCASTING



by



## PRODUCTS :

- Tv transposers and transmitters for the VHF and UHF bands from 1W to 10 KW - up to 1KW with solid-state technology.
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- Antennas : - Panels and complete arrays - Parabolic.



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Standard product characteristics conform to practically all recognised international technical specs.



## PRICES:

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ABE ELETTRONICA S.p.A. - Via Galileo Galilei, 1 - 24043 CARAVAGGIO (BG) - ITALY - Telefono (0363) 52550-51107 - Telex 352829 ABETEL I - Fax (0363) 50756

# BUYERS GUIDE

## Time Base Correctors & Frame Synchronizers

### TCI Depends on I.DEN IVT-20

by Irving Del Toro  
Engineer  
TeleCommunications Inc.

OAKLAND, New Jersey Not too long ago, my department within Tele-Communications Inc. (TCI) was in need of a TBC/frame synchronizer to augment

our operation, which is to supply our cable system with local advertisements and customer information programs.

We needed a compact and dependable unit that fit exceptionally well with our headend and master control operations, and it had to have an affordable price.

For these reasons and others, we chose the I.DEN IVT-20.

#### Repeat customer

I had worked with the I.DEN IVT-9 Plus TBC/frame sync for two years without a major problem. It has various signal formats, freeze frame/freeze field capability and strobe, and its features fit well in an edit suite.

Like the IVT-9 Plus, the IVT-20 has freeze frame, freeze field and doc input per channel. But the IVT-20 is a dual channel TBC with higher standard circuitry and surface mount technology.

The IVT-20 accepts four types of inputs—composite, YC358/YC443(PAL),

put on both channels. And since the unit has a built-in sync generator for each channel, it has the ability to stand alone.

The front panel contains a YC delay and a coarse/fine adjustment, which are used to adjust the "Y" and chroma phase difference in the output signal. The front panel also has sync phase and sub carrier phase for genlock adjustment on both channels.

Many TBCs have a problem with chroma and genlock circuitry. But the IVT-20's advanced automatic chroma control has been trouble-free. With the advanced circuitry, the input signal burst level is processed and the chroma level is corrected automatically.

#### Signal pass-through

The unit also has an internal vertical blanking (on/off) switch that is used to allow the signal contained in the vertical blanking scan to pass through. Also, turning off a memory control switch allows the unit to pass the close caption signal, a valuable asset to our system because many of our programs are close-captioned.

Another control allows the auto freeze to be turned on or off. When turned on, the signal is lost and the previous clean image is displayed.

The IVT-20 fits numerous wiring designs, such as those used in edit suites, down links, remote trucks, studios, etc., and is contained in one rack unit.

Also, I.DEN's customer service and technical support are exceptional.

Of course, few pieces of equipment are perfect, and the IVT-20 has some drawbacks that can be improved upon.

One problem is that horizontal and sub carrier phase both have one control on



The author makes an adjustment on the I.Den IVT-20 TBC/frame synchronizer at the headend.

the inside of the unit and one on the outside, and the video phase control is located only inside the unit. Having these controls located on the inside makes it difficult to adjust genlock. Ideally, these should be located on the front panel.

However, these are minor flaws. Overall, the IVT-20 meets all broadcast standards and with all its advancements, it is a fine advancement for our industry.

*Editor's note: Irving Del Toro has been an engineer for 50 years, working for a number broadcast and cable operations, including the major U.S. networks.*

For further information on the IVT-20, contact Joehan Tohkingkeo at I.DEN (Telephone: +81-44-814-0470; FAX: +81-44-814-0453), or circle Reader Service 13.

**Question:**  
Ever wonder why transmitter manufacturers operate Altronic dummy loads at NAB and other trade shows?



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Yellville, AR 72687  
(501) 449-4093

## USER REPORT

RGB, and component—and three types of output formats. It is also possible to have two output formats at the same time: continuous composite and a choice between component or YC358/YC443.

With its advanced circuitry, the IVT-20 provides a number of functions not found on other models. Among them are a frame memory that can compensate for a wide range of errors; standard operation functions like preset levels for video, chroma set-up and chroma phase; and a genlock input and black burst out-

## ELIMINATE PODIUM CLUTTER.

### PB2X8 Pressbox/Microphone Distribution System MICROAMP SERIES



Eliminate the usual press conference microphone clutter with just a single or a back-up pair of microphones.

Feed each of eight transformer isolated channels from either input or both Mic/Line inputs mixed.

Drive a high level XLR and a medium or low level TRS line simultaneously from each output.

Use as a 2X8 DA, stereo 1X4 DA or two input mixer.

Studio grade performance, field proven ruggedness.

- Rack or desk mount
- Two low noise Mic/Line inputs
- Phantom power, low cut filter
- Loop thru expansion inputs
- Calibrated test oscillator
- Switchable bargraph VU meter
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- Headphone output

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AUDIO TECHNOLOGIES INCORPORATED

328 Maple Ave., Horsham, PA 19044, USA

(215) 443-0330 FAX: (215) 443-0394

widths. MDDA Series video delay distribution amplifiers. DIL modules for baseband video, 11 MHz and 30 MHz extended bandwidths. Video ADC/DAC filters. 70 MHz IF bandpass filters. Brickwall filters. Networks.

Contact: Alan Holden  
Burslem Stoke-on-Trent  
ST6 3A6  
United Kingdom  
T: +44-782-577588  
F: +44-782-838558

For more information, circle Reader Service 22

#### Maxell Europe GmbH

#### McCurdy Radio Industries

#### MDI

#### Media Products Ltd.

#### Megahertz Communications

#### Melford Electronics Ltd.

#### Meret Optical Communications

*On Display:* Analog and digital fiber optic transmission systems designed for broadcast applications, including the Live Link 500 serial digital link that allows the user of digital products to transmit a serial digital signal up to 10 Km. It can transmit compressed HDTV, widescreen video and all digital tape formats. Also exhibited will be the Live Link 450 and Live Link 100/200 NTSC/PAL transmission system.

Contact: Alan Davis  
1800 Stewart Street  
Santa Monica, CA 90404  
T: +1-310-828-7496  
F: +1-310-828-7567

For more information, circle Reader Service 85

#### MHB Telecomunicacoes SA

#### Michael Stevens & Partners Ltd.

#### Micro Electric Industry Co. Ltd.

#### Microset Elettronica

#### Microvideo Ltd.

*New products:* Digital video data inserter. Dual 10-bit D-to-A converters. 270 Mbps serial digital (D-1) modules for monitoring. Serial digital CRC checker for error detection in digital systems. *Also:* Digital test pattern generator. Digital proc amp. A-to-D and D-to-A converters.

Contact: Ric Brunwin  
The Old Farm Offices  
Copley Hill Farm  
Cambridge Road  
Babraham  
Cambridge, CB2 4AF  
United Kingdom  
T: +44-223-834119  
F: +44-223-834471

For more information, circle Reader Service 122

#### Microwave Radio Corporation B555

*On Display:* The FLR 2-15 GHz fixed radio; the MicroLink III 18/23 GHz fixed radio, the ProStar 2T10WB portable radio and the PC-100 Microwave Antenna Master Controller for remote control applications.

Contact: Nadine Frechette  
20 Alpha Road  
Chelmsford, MA 01824-4168  
T: +1-508-250-1110  
F: +1-508-256-5215

For more information, circle Reader Service 130

#### Milab International AB

#### Miller Fluid Heads

#### Minoita Radiometric Inst. Ops.

#### Miranda Technologies Inc.

#### Montage Group Ltd.

#### Movie Engineering

#### MRG Systems Ltd.

#### MSC Electronics Ltd.

#### MSI Video AB

#### MTR Electronics AG

#### Multipoint Communications Ltd.

#### Munro Assoc, the studio

#### MW Video Systems Ltd.

#### Nagra Kudelski SA

*New products:* NAGRA-D four-channel self-contained professional digital audio recorder. *Also:* Analog audio tape recorders.

Contact: Aldona Mury  
Kudelski SA  
CH-1033 Cheseaux  
Switzerland  
T: 021-732-01-01  
F: 021-732-01-00

For more information, circle Reader Service 25

#### National Transcommunications Ltd. B531

*New products:* System 2000 video compression system that allows four broadcast signals to be conveyed within the space normally occupied by one.

*Also:* Satellite and terrestrial program linking. EDTV/HDTV upconversion equipment. Broadcast facilities. System design. Project management.

Contact: John Forrest  
Crawley Court  
Winchester  
Hampshire, SO21 2QA  
United Kingdom  
T: +44-962-822243  
F: +44-962-822374

For more information, circle Reader Service 71

#### NEC Corporation

#### Neumann Georg GmbH

#### Neurodata Design SA

#### Neutrik AG

#### Neve Electronics Int'l Ltd.

#### New EVS SA

#### Nexus

#### Nihon Tsushinki Co Ltd.

#### Nikon

#### Nippon TV Industry Corp.

#### Nippon Columbia Co. Ltd.

#### NKF Kabel BV

#### Norsat International

#### NTP Elektronik AS

*New products:* Model 560, which contains up to four independent A-to-D and D-to-A converter units in any combination. The A-to-D converter is an 18-bit, 64 times oversampling sigma-delta type. The D-to-A converter is a 20-bit type with an AES/EBU input. Also a digital peak program meter. Digital peak level limiter.

*Also:* Analog and digital audio routing switchers. VAX- and PC- controls for the switchers. PPMs, VU and phase meters. Telephone hybrids. Limiters and compressors/expanders.

Contact: Ole Suhr  
Knapholm 7  
DK-2730 Herlev  
Denmark  
T: +45-44-53-11-88  
F: +45-44-53-11-70

For more information, circle Reader Service 82

#### Nucleus Electronics

#### NVision

*On Display:* NV1000 terminal equipment. NV2000 digital audio transmission system. NV3512 and NV3064 digital audio routing switches. NV4448 digital audio sample rate converter. NV5000 universal sync generator.

Contact: Sue Evans  
P.O. Box 1658  
Nevada City, CA 95959  
T: +1-916-265-1000  
F: +1-916-265-1010

For more information, circle Reader Service 6

#### Odetics UK Ltd.

*New products:* OmniCart multichannel automation system, which simultaneously records, compiles, and plays spots and programming to air. LEM90 library expansion module for the TCS90 Cart Machine that increases storage capacity from 150 to 380 tapes. TCS2000 cart machine

with a News Control Terminal and TCS90 Cart Machine with a Break Tape Manager.

Contact: Holly Barnett  
1515 South Manchester Ave.  
Anaheim, CA 92802-2907  
T: +1-714-774-5000  
F: +1-714-774-9432

For more information, circle Reader Service 34

#### Oki Elec.

#### Oki Alpha Create

#### OKPR

#### Ole Ltd.

#### Optical & Textile Ltd. (OpTex)

*On Display:* Pan Bar Imitator System (PBIS), which permits camera operators to remotely control a camera's functions in the same way as if they were standing next to it. ARC (Advanced Robotic Control) system, a digital programmable panel equipped with a three-axis joystick for either real time or pre-programmed operation. Specialist optics. Periscope/Borescope systems. OpTex/Canon Multi-Role lens. Toshiba miniature camera. Steadicam. Schwem GX-3 stabilizing system. Miniature microwave systems. SurFace Splashbag for film and video cameras. Matte boxes. Tiffen filters.

Contact: Richard Stone  
22-26 Victoria Road  
New Barnet  
Herts EN4 9PF  
United Kingdom  
T: +44-81-441-2199  
F: +44-81-449-3646

For more information, circle Reader Service 94

#### Optical Disc Corporation

#### Options International

#### Otari Inc.

#### Overland Moving Pictures

#### Oxtel Ltd.

#### Paco Elec Industry Inc.

#### PAG Ltd.

*New products:* PAG Analyzer for nickel-cadmium batteries. PAG AR124NP One charger. Powerman battery packs. *Also:* Fast chargers. Pagbelts. Power modules. Paglock batteries.

Contact: Brian Walker  
565 Kingston Road  
London, SW20 8SA  
United Kingdom  
T: +44-81-543-3131  
F: +44-81-540-4797

For more information, circle Reader Service 36

#### Paltex International Group

#### Panasonic Broadcast Europe

#### Pandora International Ltd.

#### Panther GmbH

#### Parallax Graphic Systems Ltd.

#### Pastega SRL

#### Pema 2B



#### Perfectone Corporation

#### Pesa Electronica SA

#### Pesa Intl Ltd.

*New products:* GC Plus multi-functional graphics

B561

workstation. CG4731 real time CG. SD5000 serial digital video/audio router. RM4000 48x48 analog stereo audio router. RM2416 24x16 analog and video router. Chyron Graphics—Maxine ultra-compact single-channel character and graphics system. Centaur video adapter for Silicon Graphics IRIS Indigo series workstations. CODI computer display system. CMX—Cinema non-linear editing system. Omni 500 off-line/on-line editing system. Aegis on-line editing system. Aurora—Liberty paint, typography, image processing, comprehensive 2 1/2-D animation software.

#### Peter Powell Associates

#### Philip Drake Electronics Ltd.

#### Philips Eindhoven

#### Philips Press Office

#### Philips TV Test Equipment AS

#### Philips RHW

#### Pinnacle Systems Inc.

#### Pioneer

#### Pixel Power Ltd.

#### Plante Indust & Comercio Ltd.

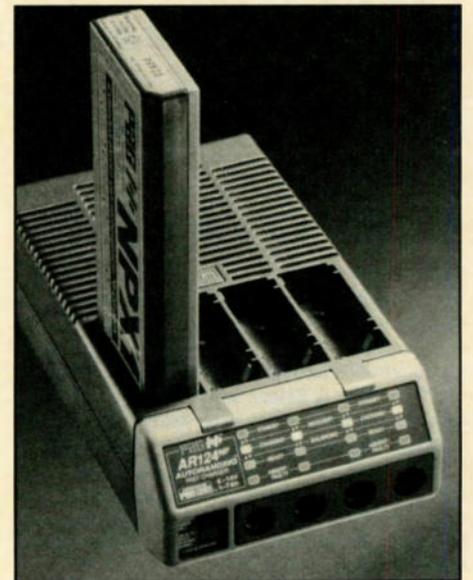
#### Plasmec Systems Ltd.

#### Pilsch Nachrichtentechnik

#### Polaris Advertising

#### Polytron Vertrieb GmbH

#### Potter Reeve & Co. Ltd.



PAG AR124NP One charger for any mix of NiCad batteries.

#### Practel Sales Int'l

#### Prime Image

*New products:* Model ESS-5 access II dual-channel electronic still store access II with effects, in NTSC, PAL and PAL-M with three-way adaptive comb to provide 5.5 MHz bandwidth, with Y/C or composite in or out. The Std Con/PCB 5.5 MHz bandwidth plug-in standards converter, which converts between NTSC, PAL, PAL-M, PAL-N, SECAM and NTSC 4.43 standards. The Std/Con Series of digital standards converters. The SC Series of digital standards converters offering NTSC to PAL and PAL to NTSC conversion. Also PAL or NTSC Multi/TBC-SYNC one to 10 channel TBC/synchronizer.

Contact: Bobbie Hendershot  
19943 Via Escuela  
Saratoga, CA 95070  
T: +1-408-867-6519  
F: +1-408-926-7294

For more information, circle Reader Service 79

#### Primo Company Ltd.

#### Prism Sounds Ltd.

#### Pro Bel Ltd.

*New products:* SM Series of 24 x 12 routing switchers. 16 x 4 compact routing switchers. Six-channel digital audio mixer. MAD1 routing system. Procion control solutions, Windows-based signal monitoring and VTR control workstation. *Also:* Korum digital video keyer. 6610 digital video and 6510 digital audio analyzers. HD

B424

Series of routing switchers. A/D and D/A digital audio converters. Eurocard signal processing and distribution modules.

Contact: Ian Blake  
Danehill  
Lower Earley  
Reading  
Berkshire, RG6 4PB  
United Kingdom  
T: +44-734-866123  
F: +44-734-755787

For more information, circle Reader Service 14

#### Productions Audio Visuelles 16/36

#### Promedia Gmbh

#### Propulsa SA

#### Psycholites Ltd.

#### Publison Audio Professional

#### Quadrant Research & Develop

#### Quantel Ltd.

**Quartz Electronic Designs** **B163**  
*New products:* Q1600 serial digital video routing switcher for systems up to 16 x 16. Q3200 AES digital audio routing switcher up to 32 x 32. Q1600 RS-422 control signal routing switcher. CP-3200, CP-3201 and CP-1601 remote control panels. *Also:* Q1600 and Q3200 routing switchers now available in 60 MHz versions. CP-1600 remote control panel with improved software. VS-3200 video status display. Configuration software with improvements.

Contact: Alan Edwards  
11 Bearwood Road  
Wokingham  
Berkshire, RG11 4TB  
United Kingdom  
T: +44-734-780673  
F: +44-734-780673

For more information, circle Reader Service 119

#### Questec Ltd.

#### Quinto Communications Pty. Ltd.

**Radamec EPO Ltd.** **B508**  
*New products:* RP2H robotic studio pedestal which incorporates a unique studio navigation and collision avoidance system, according to the company. It also provides full manual operation of all pedestal functions. See & Select, which enables the video coming from the camera to be frozen and reduced in size and displayed on a monitor when a shot is stored. Model 435 pan-and-tilt head with a payload capacity of 154 lbs. and full manual operation. *Also:* ARC (Advanced Robotic Control) System Cue Computer for simultaneous multiple camera movement, with data tablet and touchscreen control.

Contact: Mike Wolfe  
Bridge Road  
Chertsey  
Surrey, KT16 8LJ  
United Kingdom  
T: +44-932-561181  
F: +44-932-568775

For more information, circle Reader Service 43

#### Radio Frequency Systems Pty

#### RAI

#### Rank Cintel Ltd.

#### RCF SPA

#### RDS Corp.

#### RE Technology AS

#### RE Broadcast Ltd.

#### Regis BLT

#### Regoli Audiovisivi SAS

#### Relec Ltd.

#### Repac Electronics Ltd.

#### RGB Computer & Video

#### RGB Dynamics Ltd.

**Richard Hirschmann Gmbh**  
*On Display:* KARIN CATV headed system. PME 350 PAL-MAC test receiver. 100W DAB transmitter with satellite receiver.

Contact: Dipl. Ing. Kornherr  
Oberer Paspelsweg 6-B  
A-6830 Rankweil-Brederis  
Austria  
T: +43-5522-307-332  
F: +43-5522-307-555

For more information, circle Reader Service 84

#### RO.VE.R. SPA

#### Rohde & Schwarz

#### Roland Rank AG

#### Ross Video Ltd.

#### RTI (UK) Ltd.

#### S.E. TEL SPA

#### Sachtler AG

#### SAE

#### Sandar Electronics A/S

#### Sanix Corporation

#### Sanken Audio Systems Inc.

#### SAV Systemes Audiofrequence

#### SBP SpA

#### Scan Titling AB

#### Schmid Telecommunications

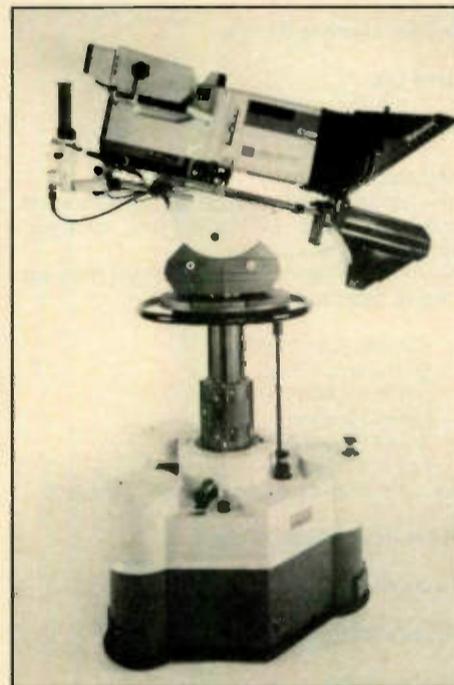
#### Schlumberger Technologies

#### Schweizer AG

#### Scientific Atlanta

#### Screen Subtitling Systems Ltd.

#### SEE Signal Engineering & Electronics



**Radamec EPO Robotic Pedestal RP2H**

#### Sennheiser Electronic KG

#### Shanghai Chunmei R&TV Factory

#### Sharp Electronics Gmbh

#### Shima Seiki Mfg. Ltd.

#### Shotoku Corp.

#### Showa Advertising Service Inc.

#### Siae Microelettronica SPA

#### Sice SRL

#### Sichuan Bdct Facility Factory

#### Siemens

**Sierra Video Systems** **B136**  
*New products:* Model 1616D serial digital video routing switcher. Model 88VS 8 x 8 composite video plus stereo audio router in 1 RU. Wideband component video routers for graphics. *Also:* Updated version of Model CIK-1 component video insert keyer. International version of 1993 Sierra's catalog.

Contact: D. Brunnenmeyer  
P.O. Box 2462  
Grass Valley, CA 95945  
T: +1-916-273-9331  
F: +1-916-273-9390

For more information, circle Reader Service 18

#### Sigma Electronics Inc.

#### Signum Computer Für Signal Verarbeitung Und Mustererkennung Gmbh

#### Sira SRL

*On Display:* Broadband FM, VHF and UHF antenna systems. Combiners. Coaxial components. SIRA will display a downscaled replica of an FM-VHF/Band I and III-UHF broadcasting TV tower.

Contact: Lorenza Gervasoni  
Via Senatore Simonetta, 26  
20040 Caponago, Milan  
Italy  
T: +39-2-957-42605  
F: +39-2-957-42599

For more information, circle Reader Service 5

#### Sislink

#### B160

*New products:* ComLink two-way communications system which operates over satellite. It is a digital system used for production and engineering talk-back purposes.

*Also:* Provides satellite links for live transmission of TV pictures for SNG/OB events.

Contact: Meriam Kahn  
Satellite House  
17 corsham Street  
London, N1 6DR  
United Kingdom  
T: +44-71-696-8002  
F: +44-71-608-0834

For more information, circle Reader Service 101

#### Skotel Corp

#### Snell & Wilcox

*On Display:* Alchemist standards converter with phase correlation motion estimation. HD 5100 HDTV upconverter. Gazelle slow motion system. HD 3100 and HD 2100 HDTV downconverters. DVS 1000 component digital switcher and router. PRISM digital decoding system. Kudos range of products.

Contact: Joe Zaller  
57 Jubilee Road  
Waterlooville  
Hampshire P07 7RF  
United Kingdom

#### Sofratev

#### Softel Electronics Ltd.

*New products:* PC-based teletext transmission system with Windows teletext editing capabilities. *Also:* Teletext data bridges. Video inserters. Data broadcast systems. Video Network Automation equipment.

Contact: Gordon Hunter  
14 Kingfisher Court  
Hambridge Road  
Newbury  
Berks RG14 5SJ  
United Kingdom  
T: +44-635-529345  
F: +44-635-580010

For more information, circle Reader Service 32

#### Softimage Inc.

*New products:* DIGITAL STUDIO product line, designed to provide complete, interactive digital software solution for production and post production work on Silicon Graphics workstations. Allows users to work in either 2-D or 3-D animation and visualization.

Contact: Carolyn Archambault  
3510, Boul. St-Laurent, Suite 500  
Montreal, Quebec, Canada H2X 2V2  
T: +1-514-845-1636  
F: +1-514-845-5676

For more information, circle Reader Service 11

#### Solid State Logic Ltd.

#### Solutec Ltd.

#### Sondor AG

#### Sonidovision SA

#### Sonosax SA

#### Sony Corporation

#### Soundcraft Electronics Ltd.

#### Soundtracs PLC

#### Space & Scientific Ltd.

#### Spaceward Graphics Ltd.

#### Spectra Coachbuilding Ltd.

#### Spinner Gmbh

#### Stanley Productions Ltd.

#### Studer International

*New products:* MAD1 routing system based on a time division multiplex bus with a capacity of up to 840 inputs x 512 outputs, new quadruplex A/D and D/A converters generating or accepting AES/EBU signals and REPORTIS, a portable reporter unit with direct 7 kHz ISDN access. *Also:* Dyaxis II multichannel audio workstation with Smart Log, which accepts EDLs from different video editing systems. D730 and D731 CD players. Updated D732 rack/CD player. Numisys automation system. Model 990 broadcast mixing console.

Contact: Jules Limon  
Althardstrasse 10  
Regensdorf  
8105  
Switzerland  
T: +41-1-870-75-11  
F: +41-1-840-47-37

For more information, circle Reader Service 86

#### State Television Institute

#### Suono Telecom SRL

#### Symbolics Ltd.

#### System Video Div Technische Ltd.

#### Talia Sound & Vision Pty Ltd.

#### T.E.M. Technologie Elettroniche Milanesi SPA

#### Tandberg Television AS

#### TBS Systems Gmbh

#### TEAC Corp.

#### Techex

*On Display:* Montage III editing system, which is Windows-based, with models for industrial and corporate markets as well as high-end users. Montage Model 20 for non-linear desktop video editing.

Contact: Mo Wright  
Techex House  
Vanwall Road  
Maidenhead  
Berkshire, SL6 4UB  
United Kingdom  
T: +44-628-777800  
F: +44-628-778022

For more information, circle Reader Service 134

#### Technosystem SPA

#### Tecnotel RF Audiovisivi

#### Tekniche Ltd.

#### Teko Telecom SRL

*New products:* VHF and UHF 100 and 200 watt wide-band TV amplifiers. VHF-FM 500 and 1000 watt amplifiers. TV precision off-set equipment. Outdoor and portable 2/10/14/18 GHz vision/sound link systems.

Contact: G. Nanni  
Via dell'Industria, 5  
40068 S. Lazzaro di Savena Bologna  
Italy  
T: +39-51-6256148  
F: +39-51-6257670

For more information, circle Reader Service 105

#### Tekskil Industries Inc

#### Tektronix Television Systems

#### Telcom Research Ltd.

#### Tele Network Technologies SRL

#### Telecom Video System

#### Telecomunicazioni Ghisellini

#### Telecomunicazioni Aldena SRL

#### Telediffusion de France

#### Telefunken Sendertechnik Gmbh

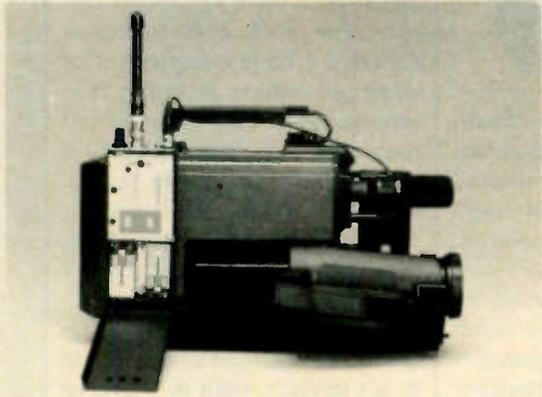
405

(continued on page 27)

# PRODUCTS & SERVICES SHOWCASE

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

## WIRELESS ENG BODY PACK SYSTEMS



Experience state-of-the-art technology in wireless microphone systems with the SWINTEK Mark QDC system. Compare these features to any system on the market and discover why professionals who require consistent, field proven reliability, demand SWINTEK. For more information call (408) 727-4889.

**Swintek** 965 Shulman Ave.  
Santa Clara, CA 95050

READER SERVICE NO. 80

## Don't let their size fool you.

### STEREO HEADPHONE AMPLIFIERS



#### HD-1000 MASTER

- Drives Four Independent Headsets
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Panned Microphone Input for Announcements
- Stereo or Left Only-Mono Output
- Balanced Line Out to HD-100
- Half Rack or Desk Mount

#### HD-100

- Drives Single Headset
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Loop-thru Inputs Feed Multiple Positions
- AC Powered, Compact
- Ideal for Offices and Study Carrels

CALL OR WRITE NOW FOR FREE DETAILED BROCHURE.

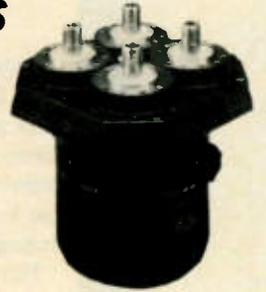
**ATI** AUDIO TECHNOLOGIES INCORPORATED

328 Maple Ave. Horsham, PA 19044, USA  
(215) 443-0330 • FAX: (215) 443-0394

READER SERVICE NO. 7

## DIELECTRIC Switches

Reliability & Performance. Reasons why Dielectric motorized switches are specified worldwide.



In coaxial sizes from 7/8" through 8-3/16" and waveguide, Dielectric also designs custom switch matrices.

The superior design and workmanship insures that your switch will be...

READY WHEN YOU ARE!

**DIELECTRIC COMMUNICATIONS**   
207-655-4555 P.O. Box 949  
FAX 207-655-7120 Raymond, Maine USA 04071

READER SERVICE NO. 67

## WE KNOW THE VALUE OF TIME... AND SO DO YOU!



In 1971, a member of the Broadcast Community brought to our attention the importance of accurate time in the studio environment. Ever since then, other members of the Broadcast Community have shared their needs and each reiterated the growing importance for accurate, yet affordable time keeping equipment.

Especially important is the need for a Master Clock System. And as you are well aware, just one person knowing the correct time is not good enough! Everybody (and everything) must... be in sync!

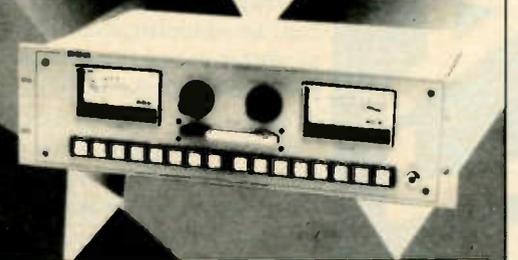
If your present Master Clock System (or lack of) leaves something to be desired, call ESE and allow us to demonstrate what is of value to us... YOU and solving your timing requirements.

**ESE** CLOCKS AS ACCURATE AS TIME PERMITS!

142 Sierra St., El Segundo, CA 90245 USA (310) 322-2136 / Fax: (310) 322-8127

READER SERVICE NO. 28

## AUDIO LINE MONITOR / BRIDGING SWITCHER



- Accurately measures the signal levels and quality of multiple audio sources, mono or stereo.
- Both standard VU ballistic and fast acting peak response metering of individual or multiple inputs or outputs.
- High quality Power Amp for headphone or external loudspeakers.
- 8 and 16 channel mono units have built-in speaker.
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- Silent electronic switching, interlocked standard, non-inter lock optional.
- Remote control and unlimited input expansion available.

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Phone: (818) 500-0137 / FAX: (818) 240-1828

**ROH**

READER SERVICE NO. 100

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AUDIO ROOM



CONTROL ROOM



STUDIO

Torpey Timers Drive Multiple Displays, So Everyone Can See!

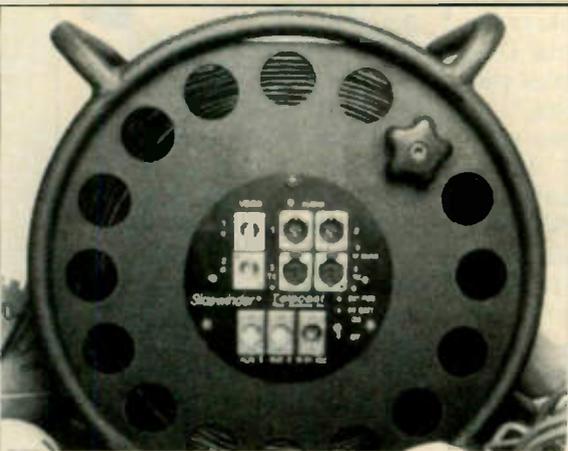
Call Bob At

### TORPEY CONTROLS & ENGINEERING

98-2220 MIDLAND AVE., SCARBOROUGH, ONT. CANADA M1P 3E6

TEL: (416) 298-7788 FAX: (416) 298-7789

READER SERVICE NO. 133



## Fiber Optic ENG/EFP

Telecast's Sidewinder™ Video/Audio Snake Speeds set up and improves performance — to 30,000 ft. 2-way Video, Audio & Data in one cable, 12 lbs/1,000 ft. FAX today for FREE Cable Sample and Videotape Demo!

**Telecast**  
Fiber Systems, Inc.

102 Grove Street  
Worcester, MA 01605  
Tel: (508)754-4858  
FAX: (508)752-1520

READER SERVICE NO. 39

... highlighting the latest products available to professionals in the television industry.

# MARKETPLACE



### Anamorphic lens

Angenieux's new 14x Anamorphic Lens produces widescreen 16:9 pictures using conventional cameras. The camera output is a conventional video signal that can be processed and transmitted through existing equipment.

The lens essentially performs optical compression in the horizontal plane and images the wider horizontal angle of view onto the full surface area of the 4:3 sensors in the camera to maintain overall sensitivity.

For more information, contact Angenieux at +33-7730-4210, FAX: +33-7730-4875, or circle Reader Service 2.

### PC image transmission

Viewtronics and Gravatom Technology jointly have the expertise in digital video and data communications to design and support a system to transmit still image files conforming to CCIR 601 between personal computers in different locations via ISDN. During a test, using a single 64 kbps channel, an uncompressed CCIR 601 image file of 900,000 bytes was transferred in 126 seconds. Using the optional Transfile II software that utilizes both 64 kbps channels, this was reduced to 72 seconds.

The companies claim such systems can provide cost effective and error-free distribution of broadcast quality digital images.

For more information, contact Viewtronics at +44-483-750573; FAX: +44-483-770191, or circle Reader Service 114.

### Fluid heads

At the NAB '93 show, Sachtler introduced a new series of fluid heads, the Video 20 Plus (shown above) and the Video 18 Plus. Both are equipped with an illuminated spirit bubble level for easy leveling in low light conditions, according to the company.

The whole tilt range of 90 degrees may always be used, even when the counterbalance is fully utilized. The counterbalance can be increased or lowered continuously between 1 and 5 (Video 18 Plus) or 1 and 7 (Video 20 Plus), respectively.

For more information, contact Sachtler at +49-89-32158-200; FAX: +49-89-32158-227, or circle Reader Service 73.



### Editor

Sony has introduced a new addition to its BVE Series editors. The BVE-2000 offers as standard a large complement of advanced features including twin recorder, pre-read and full list management. Interfaces to a video switcher, audio mixer, monitor switcher and four VTRs are also included as standard, together with a built-in floppy disk drive.

The BVE-2000 can be configured to simultaneously control up to six devices, such as VTRs or DMEs, and a maximum of 12 devices can be connected to the editor. The BVE-2000 has been developed with Digital Betacam in mind.

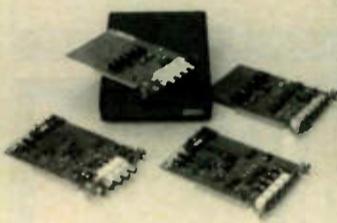
For more information, contact your local Sony representative.

### Multimedia tool for news

NEXUS informatics GmbH's NEWSWIRE 2000 is a computer system for processing news in print, sound and video, and can be customized for your station's needs. It uses simple commands to support all editorial work as well as administrative tasks such as roster scheduling, broadcast rundowns and the administration of advertising to be broadcast.

Windows and pull-down menus make the system easy to use, according to the company. Users can employ a mouse, the keyboard or whatever combination they find works best for them. The system's open architecture allows the creation of a worldwide communications network.

For more information, contact NEXUS at +49-8131-6077; FAX: +49-8131-6649, or circle Reader Service 121.



### Switcher/DA series

Available on Nova Systems' NovaBlox video processing system modules is a series of analog RGB and component video routing switchers and distribution amplifiers.

The units come in stand-alone, rack-mount or computer plug-in configurations and are offered in two versions: one for RGB with sync on green or Y/R-Y/B-Y and another for RGB/S with separate sync.

For more information, contact NOVA at +1-203-693-0238, FAX: +1-203-693-1497, or circle Reader Service 108.

### Paint software

Amiga Centre Scotland has released TVPaint 2.0. TVPaint is a professional painting system designed for graphics artists. It supports high resolution graphics cards and pressure sensitive touch tablets.

TVPaint 2 requires a new dongle (to enable compatibility with the Amiga 4000). It is available as an upgrade to registered users. TVPaint has a new look, redesigned with Workbench 3.0 in mind. You can now open several menu windows at the same time. In the opening screen, you can now specify separately the screen resolution and the working page resolution. You can move the display window in the entire image.

For more information, contact Amiga Centre Scotland at +44-89-687-583; FAX: +44-89-687-456, or circle Reader Service 90.

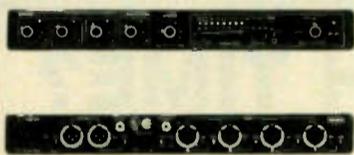


### Weather graphics system

The UltraGraphix-Plus weather graphics system from AccuWeather Inc. is designed with 16, 24 and 16/16-bit color options and is custom-tailored for individual users by the company's in-house programming staff.

The system contains overlay capabilities and an "infnavigation" feature that generates custom national and regional weather maps.

For more information, contact AccuWeather at +1-814-237-0309, FAX: +1-814-238-1339, or circle Reader Service 131.



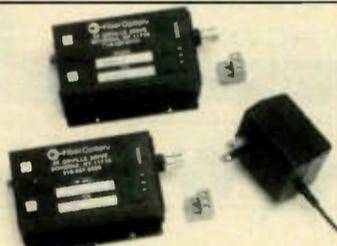
### Microphone mixer

Shure Brothers has released the new Model FP410 portable, automatic microphone mixer.

The unit features noise adaptive threshold capability, which activates microphones for speech, but not for constant noise such as air conditioning.

Max Bus circuitry limits the number of activated microphones to one per talker.

For more information, contact Shure at +1-708-866-2200; FAX: +1-708-866-2279, or circle Reader Service 120.



### Fiber optics

Fiber Options Inc. has released the Series 170B fiber optic video system, designed for runs greater than 1,000 feet where transmission lines are hit with interference or ground loops.

The system consists of a transmitter and receiver capable of a 10 MHz bandwidth and a signal-to-noise ratio of 54 dB. Level loss indicators and video presence status indicators are included.

For more information, contact Fiber Options at +1-516-567-8320, FAX: +1-516-567-8322, or circle Reader Service 127.

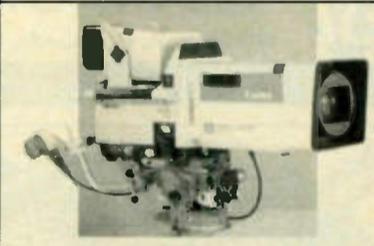
### Pan-and-tilt head

The new Vinten Vision SD12 pan-and-tilt head employs the company's patented Serial Drag pan-and-tilt system together with Vinten's "perfect balancing."

The SD12 supports the additional payloads of larger viewfinders, heavy batteries and larger lenses associated with one-piece ENG camcorders and dockables. Its many new features include a touch-activated illuminated level bubble.

Also new is the Vision SD22 pan-and-tilt head, with all the features of the SD12, but with the capacity for the additional payloads of EFP assignments.

For more information, contact Vinten at +44-284-752121; FAX: +44-284-750560, or circle Reader Service 20.



### Studio/EFP camera

Hitachi's SK-F380 camera is a 600,000-pixel NTSC FIT CCD camera boasting 850 TV lines of resolution, according to the company. A signal-to-noise ratio of 62 dB is achieved at 2000 lux at f/8.0. The camera weighs 25 kg (including a 7-inch viewfinder). The camera head has plug-in compatibility with the SK-F38 portable CCD camera, so maintenance is easy in the system operations.

For more information, contact your local Hitachi representative, or the head office at +81-3-3255-8411; FAX: +81-3-3257-1433, or circle Reader Service 135.

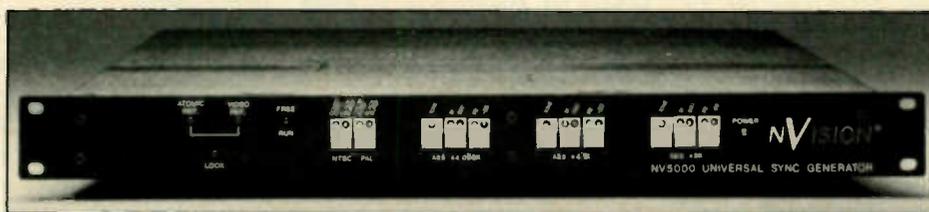
Send new product press releases along with black and white photographs to: Marketplace Editor, P.O. Box 1214, Falls Church, VA 22041 USA.

# NVISION Solves PAL/NTSC Woes

by Bob Frey, CE  
Pacific Video Resources

SAN FRANCISCO, California Pacific Video Resources is a dual standard post production facility based on component digital, D-1, AES/EBU, and SDIF-2 digital audio.

Recently, we began to encounter problems locking our PAL D-1 VTRs to AES/EBU, and we have run up against incompatible AES/EBU sampling frequencies between our PAL D-1 and NTSC D-1 machines. What's more, we have PAL and NTSC sync generators that lock their respective machines, but are not locked together.



Pacific Video Resources relies on NVISION's NV5000 Universal Sync Generator.

version and duplication, we required a reliable, easy-to-install, cost-effective master timing reference to tie the entire system together.

The NV5000 filled all of our requirements. And with industry-standard connectors, it literally plugged right into our system.

Now that we have installed the NV5000, all of our NTSC and PAL equipment is working the way we always thought it should.

*Editor's note: Bob Frey has been the chief engineer at Pacific Video Resources since 1985.*

*The opinions expressed above are the author's alone. For further information on the NV5000, contact Don Joy at NVISION (Telephone: +1-916-265-1000; FAX: +1-916-265-1010), or circle Reader Service 97.*

## USER REPORT

However, the NV5000 universal sync generator by NVISION Inc. has helped solve these problems.

Even though the AES/EBU sampling rate of our VTRs is phase-locked to the internal video of the NTSC or PAL machine, the two VTRs are not locked together. During PAL-to-NTSC transfers, this results in dropped digital audio samples or pops and clicks in the converted program's audio.

But the NV5000 locks our PAL and NTSC D-1 video tape recorders, as well as AES/EBU and SDIF-2 signals, to a common reference. It allows us to do our PAL D-1 to NTSC D-1 transfers without a sample rate converter or having to go through

**... the NV5000 locks our PAL and NTSC D-1 video tape recorders, as well as AES/EBU and SDIF-2 signals, to a common reference.**

A/D or D/A conversions to get a consistent digital audio sampling frequency.

We tested the NV5000 in a variety of modes and found that it works well in "free-run" mode to serve as a master timing reference to lock our PAL and NTSC sync generators together. The free-run specification accuracy of the NV5000 is +/- .25 ppm, but if that is not stable enough, the unit can be locked to an external 5 MHz atomic master timing reference, such as a rubidium clock.

The NV5000 gives us simultaneous SDIF-2 and AES/EBU outputs at 44.056 kHz, 44.1 kHz and 48.0 kHz sampling frequencies. It also provides digital audio test tones or digital silence for each AES/EBU sampling frequency.

The unit also provides test tones, which we have found to be accurate in terms of frequency and amplitude. They helped us verify that our gain was flat throughout our audio chain. We also use the test tones as a source to be mapped to a destination to verify the operation of our switcher and associated terminal equipment.

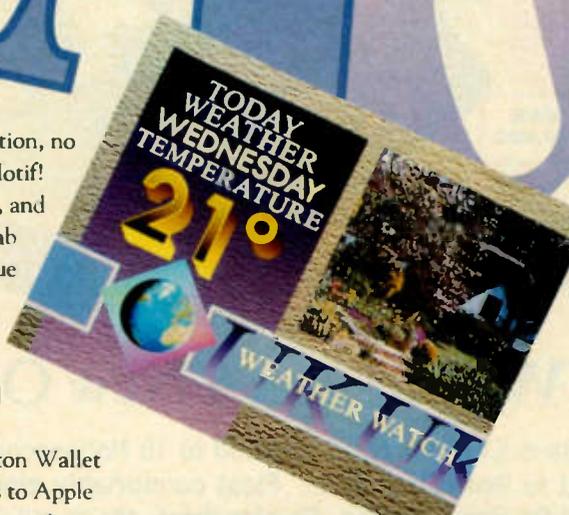
Because we handle 525/30 and 625/25 video signals for two digital edit suites, a Digital F/X Composium suite, a Mac-Graphics suite, as well as standards con-

# NEWS OF GREAT IMPORT

You're looking at the face of the future.

Motif redefines today's standard for affordable and versatile character generation. And you're not restricted to text! Not only can you manipulate your typefaces in an unbelievable number of ways, but also full colour graphics can be incorporated with ease. When you fit the Grab option, no video image is safe from Motif! Motif is the import expert, and its instantaneous frame grab gives you access to analogue or digital graphics and images from any video source. Optional removable storage on hard disk cartridge gives you compatibility with the Aston Wallet stills store as well as access to Apple Macintosh\* graphics via Aston's Mac graphics transfer program, 'The Fixer'. Add it all up and you get a package which is unbeatable in anybody's book - Motif - the ultimate character generator.

\*Apple Macintosh and Mac are registered trademarks of Apple Computer Inc.



CHARACTER  
**mō-tif**  
GENERATOR



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# Station Turns to Prime Image Model 50

by Owen Smith, CE  
KVIA-TV

EL PASO, Texas When KVIA-TV was looking for a new frame synchronizer to replace its 10-year-old unit, the Prime Image Model 50 drew our attention.

We liked its size (being about one-fifth the height of its predecessor) and its price (about one-third the cost). We received a demo to test and liked it so much we bought two of them.

One of the units is used as a TBC for 3/4-inch and Beta tapes

that we use to back up most of our network delay (we are an affiliate of the ABC network) and syndicated shows.

## Multiple uses

Primary network delay is done on five Sony one-inch VTRs. Because we are located in the mountain time zone of the U.S., we have to delay most of the network and syndicated programming. With the running of syndicated shows and network delay, we are on tape 80 percent of the day.

We run a 10x1 switcher to the Model 50, enabling us to route any one of our seven BVU-800 Sony VTR machines into it. We

location to our transmitter site to the studio.

The other Model 50 is used mainly to run signals from the station's weather graphics system to the Ultimatte/Newsmatte-2 to matte our local weather segment and news key panel. We use Sony BVP-270 studio cameras with the Newsmatte.

Because we use the graphic source directly and then wipe to the camera containing the matted graphic through the program bank, the switcher's internal

delay was creating a "shift." Due to the short cable runs at this station, the frame synchronizer is needed to correct any phasing problems in the transition between direct sources and those going through the effects output of the switcher, which we use to feed the Newsmatte-2.

## Prime capabilities

Using our Grass Valley Group Horizon router, we can pass any satellite feed through the Model 50s and have full control of the signal processing.

With our two satellite receivers (each with its own frame sync), there are times when we need to record four feeds at the same time.

That is when we utilize the

*We have been very happy with the two units, and my engineering staff is particularly overjoyed with their zero down time.*

two Model 50s. They are able to pass the VITs and VIRs information, which is helpful in setting proper levels for these feeds. In fact, we can route any one of 64 video sources using this routing configuration.

Another nice feature of the Prime Image 50 is its quick and easy access to push-button preset controls and frame grabbing capabilities, which are used extensively by our production department.

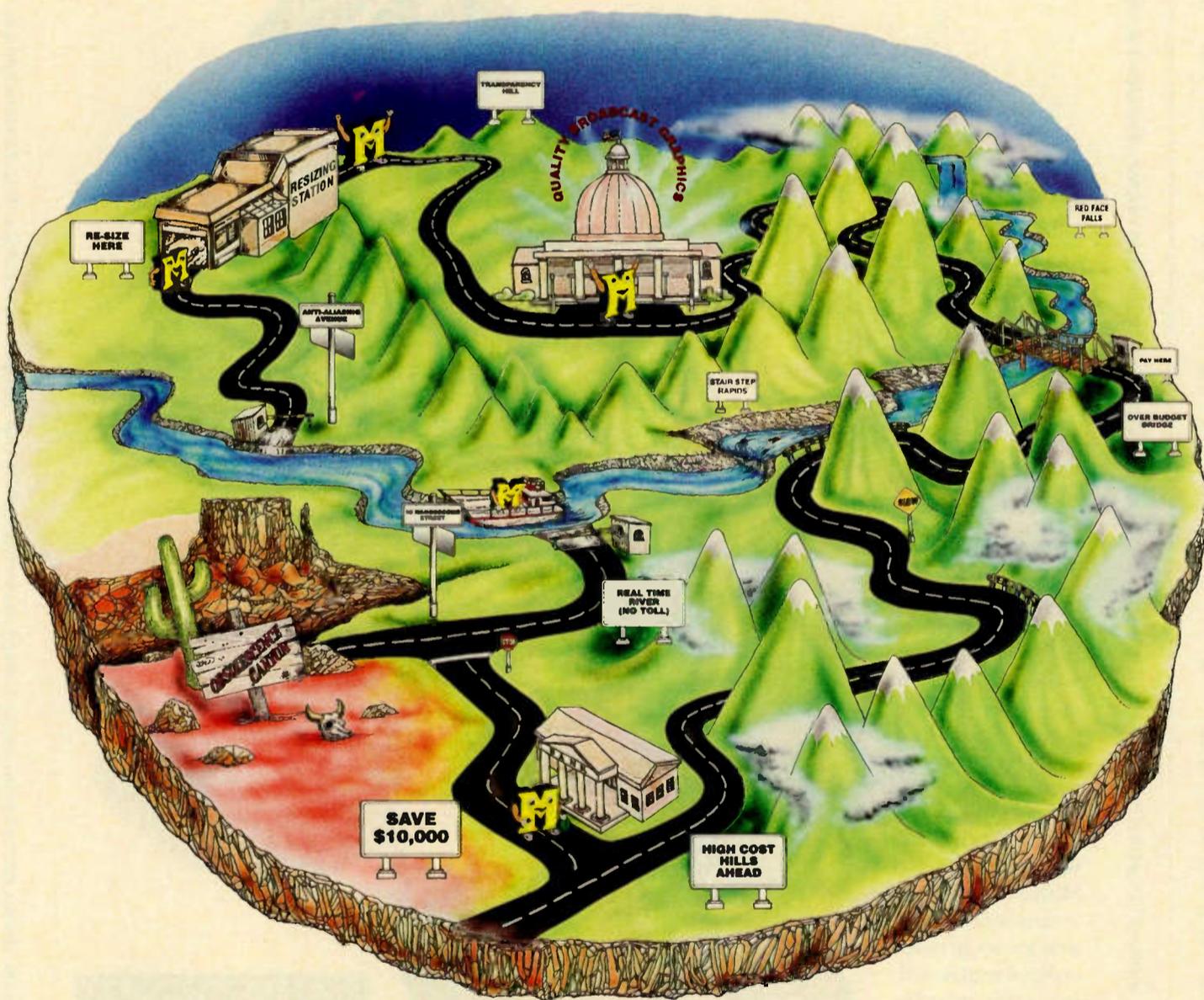
The only problem we have found with the unit is that it will distort data that our network inserts on lines 16 and 17 for the ABC News and TWIX wires. We use a different frame synchronizer on our main ABC feed.

Overall, the Prime Image 50 is compact, reasonably priced and very easy to operate. We have been very happy with the two units, and my engineering staff is particularly overjoyed with their zero down time.

*Editor's note: Owen Smith started working at KVIA in 1978, after spending four years in the Air Force as a satellite communications technician. He became assistant chief engineer in 1983, and chief engineer in 1991.*

*The opinions expressed above are the author's alone. For further information, contact Bill Hendershot at Prime Image (Telephone: +1-408-867-6519; FAX: +1-408-926-7294) or circle Reader Service 96.*

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Circle 41 On Reader Service Card

# Feral TBCs Meet the Cynergy Challenge

by Ian Cunliffe  
Owner  
Cynergy Broadcast Ltd.

MARLBOROUGH, U.K. As an international dealer, I am constantly faced with the challenge of delivering quality products that fit within the budgets of my customers. After reviewing a diverse market of time base correctors manufactured all around the world, I found the U.S.-made Feral Industries line of TBC/frame synchronizers particularly impressive.

Not only are they compact and easy to operate, they offer professional features at an affordable price and produce high resolution output quality.

## Feral familiarity

I am most familiar with the Feral C-100 TBC/frame synchronizer. Measuring only one rack unit high, this unit fits easily into an edit suite. With a 5.5 MHz bandwidth, the C-100 does not compress the signal, resulting in no loss of information or resolution.

The output quality is enhanced by the advanced filtering technology and digital sampling rate, which eliminate artifacts such as ringing, overshoot and undershoot. More specifically, the C-100 incorporates a digital trap filter that maintains a bandwidth up to a frequency of 3.58 MHz, and then recovers again at 4.2 MHz. In addition, the C-100 is designed with the internationally accepted 13.5 MHz sampling rate.

The C-100 was definitely designed for user convenience, with four input selection buttons, an operate/bypass mode button, processing amplifier

control position graph. When making adjustments, LEDs on the graph illuminate to indicate the direction of the proc amp levels. Most important to editors, the

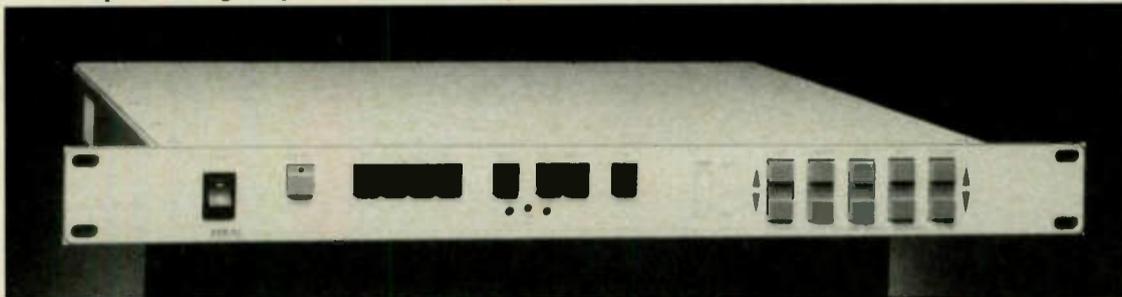
freezing moving pictures.

The unit's fade-to-black function has three built-in fade rates.

Besides these user-friendly features, the C-100 possesses a

with other equipment.

Feral, the manufacturing division of James Grunder & Assoc. Inc. offers a complete line of TBC/frame synchronizers, including stand alone single and dual units, as well as a new board level unit that plugs into any Amiga or IBM PC. The various models retail from US\$1,095 to US\$2,995, making them an economical solution to video production.



Feral Industries offers a complete line of TBC/frame synchronizers.

controls and special effects functions that are easily accessible from the front panel. With the push of a button, I can switch between composite video input 1, composite video input 2, S-VHS video input 1 and S-VHS input 2.

The S-VHS inputs and outputs are especially convenient because they allow me to transfer signals in their component forms, rather than combining them into composite. This produces a much higher quality signal. The C-100 also automatically transcodes between composite

and S-VHS video formats, allowing me to edit

up to S-VHS.

Proc amp settings can be controlled via the front panel or via RS-232 serial port remote. Luma, chroma, setup, hue and Y/C delay can be easily adjusted and stored.

Conveniently, the status of any of the five proc amp controls can be checked using the con-

C-100 has a stable freeze, allowing me to freeze a frame for maximum resolution of still images. Field 1 and field 2 functions let me freeze either field or both simultaneously for

user-changeable power-up, allowing the unit to automatically power up in the input I select. And the C-100 possesses genlock with SC and H phase controls for easy integration

*Editor's note: Ian Cunliffe established Cynergy Broadcast three years ago.*

*For further information about the C-100, contact Amy Flickinger at James Grunder & Assoc. (Telephone: +1-913-831-0188; FAX: +1-913-831-3427), or circle Reader Service 16.*

## Zaxcom: A Piece of the Puzzle

by John Grote  
Senior Editor/Mgr.  
C&C Visual

NEW YORK When C&C Visual decided to totally renovate its facility and expand into the digital domain, it meant acquiring a great deal of new gear. One piece in this puzzle was the Zaxcom TBC remote system.

When designing the perfect edit suite, there are as many combinations of equipment and cosmetics to choose from as there are shapes and sizes of editors. But certain things are necessary for any suite: a great assistant, a great switcher, a powerful audio board, a modern edit system, and of course, versatile VTRs.

Designing our all-new composite digital editing suite—equipped with a 3000 switcher, a Kaleidoscope digital effects system and a Sabre editing system, all from Grass Valley Group, and Zaxcom's amx 1000 digital audio board—was the easy part.

Renovating and updating the rest of the facility took more planning, and the Zaxcom Hub system approach to TBC control was an integral part in that design plan.

The Zaxcom Hub system acquires a VTR in seconds from any location in the facility and provides total control of the TBC on that VTR.

Keeping in mind that the type of TBC being controlled determines which functions are active, the system allows adjustments to luminance, chrominance, black level, hue, video phase, subcarrier and horizontal phase, and in some TBCs, freeze frame, noise reduction and Y/C delay.

While simple and compact in design, the system provides exact control of source.

But the system's best feature is its ability to store 14 separate setups per VTR. This does not include system timing, although it does provide for one alternate timing setup. This is helpful if a facility is not zero timed and a VTR is being shared.

Memory registers can be copied from one register to another, and the system automatically advances to the next register. With compatible edit systems, this data can be stored in the edit

decision list (EDL).

The ability to recall TBC data from the EDL makes it easier to end an edit session and continue it the next day.

Replacing a scene or lengthening a dissolve long after the tapes have been changed is accomplished quickly. The event can be easily recalled from the EDL, and the specifics of the edit and the video settings of the associated VTRs are provided.

Another feature is the system's ability to do a



The Zaxcom Hub 1000 system acquires a VTR in seconds from any location in a facility.

smooth transition from one set of levels to a different set of levels. This transition can be triggered by the edit system by way of a linear dissolve with a duration of 1 to 255 frames.

The Hub system can also be user programmed for an eight-character label to appear on the control panel display (for example, VTR.11). In my experience, however, this is one of those features that is rarely used by editors because the edit system itself keeps track of reel numbers.

Having worked with the Zaxcom TBC remote system for some time, I can say that it is an essential part of the modern edit suite.

*Editor's note: John Grote edited for four years at Post Perfect in New York prior to working at C&C Visual and is a consultant to several networks.*

*The opinions expressed above are the author's alone. For further information, contact Yvetta Tonia at Zaxcom Video (Telephone: +1-201-472-2212; FAX: +1-201-652-7776), or circle Reader Service 1.*

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# DPS Provides a 'Universal' Solution

by Mike Tonges  
President  
Image Video Teleproductions, Inc.

NORTH CANTON, Ohio At Image Video Teleproductions, we offer a variety of commercial production, editing and post production services, but our specialty is remote video production.

Our two trucks are outfitted with their share of Sony tape machines, Abekas and Pinnacle DVEs and still stores, Chyron character generators and Grass Valley Group switchers, as well as one to seven cameras, depending on the shoot. Naturally, we rely heavily on frame synchronizers to keep our signals in line.

Our synchronizer of choice has been the DPS-265 "Universal" synchronizer from Digital Processing Systems. Over the past two years we have purchased six of them, and they have performed flawlessly.

One thing we have discovered is that you can never have enough frame syncs. Many sports arenas and stadiums are at least partially pre-wired for video, and sometimes we need to get a camera shot, such as the scoreboard clock, from a location that is only served by a single

## USER REPORT

coax cable. This makes it impossible to use triax or to run a genlock feed.

Often, we also use wireless RF cameras or take feeds from microwave and satellite receivers. The frame synchronizer makes it a snap to handle any of these situations.

And even though we have a traditional still store system in each of our trucks, we sometimes need to temporarily capture and display an additional still frame or two.

When freezing moving video, the DPS lets us choose from any of five successive fields. For still images, such as character generator text, we use the four-field freeze mode for maximum transparency.

The DPS synchronizers are extremely transparent, displaying no evidence of ringing or other picture distortions, but they are also quite rugged.

We own nine 2 GHz microwave systems, which we frequently rent. If one of our customers needs a synchronizer, we just stick a DPS in the box with the microwave gear and ship it out.

In fact, we were so happy with our existing DPS-265s that I was somewhat skeptical when I first heard about the new DPS VS-2400 MicroSYNC. I could not understand how a video synchronizer fitting on a single PC card could be any good.

However, I decided to take a closer look last fall when our uplink truck was hired to provide the primary Ku pool feed for the presidential debate from East Lansing, Michigan, and all of our DPS-265s were already committed.

I was already impressed that two DPS MicroSYNC cards would fit in a single rack height expansion chassis—a real benefit considering the limited space within most uplink trucks—but when I discovered that we could buy a dual-channel, four-field frame synchronizer system for less than \$3,500, I immediately purchased one.

Surprisingly, the new DPS MicroSYNC performance is on par with the DPS-265. Although the MicroSYNC lacks a time base corrector, it is not needed for satel-



Any two DPS Personal Series or MicroSYNC cards can be mounted in the ES-2000.

lite and camera feeds.

The unit is virtually flat to 6 MHz, and offers selectable clamping speeds, black clip, blanking width and synchronization modes. Like the DPS-265, the MicroSYNC offers a choice of field, frame or four-field freeze.

Installed inside the ES-2200 rack-mount frame, the MicroSYNC looks just like any other piece of standalone

rackmount equipment.

The MicroSYNC card can also be plugged into any IBM compatible computer and be operated with the control software that comes with the unit.

For large installations, DPS even offers the ES-2000 12-slot expansion chassis. This larger box can hold up to eight MicroSYNCs, as well as any combination of DPS Personal V-Scope, routing

switcher, VDA and TBC cards.

Having worked with DPS TBC and frame synchronizers, I can say they are the only ones for us.

The DPS VS-2400 MicroSYNC system saves both money and space, two elements that are often in short supply when it comes to mobile operations.

*Editor's note: Mike Tonges has been a broadcaster for 18 years.*

*The opinions expressed above are the author's alone. For further information, contact Brad Nogar at DPS (Telephone: +1-606-371-5533; FAX: +1-606-371-3729), or circle Reader Service 95.*

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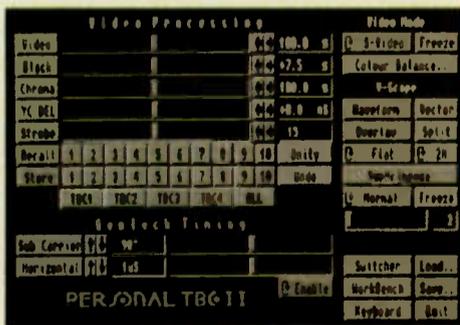
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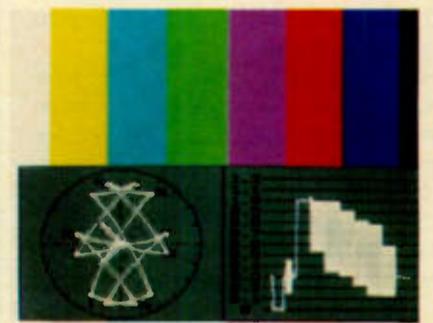
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# The Evolution of Time Base Correctors

## TBCs Have Come a Long Way From Simply Correcting Time Axis Lag

by Fumihisa Nobui

**TOKYO** In 1980, Microtime of the U.S. introduced the first Time Base Corrector (TBC) in Japan. Priced at 4 million yen (US\$34,000) and weighing 50 to 60 kg, it was certainly a technology that had room for improvement.

As its name implies, a TBC provides time axis correction. The units were initially used with VTRs, which up till then had used variable delay-lines to correct time axis fluctuations in playback signals. Digital processing techniques expanded the range of correction and made time

axis correction of stills and slow motion images possible.

### Keeping time

The main function of TBCs with VTRs, however, is to correct time axis lags caused by uneven head rotation and elongation of old tape, as well as to compensate for drop-outs and outlines. At the time of the TBC's introduction, the expense and limited availability of IC memories made it necessary to use CCDs as memories instead. Thus, TBC functioning was limited by the performance limitations of CCDs.

Around 1986, however, the price of frame memory ICs started to drop, leading to the introduction of the frame synchronizer. These devices hit the Japanese market at a price of about 2 million yen (US\$17,000), but had dropped to half that by 1989.

With increased IC memory capacity, a TBC can also function as a frame synchronizer because the range of correction can be extended to a frame. Also, the further introduction of compact, high-capacity memories made it possible to build TBCs right into VTRs. Though demand for stand-alone TBCs has dropped, they are recognized more as frame synchronizers.

Those sold as synchronizers are mainly used at on-site broadcast ENG/EFP locations. In Japan, relay running races and marathons are very popular, and races are broadcast almost every weekend during the season. In these ENG setups where several cameras are used, frame synchronizers play an important role as synchronous conversion equipment. While other applications are possible, there is little demand.

### FOR.A dominance

FOR.A Corp. is Japan's top manufacturer of TBCs and synchronizers. With more than 340 employees and subsidiaries in the US and Canada, the company's success lies in TBC sales. In fact, most TBC products offered by Japanese manufacturers have been supplied by FOR.A on an OEM basis.

FOR.A sells synchronizers with noise reduction technology. It is now pitching the UDP-2000, a universal digital processor designed to correct colors of video signals in ENG and EFP programs, and fade colors of old telecine films without converting digital signals into analog signals. By adding a digital composite input board and a digital component board, it can handle D-1, D-2, and D-3 systems. Noise reduction and image enhancement functions can be added as well.

The UDP-2000 is currently finding wide use as a total image quality improvement device. It is equipped with a color correction function for the color difference and RGB modes. It also offers gamma adjustment of three primary colors, as well as adjustment of phase, white and black level, and

hues and level in sepia color mode.

The unit is priced at 2.75 million yen (US\$23,500) for a D-1 or D-2 serial/parallel model, plus an additional 1.5 million (US\$12,800) for noise reduction.

### Top of the line

In addition to the UDP-2000 line, the UDP-1000 features transcoding, noise reduction, and image enhancing functions at a price of 4.9 million yen (US\$41,800).

In addition to multi-function models, FOR.A was expected to introduce a plug-in TBC, the FA-20, this spring.

Priced at 250,000 yen (US\$2,100), the FA-20 is a TBC board that mounts into the expansion slots of IBM PC-compatibles. It provides full frame time base cor-

rection in playback output signals (inputs/outputs of composite and Y/C358) from the VTR. With a built-in noise reduction function, it can be

used as a frame synchronizer, color frame memory, or transcoder.

While several U.S. manufacturers have been producing plug-in TBC cards for several years, these are not readily available in Japan.

In conjunction with the FA-20, FOR.A was also expected to release the FA-102, a frame for mounting up to two FA-20 channels. The FA-102 is priced at 100,000 yen (US\$850).

In keeping with the down-sizing trend, a small and inexpensive stand-alone TBC, the FA-100, may also be introduced at the same time. Equipped with a form of dynamic noise reduction, it can handle input/output composite and S-VHS (Y/C358) signals and can be used as a time base corrector for heterodyne process VTR playback, a frame synchronizer, a transcoder, or a noise reducer. The price is 330,000 yen (US\$2,800).

Other FOR.A products include the FA-810 frame synchronizer with a four-field data memory by 10-bit quantization (800,000 yen [US\$6,800], plus 150,000 yen [US\$1,200] for the noise reducer), and the FA-510 digital TBC with built-in color correcting functions for NTSC het-

erodyne process VTRs (650,000 yen [US\$5,500]).

While FOR.A has captured the lion's share of the TBC market in Japan, close behind is I.DEN, which was founded by former FOR.A employees.

Integrated TBC/frame syncs are I.DEN's main line of products, and it currently offers three main units in the line: the IVT-7, the IVT-20 and the IVT-60.

The IVT-7 is an upgraded successor to the IVT-9, which was popular among TV stations and post production houses. The IVT-7 has 4:2:2 internal processing and has a built-in frame memory for use as a frame sync.

Because it can handle many YC signals (YC358, YC688 and YC629) and has a 5.5 MHz bandwidth with more than 450 lines of horizontal resolution, the IVT-7 interfaces well with S-VHS signals, as well as Hi8 and DUB signals of U-matic and other professional formats.

Priced at 450,000 yen (US\$3,800), the unit is equipped with a shuttle monitor and drop-correction functions.

### Two channels

The IVT-20 is a dual channel unit with two TBC/frame syncs in a 1 RU frame. With 4:2:2 internal processing, it can handle all VTR formats except one-inch.

Like the IVT-7, the IVT-20 also has a built-in frame memory and a 5.5 MHz bandwidth with 450 lines of resolution. Priced at 750,000 yen (US\$6,400) it can be used as a frame synchronizer in TV conference systems, as well as field production and satellite operations where synchronized connections of multichannel TV signals are required.

The IVT-60 is also a multichannel product, but allows up to six TBC/frame syncs to be mounted in a 4 RU frame. It also has a built-in full frame memory, as well as the 5.5 MHz resolution and 450-line resolution.

The unit can be used with multi-channel videoconferencing, as well as EFP and satellite operations, but is also suitable for ISDN image transmission.

The basic unit is priced at 580,000 yen (US\$5,000) for a single-channel system, and 1.9 million yen (US\$16,200) for a six-channel system.



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## BUYERS BRIEFS

**FOR.A Corp.**'s FA-700 dual channel digital TBC corrects signals from S-VHS (Y/C358) VTRs, as well as composite signals from 3/4-inch and 1/2-inch heterodyne machines.

The unit features DOC for each channel, as well as component processing with 4:1:1 sampling and eight-bit processed Y and C. A wideband CCD comb filter is also included, as well as frame memory and freeze functions.

An automatic chroma level control restores the reduced chroma signal to the correct level at play back, and a black stretch function enhances low level luminance input signals, allowing darker scenes to be changed to higher contrast.

For further information, circle **Reader Service 104**.

The **Microtime Tx6** modular

TBC/framestore system is capable of utilizing all current signal architectures, such as composite, component, dub and S-VHS input and output.

The unit's VariTrak feature provides broadcast quality pictures from -1 to +3X play speed with automatic pause detection. Shuttle performance provides viewable pictures at +/-40X shuttle speed.

EBU/SMPTE standard 13.5 MHz sampling is utilized and an optional noise reducer provides an additional 6 dB of luminance noise reduction.

The unit genlocks with RS-170A NTSC or EBU PAL 0-SCH standards, and an internal sync generator allows it to operate as a standalone unit.

The Tx6 can also be upgraded to AB effects with transition and effects control, mosaics, posterization, paint and strobe.

For further information, circle **Reader Service 24**.

# Sonus Takes Control with Ensemble

## The TC400D Remote Helps Sonus Keep Close Track of its TBCs

by Al Cohen, DE/Co-Owner  
Sonus Audio-Video

**SANTIAGO, Chile** Sonus Audio-Video is a D-1 component digital video editing and audio production house—the first facility of its kind in South America.

While Sonus was originally an audio recording studio, we added video editing and graphics production in July of 1992. And although we are a complete D-1 facility, many of our clients require an analog interface, which means we have a tremendous need for time base correctors and the means to control them reliably.

Sonus has been using the Ensemble Designs TC400D TBC remote controller for about eight months.

### Fighting TBC drift

When working in a digital environment, consistent TBC control is essential. Any type of TBC drift is immediately noticeable, particularly when layering or in graphics production.

The TC400D has dedicated knobs for video level, chroma level, setup and hue. Other parameters, such as sync and sub-carrier phase, are adjusted in their own menus.

At Sonus, we have two areas from which we control the TBCs of Sony one-inch C machines, as well as 3/4-inch U-

Our TC400Ds are networked via Appletalk, Apple Computer's standard networking protocol that uses ordinary pre-made four-wire telephone cables. Each controller has all the necessary Appletalk hardware built in; we just plug them together.

Up to 25 TC400Ds can be connected on the network, allowing remote control of 99 VTRs. Expansion capabilities are built in.

With the purchase of the studio con-

Some of the other options available with the controller are output video control of D-2 VTRs, and a panel for control of the network without adding more channels of TBC remote control. But because we do not have D-2 machines, and only a limited number of analog machines, we did not purchase these options.

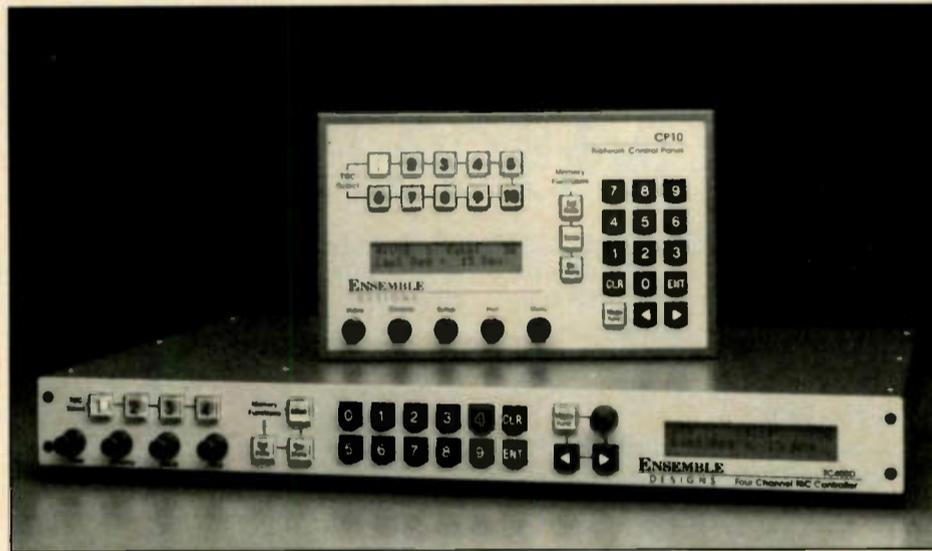
Communications with the Sonus edit controller is another advantage of the Ensemble system. Using a color corrector interface (Sony's BKE-9013), our Sony BVE-9100 editor thinks the TC400D is a color corrector that can store TBC information on an edit-by-edit basis.

Each BKE-9013 interface can connect to four devices, and any combination of

having to wonder if your TBC is where you left it.

*Editor's note: Al Cohen has been involved with the design, installation, maintenance and operation of video post production systems for more than 11 years.*

*The opinions expressed above are the author's alone. For further information on the TC400D, contact Cindy Zuelsdorf at Ensemble Designs (Telephone: +1-916-478-1830; FAX: +1-916-478-1832), or circle Reader Service 51.*



Sonus' Ensemble Designs TC400D units are networked via Appletalk, Apple Computer's standard networking protocol.

troller software, it is possible to network with a Macintosh computer, also via Appletalk. This allows us to store TBC information from the remote controller's registers on a disk drive of the Mac and provides for easy uploading and downloading of information on a VTR-by-VTR basis.

In addition, the software enables us to use the Mac as another remote control panel. However, it should be noted that the control from the Mac is not as elegant as that of the TC400D.

color correctors and Ensemble TBC remote controllers can be used. Each TC400D can save the TBC information of up to four VTRs per edit via the BKE-9013, meaning four TC400Ds connected to the four ports of the BKE-9013 would be capable of storing the TBC information of 16 VTRs per edit.

Another nice feature of the remote controller is its ability to transition between TBC settings at a user-defined rate. The transition or transitions can be triggered from the edit controller using the TC400D's four programmable GPI triggers.

### Trouble-free

Our TC400Ds have been operating without problems since installation. During installation, we encountered a minor problem when trying to network two units. But Ensemble reacted quickly, sending us more replacements than were needed, as it was unclear which unit had the problem.

In addition, Ensemble appreciated the complexity of working with a South American facility, in which the realities of shipping and customs does not allow for piece-by-piece solutions. This is a lesson that other manufacturers and suppliers should learn if they want to be successful in this market.

The most important aspect of the TC400D is that it fulfills a need. Even in the most advanced facilities with the latest equipment, reliable control of the basic equipment is still required.

To be working at the level of complexity that Sonus does, it would be inexcusable to suffer with an inferior system performing this important task. There is already enough to worry about without

## BUYERS BRIEFS

The AF75 TBC/frame synchronizer from **Hotronic Inc.** is compatible with S-VHS, VHS, U-matic and U-matic SP machines, and features Y/C input and output.

The unit offers time base correction for heterodyne VTRs and has full frame memory. A constant H phase function is utilized for matched frame edits, and 4x sub-carrier sampling is provided with eight-bit resolution.

Adjustable horizontal and vertical blanking is also offered, as is separate Y/C processing and adjustable, digital Y/C differential delay. A 3-D chroma noise reducer and a comb filter are built in.

For further information, circle **Reader Service 33.**

The new Model 10X all-digital multiTBC/frame synchronizer from **Prime Image** can operate at up to 10 channels utilizing a plug-in board design.

At US\$1,600 per channel, the unit draws a maximum of only 70 watts.

Each channel accepts composite or Y/C inputs and transcodes to Y/C and composite out, regardless of input type. Outputs can be gen-locked together or independently locked to different sync sources.

All functions of each channel can be controlled separately from the front panel, a remote unit or via RS-232 port.

For further information, circle **Reader Service 110.**

**Feral Industries** has introduced the Micro 4:2:2 TBC/frame synchronizer that plugs into any personal Amiga or IBM computer.

The unit offers infinite window composite or Y/C time base correction using eight-bit, 4:2:2 component processing. Adaptive comb filtering and automatic drop-out compensation is optional.

Other features include the ability to transcode between formats, gen-lock with SC and H phase controls, and memorize proc amp controls, as well as freeze with field 1 and field 2 select.

The unit can be hosted by a standard PC with on-screen graphical software and operated with a mouse or keyboard, or it can be controlled from an external remote unit or via an RS-422 serial port.

For further information, circle **Reader Service 27.**

## USER REPORT

matic and Betacam SPs. The VTR TBC remote control port is connected to a channel of the TC400D. Each TC400D has four channels, enabling it to control up to four machines.

Interconnection with Sony VTRs seems to be the most straightforward. The cable connecting the VTR TBC remote to the channel has standard DB9 connectors, which are very easy to work with.

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# Leitch Keeps Station in Sync

**Fred Sperry**  
**Engineer**  
**Wisconsin Public Television**

**MADISON, Wisconsin** When our Telecommunications Operations Center (TOC) began operation in October of 1988, it was outfitted with four Leitch DFS-3000N frame synchronizers.

Originally designed to feed signals to Wisconsin Public Television, the TOC has grown to provide other services, such as Ku uplinks. In addition, incoming signals to the plant from outside sources have increased to include an intercity microwave relay (IMR) between our facility and a production facility across town, along with an incoming line from a regional microwave carrier. This growth has required the addition of five more DFS-3000Ns.

**Invisible sync**

These units operate as virtually transparent devices. Their sole purpose is to provide plant synchronization, and for this reason do not require any operator intervention.

The DFS-3000N can be customized to the needs of the plant.

The front panel contains all the commonly used operator controls. Since the TOC receives incoming video signals from a variety of sources, we often find it necessary to

## USER REPORT

tweak levels on these incoming signals.

There are level adjustments provided for video, chroma, and set-up, along with a hue adjustment. A set of five LED indicators above each level adjust pot indicates the control positions. The levels can then be returned to a unity setting by the push of a button located on the front panel. Another push of the button returns the previous set levels. If desired, these front panel pots can be disabled by a DIP switch selection inside the unit to safeguard previous settings.

**Expandable memory**

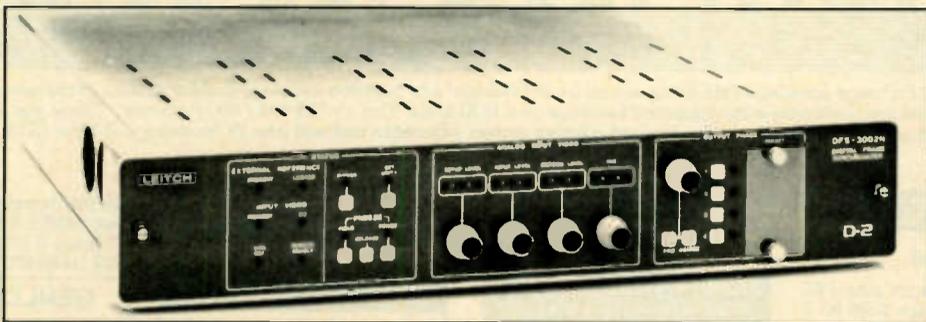
Other features commonly used in our facility include a memory card that can store two fields of video for video freeze-framing. A second memory card can be added to allow four fields of storage or one full color frame.

Remote panels are also available on the DFS-3000N. In the past, a separate 3000RP remote panel was required for each frame sync. However Leitch recently introduced the 3000RA remote assignment panel that allows control of up to eight separate frame syncs from one 3000RP.

One upgrade to the DFS-3000N that we are currently investigating is the addition of an audio synchronizer. Since our facility is often passing signals through our plant from one source to another, lip-sync problems have occurred as a result of several frame syncs throughout the signal path.

Even though Leitch does not market an audio synchronizer, the units we have looked at can be interfaced to the DFS-3000N with little or no modifications.

The Leitch DFS-3000N frame synchronizer has worked very well for us. It has all the features our facility requires, and all DIP switches are easily accessible. The front panel is laid out in an orderly and user-friendly fashion and contains all



The Leitch DFS-3002N digital frame synchronizer handles D-2 and analog video.

the necessary status LEDs.

One thing that has always impressed us about the DFS-3000N is its rugged construction, which makes it ideal for any type of work environment (such as a remote truck).

The maintenance record on the unit has been outstanding. In the past five years, we have only experienced one frame sync failure, and this turned out to be a faulty power supply.

Our facility owns other Leitch products and customer service has always been excellent. Since we acquired our most recent DFS-3000N, Leitch has replaced the unit with the DFS-3002N, which also handles D-2 as well as analog video. Other than this upgrade, the two machines are similar in features and operation, and I am sure that our positive experience with the DFS-3000N can be expected with the DFS-3002N as well.

*Editor's note: Fred Sperry has been part of the staff of the Telecommunications Operations Center for the past five years and was involved in the initial construction of the facility.*

*The opinions expressed above are the author's alone. For further information on the DFS-3002N, contact David Strachan at Leitch (Telephone: +1-416-445-9640; FAX: +1-416-445-0595), or circle Reader Service 61.*

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Sony DXC-M7 hd, VF, 26-pin cbl, \$4900; EDC-55 camcorder w/10x lens, wmtly to 9/93, \$2900, both w/base plate & in very gd cond. C Huffman, C Huffman Video, 616 S 8th St #1, San Jose CA 95112. 408-288-8505.

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Pana MX-50. Michael, Elec Visions, 43 Greenwich Ave, NY NY 10014. 212-691-0375.

JVC KM 1200U, \$1500. M Downey, 407-655-2855.

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Sony VO-8800 3/4" SP, port R/P w/TC, Kang case, batts & chrg, mint cond, \$1800; Ampex SMC 200 univ w/job/shuttle remote, \$1500/BO. Michael, Elec Visions, 43 Greenwich Ave, NY NY 10014. 212-691-0375.

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JVC KY-310 camera w/port 3/4" Hitachi 4400LU & case w/whis & cbs, BO. R Millman, Merchandising, 550 W 43rd St, NY NY 10036. 212-239-4646.

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Hitachi SK-970 (3) w/7" viewfinders, BV-970s, DU-970s, RU-970s, exc cond, \$10K ea/ BO. Shereen, Video Pac Sys, 800 N Seward St, Hollywood CA 90038. 213-469-7244.

Pana DM7010 dock w/750 lines, 62 dB S/N, (3) 2/3" CCDs, dig proc, warranty, \$13K. Greg, AVS Prods, 497B Roots Ln, Owego NY 13827. 607-687-0545.

BVP 300 w/low hrs, \$16K. (2) BVP-7s w/BV-5, \$16500 ea; BVW-20 w/1000 hrs+, \$3200; (3) Toshiba & Elmo IKM 40A micro minis w/7.5MM lens, cbs & pwr sply, low hrs, \$1650 ea. 818-509-7992.

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Sony BVP-3A & BVV-1A w/Fuji A14x9 lens, ctrls, 5" VF, CCU-300, CA-50, VA-IV, BVW-20 plyr, manuals, \$6000 ea/\$10000 both. J Peak, Genl TV Ntwk, 13320 Northend, Oak Park MI 48237. 313-548-2500.

Ikegami HC-200 w/12x Canon lens, viewfinder, mic, docked to JVC BRS-411 S-VHS VCR, adap, AD/chrg, 4 batts, case, \$4800/BO; Pana AG-450 w/all access, case, 3 batts, \$800, both exc cond. R Novick, Competitive Ents, POB 191032, San Diego CA 92159. 619-462-0064.

Sony DXC-3000 w/Fujinon 12x1 lens, case, cable plate & 2 batts, very gd cond, \$3195. Patric, Oasis Prods, 9217 71st Ave, Forest Hills NY 11375. 718-793-2934.

JVC GSX 700, gd cond, \$350; Hitachi VMS8200A S-VHS camcorder, new w/extra batts, \$975. Amie, A/R Video, 12691 NW 11 Pl, Sunrise FL 33323. 305-846-8186.

Sony DXC-M3AK w/15x Canon lens, tripod adap, batt & syst case, exc cond, \$2500. F Soo, Hi Res Comms, 18464 Ash Creek Dr, Mt Clemens MI 48044. 313-228-1600.

Sony DXC-1210 studio chip w/Canon lens, \$300/BO. R Werner, Electri Graphics, 1080 Elmira St, Aurora CO 80010. 303-367-0707.

## DIGITAL EFFECTS

### Want to Sell

Sony ENG (2) viewfinder w/shotgun mic for BVP-7 cams, exc cond, \$750 ea/\$1250 both. J Nogueira, JMN Prods, 257 Purchase St, Millford MA 01757. 508-478-1762.

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Jazz Tempo compression spin tumble w/3 harmony effect cards & 2 storage, \$9800/BO. Amie, A/R Video, 12691 NW 11 Pl, Sunrise FL 33323. 305-846-8186.

## EDITING EQUIPMENT

### Want to Sell

JVC CR8250U; JVC CP5550U; VE90A controller, all BO. Telecomm Dept, City Hall, 410 Abbott Rd, E Lansing MI 48823.

Pana AG-A750 w/cables, manual. R Lim, Videodoc, 805 Center St, Deer Park TX 77536. 713-476-0470.

Paltex Abner A/B roll contrlr, new w/option of Pyxis w/TBCD & 3/4" 5800/5850, \$3500. M Downey, 407-655-2855.

Pana NV-8500 (2) VHS editr, gd cond, \$1500 ea/BO; JVC CR-4400 3/4" port, exc cond w/Portabrace, \$600; Sony SLO-383 Beta I, gd cond, \$1500/BO. C Rose, Legend, 3816 N Meridian #112, Oklahoma City OK 73112.

## LIGHTING

### Want to Sell

Fresnel stage (4), BO. Telecomm Dept, City Hall, 410 Abbott Rd, E Lansing MI 48823.

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