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TV TECHNOLOGY

CORPORATE AND CABLE INDUSTRIES · PRODUCTION, POST PRODUCTION · SERVING THE BROADCAST

IN THIS ISSUE

BBC Gets a New Look for the '90s

Network Adds Flash to News Broadcasts in Wake of Increasing Competition

by Dick Hobbs

LONDON

In the opening sequence of the BBC's television news broadcast, viewers are given a wide shot of the studio with an imposing glass symbol in the foreground, beams from the lighting grid above and a videowall behind the newsreader.

The shot tracks past the glass symbol to close in on the reader who, as it turns out, is the only element of this scene that really exists.

There once was a time when every British viewer turned to the BBC for authoritative news. Now, with a choice of six or more television news broadcasters, the BBC has redesigned all its news programs around a common visual theme encapsulating that traditional authority. In the process, the network has seen a number of equipment upgrades.

The core element of the redesign is the use of the BBC coat of arms, which features a globe at its center representing the worldwide nature of British television news.

"We call it news branding," said Mike Hawkesworth, the BBC's operational development manager. "We want the viewer to know instantly that this is a BBC news program.

"As a part of the news branding operation," he continued, "we introduced some major technological changes. We now have a very high quality image, while keeping our operating costs low."

VIRTUAL STUDIO

In the opening shot, most of the studio — including the "glass" coat of arms with its spinning globe, desk, floor and lighting grid — is generated by computer. Created by the BBC's in-house designers, it was rendered using Vertigo modeling and animation software on a Silicon Graphics computer. The final model contains some 1,100 objects, or more than one million polygons, including reflection and refraction mapping that makes the glass look real by reacting with the studio lights.

The completed design was field rendered onto an Abekas A66 disk store, taking about 25 minutes per frame. Final post production of the computer animation was on a Quantel Harry, before being transferred to Sony laserdisc for transmission.

When it came time to match the camera movement on the news reader with this computer-generated environment, the BBC turned to its new robotic camera equipment. While the BBC has been using remote controlled camera pedestals since the late 1960s, the redesign and re-equip program offered a chance to install the latest generation of fully robotic equipment.

A BBC News sign-off:
Only the presenter and his immediate surroundings are real. Everything else — the glass logo, desk, lights and lighting grid — was generated on an SGI workstation, played from Sony video disks and integrated with the live pictures using a Questech Charisma DVE.

ROBOTIC SUPPORT

For camera robotics, the Radamec-EPO system was selected. Carrying Thomson 1647-S lightweight CCD cameras with Fujinon lenses, the robot pedestals move around the studio floor under remote control from the gallery. There are four robotic pedestals, supplemented by a remote-controlled camera pedestal (pan, tilt and zoom, but no movement) for the breakfast sequences.

While the Radamec-EPO system allows the pedestals to be driven around the studio floor under the direct control of an operator, in most cases they need to move precisely to preset positions. The control computer includes a facility called "See & Select," which allows operators to store shots in the system and select them via a touch screen.

At the BBC's request, Radamec has developed a system in which steering is relative to the lens axis. This is unlike the standard X-Y steering system, in which the controls

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ISO Launches MPEG 4 Process
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NEWS WATCH

IBC

ITS FIRES BACK AT IBC DECISION

MONTREUX, SWITZERLAND

Organizers of the Montreux International Television Symposium (ITS) have fired a return salvo at the IBC for the latter group's decision to turn its Amsterdam show into an annual event.

The two groups have traditionally held biennial events in alternate years, giving Europe one major television show each year.

Following the IBC announcement in late November, the ITS asserted that its 19th show will take place in June of 1995 as scheduled. The group also said that a survey of manufacturers and broadcasters in Europe, Asia and the U.S. indicated that most support the status quo.

"The overwhelming majority strongly supports the continuance of the Montreux Symposium and Exhibition in alternate years," ITS said in a statement. "Second, they do not want two conventions and exhibitions in Europe in one year and believe that IBC should continue as a biennial event."

Among those that were listed as supportive of ITS were: BTS, Panasonic, Philips, Sony, Thomson, Quantel, as well as numerous broadcast networks.

"The rationale for the IBC decision is badly flawed," the statement continued, adding that the decision "demonstrates a failure to appreciate the special needs of equipment manufacturers and broadcasters."

BUSINESS

JAPANESE COMPANIES FIGHT EUROPEAN TARIFFS

BRUSSELS, BELGIUM

Japanese camera manufacturers are furiously pursuing a rearguard action to remove temporary anti-dumping tariffs imposed on sales of their broadcast cameras in Europe.

The tariffs of up to 97 percent of current prices, were imposed at the end of October for a provisional four-month period. The action affects Hitachi Denshi, Sony, Ikegami and Matsushita, parent of Panasonic and JVC. The cameras affected are three-chip CCD units of 400,000 pixels or more with signal-to-noise ratios of 55dB or more at normal gain.

In an attempt to have the tariffs removed, the four Japanese manufacturers are trying to rally support among European broadcasters to have them petition the EC. If the Japanese companies fail to have the tariffs removed by the end of this month, they could remain in place for up to five years.

The EC said it imposed the tariffs after investigating claims by rival manufacturers that the Japanese companies were dumping cameras on the European market. The exact amount of the tariff varies between the different companies. According to the EC, the amount varies on the severity of the alleged dumping practices. Matsushita has been hit with a 97 percent hike; Ikegami received 86.4 percent; Sony, 79.8 percent; and Hitachi, 49.9 percent. The fines are in addition to the established 4.9 percent import duty already imposed on cameras imported into the European Union.

The trigger for the EC inquiry was a complaint in March by Thomson Broadcast of France and Philips subsidiary BTS alleging "material injury" to the EU's industry. In response to the complaint, the EC looked at market share within the EU for the period of July 1991 to December 1992. The EC claimed it found the Japanese companies apparently increased their collective market share by 26 percent, while European manufacturers suffered a 30 percent loss. The EC also alleged that the prices in Japan and Europe for the same cameras showed evidence of a weighted average dumping margin for all four companies.

The EC said it regretted any immediate price rises that would "probably" result from the tariffs, but insisted that protective measures would "preserve diversity" and promote competitive prices in the long term.

SATELLITE

ANDREW TO PROVIDE C-BAND SYSTEM TO RTB

BRUNEI

Radio Television Brunei (RTB) has awarded a US$1.4 million contract to Andrew Corp. of the U.S. for installation of a C-band uplink system.

The system will consist of a 7.6-meter fully redundant antenna, as well as a UPS power distribution system, antenna foundations and alterations to existing facilities.

RTB will use the system to uplink one hour of daily religious and news programming on a Palapa BR satellite.

DBS

MBC READIES NEW CHANNELS

LONDON

Middle East Broadcasting Center (MBC), an Arab-language satellite news and entertainment service, is preparing to launch a number of digital subscriber channels early this year.

The initial offering includes a movie channel, a family entertainment and educational channel, a general entertainment channel, a news channel and a sports channel. Future channels are expected as demand increases.

The subscriber service is designed to cover all major cities on the Arabian Peninsula. MBC's current advertiser-based channel is available throughout Europe and North and Central Africa via Eutelsat or Arabsat, as well as in the U.S., Canada and Central America on the Arab Network of America.

MBC has decided to utilize General Instrument's DigiCipher digital compression technology for the subscriber channels.

Programming will originate from a new 100,000 square-foot complex in London. The facility consists of three state-of-the-art production studios and a large satellite dish farm.

AUTOMATION

ASIAN BUSINESS NEWS AUTOMATES WITH ODETICS

SINGAPORE

Asian Business News (ABN), an English-language all-business news service for the Asia-Pacific region, has completed an automation project based around an Odetics TCS90 cart machine.

The unit interfaces with ABN's NewStar newsroom automation system to allow journalists' reports to be automatically lined up for air play.

The TCS90 is format independent and can support regular programming and commercial playback.

ABN is a joint venture of the U.S.'s Dow Jones & Co. and Tele-Communications Inc., as well as Television New Zealand and SIM Ventures, parent company of Singapore Broadcast Corp. The service is carried on the Palapa B2P satellite.

NEW TECHNOLOGY

CINDY BOARD FOR SGI RELEASED

LOS ANGELES, CALIFORNIA

Chyron Corp., a member of the PESA/Chyron Group, has begun showing its Cindy video board designed for Silicon Graphics' Indy workstations.

According to the company, the board operates with virtually all recording devices and maintains full bandwidth, full color video with realtime output. Also included are dual frame buffers and a built-in Videomedia V-LAN transmitter for remote control of numerous other devices.

"Cindy provides Indy workstation users with the ability to take advantage of the economical Indy workstation in the broadcast, production and corporate video communities," said Paul Yarmolich, vice president of engineering for Chyron Graphics.

BROADCAST

TURKISH FACILITY NEARING COMPLETION

ISTANBUL, TURKEY

A new US$6 million broadcast facility for the Municipality of Istanbul is close to completion and is expected to be on-air early this year.

Most recently, the U.K.'s AVS Graphics was awarded a contract to be the exclusive provider of character generators for the facility. The company's ManuScript 500 character generators are slated for use in master control, post production titling and outside broadcasts.

The overall broadcast center will contain full production studios, as well as dubbing and edit suites. For.A's U.K. subsidiary is the turnkey provider and is supplying a number of editing systems.

Other contributing manufacturers include Ampex, which is supplying one-inch equipment; Sony, supplying Betacam VTRs; and Panasonic, providing various digital cameras.

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BBC Gets a Fresh Look for the '90s

work relative to the studio walls regardless of the direction the camera is pointing. The new system will shortly be under test to see if it simplifies operation.

The Radamec system requires a clear studio floor. Not only must there be free movement of cables, but because the pedestals position themselves by means of bar-codes on the wall, they require clear lines of "sight." If it can see two bar codes, or better still, three, it knows where it is and what its rotation is.

"We frequently, particularly in the breakfast program, move a camera around behind the desk," Hawkesworth said. "That means it relies on its dead reckoning, which is usually accurate enough."

SAFETY SYSTEMS

There are two independent safety systems on the pedestals — infra-red detectors and contact strips — to prevent collisions with other pedestals and with studio personnel. In addition, when the pedestals are moving, an alarm sounds. Of course, when the studio is on-air the alarm is restricted to the headset of the floor manager.

The live studio cameras are linked to the animation in Questech Charisma DVEs, which act as the glue holding everything together. In the opening sequence, for instance, the live camera needs to be cropped, reduced and adjusted for perspective, before being matted into the computer animation. The Charisma controls the laserdisc players directly to ensure that the various elements of the animation are run in sync.

Perhaps surprisingly, the main video switcher is a small CDL mixer dating from 1981, although it has been enhanced by the addition of desk effects, including Pro-Bel routers and multi-layer downstream keyers, as well as the Questech Charisma DVEs.

KEEP IT SIMPLE

In part, this is for operational simplicity in the news environment, where things are constantly changing.

"We have one golden rule," Hawkesworth joked. "The only time you cannot change the program's running order is during the closing credits."

The serious implication of the need to support constantly changing editorial requirements is the reason that inserts are still played in from individual Beta SP players under direct manual control with zero pre-roll. The BBC has an eye on automation for the future, but the goal is to retain flexibility.

This need for flexibility is also the reason the BBC transfers its disk-based non-linear edited material to tape for airing, although the network is enthusiastically experimenting with Avid's NewsCutter direct-to-air system.

"We also need a networked non-linear editing system," said Hawkesworth. "Material coming in may need to be cut into a number of lengths to fit into short bulletins or half-hour programs."

Clearly, the BBC redesign is aimed at providing the most up-to-date on-air look for the network. However, there is just as much attention being paid to function as to form.

"By using the latest technologies, not only have we given our news programs a fresh look which the viewer can immediately recognize, at the same time we have streamlined and simplified production, enabling significant cost savings," Hawkesworth said. ■

Editor's note: Dick Hobbs is a free-lance writer living in London. He recently completed a thorough tour of the new BBC facilities.

CONTINUED FROM PAGE 5

Tips on Selecting a Library System

independence and continues to counsel stations to look forward when making cart machine investments. We believe that modularity and upgradeability are imperative to making long-term library management decisions.

If one theme is constant around the world, it is that the broadcast industry hopes to benefit from the advancements in digital image processing and disk-based storage. Recent developments in digital compression are making disk-based storage of broadcast quality television practical. The result: a wide range of digital storage systems from companies that are very new to the world of on-air automation.

There is a saying in the United States that the pioneers take the arrows in the back. Loosely translated, this means that one should tread lightly into areas of vast technological advancement. This is not to say that stations should shy away from digital disk-based storage systems. Rather, determining how stations can cost-effectively integrate this promising new technology should be a priority.

The computer industry has learned the difficult lesson that disk-based storage is considerably more expensive than tape. Consider this comparison: the cost of storing one megabyte (MB) of data on a hard disk drive costs between US$1 and $5. Conversely, storing one MB on tape costs between five and 25 cents. Not even the elimination of VTR maintenance is likely to offset these differences.

At Odetics, we believe that the sensible solution for a traditional broadcast application is a hybrid system combining either analog or digital VTRs with a random access digital disk cache that buffers the short segment material prior to air. Because the cache provides random access and internal buffering, it is possible to replay the same copy of a spot to several different output channels, even if each channel starts at a different time.

In both traditional broadcast and multichannel applications, the cart machine downloads spots from the archive reel to the cache well in advance of air time. The buffer is continually monitored and automatically adds and deletes material as required. It elegantly solves the multicut conflict challenge and increases on-line storage.

Stations with modular and upgradeable systems will soon be able to add a digital cache and ultimately put their entire spot inventory on-line. To ensure that they are not locked out of these exciting new technologies, stations making their initial large library management purchases should choose modular systems with both media and format independence.

In many ways, emerging markets are the envy of more established segments of the broadcast industry. By combining the best of proven cart management techniques with the ability to integrate future technology breakthroughs, stations in emerging markets can ensure a straight-forward path to station automation. ■

Editor's note: As director of global business development at Odetics, Frank Borst is responsible for managing Odetics U.K. and Odetics Asia Pacific, located in Singapore. He has both graduate and undergraduate degrees in marketing and finance from Arizona State University and the American Graduate School of International Management, Thunderbird.

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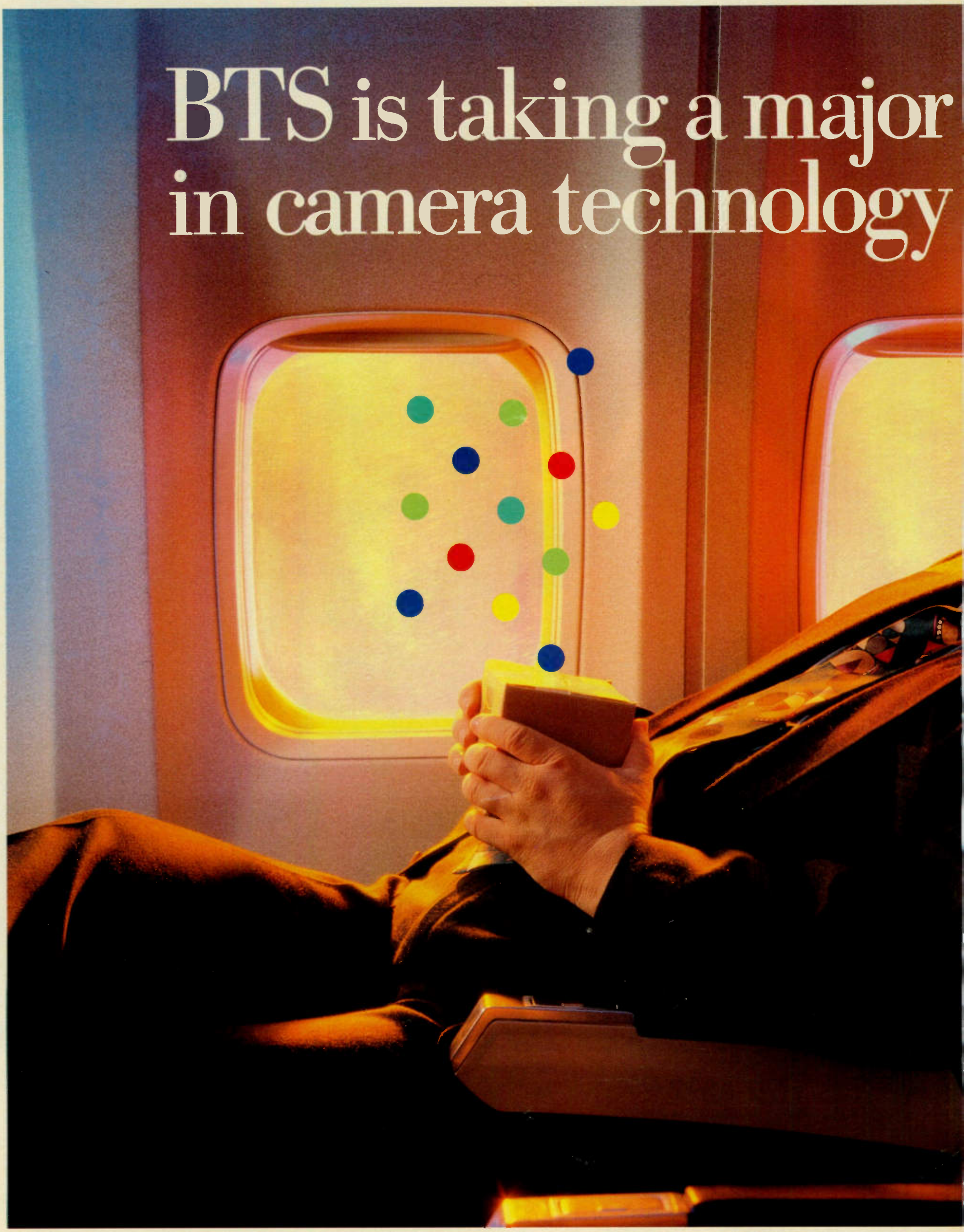

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Creative Television Technology from BTS

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Thomson and ABB, One Year Later

by Chris Dickinson

PARIS

In February, French giant Thomson Group celebrates the first anniversary of its expanded radio and television transmitter business. The month marks one year since Thomson set in motion the acquisition of the transmitter and electron tube side of Swiss-Swedish group Asea Brown Boveri (ABB).

The deal, formally closed five months later in July of 1993, has doubled Thomson's overall share of the transmitter and antenna market and propelled it to the top of the world league tables.

MAJOR PLAYER

By Thomson's own estimates, the acquisition gives it 25 percent of the world market share in television systems and 55 percent in radio. In AM transmissions in particular, ABB and Thomson Group subsidiary Thomson-CSF already dominated the market.

Since the deal was struck, ABB's tube side — covering a production center at Lenzburg, Switzerland, and a 61 percent share in a joint venture in Poland, renamed Thomson-Lamina Tubes Electroniques — has been absorbed into Thomson's own tube operation, Thomson Tube Electroniques.

The ABB transmitter business — ABB Infocom, the Zurich-based AM radio operation, and the antenna operation Antennenanlajen Mannheim, based in Mannheim, Germany — has been brought under the control of Thomson-CSF.

All the AM transmitter operations of Thomson-CSF and the TV and antenna activities of another Thomson subsidiary, Thomson-LGT, have been put with the ABB units into a new company, Thomcast. Thomcast is headquartered in Paris and run by General Manager Marc Russel, who in turn reports to Roger Chevral, head of the communications division of Thomson-CSF.

In France, Switzerland and Germany, the company trades as Thomcast. In the U.S., the ABB transmitter operation, Thomson-CSF, Thomson-LGT and Comark Communications, which was acquired by Thomson in 1989, have been brought together under the Comark banner. The general managers of the Swiss, German and U.S. operations all sit on the main Thomcast board.

According to Thomcast, the company now has a dominant share of the home market in its four main bases of the U.S., France, Germany and Switzerland, and in each country, the local operation has a percentage split between domestic and overseas sales of roughly 40:60.

LONG-TERM PLANS

Gui-Nolnoel Le Carvennec, Thomcast's vice president for strategy and marketing, said the acquisition and reorganization suited both Thomson and ABB's plans.

"ABB wanted to disinvest, and it is part of Thomson's policy to be at the top of the world in sound and vision broadcasting," Le Carvennec said. "Being part of the Thomson Group, the Thomcast operation can also rely on strong company resources, especially in research and development in our central laboratories and from Thomson's success as a world leader in electronics."

Le Carvennec said the Thomcast/Comark range of products and services covers practically every radio and TV field, including transmitters, antennae and turnkey systems for AM and FM radio, and VHF and UHF TV. Transmitter power ranges from the lowest to the highest megawatt (MW) transmitters.

The imminent arrival of new forms of digital radio and television broadcasting means only one thing to all transmitter manufacturers: sales. It has been estimated by the U.S.'s Grand Alliance HDTV development consortium that each television station in the U.S. will have to spend between US$700,000 and US$1.2 million upgrading its transmitter and antenna systems to handle HDTV simulcasts, assuming each station continues to use its existing tower and has no back-up transmitter.

Costs to radio broadcasters for the adoption of digital audio broadcasting (DAB), or an alternative in-band system, are likely to be lower, but still significant.

PREPARING FOR BATTLE

The combination of HDTV and DAB, plus the advances in SW transmissions, means that the world's transmitter manufacturers are lining up for what is likely to be quite a battle.

"The next few years are going to be very challenging for all the market players," Le Carvennec said. "We are at the beginning of big changes in technology; the television of tomorrow is going to be very different from television now — this is also the case in radio — and this will be a major challenge for the industry. It is one of the reasons for the creation of the Thomcast group." ■

ISO Targets MPEG 4 At Low Data Rates

by Chris Dickinson

LONDON

Leonardo Chiariglone, head of the International Standards Organization (ISO) Moving Pictures Experts Group (MPEG), has announced the first details of a low-end standard, MPEG 4, which will allow video technology to be merged with telecommunications systems.

Speaking at the biennial BKSTS conference in London, Chiariglone said MPEG 4 would enable a new generation of services to be created.

"Take it as a challenge to provide for a marriage between industries yet to be discovered," he said.

MPEG 4 will have an extremely low data rate of 6 Kbps (kilobits per second) or less, to enable services such as video conferencing and video telephones to be run on Integrated Services Digital Networks (ISDN).

As for the top-end MPEG 2 compression standard agreed in principle last October, Chiariglone said further tests are planned to verify the standard's quality over a number of bit rates. Full software implementation is expected by the end of 1994.

"As we cannot guarantee the MPEG 2 standards are suitable for every application, what we are doing is to verify the quality of the standard at the bit rates of 4, 6 and 9 Mbps (megabits per second) for a range of test sequences," he said. "The results of these tests will be known in Paris at end of March, and the exercise should be completed by end of 1994."

Chiariglone said MPEG 2 was designed to be as simple as possible to enable it to be used in a large number of applications.

"The MPEG story has been about meeting two challenges," he said. "The first has been finding a mechanism to convince different industries that there is a technological advantage in going digital together. The second, and much more important, has been defining at the same time a single sentence capable of representing such a way that common signals could be understood by all.

"A standard must only define what is really necessary to define. This has (the) advantage that during the life of a standard you can have different variants of encoders, each generation more powerful than the preceding one."

Chiariglone added that tests in Germany on the audio side of MPEG 2 might also lead to a new variant that would make the standard more robust.

"We intend to extend the functionalities of MPEG 2 in a number of ways. The first is the development of the non-backward compatible audio coding mode, in case the current testing being carried out in Berlin proves there is advantage in not being backward compatible. The second is to develop a generic protocol that will connect different digital storage media containing MPEG chips."

Chiariglone also acknowledged that a super high quality MPEG standard — MPEG 3 — dedicated to high definition television had been killed off. Although a standard capable of handling bit rates of 20 Mbps is technically feasible, he said high implementation costs make it unlikely such a system would ever be commercially viable. Operators wanting to run HDTV services will instead use a number of MPEG 2 channels to reach the required quality. ■

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SOMEWHERE OUT THERE *You might not have noticed* that you're allowed to use an electric shaver on a commercial airliner. Bear (or should I say "bare"?) with me a moment or three. I promise that these verbal split-ends on aircraft haircraft will eventually wend their way into TV technology.

Remember when the United Airlines pilots and mechanics staged a "slowdown" last November by following every safety rule to the letter? Well, what the heck do they do the rest of the time? The fact of the matter is, if you want to be scared about flying, there are plenty of good reasons, but the possibility that some fellow passenger might be listening to a clandestine radio is not one of them.

I guess this is the theory behind the ban on radios: The VHF broadcast radio IF is 10.7 MHz. Add that to the top of the band and you have 118.7, somebody's control tower frequency, unless I messed up somewhere in the addition. And, worse yet, if you tune somewhere between 97.3 and 107.3, you are going to generate something right in the middle of the air navigation band. It is not a great idea for a pilot to hear rap music while trying to get clearance to land, but how would you like the autopilot to yaw the nose to some heavy metal beat?

Down in MW land, the situation is similar. Subtract the 455 kHz IF from any station between 640 and 980, and you are sitting on either navigation or distress signals. Scary stuff, boys and girls, eh?

A FEW STRAYS

Frankly, put me on an overdue flight in the middle of heavy turbulence, and I just might figure that the spark from turning off a reading lamp will send us into a spin. But, here on terra firma (or even earthquakeland's terra not-so-firma), this stuff is about as threatening to me as an overcooked noodle.

Let me ignore, for a moment, all the stray RF sources that the airlines are not doing anything about. Take an MW radio and tune it to an unused channel (a handy technique for finding potential microphone interference problems on a remote site survey). Bring it near your notebook computer when it is in sleep mode and give a listen. Do the flight attendants ask you to remove all the batteries from your computers when they ask you to stop using them between zip and 10 kilofeet? Nah, just put them away. Out of sight, out of mind (and I *do* mean the latter).

Hey — as long as I am encased in an oversized toothpaste tube levitated by wings filled with tons of flammable liquid, I am willing to worship pilots as gods. If it makes them feel better to have witch doctors sprinkle jujubes along the edges of the runway, I will just curtsy, say, "Yes, Your Flyness," and cheerfully pay the jujube tax on my ticket.

Likewise, if it improves their attitude to keep me from catching a little music or news, I am willing to go along with that, too, but please spare me the cartoon physics about signals leaping from receivers out windows, bouncing off the empennage, entering the navigation antennas and sending a transatlantic flight to Australia.

You can bet that there is a real problem with interference to aircraft navigation caused by VHF broadcast radio, but it is not the receivers. A while back, a perfectly legal station at 107.9 MHz went on the air in Toronto, a city with an existing station at 107.1. Intermodulation from those two wiped out reception of a runway localizer at the 1992 SMPTE's main airport, forcing a shutdown of instrument landings until the system was retuned.

That is a serious problem; the pathetically weak L.O. leakage from a VHF broadcast radio receiver is not. Likewise, I am not saying it is a good idea for CATV systems to ignore leaks. Just because those amplifier-equalizing signals at runway-marker frequencies are called pilots does not mean they are supposed to be aimed at airplanes. But that, too, pales as an air navigation problem in comparison with intermodulation caused by perfectly maintained VHF broadcast radio stations.

That is not just my opinion; unless I am way off base again, I think you can find similar thoughts expressed better in the pages of such flying-industry publications as "Aviation Week and Space Technology."

Let me put this another way: Saddam Hussein is not going to get very far trying to get planes to crash by positioning an army of terrorists armed only with portable radio receivers.

So much for navigation. Want to know what *the* single biggest problem with air/ground communication is? Stuck PTT mic switches. Period. A pilot squeezes and releases, but, if a little gunk keeps the button from popping out, what you have is a full-power transmitter, bang-on frequency, wiping out all communications on that channel from one horizon to the other (*that*, by the way, is why it is a dumb idea to use a cellular phone in flight; seven miles up, small-cell frequency re-use is a joke).

A CLOSE SHAVE

"But, Mario, isn't interference from passenger electronic devices even a potential problem?" Glad you asked. This is my favorite part.

Look: Where are the avionic receivers on a plane? You got it: the front. And what is the farthest front point accessible in flight by a passenger? Yep, a lavatory with an electrical outlet, where you can plug in a shaver and depilate your hairy knees or whatever other hirsute portion of your anatomy could stand tonsure.

Let me recap for those of you still bloated from holiday gustations. Pilots are concerned about falling Tetris blocks on a Game Boy causing jets to do the same, but they allow broadband RF noise generators (also known as electric shavers) to be operated in closer proximity to every critical avionic device. To me, the jujubes make more sense.

Tek achieved the ancient computer mantra of "garbage in, garbage out," for which they deserve at least an Emmy . . .

Anyhow, the point of all this is not just another example of the neverending battle between mysticism and engineering, like when you hear a sales "engineer" for an edit controller manufacturer say as you press the button to make the machine stop and instead it shreds your master tape, "Well, those particular VTRs do not always *pay attention* to our commands." The point is that the world is full of noise, whether it is Fessenden-style spark-gap transmitters giving close shaves in flying washrooms or elevator relays corrupting edit-control messages.

HAIL TO THE FRAME SYNC

That is why I have something nice to say about Tektronix this month. You are reading the random effluent of someone who remembers the days before genlock. Back then, I served a stint slewing the pulse generators of TV stations by phone line connection to the network so there could be "Nightline"-type interviews without sync crashes. And then there was that rack of equipment NEC called a frame synchronizer. Shazzam!

If I was even more crotchety than I am, I would complain about how you young whipper-snappers have it too easy these days. You can genlock cameras instead of feeding them thigh-sized cable bundles of pulses, time systems with diddle sticks instead of long coils of coax, or almost forget timing altogether and just use frame syncs. Heck, frame syncs are so cheap these days that some consumer-video company called Videonics is selling a digital video switcher with effects and a couple of frame

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Is Your Satellite Bed 'Digital Ready'?

by Doug Lung

RF TECHNOLOGY

Digital video compression is coming soon to a satellite near you! Judging from the regular mail, e-mail and phone calls I get, it is a favorite topic among TV engineers. This month, I will tell you how to check out your satellite installation to see if it is "digital ready" and give a glimpse at compression at the Western Cable Show in Anaheim.

Also, I will talk about software for the Cheap Remote 2 I wrote about last month. If you did not read my original Cheap Remote article, you will be surprised how much this little box can do.

After reading about equipment that HBO, Viacom and TCI are buying that can put four or more video channels on one satellite transponder, you might be wondering if you can use the technology to get more use out of a microwave or cable path. The short answer is "yes." The long answer adds "if you can afford it."

High-quality MCPC (multiple channel per carrier) video compression equipment such as that offered by General Instrument and Scientific Atlanta costs over US$100,000 per video channel for the encoding equipment! GI is planning a less expensive single channel per carrier (SCPC) system.

PRICEY ASYMMETRICS

Why is the encoding cost so high? Because the compression is asymmetrical. Most of the work is done in the encoder, so under-US$2,000 integrated receiver/decoders (IRD) are possible. More symmetrical systems are available, although the cost still is not cheap for full bandwidth video. Compression Labs Inc. of Boulder, Colorado, in the U.S. is one of the companies offering this type of equipment.

The major manufacturers of video compression equipment are moving toward the MPEG 2 compression protocol. Currently, ICs are available for "near MPEG 2" compression from C-Cube, LSI Logic, Thomson and Pioneer. There may be more, but these are the ones I have heard of.

Does this mean that one manufacturer's MPEG 2 IRD will receive a channel encoded with a different manufacturer's encoder? No, not anytime soon. MPEG 2 equipment will start shipping in the middle of 1994, but compatibility is not assured. While the compression scheme is the same, it is likely manufacturers will package it differently — perhaps different forms of modulation, different conditional access, different transport protocols.

What MPEG 2 will mean is that any MPEG 2 equipment should be compatible at the compression level. It should be possible to obtain a digital data stream that can be moved between different manufacturers' equipment without decompressing the video.

While this compatibility issue might not seem important now, think about how many times a news feed might have to be compressed and decompressed before you transmit it. As encoder costs drop, more Ku-truck field and international feeds will be compressed to save transponder space. These are then collected by a news bureau (e.g., CNN, Reuters, ABC NewsOne or Conus), decompressed, then re-compressed for transmission to their customers. If it is a network, at some point they will probably decompress and re-compress the signal again for transmission to affiliates, where it will finally be decompressed.

My tests showed only minor problems with concatenation (multiple compress/decompress cycles) at higher data rates, but news gathering will likely try to use the least transponder space possible. With MPEG 2, the compressed video data should be able to be moved between systems without degradation.

RECORDING MPEG 2

What's missing from this scenario? A way to record MPEG 2 compressed digital video. At the Western Cable Show, in Anaheim, California, last 1-3 December, Scientific Atlanta showed a system it developed for StarNet that uses pre-MPEG 2 encoder/decoder chips to record video on computer hard disks. Pioneer, whose VDR-V1000 analog laserdisc recorder has become something of an industry standard, is moving into MPEG 2 digital. Soon after MPEG 2 is finalized in mid 1994, the company plans to have its own chip set, as well as a play-only MPEG 2 digital disk player.

The major manufacturers of video compression equipment are moving toward the MPEG2 compression protocol.

By 1995, that Pioneer unit should have record capability as well. Judging from the number of companies pre-announcing MPEG 2 compatible products at the show, I feel much more comfortable predicting MPEG 2 will dominate the compression market by the end of 1994. (NAB is going to be very interesting this year!)

Most of my readers will not have to worry about encoding digital video compression for a year or two. Many, however, are now wondering how they will handle decoding digital video signals. In the past month, I have tested both General Instrument's Digicipher I decoder and Scientific Atlanta's first-generation digital video decoder. What follows is what I have learned from the real-world tests. It should help you plan ahead for satellite digital video at your station.

First, there is a lot more that can go wrong with digital satellite signals. Your antenna system may produce excellent analog video but may fail to receive digital signals reliably. Both GI's and SA's digital systems use QPSK modulation spread over most of the transponder. Unlike analog signals, where the carrier and subcarriers are clearly visible on a spectrum analyzer, the digital signal should look like a flat-topped hay stack or like the frequency response curve from a good bandpass filter. On a satellite receiver, it will look like noise.

As I am writing this, there are digital compressed video signals on Galaxy V, transponder 24, Galaxy I, transponder 18, and Galaxy III, transponder 24. There are also digital signals on the Morelos satellite.

L-BAND MONITORING

If you have a Tektronix spectrum monitor or a spectrum analyzer that will cover L-band, take a look at one of these transponders on your satellite system. If you see a nice, flat frequency response across the transponder, without significant sloping or ripple (under 2 dB), congratulations! This response is essential for low bit error rates (BERs) on digital reception. (Make sure to note that flat response on one transponder does not mean your system is flat on all of them.)

If the tests show ripple (one dish I looked at had 5 dB of ripple across the transponder) or sloping response, here are some things to check. When troubleshooting some problems with the engineers at Scientific Atlanta, they kept talking about unterminated splitters on the L-band input to the receiver. This seems to be one of the most common causes of reflections in the downlink RF system. Other suspects include RF adapters — especially when joining two different types of coaxial cable, DC taps, polarity relays and line amplifiers.

A clean run of low-loss coax between the LNB at the dish and the input of the digital receiver is the best way to avoid these problems. GI includes a DC block or supply along with a splitter in its DSR-1500 receiver/decoder. Use it! If you must use an external splitter, purchase one made for L-band satellite work, and if you cannot avoid leaving outputs unused, make sure they have good 75 ohm terminators on them. Remember: Most cable TV signals stop around 700 MHz and the UHF TV frequency band ends at 806 MHz. The L-band output from most LNBs runs from 950 to 1450 MHz. Cable and UHF TV splitters might work okay for analog satellite work, but they could cause problems with digital L-band signals from the LNB.

SIGNAL TESTS

I did some tests to see how robust the digital video signals were. While monitoring the output of the digital compressed video IRDs, I also hooked a second receiver up to the dish and monitored analog transponders on the same satellite. I did not have the equipment to do a scientific test, but, in general, I found that if the analog signals on the same satellite displayed a good picture or one with only a slight amount of sparkles, the digital signal gave a solid picture with no breakup.

I reduced the signal to the receiver by moving the dish slightly off of the satellite. The threshold on the digital receivers was very sharp — a slight nudge on the dish and the digital signals became unusable, while the analog signal remained (though with the sparkles I would not have broadcast it). My conclusion? If you are getting clean reception of the analog signals on the same satellite you plan to receive digital signals and the system is free of reflections that can cause ripples in the frequency response, you should not have any problem with digital reception.

Theoretically, the GI system should be more robust than the SA system because the latter uses a little wider bandwidth. In my tests, I didn't notice any significant difference. The SA signals, however, were both on transponder 24, which will receive

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CONTINUED FROM PAGE 13

Preparing the Jump to Digital

less interference from signals on the opposite polarity than the GI signals with carriers on either side of them.

Here is something else to worry about. Interference will destroy your ability to receive digital signals. The problem is radar interference, which causes a group of fine white lines to appear on an analog picture every 12 seconds or so; it will probably wipe out enough of the picture data to either cause the picture to freeze, display "blocks" of video or break up altogether.

Electrical interference from a noisy transformer, neon sign or gasoline engine will have the same effect. If you experience these problems on analog signals or require traps in the IF of the receiver to eliminate the garbage, fix it now before you have to receive digital signals. It may require moving the dish to another location or erecting shielding around the dish.

My network will be converting to digital compressed video around NAB time, as will a number of other networks, including PBS. I am sure it is going to be interesting, and I will report any significant discoveries resulting from the switch in this column.

CHEAP REMOTE TIPS

Last month, I promised some tips on building the Cheap Remote 2 and the program I wrote for controlling it.

I've found that a couple things make construction much easier. Use SIP (single in line) or DIP (dual in line) resistor arrays where possible. They can often be aligned with IC pins to make connections simple.

Also, use IDCs (insulation displacement connectors) for cables to the serial port and Blue Earth Micro I/O port. If you match up the IDC connections so that the flat cable can be crimped directly onto a DB-9 or DB-25 connector, it will save a lot of soldering.

The schematic printed last month shows a top view of both the IDC headers. Wire the board this way and a simple crimp connection is all that is needed to get the signals off the board.

I also found that two-piece PC board/screw terminal connections work great for the inputs and command outputs. Simply unplug the whole screw terminal portion if you need to pull out the circuit board or remote control box. No wiring is needed from a board to a terminal strip. Several connector/terminal manufacturers make them.

The final tip is to use a circuit board with pads on one side and an isolated ground plane on the other. Use wire-wrap wire to run the connections from pad to pad. This keeps things clean and there is always a ground handy. I used the Vector "Circboard" for mine, although I hope to get a printed board made up before building many more units.

The cast aluminum box was a bit more expensive than the ones made out of aluminum sheet, but it gives the device a nice sturdy look and provides better RF shielding.

The software program is designed to work with a conventional external modem. As I wrote it, many of the "off-line" features will not work if it is kept "on-line" all the time. When off line, the program loop monitors the day of week and time of day and looks for some wake up data on the RS-232 lines.

Every couple of seconds, the program takes a set of readings. These readings can be tested for fault conditions, and if faults exist, it logs them in an array that can hold up to 30 faults. It also logs when the fault clears. I have the program set up to page me at the top of the hour if a fault exists. (It can be modified to page immediately, if necessary.)

To make it easier to see what the problem is, the page generates a pseudo phone number that is sent to the pager. It identifies the transmitter and gives me a series of readings. Currently I have it set up to display visual power, satellite AGC voltage and room temperature. While it is checking these readings, it compares the current time against a table of times for the transmitter to be on or off and for the fault monitoring to be on or off. Each day of the week can have different times.

I kept the fault monitoring and turn-on times separate to avoid generating alarms at sign-on when things were warming up or at sign-off as the meters were settling down. At the top of the hour, it takes a full set of readings and stores them in an array. While I only store 24 hours of readings, there should be enough memory left over to double this.

SHORT COMMANDS

On line, the program gets more complicated. Blue Earth Basic does not handle strings very well, so I had to keep commands short. I did include password protection and time outs to help prevent someone from breaking into the system. The Blue Earth micro I used in the remote can be programmed to not respond to CONTROL-C commands, and I strongly recommend you use that feature.

Your antenna system may produce excellent analog video but may fail to receive digital signals reliably.

A couple of characters and the password wake up the computer. Once the caller is verified, a press of the "RETURN" or "ENTER" key gives you the current time and readings. CONTROL-F gives a listing of the last 30 faults, and CONTROL-G sends the log for the last 24 hours. Other keys or combinations permit transmitter on/off control or whatever else you want to do with the three command outputs.

I am also working on a simple program that will run on IBM-compatible PCs and handle communications with the Cheap Remote 2. For now, any terminal program on any computer will talk to the unit, provided it can send control codes (ASCII codes below 32).

The new version of software is now available on the BPFORUM (GO BPFORUM) on CompuServe. Look for the file RMTCTL.BAS (the text file listing the Basic program loaded into the Blue Earth Micro) and RMTACC.ARC (an archive containing short Basic programs for setting the time, baud-rate, etc. on the Blue Earth Micro). If you see two versions, the latest is the one with the December 1993 date. If you are not yet a member of CompuServe, free intro-packs are still available to TV Technology International readers by calling +1-614-457-8650 and asking for operator 175.

I can also supply copies of the program via mail if you send me a blank disk (DOS format), preferably 3.5 inch, and a label and enough U.S. postage to return it to you. Send it to my mail service at 2265 Westwood Blvd., Suite 553, Los Angeles, CA 90064.

I also can FAX the listings or put my computer on the FAX line so you can download it from me. Call me at work in Miami at 305-884-9664 if you're interested. The best times are after 6 p.m. or before 10 a.m. EST. Things get too busy during the day. ■

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

SPECIAL REPORT

Europe Eyes Common Encryption

by Chris Dickinson

What chance is there that a single conditional access system will be agreed upon in Europe? Not much, it seems, according to the chairman of an ad hoc committee created to do just that.

Eamon Lalor, chairman of the committee set up within the European DVB (digital video broadcasting) initiative, said that despite the committee being only a few months old, he has already abandoned the prospect of persuading rival broadcasters and manufacturers to give up hope for market domination in favor of a single decryption box.

"It is not the easiest of all policy issues," he said. "Even from the technical viewpoint it is not easy."

SHADES OF MAC

Rather than trying to force one all-encompassing standard on the industry — a scenario that brings to mind the fight the EC had with the failed MAC system — Lalor is looking at getting the parties involved to agree on a common format that then could be adapted for different systems.

"We are attempting to see that what is developed has common parts," he said. "And I do believe the parties in the group are serious about their efforts to arrive at a common understanding. I do hope, and have the expectation, that we will be fruitful."

Lalor is backed in his view by John Forrest, chief executive of NTL and chairman of the commercial satellite and cable TV group within DVB.

"The objective of the European Commission at the beginning was to see if we could establish a common conditional access system for all of these future digital broadcasting systems," Forrest said. "That, in concept, would have advantage to the consumer because you could say there would be one card. You would then have to define out of that a payment method that could go to the various program suppliers.

"But of course it is very difficult from the program provider's point of view," he added, "because they see great advantage and indeed great importance attached to having a conditional access system under their own control. Not least because, if there were piracy in the system, they have got the ability to control it and change it themselves without reference to others.

"I think there is probably the realization that the concept of one common European conditional access system is unlikely to be achieved. But equally one does not want to have the situation where in the average home there is a whole stack of decoder boxes; or decoder boxes have to be made with many different slots to fit different cards; or there have to be different combinations of systems, various devices and smart cards and so on.

"It is trying to achieve the happy medium between satisfying the constraints of the consumer of something which is very simple and straightforward to use, and satisfying the constraints from the service providers that they need absolute security from their business needs, and they need the flexibility to be able to control that."

EQUAL PLAYERS

Forrest added that the committee was as much attempting to ensure no one company dominated the market.

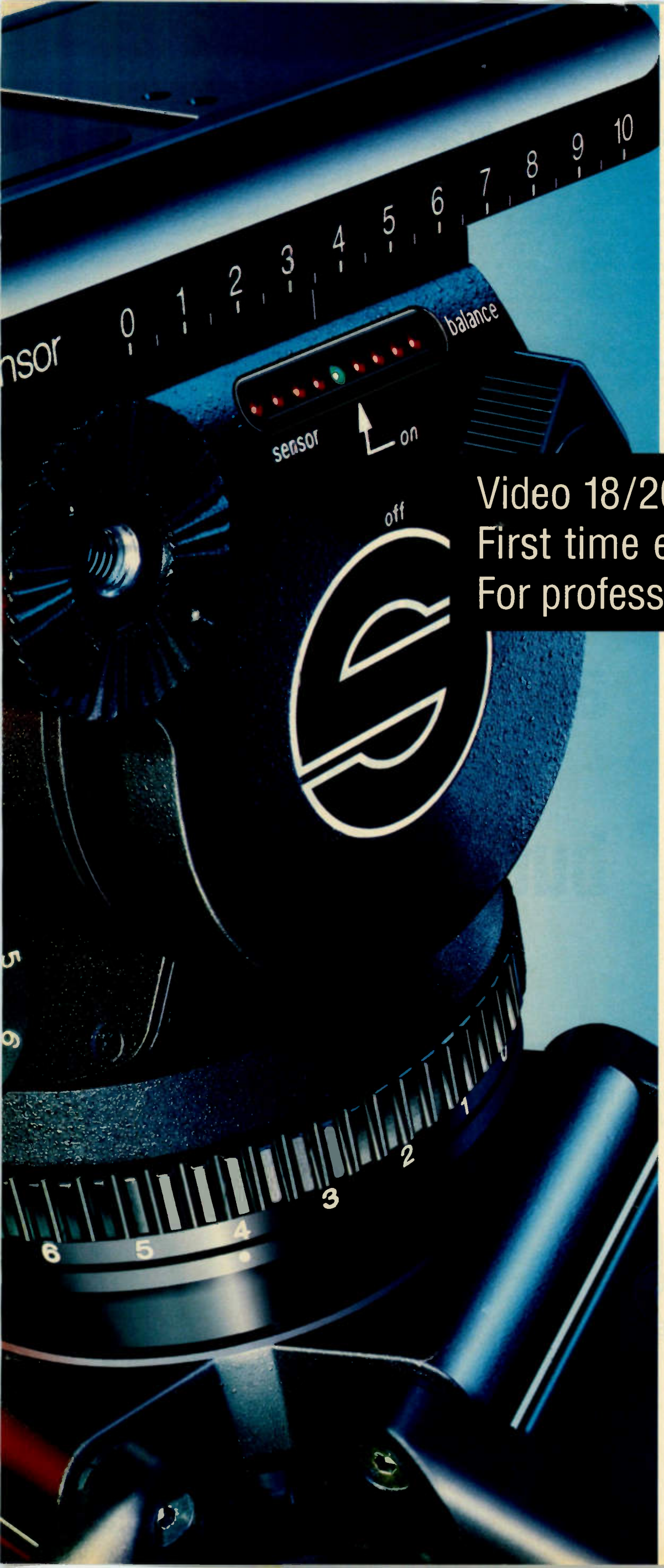
"As we stand right now, there is a dominant type," he said. "But I expect the European Commission would be concerned from competition policy angles about a particular proprietary system becoming the dominant system."

News Datacom, Rupert Murdoch's encryption management company which controls the main European conditional access system, Video Crypt, sees the DVB committee as a chance to influence events

Whatever happens, all the conditional access systems will be compatible with the MPEG 2 compression standard.

The most likely scenario is that there will be an agreement on a common scrambling system, which would save on receiver costs.

Meanwhile, the conditional access committee is expected to report to the DVB's overall steering committee in the new year, and it is expected that it will recommend that services adopt any system in time to launch by the end of 1994 or the beginning of 1995. ■



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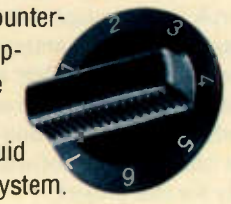

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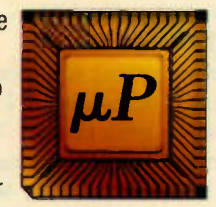

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Morphing Effects Made Easier

by John Spofford

COMPUTER GRAPHICS

For the past year or so, "morphing" has been a popular digital video effect. Short for metamorphosis, a morph is an image transition where one image changes seamlessly into another. Most of the most widely seen morphs, such as those on television commercials, are the products of workstation-class computers that often employ software written specifically for that project.

Now, though, morphing has arrived at the personal computer level, and if you are running Windows in an IBM clone, it is surprisingly affordable — typically around US$150.

With morphing software widely available for more than a year, I have stubbornly refused to write about it. This has just been a personal bias: Morphing was so overdone that I did not consider the available software as serious video production tools.

GET WITH THE PROGRAM

North Coast Software, a U.S. software developer, recently showed me its new program, PhotoMorph, for the Windows environment. Though skeptical, I agreed to use — and generally abuse — it in the heavy production environment of my computer animation studio.

While many Windows-based morphing programs have been ported from the Macintosh or Amiga platforms, PhotoMorph was written specifically for Windows. This seems a minor point until one considers the complex (and quirky) nature of the Windows environment, which is in fact tacked onto the MS-DOS operating system.

A program ported from a tightly integrated operating system such as Apple's Desktop or Commodore's Workbench often suffers in its translation to Windows. But PhotoMorph is designed to accent the strengths of Windows, and it is fast and efficient enough to give acceptable performance with even a minimal PC such as a 386SX without a math co-processor. (Though, of course, in computer graphics faster is always better.)

PhotoMorph also benefits from North Coast Software's experience as a long-term Windows developer. Its user interface is well thought out, with a layout that accommodates a fast and furious professional production pace.

The program is stable and generally free of memory problems, strange bugs and obscure crashes that might otherwise plague a release version of a Windows application. Needless to say, I am impressed with PhotoMorph, which is quite a compliment, coming from an Amiga partisan. But, then again, PhotoMorph turns out to be much more than a simple morphing program.

PhotoMorph is best described as a special effects image transition program. I often need to display and videotape a series of digital pictures such as scanned-in photos or computer-generated artwork. PhotoMorph has a number of tools to get this job done. Built-in transitions range from simple wipes and 2-D digital video effects called distortions to complex single image warps or two-image morphs.

PhotoMorph also contains: a comprehensive set of image processing tools; the ability to grab images from other applications; tools to add borders, text or masks to images; and output to a printer.

The user interface is focused around the project window. In this window, source and destination images are loaded and the type of transition is selected. Simple transitions include dissolves, various wipes or a "curtain" effect where the source image splits, revealing the destination image.

A distortion menu offers 18 special effects, with descriptive names such as ripple, wave, twist, shear, zoom, tumble, rotate and more. My favorite is the "lens," which imitates a magnifying glass, with true refraction for a startling effect. Distortions can be performed on a single image or used as a transition between two images.

DIRECT DISSOLVE

PhotoMorph's specialty is, of course, the morph. Morphing can best be thought of, in video production terms, as a directed dissolve. Two images are dissolved (much as a video switcher would do it) except that control points are added to each image to lend some computer intelligence to the transition.

For example, in morphing the images of two different individuals, control points might be added to the outlines of the eyelids, mouth and nose. Each control point on the source image is paired with a corresponding point on the destination image.

A morph is set up in a special editing window that affords a close inspection of both images. Tools are provided to add, move, or delete points. The goal is to place pairs of points that tell the computer how to dissolve from one image to another. PhotoMorph's simple user interface hides the sophisticated internal algorithms. Some user experience is required to anticipate how images will merge.

The final type of PhotoMorph transition, the warp, is simply a morph with no destination image. An example of a warp might start with a photo of an automobile and proceed to warp or distort it to the shape of a tea kettle.

A preview window gives an indication of how the transition will look. In this window final output is scaled and displayed.

Previews are calculated in as little as a second per frame, providing excellent feedback.

Previewed images can be saved to disk or loaded into another project window. In this way, it is possible, to some degree, to mix transition effects. PhotoMorph allows transitions between any number of images (limited only by memory availability) by means of a storyboard display.

North Coast Software, which is also the author of a Windows-based image processing program, Conversion Artist, has given PhotoMorph its own set of image processing tools. Among the available tools are: anti-aliased scaling, the ability to crop an image, rotate it, mirror it horizontally or flip it vertically. In addition, there are special tools to add a border or caption to an image, using fonts available through Windows.

The font tools are only suitable for simple captions. While PhotoMorph is capable of adding complex transitions to video titles, its text-handling capability falls far short of dedicated character generator software.

Fortunately, pages of text saved out of CG software can be imported into PhotoMorph via a wide variety of image formats.

One of the principle reasons PhotoMorph is so useful for Windows-based graphics production is the wide range of image formats it is able to load, convert and export. Image formats that PhotoMorph imports include: Windows BMP, CLP clipboard files, DIB, RLE, TGA-Targa, TIFF, GIF, PCX, PCC, PCT (Macintosh) and Amiga/Video Toaster IFF. PhotoMorph can also export most of these formats, with the addition of EPS Encapsulated PostScript files used by high-end printers and desktop publishing programs.

Morphing can best be thought of, in video production terms, as a directed dissolve.

PhotoMorph can read and write JPEG compressed files. JPEG is a compression technique for 16 million color (24-bit) files, and it is capable of compression rates as great as 75:1. It achieves this by throwing away image data through "lossy compression."

Assuming a moderate compression rate (compression is selectable within PhotoMorph), no appreciable change is detectable after the image is decompressed.

JPEG files are my favorite method of transporting 24-bit images between applications or even computer platforms. While a single 16 million color file fills a high-density floppy disk, the same disk might hold a dozen or more JPEG compressed files.

PhotoMorph's color menus control image palettes. In the case of palette reduction, control of both the method of color reduction and dithering methods is possible. This is necessary, for example, when converting a full-color image (such as a 24-bit Targa file) to GIF format, which can only support 256 colors.

THREE WAYS OUT

Once everything is set up, PhotoMorph offers three forms of output.

For one, calculated transitions can be stored on the hard drive as a series of numbered still images. This method yields the most professional results, and I often generate high-resolution 16 million color images using professional video equipment to record these frames to videotape.

Another option is to let PhotoMorph create FLC animations. FLC format is used by Autodesk Animator, and a DOS-based animation player is provided that can play back animations out of RAM in real time, at respectable frame rates. With an NTSC encoder, animations can be played directly to a VCR. These FLC animations or "flics" provide sufficient quality for many low-end desktop video applications.

The third output option is presently the least useful to professional video production but, ironically, has the greatest long-term potential. PhotoMorph creates AVI (Audio/Video Interleaved) animations that are played back through Microsoft's Video for Windows.

Still in its first generation, AVI animations are limited in resolution and playback speed. AVI animations are useful as test animations, but their only professional use at present is for multimedia applications such as CD-ROM publishing. My guess is that this will change.

Macintosh QuickTime movies give us an idea of what the future holds for Video for Windows. Last year, QuickTime movies were tiny, jerky, 256-color animations. This year, QuickTime movies are 60 fps, full-screen animations that approach the quality of low-end tape formats.

I predict a similar future for AVI movies. If Video for Windows has a future in real video production, PhotoMorph has already established itself as a Video for Windows special effects program. It provides some of the best AVI support available, including a choice between three different compression methods and a built-in AVI run time module.

Speculation aside, with or without Video for Windows, PhotoMorph already handles high-resolution images required in computer animation for video production. In its initial release, it does not yet compete with high-end morphing software, and it is unable, for example, to morph a moving series of frames nor does it allow variable dissolve curves.

Of course, PhotoMorph also lists at one-tenth the cost of software that can do those things. So if you are creating computer graphics in the Windows environment, PhotoMorph offers a powerful set of tools at a great price. ■

For more information on PhotoMorph, contact North Coast Software Inc. (P.O. Box 459, 265 Scuton Pond Road, Barrington, NH, USA, 03825) at +1-603-664-7871 (FAX: +1-603-664-7872), or circle **Reader Service 18.**

John Spofford is the owner of SPOFFORD MULTIMEDIA, a computer animation and video production studio located in Exeter, NH, USA. He can be reached at +1-603-772-0624.

CONTINUED FROM PAGE 12

Rotten Video Can Be Useful Too

syncs, and the whole thing lists under US$1,200.

The fact of the matter is, I am lazy, too. Frame syncs are great, as long as you *do not* forget timing altogether (like building up ridiculous video-to-audio lag times). That is, *now* frame syncs are great, after Tek introduced them to the real world.

Back in paleolithic times (before the Tek 110), frame syncs behaved just fine if the signal you fed them was just fine. But they ceased "paying attention" if you deigned to deliver less than magnificent video. Stick a noisy, multi-hop satellite feed into the input, and you would get a bunch of perfectly synchronized freeze frames on the output. I do not know about you, but as a viewer I think I would prefer an occasional sync crash.

REAL WORLD NOISE

"All" Tek did was recognize that the real world's noise gets in some video signals — maybe signals that viewers would really like to see, no matter how raunchy they look. I mean — technically, what is the worst movie that has ever been shot? My vote goes to the Zapruder film of the John F. Kennedy assassination: 8mm, cheap lens, pre-Steadicam jerkiness — you name it. Next question: What is the single most-viewed piece of film ever shot? Yep, the same.

This is what was so magnificent about the introduction of the Tek 110: you could get lousy, cruddy, stinking, noisy video out of it. That happens to be an awful lot nicer than 10 minutes of a technically decent freeze frame when lousy, cruddy, stinking, noisy *motion* video is what you have shoved into it. Tek achieved the ancient computer mantra of "garbage in, garbage out," for which they deserve at least an Emmy (methinks ABC got one for the old, pre-frame-sync, open-loop sync system, which should lend some credence to my claims that there were live remotes before frame syncs — unless I am wrong, of course).

Fortunately, the 110 is not the last nifty product Tek has made, and, as long as they let their creative types do such things as send 1780s out with the solution to the Towers of Hanoi available at the push of a button (ask your Tek rep; it is the other built-in game, besides Pac-Man), I am going to look forward to plenty more. But I did not perform high-impact fingertip aerobics on my keyboard this month to praise Tek; I came to bury the way video bit rate reduction (alias "compression") systems are being tested.

A while back, I was evaluating one such system with a lousy tape that I provided. Like what I just said about the Tek 110, lousy, cruddy, stinking pictures were emerging. Only this time, they were lousier, cruddier and stinkier than what went in. The manufacturer's rep turned to me and said, "Don't you have a cleaner tape?"

In my own, gentle, sweet, demure way, I patiently explained that that was not the point. The point was that there are lousy tapes in the real-world. There are cruddy, rain-faded microwave paths. There are stinky old tube cameras.

However wonderful their frame syncs are, the pristine test signals from Tek's generators (or those of their competitors) are worth approximately diddley-squat in evaluating BRR systems. Tapes with real-world video on them are one whole heck of a lot more useful, and the worse the better.

I have said it before, and I will say it again: You cannot losslessly bit rate reduce random noise. Period. But that better not mean you cannot feed a signal that has some amount of random noise in it into a BRR system. If it does, we are in big trouble.

Let me see: A carload of TV programming originates on film. Film grain is a form of random noise. Does that mean DirecTV's satellite broadcasts cannot include films? The Weather Channel's satellite signals get precipitously noisy during heavy rain. Does that mean it is okay for a cable BRR system to fail to deliver The Weather Channel when the weather is bad?

Heck, no! I am being ridiculous here (but, then, when aren't I?) Ampex and Sony do not specify minimum input SNRs for DCT and Digital Betacam. CLI and GI do not say you cannot run grainy film through Spectrum Saver or DigiCipher.

AN UGLY SCENE

In all my testing of BRR systems, I have yet to see one go crazy or freeze when it got a lousy input signal, unlike the old frame syncs. But I *have* seen systems that act like Mary Poppins when fed textbook-perfect test signals change to Jack the Ripper in the presence of noise, dot-crawl, standards-conversion judder, overdeviation tearing and all those other real-world phenomena we are going to have to live with until the advent of the perfect digital video world (which will follow immediately on the heels of the paperless society that computers are currently creating in offices).

Criminy! You have to figure on real-world conditions whether you are testing a frame sync, a navigation receiver or a BRR system. Do me (and yourself) a big favor: When it comes to testing BRR, do not give it your best. ■

Mario Orazio is the pseudonym of a well-known television engineer who wishes to remain anonymous. Send your questions or comments to him care of TV Technology. Or drop him a note on e-mail 581-6729@MCIMail.com.

CCETT Takes STERNE Approach to HD

by Chris Dickinson

RENNES, France

The CCETT research center here in Rennes has taken on a dual role under the European Community's Digital Terrestrial Television Broadcast (dTTb) project.

In one role, it is an overseer of the project, coordinating the work of the dTTb participants, which includes up to 25 European broadcasters, manufacturers, research groups and operators working on at least six different terrestrial digital transmission systems. In the end, the systems are to be merged into a single entity for submission as a European standard.

STERNE BACKER

In its other role, however, CCETT, which is jointly owned by France Telecom and Telediffusion De France (TDF), is one of those participants as the backer of the STERNE (Systems de Television En Radiofusion Numerique) transmission system.

STERNE is being developed with the dual aim of broadcasting conventional 625-line television signals to portable receivers and high definition television signals to fixed receivers. At its heart is the Digicast coding system, which is based on COFDM (Coded Orthogonal Frequency Division Multiplex).

Speaking at the Montreux ITS show this past summer, Philippe Levrier, managing director of TDF, said Digicast offers a number of technological advantages over conventional broadcasting.

"Thanks to Digicast's remarkable properties, terrestrial digital transmission will make it possible, under certain circumstances, to dispense with the need for roof aerials for receiving televised programs," he said. "This opens the way to the portable television, with built-in aerial, and therefore to multi-equipment and possibly to the extension of television services to receivers in motion."

Levrier added that Digicast is also "very well-suited to scrambling and access control systems," and is highly compatible with computers.

"The use of technologies and standards shared with computer technology conjures up the possibility of a transformation of the television set itself," he said. "The development of video games is the first sign of such development. Television, originally designed for single-purpose collective use, could become an item of multipurpose personal use."

DATA SPREAD

Technically, Digicast has a number of principles behind it. Distribution of the data stream is spread over a large number of independent, overlapping carriers, while guard intervals are inserted between data spurts to prevent bit errors.

Modulation and demodulation is carried out through the Fast Fourier Transform technique, while Maximum Likelihood Viterbi Decoding (MLVD) and channel state estimation are used in conjunction with frequency and time interleaving to allow the maximum number of channels to be coded together.

CCETT officials insist COFDM is the only "evolutive" technique that meets the requirement of a single-frequency network.

"COFDM supports optimally hierarchical services, such as a two-layer approach: HDTV in the case of fixed reception; 625-line TV in the case of portable reception," the group says in its marketing brochures.

To validate the decoding system, specific ICs, called Treillis-coding and turbo-coding, have been developed.

Among the tests CCETT is currently performing with STERNE are trials of a variety of modulation systems to see which one works most effectively as a complete transmission system.

"Several carrier modulations, including QPSK, 16- and 64-QAM, are being combined with Digicast to test the trade-off between reception robustness and spectrum efficiency," CCETT said.

DCT CODING

The image coding is a hybrid DCT (Discrete Cosine Transform) coding and motion compensation system, which is being developed to conform with the International Standards Organizations' (ISO) MPEG 2 compression standard. Three data rates will be available: about 5 Mbps for standard definition 625-line quality; about 10 Mbps for enhanced definition TV; and 25-30 Mbps for HDTV.

At 5 Mbps, CCETT researchers believe truly mobile reception is possible, although the signal will probably fade quickly. At 10 Mbps, portable reception is possible with a slower fade, while at 25 Mbps, only fixed reception is possible.

The sound coding is Musicam-ISO Audio Layer 2. Musicam (Masking pattern adapted to Universal Sub-band Integrated Coding and Multiplexing) is an audio source encoder based on a model of the human ear.

Another important part of the STERNE system is its conditional access capabilities. A service information channel gives the description of the logical channel's organization and the access conditions to the programs. Conditional access is based on the Eurocrypt Access Control European standard, running at either a program level or a component level.

"It is important to introduce an over-the-air access control system and service identification," CCETT said. "It is also important to offer program multiplexing in a flexible and modular way."

At the Montreux ITS show, CCETT demonstrated STERNE running with a 625-line channel to a portable receiver, as well as several 625-line programs in one channel linked to access control facilities. The next stage is to demonstrate a full HDTV channel.

Within dTTb, STERNE will be put forward alongside the other projects with the aim of establishing a standard.

"Proponents may propose a complete system or part of a chain," said one CCETT spokesman. "The aim is to make all the parts fit together into one system."

A demonstration of the full dTTb system is scheduled for the end of 1994, although "the time schedule is very tight and this date is under review," the spokesman said.

"There are certain constraints, for instance, certain time scales that cannot be reduced because it takes time to make the various modules work together," he said. "But the project cannot wait too long; there is pressure from the U.S. and Japan." ■

Europe Asked to Give Up 1250/50

LONDON

Joseph Flaherty, technical head of CBS and chairman of the FCC advisory committee examining the Grand Alliance HDTV system in the U.S., has called on Europe to reconsider the 1250-line/50 Hz HDTV production standard.

Flaherty's call at the annual Shoenberg Lecture to the Royal Television Society in November came at roughly the same time that the BBC and HD-Thames, the HDTV production arm of Thames TV, announced plans to set up a new independent HDTV facility in London based around BTS 1250/50 digital HDTV equipment. The facility, the first of its kind in the U.K., will open in the new year.

TIME TO CHANGE

At the Shoenberg Lecture, Flaherty said Europe should change the 1250/50 standard if it wanted to compete in the HDTV program market of the next century. He singled out the 50 Hz frame rate of the standard — designed to be compatible with 625-line/50 Hz PAL — as the main problem.

"At a time when such compatibility [between 1250/50 and 625/50] is not only unnecessary but absolutely undesirable, Europe may miss the only chance it will have for the next quarter century to increase its picture frame rate and improve its motion portrayal and dynamic resolution," he said. "The emergence of HDTV cameras with solid state CCD pick-up devices will reveal many 50 Hz picture artifacts heretofore concealed in the lag of vacuum tube cameras.

"If the television service were to be started today with the technology now available, no one would choose a frame rate as low as 50 Hz. Some consideration should be given to selecting a higher HDTV frame rate during this unique window of opportunity."

Flaherty said that if Europe got it right, it could compete with Hollywood as an international production base for HDTV. However, he warned against trying to set up a film-based production center.

"In Europe....no large and viable indigenous film industry exists for the production of television programs," he said, "and, in the final decade of the 20th century, it is too late and would be ill-advised to try to duplicate a monster "Hollywood" style 35mm television film production operation.

"I believe Europe's future strength will be in high definition electronic production. Only this way can Europe hope to compete in the international HDTV program market of the 21st century."

Speaking outside the lecture hall, Flaherty called for the establishment of a worldwide HDTV standard, based on the frame rates of computers. But he pulled back from demanding 1250/50 be abandoned altogether.

"I do not know about completely abandoning 1250/50," he said, "but Europe could look at a higher taking rate, which is only part of that standard. The dynamic resolution is relatively poor: at 50 pictures a second, almost as bad as film.

"They (Europe) can either reject or accept this, but it is really now or never. It is their one shot at doing something.

"Japan and the United States are both 60 pictures a second. The modern industry that came on later is, of course, computers. And what they picked was 72 pictures a second. What you want to do is take as many pictures a second as possible.

"The difficulty is the more often you take the charge off, or, in the case of film, the shorter the exposure, the more light you have to pour through the lens. So you have to come to a practical compromise of light that does not cook the actors and motion that is satisfactory.

"I think the rate should probably not be less than 60. Seventy-two would be good, but I do not yet believe we have the sensitivity of pick-up devices. However, that is probably a good goal."

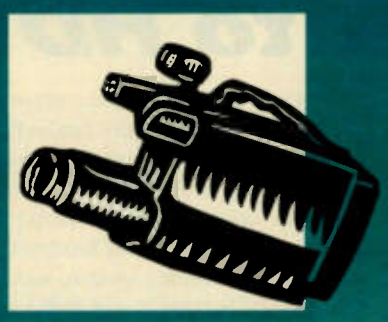
POSSIBLE BUT UNNECESSARY

In reaction to Flaherty's speech, Paul Kafno, managing director of HD-Thames (one of the main European producers of 1250/50 HDTV programming), said it was possible to switch from the 50 Hz rate, but that it was probably unnecessary given the advances in receiver technology.

"There is no reason we should not switch over," he said. "But the whole argument about standards is slightly old hat. It does not matter what you record things on, the TV sets of the future will basically be computers which will handle any signal coming in."

The HD-Thames/BBC facility will be open to all producers and will consist of a multi-camera OB truck, a single-camera portable unit and a fully equipped edit suite. Kafno said the OBs and the portable production unit will have BTS's new LDK 9000 CCD HDTV cameras and digital HDTV cassette-based VTRs, while the post production facilities will include an edit suite with more digital VTRs and a Quantel HD Paintbox.

The new facility is a first for the U.K., which has lagged behind the rest of Europe in terms of HDTV availability. Currently, there is little 1250/50 equipment in the country outside the BBC and ITV, while the only dedicated HDTV facility in the country is at Sony's corporate headquarters in Basingstoke, which is based on the 1125/60 production standard. ■

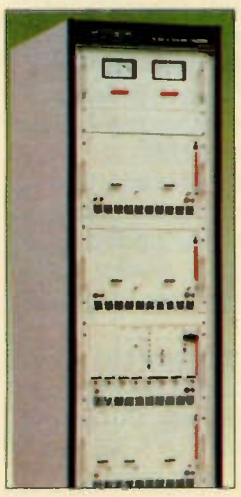


MARKETPLACE

HIGHLIGHTING THE LATEST PRODUCTS AVAILABLE TO PROFESSIONALS IN THE VIDEO INDUSTRY.

UHF TV TRANSMITTER

The TDC-300-II by Chendu TV Equipment Factory is engineered for large loop ALC and PA protection and designed for low operating voltage. This transmitter offers high-power switching power supply, with over-voltage and over-current automatic protection circuits.



For more information, contact CTEF in China at +86-2-858-4912; FAX: +86-2-858-4575, or circle **Reader Service 48.**

ENCODING/DECODING SYSTEM

JVC has developed one of the first broadcasting and communications-use realtime encoding/decoding systems to provide MPEG-2 level high-quality video and audio processing.

The development is based on the MPEG-1 standard and allows for the transmission of high-quality video that satisfies the digital studio standard.

For further information, contact Masayuki Murakami at +81-3-3241-6315; FAX: +81-3-3246-1254, or circle **Reader Service 105**.

TELECINE

Snell & Wilcox has introduced a process enabling 35mm film material to be simultaneously transferred to digital 1125 HDTV, 525 and 625 line standards.

DEFCON24 enables studios to digitally remaster their film library in a variety of formats from only one telecine pass, saving time and reducing the risk of film damage.

For further information, contact Joe Zaller in the U.K. at +44-81-332-6202; FAX: +44-81-948-5040, or circle **Reader Service 43.**

TRANSMITTERS

The Bejing Broadcast Equipment Factory manufactures various types of broadcast, television, transmitter and high-power RF equipment. All specifications are in accordance with CCIR recommendations and relevant international regulations.

Among BBEF's products are 10 and 30 kW VHF and UHF TV transmitters, 300 W VHF and UHF transposers, 500 kW shortwave broadcast transmitters, and 120 kW shortwave SSB communication transmitters.

For more information, contact the company in China at +86-1-445231-440943 or circle **Reader Service 58.**

RASTERIZER

The WVR500 Waveform/Vector Rasterizer by Tektronix Inc. performs the composite NTSC or PAL signal monitoring functions of a standard two-input waveform/vector monitor.

It is the company's first combination monitor to display signals on a separate picture monitor with display quality rivaling that of a CRT.

For more information, contact Donna Loveland at +1-503-627-3127; FAX: +1-503-627-5801, or circle **Reader Service 33.**

DIGITAL SWITCHER

Alpha Image's Alphie SX component digital production switcher offers the same performance as the original Alphie but is packaged in a compact 6U rackframe, with an internal 16 input matrix for source selection. Unlike the Alphie, the Alphie SX is non-expandable and therefore less costly.

The Alphie SX features SuperLayer technology, AlphaMatte keying tools and Alpha's digital chroma keyer.

For further information, contact Art Shifrin in the U.S. at +1-203-329-3777, or circle **Reader Service 52.**

TIME CODE READER

The Logger by BVE is a hand-held, battery-powered time code reader and display. When linked to a camera either by integral radio receiver or by cable, it stores all shot in and out point information as a list and numbers all shots automatically. After a shoot, the Logger information can be downloaded to a printer or a computer running BVE's SoftLog program.

For more information, contact Irene Cockroft in the U.K. at +44-81-563-0600; FAX: +44-81-563-7601, or circle **Reader Service 34.**

WORKSTATION SOFTWARE

DAR has released new software upgrades for their SIGMA, DELTA and SABRE WorkStations. These upgrades incorporate a Feet and Frames facility. Foot/Frame displays, film transport follow and an instant offset mechanism provide film editors with familiar position indicators, even when working with time code on a videotape.

DAR workstations can be locked to film transporters via additional external hardware. Other features of this facility include a laser disc interface, automatic and flexible time code standard switching and reel split and merge.

For more information, contact Jeff Bloom in the U.K. at +44-372-742-848; FAX: +44-372-743-532, or circle **Reader Service 133.**

SIGNAL PROCESSOR

ESE announces the ES-2940 for use in post house editing bays and broadcast systems. The ES-2940 is a single rack mounted unit that contains dual 1x4 audio and video distribution amplifiers and a five-output RS-170A Black Burst Sync

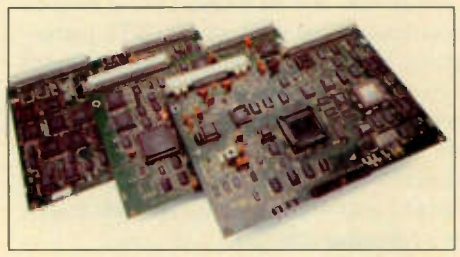
Generator (BBSG).

The unit is designed to meet the requirements of systems that must interface with, distribute and synchronize video and audio signals.

For further information, contact Brian Way in the U.S. at +1-310-322-2136, or circle **Reader Service 63.**

VIDEO CODEC

RE Technology introduces the RE 3400



Video Codec to match future requirements when setting up TV contribution and distribution networks.

The RE 3400 fulfills the ETSI standard for 34/45 Mbit/s transmission systems. This unit adapts to multiple video and audio source types and offers optimum transmission quality in harsh environments.

For more information, contact Mogens Olsen at +45-3118-4422, or circle **Reader Service 25.**

NEWSROOM WORKSTATION

With the Newswire 2000 system, Nexus is aiming for a computer solution to control all aspects of television studio operation and newspaper production. Using Newswire 2000, reporters in the field can pick up the phone and access newsroom archives, news agency wires or other outside databases through the newsroom system.

All workstations are menu driven with users working on a Windows-based screen. Newswire 2000 offers extensive machine control capabilities, including control of the teleprompter.

For further information, contact John Buckley at +44-703-834058; FAX: +44-703-636132, or circle **Reader Service 15.**

VIDEO CAMERA

Hitachi's new SK2000 camera series offers full digital video processing in both studio and portable versions. The new ultra wideband trieax and digital optical fiber systems provide high quality transmission between the camera head and the CCU. The CU-

F310/F320 camera control units offer serial digital outputs in D1 or D2/D3 standards.

For further information, contact the company in Japan at +81-3-3255-8411; FAX: +81-3-3257-1433/1434, or circle **Reader Service 117.**

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

USER REPORT

AB Masters with Panasonic D-3

by Jean-Marc Fonseca
Technical Director
AB Productions

PARIS

AB Productions began in 1987 as an extension of AB Disques, a small record production house. The idea was to set up a program-producing complex with all facilities in-house. A small team — including founders Claude Berda, Jean-Luc Azoulay and myself — began operations one mile north of Paris in a warehouse with a rented outside broadcast van parked alongside.

The first television break came when AB signed a contract with Dorothee, a young performer who presented a morning children's show.

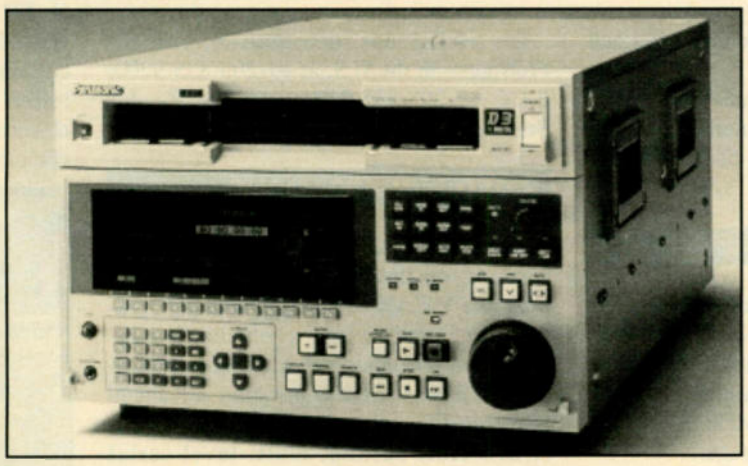
RAPID GROWTH

Today, at the same location, AB Productions now has 1,500 people working in 500,000 square feet, including six production studios, nine editing suites, six voice-dubbing studios, two audio editing suites and four rooms for quality control, playback and dubbing. We also build our own props in our workshops. We broadcast six hours of programs, mostly live, direct from AB each week. Our program stock is over 50,000 items.

Since our goal was to make programs, the format originally chosen for mastering was one-inch C in PAL, the only reliable format available at the time. In 1991, when Panasonic D-3 became available in Europe, we found several good reasons to choose it as our new mastering format.

With D-3, we could make a straight copy of one-inch tape archives, and D-3's small half-inch size would save space. Also, digital stock has a virtually endless life span, and using D-3 means one format from production to transmission.

Three AJ-D350 studio VTRs were thoroughly tested over several months, and we found them to be the most rugged VTRs available and very user friendly.



Panasonic's AJ-D350 half-inch digital composite VTR

Digital was totally new to us, and some operators were somewhat taken aback by the different feel at the editor wheel. For instance, shuttling at x100 when you are used to x16 can really make you believe the tape has gone out of control. Others were pondering over the large amber display, gaping at the new possibilities offered.

Troubleshooting was also quite surprising; digital video is so good that the eye cannot detect minor defects — such as those caused by clogged heads — that suddenly reappear after many dubs. Operators now had to rely mostly on the on-screen displays.

The company was growing rapidly in 1991, and we had no time to train our staff on the new equipment. During this transition period, Panasonic France helped us by training our editors, while one of their engineers worked every day with our VTR operators. Panasonic's support for the launch of D-3 in AB Productions was appreciated as an important contribution to our development.

Our production house is still growing. We now sell about 2,500 hours of programs each year, mostly youth programs, including 500 sitcom episodes of 26 minutes each, which we produce from start to finish and master on D-3. We also produce cartoons with computer graphics, dumping them onto and editing on D-3. In addition, we buy series and cartoons, dub them into French, master them on D-3 and sell them to broadcasters in France and French-speaking countries.

PROGRAM EXPORTS

We also export our productions; "Helen and the Boys," our most popular sitcom, has been exported all over western and eastern Europe. We sell to Canada, Mexico, Africa, Turkey and the Persian Gulf. We are now starting to produce directly in other languages. "Helen and the Boys" is now being shot with German actors and has been renamed "Bella-Bella" for German-speaking countries.

D-3 has really helped us enhance our operations, in terms of time and quality. We own 16 AJ-D350 D-3 studio VTRs and expect to have more. The commitment of Panasonic to D-3 for the next ten years at least has led us to the conclusion that D-3 was indeed the best replacement for our one-inch machines without having to rebuild our composite facilities. The upward compatibility of D-3 with component D-5 is also a bonus that we are considering for the future.

We believe that the cost-effectiveness and quality of D-3 should logically make it a more widely used broadcast format throughout the world. For many program exchanges, we supply Betacam dubs, even if the company we send it to owns D-3. It seems incredible to revert to analog from our digital masters.

At AB, we are perfectionists. We are proud of the quality of our productions, and it seems a shame not to have our series broadcast in D-3. We also wonder why major broadcasters abroad keep sending us one-inch C format masters when the facilities they work with have PAL D-3 VTRs.

D-3 format has been an excellent, rugged and flexible production and post-production tool for over two years, and we thank Panasonic for having marketed the format at the right time. ■

Editor's note: Jean-Marc Fonseca is one of the original founders of AB Productions and has been with the company since 1987.

The opinions expressed above are the authors alone. For further information on the AJ-D350, contact you nearest Panasonic representative, or circle **Reader Service 108.**

USER REPORT

Imaginaction Selects Abekas

by Massimo Lovato
Senior Editor
Imaginaction

MILAN

Imaginaction is a post production and video facility established in Milan in 1984. We deal mainly with commercial and short-format video productions.

We started business with one Paintbox tied to a Sony BVH 2500 for graphic design and frame-by-frame effects. After a short while, we enhanced our structure with a Harry suite complete with an Encore and a digital VTR.

The decision to buy a disk-based digital edit suite — the first in Italy — was made to distinguish our services in the Italian post production market, which had been accustomed to digital post production based on graphics systems.

MEETING A NEED

For disk-based recording and storage, Abekas offered what we were looking for: devices capable of holding large amounts of material to enable us to produce an entire commercial, as well as a signature to allow the commercial to be inserted into a television program. What's more, the company offered the traditional quality of digital recording and added to the flexibility and power of our edit suite.

We chose the Abekas A66 and A65 digital disk recorders (DDRs). These units conform to CCIR 601 quality with recording times of 60 seconds for the A66 and 30 seconds for the A65 for real time 625/50 images.

It is even possible to use these DDRs as VTRs in digital systems, even for slow motion and still frame playback. Also available is the possibility of single-frame/single-field recording, and the availability of Ethernet and SCSI interfaces make these units extremely versatile and powerful for numerous other uses.

A recent software upgrade has now given us "segment-play," which is the real-time in-sequence playback of clips that are not adjoining on the disk.

In our structure, there are four A66s — usually connected to the edit suite via an Abekas A84 Vision mixer — an A57 DVE, an A72 character generator and a Sony BVE 9100 edit controller. We also have one A65 that works mainly over Ethernet with our Wavefront 3-D system operating on Silicon Graphics hardware.

As for sound, we combined the A66 with a DN735 RAM recorder from Klark Teknik.

INSTANT ACCESS

The A66s work as if they were VTRs guided by an edit controller and connected to two other devices: a D-1 machine and a Betacam SP recorder. This has simplified our post production process because of the instantaneous access to each frame, which eliminates the wait for cue and pre-roll. The typical transparency of the D-1 digital format allows us to perform an unlimited number of passes without reducing quality.

The creation of multilayer events in a single edit is now much easier,

(continued on page 24)

BUYERS GUIDE

VIDEO RECORDING

BUYERS GUIDE calendar

APRIL

Mobile, Remote & Satellite Equipment

MAY

Studio Cameras & Accessories

JUNE

Time Base Correctors & Frame Synchronizers

JULY

Transmission Equipment

MARKETPLACE

HIGHLIGHTING THE LATEST PRODUCTS AVAILABLE TO PROFESSIONALS IN THE VIDEO INDUSTRY.

LIGHTING

The Duolite by Balcar is a small, highly efficient reflecting lightbox for video, TV, movies, theater, museums and video-conferencing. Equipped with two "daylight" 5200 K or "tungsten" 3100 K fluorescent lamps, the Duolite uses only 100 W and generates almost no heat.

Because it is compact, the Duolite is portable and ideal for use in studios with low ceilings.

For more information, contact the company in France at +33-1-45-03-00-30; FAX: +33-1-45-03-12-48, or circle **Reader Service 3.**

OUTSTATION MODULE

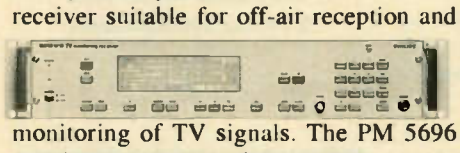
The PESA Talkback System TV8000 is designed to provide high quality and reliable communications among members of production staff in a broadcast station.

The new TB8000 series of outstation modules consist of a self-contained TP8008 panel with loudspeaker and microphone; a Talkback Panel, AP8000 and a 16-way or 32-way Selector Panel CP8016 or CP8032.

For further information, contact the company in the U.S. at +1-205-883-7370; FAX: +1-205-882-3294, or circle **Reader Service 119.**

TV MONITORING RECEIVER

The PM 5696 TV monitoring receiver by Philips is a professional multichannel receiver suitable for off-air reception and



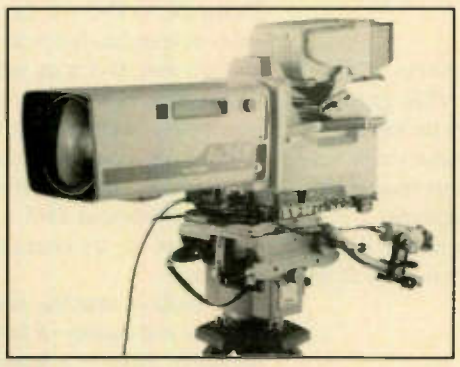
monitoring of TV signals. The PM 5696 receives and demodulates RF signals between 40 and 960 MHZ with a signal level between 100 and 1000 mV.

Typical applications of the receiver include monitoring the installation of CATV and checking the quality of signal distribution in TV factories.

For more information, contact the Philips TV Test Equipment in Denmark at +45-43-43-48-48; FAX: +45-43-43-23-90, or circle **Reader Service 107.**

STUDIO CAMERA

The HK-377 is Ikegami's latest three-CCD camera, featuring a 600,000-pixel high-density CCD sensor for exceptional resolution. With this camera a triax system has been developed to achieve a 10-MHz ultra-wideband and long-distance coverage.



For further information, contact the company in Japan at +81-3-5700-1111; FAX: +81-3-5700-1137, or circle **Reader Service 121.**

VIDEO ROUTING SWITCHER

Videotek's RS-61F is a new 6x1 vertical interval video routing switcher for the Omniframe series of products. Push buttons on the front of the module permit local selection of the video signal with LED indication. The module has remote control capabilities which allow for remote input selection and indication of selected input.

For more information, contact Don Taylor in the U.S. at +1-215-327-2292; FAX: +1-215-327-9295, or circle **Reader Service 126.**

WIRELESS TIME CODE READER

The Scriptboy from Noriyuki Electronics is a wireless time code reader system that enables video producers and directors accurate wireless logging of time code for both shotlistings and storyboard transcription.

A small battery-powered transmitter with a range of 50 feet is connected to the time code signal output of any camcorder. Its signal is transmitted to the time code script clipboard which contains a radio receiver and large LCD time code display.

For additional information, contact ProSource in the U.S. at +1-203-855-9200; FAX: +1-203-855-9225, or circle **Reader Service 123.**

VIDEO WORKSTATIONS

Videomedia has announced two OZ-PRO systems, on-line video workstations that integrate V-LAN technology with a graphical user interface and a job/shuttle keyboard for broadcast video editing applications. These workstations offer advanced features for editing control, including A/B/C Roll editing, multi-level serial switcher control, audio mixer control, menu-driven switcher operation with pattern icons and two levels of video keying.

For more information, contact Amy Gomersall in the U.S. at +1-408-227-9977; FAX: +1-408-227-6707, or circle **Reader Service 36.**

SOFTWARE

Version 5.2 software for Quanta's Delta text and graphics generator brings several key enhancements to Delta, including Macro Editor, Ease In/Ease Out and Vietnamese language and typeface support. The Ease In/Ease Out function helps the user avoid abrupt starts, stops and speed changes when displaying roll messages.

For more information, contact Laura Lunceford in the U.S. at +1-801-328-8872 or circle **Reader Service 69.**

UHF TV TRANSMITTER

Itelco's T674K is a new 40kW UHF TV transmitter with common amplification of vision and sound carriers. It employs an I.O.T. IM 7360 for the final amplification stage and is equipped with a new distributed control system for management of the transmitter.

For further information, contact the company in Italy at +39-763-26355; FAX: +39-763-26336, or circle **Reader Service 26.**

MASTER CONTROL SWITCHER

The MA-2000 Master Control Switcher by NEC is applicable to various program transmission systems located in small-scale to large-scale systems. This switcher is compact and utilizes IC technology for the video

and audio processing functions necessary for master control. The control panel offers ease of operation through simple construction.

For more information, contact the company in Japan at +81-3-3798-6364 or circle **Reader Service 103.**

DESKTOP VIDEO

The Video Machine from FAST Electronic GmbH is a single-board desktop production studio for PCs running Windows. The system contains an A/B roll editor, a six-input video mixer, a video print driver for graphics and character generation, a DVE, two frame synchronizers and four-channel audio. Two inde-

pendent input channels support composite and S-Video, including PAL, NTSC and SECAM. Output is composite or Y/C in PAL or NTSC, with an optional YUV output.

For further information, contact the company in Germany at +49-89-50206-0; FAX: +49-89-50206-199, or circle **Reader Service 14.**

VIDEO MONITOR

The CT EQ line of multistandard video monitors from Hantarek Electronic Systems are available in 21-, 25- and 28-inch models, all capable of displaying PAL, SECAM, NTSC and NTSC 4.43. Input signals can be composite, RGB or S-VHS, while positive/negative sync selection can be acti-

vated through a nine-pin D-connector. The unit consumes 90 W of power maximum and weighs from 24.9 to 36.5 kg.

For further information, contact the company in Italy at +39-55-49731; FAX: +39-55-4220129, or circle **Reader Service 11.**

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

USER REPORT

Fuji TV Puts Pioneer On the Air

by Go Takemura and Manji Igarashi
Senior Engineers
Fuji TV Broadcasting

TOKYO

Fuji TV broadcasts a morning news program entitled "Ohayo-Sunrise" daily from 6:30 to 7:00 a.m. Our Pioneer VDR-V1000 disc system has greatly increased the efficiency of our operation.

One major advantage to a disc system is that while the program is on the air, there is no need to change cassettes anymore. All we have to do is record the tapes (32 kinds of 60-minute tapes) onto one disc. When we were using VTRs, we had to change the cassettes and, because we used six VTRs with three lines each, we had to continuously switch the line.

QUICK CHANGES

As all broadcasters know, news schedules are often changed. Using the disc system allows us to easily change the schedule in a few seconds. Now, a last-second schedule change is no longer a difficult task. I can operate the system without any anxiety. With a VTR, it took 20 to 30 seconds to change the cassettes, making it nearly impossible to make changes during a running news program.

The VDR also stabilizes the video quality immediately after play begins, making it easier for the switcher to catch and read the time.

The Pioneer disc system makes it possible to set and start from any point at any time, and this makes it very useful when we want to repeat a specific scene. To do this with a VTR required us to either prepare a tape with multiple cuts of the same scene or to continuously rewind the tape to set at the beginning of the scene. Both of these methods led to a lot of trouble.

Another advantage to the Pioneer disc system is the quality of its still frames. Even when the disc has stopped by mistake or played through to the end, the clear still picture does not cause any trouble. With a VTR, we used to encounter noise and black and white problems, which left a very bad impression among our viewers.

Also to the VDR's advantage, the counter on the screen is clearly visible. The director can easily recognize it and transmit the video signal without error and at the correct time. Our VTRs produced a noise bar on the screen that made the counter difficult to recognize. This occasionally caused the operator to misread the time to begin operation.

STABLE VIDEO

The VDR also stabilizes the video quality immediately after play begins, making it easier for the switcher to catch and read the time.

We also enjoy the dual-head feature of the VDR. Even when the system is broadcasting one signal, it can record from another source. This makes it possible to record and replay the very latest news, as well as relocate and insert news stories. Although this is possible with a VTR, it is necessary to reserve some blank space in advance. The relocation and insertion of news stories required cassettes to be changed, which sometimes became very complicated.

The Pioneer VDR has become very useful in our broadcast of major news stories in Japan, such as the recent royal wedding and the change of the government from the ruling Liberal Democratic Party to the coalition parties. At these events, our director gave us numerous instructions, but we were able to meet the requests and broadcast the required videos quickly with the dual head function .

In a news program "Supertime Kanto," which we began in October, we control the disc system from a computer screen so that the newscasters can choose news items by touching the screen. We are hopeful that this type of control will allow us to make the news program more attractive.

Although the Pioneer VDR has numerous advantages. there are areas that we feel could be improved.

First, the video quality must be improved beyond the current Betacam level. We are also anxiously awaiting the development of a digital VDR.

Also, improved control software is needed to make the editing process faster and more efficient. We think it is also necessary to develop a four-head VDR.

We would also like to see a compact, integrated system consisting of 16 divided touch screens and a cut list monitor. This will help us find wider applications for the unit.

However, we find disc-based technology offers numerous advantages to broadcasters, allowing us to do our jobs in a more efficient and timely manner. ■

Editor's note: Go Takemuro and Manji Igarashi are senior engineers at Fuji Television.

The opinions expressed above are the authors' alone. For further information on the VDR-V1000, contact Satoru Matsumoto at Pioneer (Telephone: +81-3-5434-3052: FAX: +81-3-5434-3077), or circle **Reader Service 61.**

USER REPORT

JVC Brings S-VHS to School

by Russell M. Little
Head of Learning Development
University of Wolverhampton

WOLVERHAMPTON, U.K.

The University of Wolverhampton has a long tradition of applying technology and teaching in innovative ways. So when JVC introduced its range of 22 Series Professional S-VHS VCRs last year, the university was quick to exploit its features.

JVC's more recent introduction of the variable tracking Professional S players, Model BR-S525E, has provided even more versatility to the university's video programming options. With a multitude of teaching disciplines to administer, it was important that our choice of upgraded professional equipment could do justice to the high standards set by both ourselves and our students.

EDUCATIONAL VIDEO

Many faculties within the university make use of video. In particular, the School of Health Sciences is engaged in physiotherapy research, such as analyzing a person's gait or walking style. The ability of the JVC BR-S525E to deliver crisp, flicker-free slow motion playback was seen as an exciting development, helping the researchers analyze human movement more easily.

Until the arrival of the BR-S525E, the researchers were dependent on expensive cine film techniques, slide stills or domestic video slow motion. However, the new machine provides not only excellent high definition slow motion, but the variable playback speed allows a detailed examination of how the individual human movements in walking, sitting and standing are linked together. All this makes it possible to produce a far more accurate assessment of movement and posture problems.

The School of Health Sciences will be making a variety of video clips using the facilities of the BR-S525E so that students can use them to develop their own diagnostic skills. Interest in the new equipment is also being expressed by local hospitals connected to the university.

The University of Wolverhampton has always been concerned with environmental and earth resource issues and as a result has been keen to find ways to reduce the dependency on laboratory animals for investigative research, etc. Using the JVC BR-S822E editing recorder in conjunction with Windows-based computer software developed by engineers at JVC Professional, the university is now starting to produce a series of instructional videos in the areas of Applied Science. Using the stop frame animation techniques that are possible with the new equipment, it is now possible to produce video material of animal dissections without necessarily showing shots of hands performing the procedure, and the reverse animation possible provides a stimulating and innovative way for students to learn the necessary techniques.

STOP-FRAME RECORDING

In other areas, such as biology and chemistry, the faculty intends to provide video material on organic and inorganic changes to substances that are time dependent. Again, in the past, expensive time lapse cinematography was the only way to produce such material, but with the stop-frame recording feature of the BR-S822 it should now be possible to produce this material directly onto tape. The built-in time code generator will be used to "burn in" time code, allowing students to accurately locate specific segments of the material as directed by their study notes.

The JVC BR-S525E VTR

The University of Wolverhampton has produced video programs of many kinds, both for internal use and for a long list of external clients. The acquisition of the new Professional S series of JVC equipment means that the university can now produce an even higher technical quality product together with production features that up until now have only been possible on much more expensive machines. The university sees the acquisition of this equipment as a highly cost effective way of producing visually exciting and technically excellent video material.

The University of Wolverhampton has already made a long-term strategic commitment to develop multimedia techniques within its learning development systems. So the requirement to produce high quality video sequences to incorporate within computer-based multimedia learning materials is now an absolute necessity.

Once again the BR-S525E is seen as the machine of choice by the university, particularly when transferring video to CD-ROM via JVC's ROM maker. The ability of the machine to deliver reliable video at a variety of speeds and the availability of a computer control interface board allows the university's multimedia production facilities to be housed in the same location.

Finally, within the School of Languages and European Studies, the European film history department is excited by the possibility of using the BR-S525E to study archival European film when examining early cinematography production techniques.

Many of the above ideas are still in the first, early stages of development, but the partnership between the University of Wolverhampton and JVC is providing an excellent technical platform for exciting and innovative video applications. ■

Editor's note: Russell M. Little, B.Phil. Cert.Ed. BIPP, has headed the University of Wolverhampton's Learning Development Unit for eight years. He is a teacher and researcher in the areas of television and multimedia production, communications, stress management and personal effectiveness.

The opinions expressed above are the author's alone. For further information on the BR-S525E, contact your nearest JVC representative, or circle **Reader Service 59.**

CONTINUED FROM PAGE 21

Imaginaction Brings Abekas A66 to Italy

thanks to the ability to keep the disks constantly in sync. This allows us frame-accurate control of the relationship between the elements of the final image.

While this ability is common to many DDRs, Abekas has exploited it by using a LINC protocol, which allows all functions of the DDRs to be controlled directly from the video switcher, greatly increasing the power of the system.

When it came to using an on-line system for off-line jobs, we took advantage of the DDRs' ability to be used like a cache recorder. In this mode, it is not necessary to have a second copy of a recording to make simple dissolves. Rather, it is sufficient to copy onto disk all the useful scenes from one tape. In this way, we create a "virtual B-roll," saving our clients' tapes, as well as time and wear and tear on our machines.

Our DDRs are also addressable from our routing switcher when we need larger flexibility from our system. It often happens that a digital disk can be released from the edit suite to catch images frame-by-frame from our caption camera. These images can then be enhanced in the Harry suite, which may have been occupied earlier.

The reverse is also true. The DDRs that are usually connected to 3-D systems can be controlled from the edit suite to catch material created on computer.

In addition, the various remote control possibilities allow the units to be used in conjunction with images from our paint systems and rotoscoping/retouching devices in a quick way. This allows us to make painting corrections in parallel to the edit suite for the same job. We simply give one of the DDRs up to a Paintbox, which utilizes it as a player/recorder to catch and release sequences or single images.

We are extremely satisfied with the Abekas DDRs. They are powerful, quick and reliable, and they allow us to give our clients a DDR facility that is currently in great demand in this market. ■

Editor's note: Massimo Lovato has worked as an editor at various facilities over the years, utilizing numerous painting and 3-D animation systems.

The opinions expressed above are the author's alone. For further information, contact Willie Scullion at Abekas (Telephone: +44-734-585421; FAX: +44-734-597267), or circle **Reader Service 38.**

INFORME DE LOS USUARIOS

EQUIPO SONY REALZA A TELEVIDEO

por Juan Fernando Oviedo
Jefe Técnico
Televideo

BOGOTÁ, Colombia

Hace quince años, al inicio de la empresa Televideo, nuestras salas de edición contaban con videograbadoras de formato U-Matic. Rápidamente, el desarrollo y la acogida de nuestra empresa en el medio nos permitió contar con VTRs en formato de una pulgada tipo "C". Televideo es hoy una de las casas productoras más grandes del país y cuenta con salas para edición de video educativos, musicales, documentales, audiovisuales, programación y salas de post-producción de comerciales, entre otras.

El incluir en nuestras instalaciones el formato D2, y con estos las videograbadoras Sony DVR-2 y DVR-20, ha representado uno de los mejores recursos para la producción y post-producción de comerciales. Más del 20 por ciento de los comerciales que se realizan en el país, son realizados o post-producidas por nuestra empresa.

La capacidad de multigeneraciones, la velocidad en edición, la calidad de imagen y sonido, la corrección de "drop-outs" (desapariciones), la compatibilidad y adaptabilidad a las instalaciones con que ya contábamos, son algunas de las características que nos brindan las unidades del video digital compuesto y nos permiten mantenernos a la vanguardia en tecnología y servicios.

La integración de las DVR-20 a nuestro sistema se realizó sin contratiempos. Rápidamente estuvimos en capacidad de ofrecer a nuestros clientes nuevos servicios de mejor calidad y menos tiempo en edición "on-line" (en línea) y animación cuadro a cuadro.

La nueva calidad de edición está asegurada directamente con el equipo de graficación. Se realiza con la BVH-2500, utilizando algunas veces con la función de "read before writing" (leer antes de escribir) y la velocidad variable en imagen que supera la calidad de las VTRs de una pulgada.

Recientemente, unos productores nos consultaron para alquilar los servicios de nuestra unidad móvil para la producción de la miniserie "Crónicas de una Generación Trágica". Inicialmente le ofrecimos producirla en formato de una pulgada tipo "C" con la portátil BVH-500A, pero al discutir los detalles en una reunión técnica y enterarnos un poco más acerca del proyecto; escrita por Gabriel García Márquez y dirigida por Jorge Alí Triana, puesta en escena con más de 40 actores y 4000 extras; decidimos cambiar nuestra oferta al formato D2.

Para lograr la aceptación de los mayores costos, invitamos al personal directivo de este proyecto a nuestras instalaciones para mostrarles las ventajas de trabajar con equipo digital. Velocidad, confiabilidad, limpieza de imagen fueron algunas de las mejores características que encontraron observando la gran cantidad de trabajos realizados con D2; comerciales, audiovisuales, "videoclips" entre otros.

El resultado después de ochenta días de producción en exteriores, complementados con días de producción en estudio y cerca de cincuenta horas de pregrabados con la ventaja de poder ser vistos inmediatamente en la calidad requerida sin corrector de base de tiempos, fue la miniserie que luego de 100 horas de edición se presentó de ocho horas en su versión nacional y seis horas en la internacional.

La integración de las DVR-20 a nuestro sistema nos dio la capacidad de ofrecer nuevos servicios de mejor calidad.

La producción de campo llevó nuestra unidad móvil por variadas regiones y climas de Colombia y extremas condiciones de trabajo, gran cantidad de polvo, humedad y cambios bruscos de clima. Tanto nuestras cámaras Sony BVP-7A como la grabadora portátil DVR-2 respondieron a las exigencias de una forma inmejorable. La post-producción en formato digital nos permitió entregarlo al cliente su programa en primera generación y sin ningún "drop-out". Las Crónicas se emitieron a finales de octubre del año pasado, en horario especial de miniserie. ■

Nota del director: Juan Fernando Oviedo es Jefe Técnico de Televideo e Ingeniero Electrónico graduado de la Universidad Distrital "Francisco José de Caldas". Cuenta con seis años de experiencia en video, incluyendo trabajo con unidades móviles, cámaras, videograbadoras, equipos de audio, grabaciones en exteriores y estudio. Igualmente ha trabajado en edición y post-producción.

Para más información, comuníquese con el representante de Sony en su región.

TECHNOLOGY UPDATE

DigiStore: The Next Step in Automation

by Matt Danilowicz
V.P., Marketing
Dynatech DigiStore

MADISON, Wisconsin

The DigiStore system from Dynatech represents an entirely new approach to automated video storage and playback. Designed as an alternative to robotic VTR solutions, DigiStore utilizes high quality video compression to record commercial spots and other short-duration material onto computer-based Winchester magnetic disk drives.

DigiStore has enormous potential, foremost of which will be automated commercial playback.

In addition to the savings in supporting and maintaining industry-standard computer components rather than tape, DigiStore offers a new level of operational flexibility. For example, no more rewinds and no more prerolls. Even more important, a single DigiStore chassis offers multiple independent channels capable of transferring material among disk drives in faster than real time — essentially providing a basic video server for telecasters.

ON THE RISE

Currently installed in several small market broadcast facilities in the United States, DigiStore ignited the collective imagination of the industry at the 1993 NAB convention with its demonstration of high quality video output running on a 486 computer platform. Since then, the company has received numerous orders, including Australia's Prime Network, a local facility of the Swedish Television Network, and Russian Television and Radio in Moscow. The same software framework of the NTSC system will be enabled for general PAL deliveries, commencing in May 1994.

Subjective evaluations of DigiStore rate its video quality in the same class as Beta SP and one-inch type C. Thanks to the use of a patented technique called parallel processing, Dynatech is capable of producing full motion, high quality video output using dual on-board JPEG processors. The compression takes place in real time (the same time it takes to play back from a source deck), and it utilizes a dynamic quantization factor to adjust compression ratios on the fly, maximizing video quality within each frame.

Most television facilities will use a three-channel DigiStore to record on one channel while playing back on the other two. Because the system runs on a Local Area Network (LAN), the multiple chassis can interconnect together for large ad-insertion applications of many channels.

Typical DigiStore configurations store at least a day's worth of spots on the hard disk drives, while maintaining the rest of the library — many thousands of spots — on an attached library system. This attached library may be comprised of no more than two magneto optical drives with removable, rewritable optical platters (therefore requiring manual dubbing), or it may be comprised of a rewritable optical autochanger with dozens of platters, which automates the daily transfer of spots in and out of the archive.

DigiStore utilizes industry-standard SCSI-2 disk drives from a variety of manufacturers, as well as magneto-optical storage from Hewlett-Packard. The design of the video compression system allows each alternating field of video to be stored on a separate drive, so that each spot is stored on a pair of drives. This means that if one drive fails, the spot continues to play back in reduced resolution. The drive can then be "hot-pulled" from the system and replaced. DigiStore plans a recovery facility to automatically rebuild the drive from the archive if such a failure occurs.

GROUP EFFORT

The Dynatech Video Group is comprised of several well-known industry suppliers, most of whom have contributed core expertise, personnel or technology to the formulation of the DigiStore. Utah Scientific and Alpha Image, leading suppliers of router and automation technology, have assisted in developing DigiStore interfaces to traffic and automation systems. DigiStore is developing news interfaces in conjunction with Dynatech NewStar and has borrowed key video disk storage and driver technologies from Dynatech's Colorgraphics and Quanta corporations.

DigiStore utilizes a rack-mounted computer chassis that connects to multiple remote PC consoles using its Windows NT operating system. Windows NT provides extensive LAN connectivity to a variety of other network operation systems, and its protective multitasking design enhances failsafe operations.

DigiStore's AdWare package includes two components: a scheduling module, which allows for manual creation of playlists or integration with the TrafficWare module to link with external traffic and billing systems; and a master control display, which allows the operator to preview, re-order and manually trigger break playback. An inventory control module provides a database window for the dub station operator to enter the spot title, ID and other pertinent information, and this window also allows him to enter the start of message, end of message, duration or manual cue for the recording of the original material from a remote controlled tape deck.

DigiStore's 20-slot passive backplane includes separate GPI and master clock interface boards. Individual breaks can be triggered by contact closure or an absolute clock time, and upon completion of the break, DigiStore can trigger a GPI output to relinquish control to the automation system for the cueing of program playback.

The Dynatech DigiStore offers a disk-based storage and playback solution.

Thanks to the lower cost and operational savings, many early purchasers of DigiStore have opted for redundant configurations, interconnecting two or more chassis to provide on-line backup at all times — a configuration that is significantly more expensive when using robotic library systems.

The imminent PAL release of DigiStore will provide YUV input and output, with the option of a composite or 601 serial digital transcoder. Both NTSC and PAL systems offer four-channel uncompressed audio storage at 35 kHz PCM.

In the words of Roi Agneta, the newly appointed general manager of DigiStore: "As the rollout of our PAL video board draws near, we are looking forward to expanding DigiStore's presence in international markets, where the emphasis on quality and state-of-the-art technology will play to DigiStore's strengths." ■

The opinions expressed above are the author's alone. For more information, contact the author at (Telephone +1-608-276-4680; FAX: 608-273-5832), or circle **Reader Service 7.**

BUYERS BRIEFS

Asaca-Shibasoku's ADR-6000 magneto-optical disc recorder features a high-speed proprietary drive capable of storing 50 seconds of D-2 quality video on a single 5.25-inch disc.

The unit also stores two channels of audio.

Both the video and audio and be recorded, played back and erased numerous times.

An optional Ethernet interface is also available.

For further information, circle **Reader Service 8.**

BTS has available the DCR-500, a full-featured digital component (D-1) VTR capable of working in analog component without an external A/D or D/A converter.

The unit has seven inputs and nine outputs, including serial and parallel digital ins and outs. Also available are composite and component monitor outputs.

The unit also stores, edits and transmits 16:9 EDTV images.

For further information, circle **Reader Service 111.**

USER REPORT

Tele-Cine Moves Up to Ampex DCT

by David Pollard
Head of Post Production
Tele-Cine

LONDON

As everyone knows by now, there are three new component digital video recorders on the market: the Sony Digital Betacam, the Panasonic D-5 and the Ampex DCT. When Ampex announced that it had built an entirely new VCR, I am sure I was not alone in expressing skepticism about its likely chance of success.

At first glance DCT seems to have a number of disadvantages over its two competitors. First, it uses data compression in recording its video signal. Second, it uses 19mm tape, making the cassette much larger than its rivals. And third, it is not backward compatible with any other video format.

FIRST IMPRESSIONS

I, therefore, approached my first view of DCT at IBC in Amsterdam fully expecting to walk away convinced that we would not be investing in DCT. To date, we have bought two DCT machines, and we confidently expect to buy more in the future.

The advent of the new formats and new techniques in program post production allow the facility to specify an "in house" format for telecine, editing and graphics. This VCR should be able to accept as inputs serial digital, parallel digital and analog component. It should be able to output all of these plus a high quality composite signal.

Ideally, a format should be standards independent. All areas of the VCR's engineering should be accessible from the front panel of the machine. Software updates should be loaded from disc rather than time-consuming PROM changes. Also, the head life should be as long as possible and head replacements should not involve spending 10 percent of the cost of the machine or a trip back to the factory. Ampex DCT is the only format that can offer all of these.

Our use for DCT is as an all-purpose digital support VCR. By that I mean that we stay on DCT as far into post production as we can, avoiding D-1 until the last moment. The number of clients who will accept a DCT master is still relatively small, so we normally end up making a D-1 clone at the end of an edit. We have found the Ampex DCT drive to offer near-disc access speeds, making DCT worth having even when it is not specified in the edit sessions.

DCT offers the operator a great deal of control from the front panel of the machine. Menus are accessed from a mixture of hard and soft keys, and there are shortcuts through the menu system to get to the key operational areas.

In addition to engineering functions, DCT also has a good machine-to-machine editing system as standard, with the ability to split multiple tracks and do seamless pick-ups in the machine room should this be desired. NVRAMs are provided for quick and easy specification of tasks.

The DCT front panel also logs the timecode every time DCT performs a concealment (about once an hour on average), and these can be cued to from the front of the machine. New software releases for the DCT 700d tape drive are loaded from a 3.5-inch disc drive mounted in the chassis.

SMOOTH ROLLING

The tape transport on the DCT 700d drive sets new standards in engineering. Air lubricated guides and a pinch-rollerless capstan allow the tape to be accelerated to full speed (60x play speed) in less than one second. DCT is not only fast but gentle too. The concept of design is to reduce tape contact with any surface to an absolute minimum. In addition to this, DCT employs co-planar and helical threading, so it can read and cue from timecode without the tape being in contact with the video head.

The attention to detail does not end with the machine. The Ampex DCT 700t tape cartridge has been designed to meet the tight tolerances and high performance of the VCR. The result is precise, dependable and repeatable performance.

One of the most annoying things about the general debate regarding new video formats has been a slavish obsession with the number of generations that any particular new machine can "go" before the picture starts to degrade. Not to be left out of this largely irrelevant exercise, I recorded three hundred generations of film sourced grainy material and could not see a difference in number 300 compared to number one.

Generation loss debates are now surely irrelevant to our choice of new VCRs. Everyone's component digital VCR will record lots of generations, far more than you or I will ever use. We should be concentrating on much more important things like, "Can I be sure that my recording will perform well in another facility's suite?"

DCT's engineering gives me a great deal of confidence that I can answer "yes" to that question. All users of D-1 have experienced incompatibility problems between various machines. D-1 recordings are inherently not stable and small differences in tracking and scanner phase can make it impossible to edit correctly into someone else's recording. Ampex has addressed this problem by the sheer mechanical stability of the VCR and by a patented auto-optimize performed before every edit that adjusts the scanner phase to match that of the recording.

DCT also has excellent audio facilities with four uncompressed 20-bit, 48 kHz digital audio tracks which can be heard without digital squawk in jog and varispeed. Inputs can be analog or AES/EBU.

So what is wrong with the Ampex DCT? Well, only three things really. First, there is a six-field delay through the system in record. This can be annoying if your edit suites contain a number of preview monitors and you are working on previously edited material. Second, there is no pre-read capability. A lot of our experience has been gained on D-2 composite digital VCRs (all of which have come from Sony), and we have found the pre-read function to be invaluable. Although greatly improved from early models, the DCT picture is not recognizable at high shuttle speeds. In auto-conform this does not really matter, but improvement is needed here.

On the plus side, there really are some excellent features. Superb tape handling, very fast shuttle and lock-up time in edit, multistandard capability and ease of maintenance make it a truly formidable post production device. ■

Editor's note: David Pollard has led post production operations at Tele-Cine for several years.

The opinions expressed above are the author's alone. For further information on the DCT format, contact Martin Salter at Ampex (Telephone: +44-734-875-200; FAX: +44-734-230-396), or circle **Reader Service 83.**

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ANTENNAS, TOWERS, CABLES

Want to Sell

Utility tower 380' 24" face twr on the ground, complete w/lights, 2 avail, $4560/ea. J Procter, WCRT Radio, 980 FM 1746, Woodville TX 75979. 409-429-3679.

Fiber optic cable Belden 229657GJ, $.22/ft. Gordon, Magnolia Video, 904-681-6677.

CAMERAS

Want to Sell

Panasonic AG-450 S-VHS camcorder w/hard case, 2 batts, AC adapt, excel cond, $750. Mike, 301-739-4590.

Parts for IVC cameras 7000, cheap. F Kelley, TV40, 4237 Airline Rd, Norton Shores MI 49441. 616-733-4944.

Panasonic WV-3260, excel cond, low time, $900/BO. Roger, Morganville NJ. 908-536-4786 after 6:30pm.

Panasonic AG-450 (3) S-VHS camcorders, hard cases, AC adaptors + access, (4) batts ea, $850/ea. JL Video Prod, 3660 George F Hwy, Endwell NY 13760. 607-786-0278.

Panasonic WV-3260 digital camera, 8X zoom, $800; pwr sply, $55; 10-pin camera cable, 25', $40; copystand, $30. Petit Prod, 716-637-7583.

Panasonic AG-455 incl case, 2 batts & chrgr, excel cond, $1250. E Byrne, Byrne Video, 123 Acacia, Monrovia CA 91016. 818-303-2244.

Panasonic AG-460 S-VHS 2-chp camcorder, batt, AC pwr sply/chrgr, hard case, $1700/BO. 504-768-0278.

Sharp XC800 3-tube camera w/remote focus & zoom cntrls for Canon 15X lens, & studio viewfinder, no burn on tubes, $800; Bell & Howell Mdl 240 16mm camera w/case & light meter, great cond, $50. S Casper, N8251 Lakeshore Dr, Fond du Lac WI 54935. 414-923-3963.

JVC GR-S505 compact S-VHS camcorder, manual over-ride of iris, full range auto focus, 2 batts, hard case, all access, original pkg, hardly used, $750; Hi-8mm camcorder; Richo 808H, same as Sony V-99, manuel over-ride of iris, 2-speed zoom, 2 batts, soft case, all access, original pkg, $750; Stedicam Jr, works great w/either of the above cameras, just overhauled, spare handle & Basher light, $500. 609-354-0074.

Panasonic AG450 camera, AC adapter, hard shell case, batt, $550; Panasonic AG460 camera, case, AC adapt, battery, $1800. C Overton, 16 Birchwood Dr, Plattsburgh NY 12901. 518-561-8178 after 5 pm.

Sony DXC-325 camera w/Fujinon Eagle S16x7BRM-18B 16:1 lens, EVV-9000 Hi-8 back, CA-325A AC back, CA-325 batt back, hard case, 6 batts, new cond, $8500. L Hamilton, Neverland Studio, Rd #2 Belldon's Rd, Amsterdam NY 12010. 518-843-5028.

Sony VO-4800, 3 batts, Porta-Brace w/AC adapter/chrgr, $500; Panasonic WV 6000 camera w/case, 2 batts, AC adapter/chrgr, 14 & 10 pin cable, $1000; AG-6400 rcdr, $400; JVC GX-N70U camera, never used, $100. 205-361-0591.

Ikegami HL-95B 18X w/2X lens, 400 hrs, ENG back w/camera cable, $5500/BO. Jerry, 800-748-4982.

Sony DXC-3000 w/Fujinon 10-120; Sony M3 w/Canon J15x9.5; Sony VO-6800 port 3/4" deck; Sony VP-5000 3/4" plyr; Sony RM-580 cntrlr/remote; Crosspoint Latch 6119 SEG, all equip wks, pkg price, $5000 + shpg. 215-493-4404.

JVC KY17 camera w/BRS-411U dockable rcdr, excel cond, $3300; JVC BR-S420U for S-VHS cassettes, like new, $1500; 5 batts, JVC-NB-G1U, $300; adapter chrgr AA-P250U, $200; JVC AAG10U chrgr, $200; 2 batt belts, Redline, Wetcell, Cine Video, Bogen 3066, $200; shoulder case, Porta-Brace, $130; carrying case, Porta-Brace, $125; carrying case, tripod, Bogen, $30; adapter, C cassette, $20. Tracks Video Prod, 2811 Jackson, El Paso TX 79930. 800-351-6053.

Ikegami HL-95B w/BVV-5 new heads on 5, lke in vgc, $9500/BO, pkg only; Ikegami HL-79eal gd cond w/J-Lab adaptor, $4000/BO. Gordon, Magnolia Video, 904-681-6677.

Panasonic Color Cam WV-6000 (SI) sngl tube Saticon, high res camera 400+ lines, 12X zoom lens, w/F-stops, hard case, access, $400. R Axmacher, Morningstar Video, 159 Sawyer Ave, Babylon NY 11702. 516-422-9445.

Sony EVW 300L HI-8 camcorder, less than 50 hrs, 3-chip camera, 700 lines resolution, well balanced on the shoulder, loads of features, incl Canon 12X lens, hard cass & tripod mount, $5000. A Kohout, 708-654-2700.

Underwater housing for Sony BVW-300/400, built-in lighting system, monitor, RMP-3 CCU with batteries, chargers, etc, $2500. S Starnes, 2901 Westhelmer #17, Houston TX 77098. 713-526-2579.

JVC BY-110 w/16X zoom w/shotgun mic, AC adapter & chrgr, unit complete w/hard case & manuals, gd cond, $1300; JVC CR-4900U port 3/4 deck w/SMPTE time code generator TG-P47U, AC adapter & chrgr & 3 batts, Porta-Brace case, excel cond, $2000. Rusty, 904-427-6626.

Sony BVP-150 w/Canon lens, hard case, VO-6800 3/4", Porta-Brace, extras, lw hrs, perfect cond, $2750. P Stalionis, PTS Films, 8000 Neighbors Ave, Baltimore MD 21237. 410-866-5363.

Ikegami HL-95B complete prod pkg w/Sony BVV-5, BVW-35, CA-95, BVM-8021, (4) mics, (3) light kits, tripod, AB Batts/Quad chrgr, cases, many extras, all excel cond, $17500/BO. D Haimoff, Media 3 Ltd, 830 Greenwich St 1 fl, NY NY 10014. 212-727-7753.

Sony DXC-M7 3-CCD camera, 700 lines resolution, w/Canon 15:1 lens & case, vlh, $4995. J Gross Studios, 800-874-8466.

JVC GYXIYCVH 3-chip S-VHS combilt camera, mint, very little use, w/Anton Bauer mount, $4300. J Jones, RBY Prod, 920 Main St, Southbury CT 06488. 203-264-3666.

Sony BVP-30 3-tube Plumbicon camera, head only, tubes in gd cond, BO. Jeff, Cinecan, Sudbury, Ontario CANADA, 705-525-1801.

Panasonic AG460 camcorder, 4 hrs use, hard case, mint cond, $1800. Cliff, 408-624-2985.

Canon RC 570 still video camera, BO. Steve, 319-393-1993.

Sony DXC-M7 3-CCD camera w/Canon J15x9.5 lens, dual batt adapter, tripod plate, raincover, case, VTR cables, lw hrs, mint cond, $8000/BO. Sharpshooter Prod, 908-280-8008.

Panasonic WV-555 hi-band 3-tube cameras (2) w/WVLZ-30/12 & WVLS-30/10 lenses, both w/fresh tune ups, incl WV-PS30 pwr sply &/or WV-BC32 chrgr w/WV-PS37 batt pck, $750/ea or BO; Panasonic NV-9450 3/4" port w/WV-B450 fast/slow chrgr/pwr sply & (2) WVBP-450 batts, $650/BO; pkg price $1800; (2) Panasonic WV-6000 cameras w/WVLZ 12/12 12X lenses, single tube genlockable, tubes ok, $200/ea. S Green, Creative Video Editing, 406 Westgate Mall, Madison WI 53711. 608-274-9944.

Panasonic AG450 S-VHS camcorder w/case & 2 batts, AC adapter, w/manual, gd cond, $800. G Alford, 302-322-5119.

Canon L-1 in original cartons, extended warranty, 5 batts, excel cond, $1850. ICT Video, 619-436-4178.

JVC KY-15/BR-S410U 3-chip w/S-VHS docker, brand new Canon 13X, PS, plate, excel cond, $2750/BO; Panasonic WV-V3 3-tube, excel cond, 10X lens, PS, 3.5 AH batt & chrgr, hard case, svc manual, $850; Sony 4800 port, Porta-Brace, pwr, cable, batt, $450; Panasonic NV-9450 port, excel cond, PS, cable, svc man, $475. Steve, 608-251-8855.

Sony DXC-3000A w/12X Fujinon lens, $4000. Kelly, 318-234-1422.

Sony ED-Beta EDC-55 camcorder, 2-chips, Canon 15X lens, 1.5" VF, Y/C output, lw hrs, gd cond, $3475. Huffman Video, 408-288-8505 afternoons only.

Sony CCD-V5000 Hi-8 PRO camcorder w/5 NP-77h Ni-Cad 6 V, 2400 mAh batts & Sony extended svc contract. 619-944-7695.

Sony BVW 300A, lw hrs, operators own camera, meticulously maintained, BO. Raider Prod, 215-889-9565.

JVC KY17/BRS 410U dock camcorder w/16:1 lens, AC adapt/chrgr, batt, KA-20 back for standalone use, camera case, excel cond, $4395. D Brennan, Brennan Custom Video, 205-823-0088.

Sony BVP-30 3-tube Plumbicon camera, head only, tubes in gd cond, BO. Jeff, Cinecan, Ontario Canada. 705-525-1801.

Ikegami 730AP 9-5-143 lens, AC adapt w/Canon, case, Anton Bauer Lifesaver chrgr, manuals, gd cond, $1000. T Sankar, 14 Justice Sundarah Rd, Nageswarapuram Mylapore Madras 600004. INDIA.

CAMERA ACCESSORIES

Want to Sell

Sony Tripod mounting plate for new DXC series cameras, brand new, BO; Bogen 3068 aluminum tripod w/Manfrotto 116 fluid head, brand new, BO; RCU-730A remote panel for camera CCU cntrls ped, gain, etc, brand new, BO. MRG Prod, 516-447-1041.

ITE Fluid sets (2) pan/tilt w/Miller sticks, $700/ea; (2) ITE studio P4 pedestals, $1400; TVP studio air pedestals w/Vinten pan/tilt head, $2500; (2) standard FM mobile 2-way radios, $300; set of cable reels (4) gear driven, $150/ea. Jerry, 800-748-4982.

Canon Power zoom lens, 16-160mm auto/man iris from Panasonic WV-3900, 2 avail, $150/ea; Fujinon 9-108mm pwr zoom, macro, auto/man iris from Panasonic AK-750, $200. Mike, 201-348-7493 or 201-997-2614.

Anton Bauer Lifesaver fast chrgr LSNP Plus w/4 NP13 Plus high capacity batts; Cartoni Beta tripod syst w/head, extra stage tripod, dolly, vertical angle wedge plate & PVC tube case; Bogan head, tripod, dolly 3063/3046/3067 fluid, quick release; Sony LO-1011 lens remote cntrl system. 619-944-7695.

Nikon 59x5.5 wide angle ENG/EFP lens in new cond, must sell quickly, $4500/BO. D Soon, KGMB-TV, 1534 Kapiolani Blvd, Honolulu HI 96814. 808-973-9382.

10 pin 25' cable for docking camera to deck or extension of cable, $40. A Kohout, 708-654-2700.

RM-P200 (2) camera cntrl units w/cables, brand new, never used, $3000. Jeff, Cinecan, Sudbury, Ontario CANADA, 705-525-1801.

Sony CA3A, mint, $750/BO; Anton Bauer LSQ4, 4 position batt chrgr, $350/BO; O'Connor 50 w/legs, $500/BO. G Andracke, 212-580-9964.

RCA remote cntrl syst studio terminal, BTR-15-B, $50; Panasonic camera cntrl units (2) w/cables WV-RC 32, $125/ea. F Kelley, TV40, 4237 Airline Rd, Norton Shores MI 49441. 616-733-4944.

Porta-Brace carry-on camera case for DXC 325/327/9000 camcorder, new cond, $160; Precision Optics 12X lens adapter for DXC-325/327 1/2" lens, new cond, BO. Jim, 619-346-2308.

SachtlerMunchen Video-10 tripod, w/dolly, never used, $950. L Hamilton, Neverland Studio, Rd #2 Belldon's Rd, Amsterdam NY 12010. 518-843-5028.

Anton Bauer Lifesaver fast charger, LSNP Plus w/4 NP13 Plus high capacity batts; Bogen head/tripod, dolly, 3063/3046/3067, fluid, quick release; Sony LO-1011 lens remote cntrl syst, 619-944-7695.

J-Lab adaptor for HL-79E, $500. Gordon, Magnolia Video, 904-681-6677.

RM-P200 (2) camera cntrl units w/cables, brand new, never used, $3000. Jeff, Cinecan, Ontario Canada. 705-525-1801.

CATV/MATV EQUIPMENT

Want to Sell

CATV modulators, color, RCA mdl EXWF-VNOP pre-set for chnls M, N, O, P, Q, incl meter/monitor, phase EQ, audio modulator, video modulator & output converter modules, like new, $2500/BO. MRG Prod, 516-447-1041.

Jerrold TV modulator, 19" rack ch 7, $75; Jerrold TV modulator, 19" rack ch 2, $75; Jerrold TV modulator, 19" rack ch 3, $75; Jerrold TV modulator, 19" rack ch 4, $75. F Kelley, TV40, 4237 Airline Rd, Norton Shores MI 49441. 616-733-4944.

DIGITAL EFFECTS

Want to Sell

Tektronix 4956 graphics tablet & stylus interface unit, used w/Paint Box syst, excel cond, BO. MRG Prod, 516-447-1041.

Video F/X non linear video edit suite, Macintosh based NTSC, $7000. S David, Frontline, Radmansgatan 3, 21146 Malmo SWEDEN. Ph/FAX 011-46-40-977578.

EDITING EQUIPMENT

Want to Sell

Panasonic AG-7500A, AG7510, & AGA-750 S-VHS edit syst, excel cond, $5500. E Byrne, Byrne Video, 123 Acacia, Monrovia CA 91016. 818-303-2244.

JVC KRM-800 MII editor, newer heads w/vlh, 45-pin JVC cntrl, Y, R-Y, B-Y & composite ins & outs, $5500/BO. S Green, Creative Video Editing, 406 Westgate Mall, Madison WI 53711. 608-274-9944.

Comprehensive Edit Master A-B roll edit syst w/2 JVC CR-series parallel interfaces & 1 Panasonic/Sony serial interface, GPI module w/6 separate triggers, parallel interfaces incl time code reader/gens, computer, monitor & CMX-style keyboard, $2500. B Jones, Dapsho TV Prod, NW 1015 Clifford St, Pullman WA 99163. 509-332-5858.

CMX 300 editor w/4.92 software, xtra cntrlr avail, $4500/BO. Gordon, Magnolia Video, 904-681-6677.

JVC CR-8250U edit system, excellent condition, CP-550U, RM-86U with long cables, $4000; Panasonic WJ-AVE5 digital mixer, $1000. Rusty, 904-427-6626.

Panasonic AG-7500 rcdg editors (2) & AG-750 cntrlr, complete S-VHS edit syst, excel cond w/low time & orig cartons, $6000/BO; Panasonic WV-3260 camera, $900. Roger, Morganville NJ. 908-536-4786 after 6:30pm.

Panasonic AG-7750, $4900; AG-7650, $3900. Kelly, 318-234-1422.

Sony 3/4" SP edit syst VO 9800, $3500; VO 9850, $5500; RM-450, $1500; 9-pin cables, (2), $80, all mint cond w/low hrs. Petit Prod, 716-637-7583.

Panasonic AG-A650 edit cntrlr, NV-8500 (2) PB/record decks, (2) color video monitors, complete VHS edit syst, used only once, perfect cond, $3000. M Frauenglass, UNTV, NY NY. 212-928-7016 leave mess.

3/4" Sony 2800 edit syst w/ECS 90 cntrlr, recently overhauled, incl cables, manuals & speakers, $1495. Bennu Prod, 626 McLean Ave, Yonkers NY 10705. 914-964-1828.

Sony EV-S900 Hi-8 edit deck, new, $1350; Sony RM-E300 edit cntrlr with titler, cntrl-L & infrared connections, new, $350. L Hamilton, Neverland Studio, Rd #2 Belldon's Rd, Amsterdam NY 12010. 518-843-5028.

Panasonic AG-7750/7650 full S-VHS edit suite with AG-A770 cntrlr, Toaster 2.0, WJ-MX30 mixer, monitors, audio mixer, selling for upgrade, call for particulars. B Walker, Videoland Prod, 805B College ST SE, Lacey WA 98503. 206-491-1332.

Panasonic 3/4" cuts only edit syst w/2 Panasonic NV9600 edit decks, Panasonic NVA960 edit cntrlr, RCA 9" B/W source monitor, manuals, all video & audio cables, great cond, $1200. S Casper, N8251 Lakeshore Dr, Fond du Lac WI 54935. 414-923-3963.

Sony VO-5850 U-matic editors, good condition, $2000/each. Ugly George, 840 8th Ave, NY NY 10019. 212-969-0240.

Paltex ABR-1A A/B cntrlr w/GPI, printout, 20-event memory, split edits, (3) JVC 45p cables, $900. Steve, 608-251-8855.

Sony VO2860A/VO2260 3/4" cuts only edit system with EMS controller, good working system, $1500. M Halsey, Magnetic Dreams, 4336 Baton Rouge Dr, Hermitage TN 37076. 615-885-6801.

LIGHTING

Want to Sell

Colortran 1k Studio softlights (2) with roller stands, great condition, $175/ea. S Casper, N8251 Lakeshore Dr, Fond du Lac WI 54935. 414-923-3963.

Lowel Tota Light mdl T1-10, new in box w/lamps, $50/ea. A Gluskoter, 86 W Norman Ave, Arcadia CA 91007. 818-445-7625.

MOVIE PRODUCTION EQUIPMENT

Want to Sell

16mm Bolex H16 EBM camera, electric, complete w/case. J Winkler, Tech Dir, UCSD, 9500 Gilman Dr Dept 0108, La Jolla CA 92093-0108. 619-534-2617.

Chinon Super 8 SP 359 sound projector, BO. Steve, 319-393-1993.

Arlon Mate-Trac Express 4 (2) projector slide-cassette dissolve units w/cables, $150; (3) Kodak Extagraphic IIIE 35mm slide projectors w/Navitar 1: f2.8 lens, $225; (3) Media Cube display units, BO. M Seeber, Seeber Prod, 612-227-9520.

Moviola 6 plate M77, excellent cond, Best Offer. Pacific Productions, 202-342-7722.

Panasonic PTB1010UF 120" video projector, 1100 lines resolution, 700 lumens, wireless remote cntrl, new in box, full warranty, $5783. 607-687-0545.

Steenbeck ST P21 16 super 16mm 8 plates, 2 pictures, 2 sound tracks, interlock system, motor driven rewinder, extension boards, fold out magnifier, 2 loudspeakers, sound reader with preamp 16/35mm, excel cond, BPD 16,500. N Ambatzis, Spectral, 9 Formlonos Str, Athens 16121 GREECE.

PEDESTALS

Want to Sell

SIGNAL PROCESSING

Want to Sell

CCI 800-6 Y/C delay video DA, 3 Y/C outputs, front panel luminance & chroma gain cntrls & Y/C delay adjustment, new in box, $400. Ron, Video Keepsakes, 85 Oliver Ave, Valley Stream NY 11580. 516-285-7148.

SIGNAL PROCESSING...WTS

Archer 15-1270 image enhancer/stablizer, like new, BO. MRG Prod, 516-447-1041.

Denecke TS-1 time code gen, SMPTE time code display w/clapstick, open. G Warren, 3715 N Lakewood, Chicago IL 60613. 312-327-4785.

Arvin Echo frame store in road case w/additional disks, $500; Sony FCG-700 frame code gen, new in box, $700. Joe, Starfire Video, 910-867-5149.

Cohn video multiplexers (2) mdl 2614-400, 1 wkg, 1 parts, $75. F Kelley, TV40, 4237 Airline Rd, Norton Shores MI 49441. 616-733-4944.

Leitch DFS-3000N digital frame sync, 2 avail, brand new, very clean, $3000/BO. MRG Prod Assoc, 516-447-1041.

I-Den 9+ TBC, transcodes S-VHS, Hi8, 3/4 (Y688), MII, & Betacam, any format in, any format out, DOC, special effects, freeze frame, freeze field, sepia, strobe, B/W, $2000. Mike, 303-484-5535.

Digital Creations "Kitchen Sync", dual TBC card with S-VHS option added, works w/PC or Amiga computer, less than 1 yr old, $950. H Sutherland, 407-567-0600.

CCI 810 composite transcoding video DA w/wide bandwidth luminance & improved chroma, 1 BNC input w/loop thru, (3) 4-pin outputs, lk new, $595; Furman Q-151 graphic stereo 15 band short throw equalizer, like new, $175. J Nogueira, JMN Prod, 257 Purchase St, Milford MA 01757. 508-478-1762.

Nova 502 TBC, $900/BO. Gordon. Magnolia Video, 904-681-6677.

Nova 700 TBC, $850. Bill, CMS, 175 Bunkerhill Rd, Auburn NH 03032. 603-644-8899.

CBS Labs Image Enhancer, 1 rack unit 19" style, BO; Bosch digital encoder TC-2000, very clean, $3000/BO; Eeco time code generator B-500, clean, BO; 3M NTSC encoder, old 1 rack unit 19" style, working, clean, BO. MRG Prod, 516-447-1041.

SWITCHERS

Want to Sell

3M 101 10x1 audio follow video VI switcher, very clean, 2 avail, BO. MRG Prod, 516-447-1041.

Hotronic AH91 S-VHS/composite, full bandwidth, freeze frame, field wipes, pushes & pulls, sync gen, paint, mosaic, excel cond, $3500. S Gibson, Key Logo, 335 Wilson Ave, Satellite Bch FL 32937. 407-777-3936.

Alta Pyxis E dual chnl, TBC, digital effects, frame & field store, $2000/BO. JL Video Prod, 607-786-0278.

Panasonic WJ-MX12 switcher w/digital TBC, excel condition, $1150. L Hamilton, Neverland Studio, Rd #2 Belldon's Rd, Amsterdam NY 12010. 518-843-5028.

GVG100 or 110 for $5000. D Redman, 703-527-1200.

3M 101 vertical switcher, 10 in, 1 out, audio follow video, $185. Megastar, 702-386-2844.

Cross Point Latch 6112, 8 input, composite prod switcher, no manual, $1300/BO; Panasonic WJ-MX-12, 3 input digital Y/C or composite switcher, no TBCs required, 2 mos old, in box w/all papers & blank US warranty cards, $1800/BO; A-B roll cntrlr Convergence ECS-104, cntrlr & computer, set up to interface w/Sony Type 5 manual for T-100 avail upon purchase, $950/BO Brian, 203-270-0329 or 607-275-4777.

JVC KM-1600 SEG 4 input full process Y/C switcher w/chroma key & soft edge wipes, $4000. Jeff, Cinecan, Sudbury, Ontario CANADA, 705-525-1801.

Crosspoint Latch 6119 Y/C switcher, full S-VHS & composite inputs & outputs, 5 inputs + colorizer, 3 buses, 2 levels of keys, auto transitions, internal genlockable sync gen, 12 patterns & positioner, colored borders/soft edges, optional serial editor interface, 2 fader arms, excel cond, $2850. Bill, 813-345-6052.

Panasonic WJ-5500A 8 input switcher, genlock, bars, keyer, incl Crosspoint 6025 color gen & manuals, $850. Mike, 301-739-4590.

JVC KM-1600 SEG 4 input full process Y/C switcher with chroma key & soft edge wipes, $4000. Jeff, Cinecan, Sudbury, Ontario Canada. 705-525-1801.

TRANSMITTERS/EXCITERS

Want to Sell

Townsend 5/10 kW tetrode xmtr used on ch 57 can easily be retuned, needs Thomson TH18482 cavity rebuilt, new TH382 tube & exciter, exc cond, brand new exciter/driver & installation avail, $17500. D Wallace, 303-426-4731.

TV FILM EQUIPMENT

Want to Sell

Slide/Video transfer system Kodak SV-5035, takes Kodak Carousel 35mm carrier ring of slides & using internal chip-camera outputs photo in RGB & NTSC composite, genlocks too, adjustable zoom, tilt, focus, saturation, hue, brightness, desk top unit, really nice, brand new, $1500/Best Offer. MRG Productions, 516-447-1041.

USED EQUIPMENT

Want to Sell

Quanta MG 100srssp char gen 1 ch Spanish/English, $700/BO; 3M D2200 char gen with 4 discs of fonts, $900/BO. Gordon, Magnolia Video, 904-681-6677.

Laird Legend char gen, $2500. Kelly, 318-234-1422.

VCR/VTRS/RECORDING MEDIA

Want to Sell

Panasonic AG-7400 prof, port S-VHS deck w/AG-B640 pwr sply/chrgr, 6 batts, excel cond, $1450. L Hamilton, Neverland Studio, Rd #2 Belldon's Rd, Amsterdam NY 12010. 518-843-5028.

JVC BR-8600 U VHS edit recorder, less than 450 original hours, BO. Jeff, Cinecan, Sudbury, Ontario CANADA, 705-525-1801.

(2) **Panasonic NV 8500** VCRs, NV A-500 controller for VHS editing used about 20 hrs, like new, $1500. R Arn, 7240 Paragon Rd, Dayton OH 45459. 513-433-2786.

Sony BVW25 Betacam field rcrdr w/case & manuals, $2250; Sony BVU870 3/4" SP rcrdr w/slo-mo, lw hrs, clean, wi/extender board & manuals w/wo Sony BVT 810 TBC, $7500; Convergence ECS 195LM A/B roll edit cntrlr, lk new, w/3 Sony type 5 interfaces & 2 Sony serial interfaces, $1200/BO. M Seeber, Seeber Prods, 612-227-9520.

JVC MII KR-M800U modified to work w/S-VHS, lk new, new heads, recently overhauled, $6500/BO. Bennu Prod, 626 McLean Ave, Yonkers NY 10705. 914-964-1828.

Sony VO 5800, vgc, $1800; Sony VP 2000, gd cond, $300; Panasonic 9100, gd cond, $300; Sony BVV-75, gd cond, $23K. Gordon, Magnolia Video, 904-681-6677.

Sony VP-210 3/4" cassette player, very clean & working well, BO. MRG Prod, 516-447-1041.

JVC BR-8600U VHS edit rcdr, less than 450 hrs, BO. Jeff, Ontario Canada. 705-525-1801.

JVC KRM800U M-2 recorder/editor, good condition, 500 hours, $4100. D Andrews, Video Reflections, 6086 Fountain Bleu Dr, Salt Lake City UT 84121. 801-272-3031.

JVC CR4700 U-matic port 3/4" deck with JVC AA-P47U charger, DC power supply & Anvil case, 200 hours, new, $400. S Casper, N8251 Lakeshore Dr, Fond du Lac WI 54935. 414-923-3963.

AG-6810 VHS duplicators, $395/as is; refurbished w/30 day exchange, $495; refurbished w/new head, $595; 30 days parts/labor warr for refurbished decks. Corplex, 708-673-9200.

Panasonic PV-S4990 S-VHS, jog/shuttle, many digital effects, pip, zoom, channel scan, multi pic, strobe, etc, built-in titler, bar code programming, w/all manuals, very little use, $600; Panasonic AG-800 still video floppy recorder w/3 disks & all manuals, $350. Mike, 201-348-7493 or 201-997-2614.

Panasonic NV-9450 port. excel cond, PS, cam cable, service manual, $475; Sony 4800 port Porta-Brace, power, cam, cable, battery, $450; JVC CP-5000U 3/4" player, excel cond, $175. Steve, 608-251-8855.
Panasonic AG 7500 & 7500A w/A750 cntrlr, $5500. 415-343-7727.

Sony VO9850 3/4" SP edit recorder w/BKU 705 time code gen board, excel cond, $5400; JVC BRS 822U S-VHS edit recorder w/SAR22U time code brd, vlh, under warr, $4250. ICT Video, 619-436-4178.

Sony BVH 2000 with TBC 2000 with DT, great condition, extra clean, $18K; Sony VO8800 port 3/4" SP deck, vlh, Kangaroo case, $2500. E Stefano, 215-544-5828.

JVC BRS 611 S-VHS feeder deck, less than 50 hrs on complete rebuild, perfect cond w/JVC SAF 911U interface, use your RM 430, 440, 450 to control JVC parallel decks. Mike, 303-484-5535.

Betamax rcdrs & tapes, Sony Betamax SLO325 plyr/rcdr in gd cond, $50/ea; brand new Sony Betamax 250LS tapes, $50/case of 50. M Lee, 510-685-1230 x.264.

Panasonic NV-9200 (2), JVC CR-8500LU, JVC CP-5000U, (2) Sony VO-1600, (3) Sony VP-2000, Sony U-Matic automatic editing control unit mdl RM-400, Sony video camera AVC-3200, TV control panel mdl TCP-2, $800 takes it all + shpg. J Hayes, 515-283-1867.

EMPLOYMENT

POSTIONS WANTED

Temporary assignments wanted Asia/Pacific area, bdct prof seeks pos on installation/construction team, trade show setup, etc. Larry Vogt, Box 86, Taipei TAIWAN. FAX c/o Huang 011-886-2-395-2503.

Consultation, startup & management of a corporate video/media dept is my specialty, 15 yrs exper broadcast & corp. Nick, 011-966-1-230-2755, x216 (+8 hrs EST)

VIDEO PRODUCTION EQUIPMENT

Want to Sell

Panasonic WJMX12 digital audio/video mixer, great condition, S-Video or composite, dissolves, wipes, freeze frames, strobes & more, $1250. 609-354-0074.

3M D-5000 char gen, bdct quality graphics, on screen prompting gives status & cntrl info, stores 100 pages of text in internal memory, rack mted electronic chassis & separate keyboard, provides program & edit outputs for sgl chnl operation, designed for bdct, post-prod & CATV applications, $1200. Bill, 813-345-6052.

Chyron RGU-1 2 8" disk drives, some cables, all manuals & disks, has (2) remote units, RG-41 19" rack included, lots of extra disks, books, $2500. F Kelley, TV40, 4237 Airline Rd, Norton Shores MI 49441. 616-733-4944.

Amiga 2000, 040 accelerator w/20 MEG RAM, Toaster & software, $3500. S David, Frontline, Radmansgatan 3, 21146 Malmo, SWEDEN. Ph/FAX 011-46-40-977578.

Panasonic Prof Editing Lab w/AG7750, AG7650, AGA770, (2) AGF700, (2) AUC5, full warranty, $9700. 607-687-0545.

Panasonic AG-800 still video rcdr, BO; Panasonic AGEP 60 photos from video, BO. Steve, 319-393-1993.

Sony VO-5600 3/4" recorder/player, new, low hrs, $300. A Gluskoter, 86 W Norman Ave, Arcadia CA 91007. 818-445-7625.

Panasonic AG-7650 S-VHS VCR, brand new, $3000, would also consider trade for Toaster 4000 system. G Frei, NY Eye Surgery Ctr, 1101 Pelham Pkwy N, Bronx NY 10469. 718-519-1000.

Panasonic AG7400 port deck with AC adapter, 30' 14 pin extension & case, excellent cond, $1200; Panasonic AG6400 port deck with AC adapter, AGB640, 25' extension, case & rem cntrl, $500. C Overton, 16 Birchwood Dr, Plattsburgh NY 12901. 518-561-8178 after 5 pm.

JVC BR-S411UB dockable S-VHS recorder, new, E/W battery holder, handle & AA-G10U power supply, 4 batt charger, $2900. Joe, Starfire Video, 910-867-5149.

Panasonic AGEP70 video printer, used less than 200 prints, $600; Panasonic editing system, (2) 1960 editing VCRs & AGA95 controller, $1500; Panasonic port video rcrdr mdl AG6400 (3) with 2 batteries, case, battery-style AC adapter, car cord, $500/ea; Videonics Titlemaker, excel cond, $325; Videonics Equalizer, excel cond, $150. G Alford, 302-322-5119.

Bosch Ferensa video noise reduction syst, will make any tape look great, $4500. E Stefano, 215-544-5828.

Knox K40S char gen, 35 NS resolution w/S-video inputs/outputs, hardly used, in original box; Rhoades SW 5x4 RF switcher; Vidicraft audio/ video switcher; Vidicraft RF converter, all mint cond, BO 718-793-1632.

Basically B Stock Panasonic equip 7650 w/time code, 1 hr drum, $4100; 7650 w/time code, 9 hr drum, $4050; WVF250 camera w/7450, time code, etc, $5200; Leader 5870 waveform/vectorscope, #3800; Amilink Pro/VT A/B roll edit cntrl, $3600. R Grant, 408-559-4308.

JVC CR600 3/4" VCR, $2750/BO; JVC CR850 3/4" VCR, $4000/BO, both play full SP-level signal; Panasonic AU60 MII edit recdr, 100 hrs on Panasonic refurbish, $6500, all machines very clean w/all cable & manuals, AU60 incl diagnostic boards. B Jones, Dapsho TV Prod, NW 1015 Clifford St, Pullman WA 99163. 509-332-5858.

Ampex VPR-80 1" P/R, edit, $7500. Jerry, 800-748-4982.

ADVERTISERS INDEX

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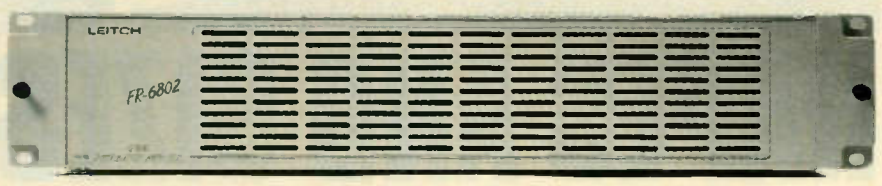

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