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LILLEHAMMER, NORWAY

In late September, as workers ran cable throughout the International Broadcast Center (IBC) here for the 1994 Winter Olympics and trucks hauled in crate after crate of prefabricated shelving and frames, the race was on to get the building ready for test runs.

"We can't miss one second," said Bjørn Suhrke, director of IBC facilities. "We have to be on the mark."

On the other side of town at Håkon Hall, one of two venues for ice hockey, Odd Kaldefoss, executive producer of venue coverage for ORTO, the Olympic Radio and Television Organization, looked across the arena and surveyed what pictures he will transmit. He wants to put a pan-and-tilt camera in the goal.

"Nobody knows how well it will work," he said.

Kaldefoss's dilemma is just one of the many unknowns at next month's games, which are shaping up to be a major showcase of the latest advancements in television technology.

When the XVII Olympic Winter Games officially begin here at 4 p.m. on 12 February, some of the most creative minds in sports television and radio will use the latest technology developments and most enterprising techniques to broadcast the story worldwide over the next 16 days.

The words "digital" and "stereo" are spoken almost simultaneously by the people at the Norwegian Broadcasting Corp., the host broadcaster producing the international feed, while at CBS, the rights-holder for U.S. broadcasts, engineers point to the design and philosophy behind their facility — the network's third-largest operation behind New York and Los Angeles.

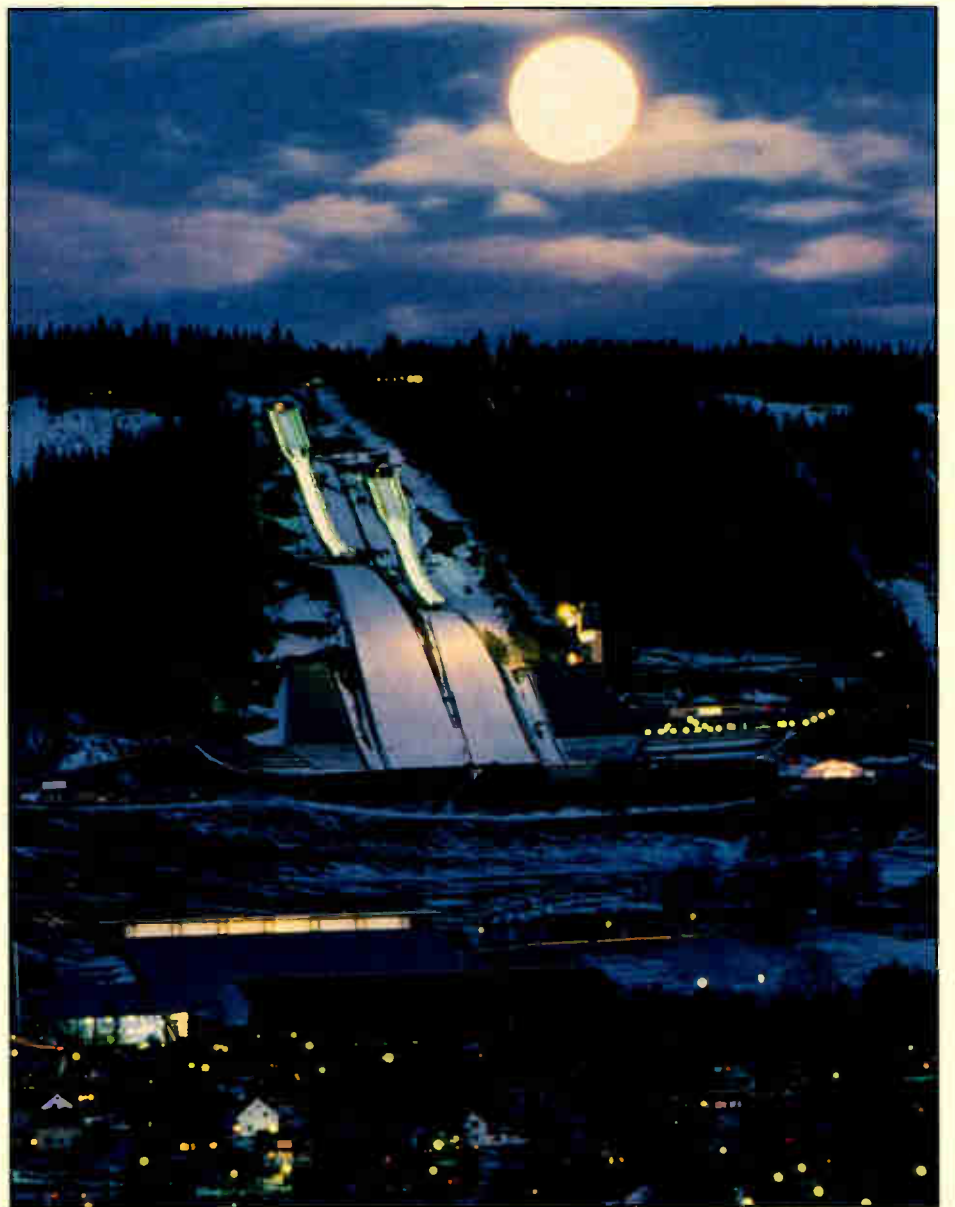
YEARS OF PREPARATION

Preparation for the broadcast of the 1994 Winter Games began during the 1988 Summer Games in Seoul, South Korea, when four engineers from NRK unofficially met after Lillehammer was awarded the '94 games.

Six years later, ORTO is in the final stages of the plans to produce more than 300 hours of live coverage of 55 events at 13 venues, 11 of which are for sporting events, spread out over a 58-kilometer area.

The IBC, command center for the event,

(continued on page 4)



The Olympic ski jump illuminates the Norwegian sky.

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NHK Eyes Digital Video Broadcasting

by Chris Dickinson

TOKYO

While the U.S. has the Grand Alliance and Europe, with the European Launching Group's Digital Video Broadcasting (DVB) initiative, has at last created a unified voice to speak for digital television, Japan's own progress toward a digital future has, inevitably, been somewhat overlooked.

In fact, details are still sketchy about what exactly the Japanese are planning in terms of digital TV.

Japan currently has a domestic satellite channel broadcasting eight hours a day of HDTV programming using the analog MUSE standard. And there are also plans for an extended NTSC system, EDTV-2, to be adopted as an intermediate standard by Japan's terrestrial broadcasters in 1995.

DIGITAL STEPS

Recently, however, state broadcaster NHK announced that it is working with the Japanese Ministry of Post and Telecommunications (MPT) on a new digital transmission system.

Yoshiaki Inamoto, NHK's former technical manager in Europe and now back in Tokyo, said the network has started tests on a system based on Orthogonal Frequency Division Multiplex (OFDM) technology, a transmission technology originally

designed for digital audio broadcasting (DAB). OFDM is currently the subject of several research efforts underway in Europe with the intent to eventually create a terrestrial transmission system for that region.

Inamoto said the focus of the NHK research is to implement a satellite-based system in a new high frequency bandwidth, due to be made available in the next century. NHK is also conducting tests on terrestrial transmission, DAB and integrating TV with telephone communication (telecom).

"We're only at the first laboratory stage of looking at digital TV," Inamoto said. "The MPT is looking at a feasibility study and most of Japan's broadcasters are looking toward 2007, when the 20-22 GHz satellite channel becomes available. We still have a lot of research to do to work out what kind of service one can do in 22 GHz; whether one has, for example, eight 3 MHz channels, a digital HDTV service, or even 3-D HDTV."

The 20-22 GHz frequency bands were identified at the last WARC (World Administrative Radio Conference) as a possible source for more bandwidth because lower bands have been getting quite congested. In Europe, Italian state broadcaster RAI has also been researching the potential of these higher frequencies.

INDEPENDENT RESEARCH

Inamoto added that, in the early stages of development, NHK plans to work on its digital TV system separately from Europe and the U.S. As the system takes shape, however, the network intends to consult with broadcasters overseas.

Masara Yoshida, chief engineer of NHK in New York, said the OFDM tests included a terrestrial system and DAB.

"There will be terrestrial trials," he said. "NHK is also very interested in OFDM for radio. I think there is a very good future for digital audio broadcasting."

NHK's belated interest in OFDM and coded OFDM-based digital TV (COFDM) comes a year after the network's hybrid analog/digital Narrow MUSE system was removed from consideration as a U.S. HDTV standard by the U.S. Federal Communications Committee (FCC), which decided to pursue a purely digital system and is now examining a proposal by the so-called "Grand Alliance" of nearly a dozen companies.

In Japan, interest is also being focused on the possibilities of fiber optic cable transmission by way of an Integrated Services Digital Network (ISDN). NHK is planning to participate in an experimental ISDN service, integrating TV with telecom services, in Osaka in 1995.

The network mirrors U.S. President Bill Clinton's own plans for a "digital super-highway" transmitting video, voice and data across America.

Inamoto said the Osaka experiment would be along the same lines as a planned ISDN service in Florida.

In Inamoto's view, the merger of telecoms and broadcasting won't begin in earnest until the next decade, but even still, "we have to talk about standardization."

"The Japanese government realizes the seriousness of the United States to start a service, and they have already laid plans for some experimental services here in Japan," he said.

Likely TV services to run on the ISDN system include 3-D television, TV catalog shopping and video-on-demand, he added.

Montreux."

But IBC chairman John Wilson said the move had the backing of other exhibitors.

"We have been under tremendous pressure for some time to provide a cost effective and yearly show," Wilson said. "We tried to sit back and not rock the boat, but our customers have been asking for this."

When IBC moved from Brighton, U.K., to Amsterdam in 1992, the facilities at the RAI exhibition center were widely praised. In contrast, Montreux 1993 was criticized for being expensive

Although an annual IBC is sure to affect ITS, it is unclear what the full impact will be.

and poorly organized, despite the completion of a refurbished exhibition center.

Wilson said he had written "out of courtesy" to Montreux to inform it of the IBC decision. "But in a situation like this, one has to be regarded as competitors," he said.

A working party has been set up to decide when exactly IBC should start its annual show, with the most likely date being 1995. IBC is already scheduled for September 1994. A poll carried out on IABM members before ITS 1993 showed a clear majority in support of dropping Montreux for Amsterdam.

IBC To Become Annual Conference

AMSTERDAM, THE NETHERLANDS

Europe's main broadcast equipment show, the International Broadcasting Convention (IBC), has announced it will become an annual event, probably from 1995.

An annual IBC would put it in direct competition with the Montreux International Television Symposium (ITS), which is currently held in alternate years from IBC. It also throws a cloud over the U.K.-based Vision show, the first of which was held last October.

Vision was set up as a local alternative to IBC and ITS and is set to be held in the same years as ITS. But an annual IBC could provide the pulling power for U.K. delegates to persuade the manufacturers' trade body, the IABM, to withdraw support for Vision.

The IABM welcomed the decision by IBC to go annual.

"...IBC in RAI (the Amsterdam exhibition center) is more cost effective than the ITS held in Montreux," said IABM chairman Tom McGann.

Although an annual IBC is sure to affect ITS, it is unclear what the full impact will be. One spokeswoman for the ITS organizers said the decision "gives us another challenge."

Meanwhile, Sony has backed ITS.

"We find it difficult to believe that the broadcast industry can support two international exhibitions a year," Sony said in a statement. "We see no reason whatsoever to withdraw support from

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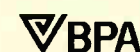


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CONTINUED FROM PAGE 1

Networks Set Sights on '94 Olympics

is a 27,300 square meter building located on a small university on the outskirts of Lillehammer. The building will be turned over to the college after the Olympics, a tribute to concerns in Norway about the use of structures after the Olympic torch is extinguished.

While the building was constructed to meet the needs of broadcasters as much as possible, they still had to work around some limitations.

For example, the CBS anchor area is located in what will be a gym, and one of the two control rooms is in a bomb shelter. Norway's building codes require such an area, even today.

At the venues, the majority of which were built for the Olympics, broadcasters monitored construction from the moment of inception. Some changes were made, such as the angle of the ski jump to avoid shadows created at the bottom of the slope by the afternoon sun.

DIGITAL AND STEREO

While the 1992 Summer Games in Barcelona, Spain, marked the first use of digital video at the Olympics, the '94 Winter Games will showcase stereo sound. While individual networks have used stereo at previous games, this is the first time a host broadcaster will provide a stereo audio feed.

"Every Olympics has to have its 'first ever,'" said Arild Hellgren, ORTO manag-

ing director. "This one has stereo audio."

For stereo, miking takes on a new meaning. Sounds engineers had to think about how they will make the sound follow the picture. If a skier turns left, the sound has to move to the left and vice versa. In mono, the sound only had to be good.

Radio broadcasters, who will be at many of the venues, are benefiting from the stereo signal. ORTO will deliver an international radio signal that is produced as an analog stereo signal in a separate mixer at the venues.

The words "digital" and "stereo" are spoken almost simultaneously by the people at the Norwegian Broadcasting Corp., the host broadcaster producing the international feed . . .

Another advancement Hellgren is quick to bring up is the use of component Digital Betacam VTRs, developed by Sony, and serial digital routing for audio and video.

"It is a perfect match: the Olympics and digital," he said.

Hellgren and his associates maintain that the advantage to working in digital is that the signal is "technically" in its first generation from routing to editing and from transmission to archiving.

"You want to stay in the digital domain to

keep the quality as high as possible for as long as possible," said Kjell Reed, director of operations for the IBC.

DIGITAL SERIAL ROUTING

All incoming ORTO routing will be digital from the 11 sports venues. Two venues, cross country and Alpine, will be produced in digital, while the others will be converted to analog PAL. This highlights one of the reasons ORTO selected Digital Betacam: its compatibility with Betacam SP.

The venue output will be serial digital at

270 Mbps with stereo audio embedded. Norwegian Telecom will convert the signal to 140 Mbps for transport from the venues to the IBC, where it will be reconverted to 270 Mbps for recording on Digital Betacam.

"That means what we're recording in our main VTR room is first-generation," Reed said. "Otherwise, you would be at third generation."

In addition to improvements in quality, increased flexibility and the control given to graphic artists with digital, Hellgren said there are administrative advantages with this new technology. Although he originally expected to spend 10 percent more for digital equipment, he actually saw a 10 percent savings. This was mainly due to fewer complications in the routing system and also not as much need for monitoring.

"Digital provides more security, more stability, and there is less equipment," Hellgren said.

NRK will also make use of a number of products from the Dynatech Video Group, including two DP/Max workstations and two DP/Mosaic digital disc recorders from ColorGraphics, two Alpha Image 501 component digital production switchers and 22 Quanta Delta character generators.

Even though NRK is the host broadcaster, it is the smallest organization to ever organize Olympic coverage and has called on assistance from other broadcasters worldwide to handle venue coverage.

For instance, NRK will handle the opening and closing ceremonies, as well as ski jumping, cross country and Nordic combined events, but freestyle skiing will be covered by SVT from Sweden. Finland's YLE will cover the biathlon, while SRG from Switzerland and the France 3 network will handle Alpine skiing. Bobsled and luge are the BBC's responsibility, while ice hockey, figure skating and short track will be covered by Canada's CTV. Speed-skating will go to NOS from the Netherlands, and medal awards and press conferences will fall to DR from Denmark.

CBS OPERATIONS

Meanwhile, CBS, which is building on and expanding its Olympic operations from the 1992 Winter Games in Albertville, France, will parallel its coverage with the operations of ORTO. CBS plans to broad-

cast 120 hours of programming, a mixture of live and tape delay to accommodate the six-hour time difference between Europe and the U.S. East Coast.

"We're really doing a sports show, an entertainment show and a news operation," said Barry Zegel, director of Olympic operations for CBS.

Key on Zegel's mind about the facility here in Lillehammer is the anchor staging area that is divided for prime time, late night and weekend coverage. Acoustically, both sides of the stage could be in operation at the same time. Meanwhile, "CBS This Morning" will be anchored off-site at a local farm.

Zegel also pointed to the design of Control Room B, which will be a backup for the main Control Room A but will function independently for production of the late night broadcasts. This is patterned after the "60 Minutes" studios in New York.

The set-up is different from Albertville, where a mobile unit served as a backup for Control Room A. But Bob Gilmartin, an engineering consultant to CBS for the Olympics, explained Control Room B could function as a self-contained control room or edit room.

For an extensive communication system, CBS negotiated for RF rights with local officials for about nine months.

While broadcasters from ORTO, NRK, the BBC, NHK and Channel 9 in Australia will use Sony Digital Betacam VTRs, CBS will use Sony D-2 and work in NTSC.

CBS Radio has a separate operation alongside its TV counterpart organized by Andy Vallon, manager of technical operations. The radio crew will work eight venues directly and take audio feeds from CBS TV and ORTO. CBS is not using stereo audio and will combine the international feed.

OPERATIONS OVERVIEW

Also involved in the Olympic operation is Sony Broadcast International (SBI) of Basingstoke, U.K., which is the turnkey provider for ORTO, and Sony Business and Professional Group of San Jose, California, which is providing engineering support and maintenance for CBS.

"You would have a job to find a better venue to display a new technology," said John Aldham, project manager for Sony at Lillehammer.

In addition to Sony equipment, such as the DVS V6464 main switcher, SBI is providing ORTO with Sandar video and audio DAs and small matrices, a Pesa analog routing system for master control, Tektronix video and waveform monitors, audio monitoring displays from Chomatek, Vistek analog coding equipment, lenses from Canon and camera support systems from Vinten.

ORTO's Hellgren said very little has caught him off guard, so far.

"There is one thing about this job I have learned," he said. "Don't worry about anything you can't do anything about. Now, I can't do anything about the snow."

Said Kaldefoss, "I'm looking forward to when we go black after the closing ceremonies." ■

Editor's note: Alan Carter is editor of the international edition of Radio World, sister publication to TV Technology.

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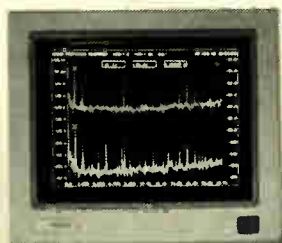
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O P I N I O N

Formatters and Bit Buckets: Developing the Generic VTR



Editor's note: The digital VTR is now a relatively common device, but it has not finished evolving. It still has too many similarities to its analog ancestors, which, in the opinion of some, owe more to conservatism than engineering necessity. Here John Watkinson argues for more creativity in future DVTR design and suggests treating DVTR transports as "bit buckets" that suit any video data.

by John Watkinson

Digital video has two main advantages. One of them is that in comparison with analog, the quality is better and more consistent. Time base error and dropouts are eliminated along with generation loss. However, comparison with analog is only possible in the limited area in which both analog and digital techniques can do the same job.

Perhaps the main strength of digital video is the opportunities it offers which were denied to analog technology. These opportunities are in areas where no comparison with analog is possible. The greatest opportunity is that once converted to the digital domain, video becomes data. Video data is indistinguishable from any other kind of data and can take advantage of hardware and techniques developed elsewhere. Data can be recorded on many types of media having different characteristics.

There are many types of analog video signals — component, composite, 525 line, 625 line — and each type gave rise to an analog video recording format. This was inevitable because each signal required different bandwidth and/or had differing field rates. One tape track represented one field, and so there was a direct mechanical relationship between head speed and the video format.

ALL FOR ONE

On the other hand, there has never been such a connection in computer recording. Hard disks have constant sized data blocks, but we have never been forced to write letters of constant length or store programs of constant length. Fitting variable length data files into fixed length storage blocks has been done for many years by a device called a formatter.

As stated above, digitized video is only data, so I cannot see why different video standards require different recorders. It should be possible to have a generic data recorder that is capable of recording any

line standard in conjunction with a suitable formatter.

There are some signs that this is beginning to happen. The first was the design of the D-1 format DVTR. The component digital sampling system has the same sampling frequencies in use for 525 and 625 line systems; therefore, the data rate in the two systems is the same. The segmentation of D-1 was based on 300 segments a second, and this was divided down two ways. In 50 Hz systems, six segments make a field, whereas in 60 Hz systems, five segments make a field. As a result, the head speed doesn't change going from 50 Hz to 60 Hz. However, the D-1 format is unable to record composite digital data.

The compatibility between D-3 and D-5 is another interesting step. D-3 records composite sampled at four times subcarrier, which results in a data rate (NTSC) of almost half that of D-5, which records component digital. Certain D-5 machines can play D-3 tapes because the formats are basically similar. D-5 and D-3 use the same head speed, but D-5 has four tracks per segment and double the tape speed of D-3, which uses two tracks per segment. If a D-5 machine plays tape at D-3 speed, two of the heads in the segment align with the D-3 tracks. The D-5 machine, then, is a dual bit rate player. However, a 60 Hz

bands are played to make it possible. In fact, editability impairs recording density. A RMW DVTR could easily use tracks half as wide as those in current formats if it only edited physically every second or so at an inter-block gap provided for the purpose. Editing to field accuracy or less could then only be performed by a RMW process. Current formats cannot offer this performance because they are not designed for RMW-only transports.

THE ECONOMIC VIEW

Halving the track width results in twice as much recording time on the same amount of tape, which has an economic advantage. However, half width tracks also result in the tape speed being halved, and so a given duration of recording can be accessed in half the time. The first video recorders used the quadruplex transverse scan principle. These machines could not offer slow motion modes with the analog technology of the day, and helical scan transports were developed instead. The longer tracks of helical scan allowed field-per-track recording, and the larger drum allowed track following heads for slow motion.

DVTRs continue the helical scan tradition unnecessarily. In the digital domain, slow motion is easier to perform, and, using RAM buffers, there are innumerable

It should be possible to have a generic data recorder that is capable of recording any line standard in conjunction with a suitable formatter.

D-5 can only play NTSC D-3, and a 50 Hz D-5 can only play PAL D-3. There is no 60/50 machine as was possible in D-1.

ADVANTAGES OF RMW

Current DVTRs edit by replacing recorded tape data on a field basis. Analog recorders had to work in that way, but digital recorders don't. They work that way because of conservatism.

Quite a few DVTRs now offer the option of read-modify-write, also called pre-read, so that a tape can be played, altered and re-recorded in one pass. RMW allows editing to take place within the field.

There is nothing magic about RMW. Your word processor has been doing it for years when you retrieve a file and correct the spelling. The spelling corrections are not made by changing individual bytes on the disk block, but are made in memory prior to writing the file back to disk. In fact, the word processor makes a better job of it because the size of the file has nothing to do with the size of the blocks on the hard disk.

Today's DVTRs only offer RMW as an option, and the formats are designed to work without it. A DVTR with RMW does *not* need to be able to edit tape tracks to field accuracy. Tape editing to field accuracy is difficult with the narrow tracks of modern formats, and all kinds of tricks with flying erase heads and guard

data recorders in which the transport can only run at normal speed, but any data rate can be obtained by reading the memory as required and running the transport incrementally. There is then no need for a variable speed transport and helical scan is no longer necessary.

Transverse scan is much more compact than helical because the drum is much smaller and threading up is trivial. Incremental operation without head wear is possible by retracting the tape guide away from the drum when not actually transferring data. For a camcorder, transverse scan results in the smallest, lightest mechanism and the lowest power consumption. Tracking errors due to tape tension or temperature changes are inevitable in helical scan but do not occur in transverse.

The point is that digital video is data like any other, but we cling to the notion that video is somehow different and make hardware that is based on analog constraints after such constraints have gone away.

The main advantages of digital technology is freedom from technological restrictions. If we carry on in the same way when the restrictions are gone, the advantage is lost. ■

John Watkinson is a consultant and writer on digital audio and video and is



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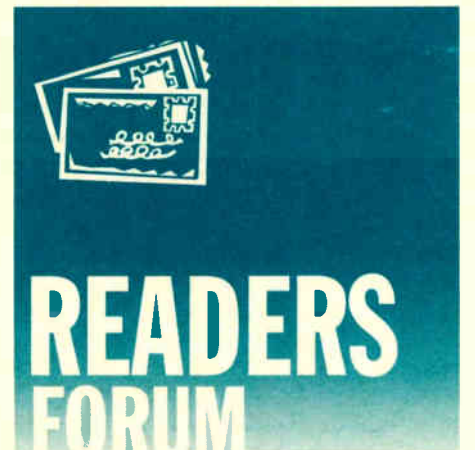
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However, inside this issue, you will find the same kind of valued articles that you have come to depend on over the last 18 months.

Let us know what you think about our new look, and about TV Technology in general. FAX your message to Marlene Lane at +1-703-998-2966, or send to: P.O. Box 1214, Falls Church, Virginia 22041, USA.

Thank You for Reading TV Technology

based in England. He presents lectures and training courses worldwide. His book "The Art of Digital Video" (Focal Press) is widely acclaimed. He is a Fellow of the Audio Engineering Society and is listed in "Who's Who in the World."



Send letters to Readers Forum, TV Technology, Box 1214, Falls Church, Virginia, 22041, USA or MCI Mailbox #302-7776

A Masked Engineer Fan

Dear TV Technology:

I enjoyed Mario Orazio's article in TV Technology regarding 8/10 bit digital video.

I have been working with D-2 (NTSC and PAL) for several years, and the company I am working for now just installed Europe's first Digital Betacam commercial post production suite. At least, according to our Sony salesman it is the first.

Anyway, your article was very interesting and informative. Thanks!

Lars Fuchs
Senior Editor
Minerva Film Video
Copenhagen, Denmark

Matrox Illuminates Parallel Universe

by Simon Browne

SPECIAL REPORT

On a recent music video for Dovetail Records, I made extensive use of the Matrox 3D Studio in conjunction with the company's Illuminator Pro Videographics Board.

"Vita Voom" by the Ozric Tentacles is a four-minute video comprising live footage of the band and 3D Studio animation. The video is currently being played on MTV Europe and other European TV networks, with worldwide distribution expected shortly.

The most difficult part of the project was modelling the head of the central character, "PongMaster," the band's psychic advisor. This was built up from several elements created within 3D Studio. A skin texture was provided consisting of a green base tone enhanced with some fractally generated bump mapping to give a complexion that had "been around."

Time was limited to about a week, so articulation on the head was kept to a minimum, only enabling the figure to track the camera with his eyes and blink. Plans are laid for the next video to use morphing technology to completely articulate the face.

The environment was created using Yost Group's suite of add-on programs that quickly produce lifelike trees, water and rocks. Animation sequences involving dancing, flying with plasma spheres and being plunged underwater were arranged.

During this phase of the operation, it was essential to make spot rendering of the action to check the integrity of the images. This was done using the Illuminator Pro's composite output.

After the animation sequences were complete, they were passed on to f64, an OEM developer for Matrox U.K. The final output was rendered on a brace of 486-DX50s networked to several gigabytes of storage.

The process of rendering the three segments of animation totalling 46 seconds, as well as stripping the final images to Betacam SP, had to be achieved in less than 24 hours. The project was used to fine tune and test f64's broadcast quality 3D Studio rendering and video installation, which consists of an Ampex VPR2B one-inch and Betacam SP frame accurate video machines linked to a Matrox Illuminator Pro video board. The system provides broadcast quality video direct, and is controlled with V-LAN 32 Animax video controller boards from Videomedia.

The Matrox Illuminator Pro was designed to expand as the user grows. In its standard form, it provides composite and Y/C signals. An optional daughter board can be added to provide a YUV output, and for digital users, Matrox can also provide a D-1 input/output option.

Matrox is also currently working on Matrox Animation Xpress (MAX), a professional digital animation controller. MAX software will provide drivers and

Animator Pro for creating JPEG streams for rendered animations at full CCIR-601 resolution, 30 frames (60 fields) per second in 24-bit true color.

The Matrox Illuminator Pro was designed to expand as the user grows. In its standard form, it provides composite and Y/C signals.

utilities to compress, manage and play back images.

An Autodesk VTR ADT driver provides direct connection to 3D Studio and

Dovetail Records has now commissioned Parallel Universe and f64 to produce a second animation video that will be a full four-minute, 3D Studio-based production.

Hopefully, this project will show the world the power of using three-dimensional graphics on PC-based systems that are extremely professional in quality and affordable to everyone. ■

Editor's note: Simon Browne is a freelance graphics designer in London specializing in advanced use of 3-D modelling systems. He works as a consultant to f64.

The opinions expressed above are the author's alone. For further information on the 3D Studio or Illuminator Pro, contact Maureen McConnell at Matrox (Telephone: +1-514-685-2630; FAX: +1-514-685-2853), or circle Reader Service 134.

TÉCNICA PARA LAS TOMAS AÉREAS

por John Premack

ENFOQUE A LA VIDEOGRAFÍA

Las inundaciones que ocurrieron en el mediooeste norteamericano el verano pasado demostraron nuevamente la importancia de los helicópteros en el mundo del reportaje de noticias. Para un equipo noticiero en el aire, carreteras inundadas y puentes derrumbados no sirven de impedimento. Es más, al poder fotografiar y rodar video desde el aire, esos mismos elementos ayudan al equipo noticiero a presentar la inmensidad de la catástrofe.

Tomado desde un helicóptero, el buen rodaje es más difícil alcanzar de lo que parece y al menos que Ud. vuele a menudo lo más probable es que regresará de sus primeros viajes aéreos con tomas de vistas borrosas o sacudidas.

Algunas emisoras tienen sistemas de estabilización para sus cámaras que eliminan o disminuyen el temblor y la vibración de las tomas aéreas, pero lo más común es que se use la misma cámara en el aire que se usa en la tierra. Para que estos equipos noticieros logren las tomas aéreas exitosas, es necesario hacer preparativos especiales antes de embarcar, y aprender a apreciar y entender las capacidades y limitaciones de un helicóptero y la buena comunicación con el piloto de la aeronave.

ANTES DEL VUELO

Lo primero que Ud. debe hacer es examinar el helicóptero. ¿Dónde se sentará Ud.? Encuentre una abertura suficientemente ancha para que quepa el lente de su cámara. Las aeronaves civiles tienden a ser construidas con cabinas y ventanas pequeñas, donde únicamente podría caber un enano con una cámara de video.

Hacer tomas a través de plexiglas puede producir reflejos y sombras. La mejor solución, muchas veces, es desmontar por completo la puerta del helicóptero (esta maniobra debe hacerse únicamente en la tierra).

Acuérdese también de amarrar un cinturón de seguridad entre la cámara y el aeronave. Es muy difícil explicar el porque aterrizó la cámara antes que Ud., y el no tenerlo es muy peligroso para los inocentes que estén debajo de su trayectoria de vuelo.

Al hacer tomas manuales desde el aeronave Bell Jet-Ranger, prefiero trabajar desde el asiento posterior izquierdo. Esta posición me permite hacer tomas panorámicas longitudinales sin desamarrar mi cinturón de seguridad ya que mi cámara y mi hombro están al centro de la abertura de la puerta. Ojo. Esta posición es mejor para mí pero puede hacerle la vida difícil al piloto ya que mi campo de visión primario es su punto ciego siniestro.

Trabajar adelante, a la derecha del piloto le permite compartir su campo de visión, pero significa que tiene Ud. que deshacerse el cinturón de seguridad y arrodillarse a lado de la ventana o desmontar la puerta y sentarse en el suelo del aeronave con ambos pies en el patín de aterrizaje. Asegure su propia seguridad volteando la hebilla del cinturón contra su pelvis para prevenir que se abra inadvertidamente o amarre una línea de seguridad en la cintura si prevé la necesidad de deshacerse el cinturón durante el vuelo.

EQUIPO NECESARIO

Una vez que Ud. haya hecho las previas preparaciones, es hora de preparar su cámara. Quítele cualquier cosa que pueda volarse

durante el vuelo: la visera del lente, focos, micrófono manual, etc. Corte un pedazo de cinta aislante y póngalo en la cámara. Úselo durante el vuelo para prevenir el movimiento del aro de enfoque. No se da cuenta uno que se ha movido el lente hasta no descubrir que esa toma perfecta de zoom (acercamiento o alejamiento rápido) no ha valido para nada.

Si es posible, quite la batería de la cámara y con un cable adaptador, enchufe la cámara a un enchufe externo. Este truco simple le dará varias pulgadas más de espacio ya que la mayoría de las tomas que Ud. efectuará desde el helicóptero son hechas con la cámara inclinada hacia

abajo.

Igualmente, es importante asegurar todo equipo suelto que lleve consigo—radios de comunicación, baterías y cintas. La gravedad de la tierra tiene un efecto interesante sobre los objetos cuando el aeronave esta girando tan velozmente que su portada da a la tierra, o cuando vuela a través de un poco de turbulencia. Sé de un colega mío cuyo jefe nunca olvidará la llamada por teléfono de uno de sus televidentes reportando que una batería de cámara con la insignia de su estación había caído por el techo de su casa.

Una vez que el helicóptero despega, el contenido y la calidad de su video queda en manos de el piloto. Los pilotos de helicóptero saben hacer maravillas con sus aeronaves. El problema es que Ud. controla el visor mientras que el o ella controla el helicóptero.

DIALOGO ABIERTO

La solución al problema es la comunicación, antes y durante el vuelo. Use un par de audífonos conectados al sistema interno del helicóptero. Antes del despegue o cuando recién se ha iniciado el vuelo, explíquelo al piloto que tipo de tomas desea hacer. Algunas de las técnicas de vuelo que me han servido bien a mí incluyen: descensos auto-rotativos, viraje de pedal, y virajes cerrados alrededor de un punto. Aprenda el vocabulario de vuelo y tendrá más facilidad de comunicación con el piloto, y mejores tomas de su cámara.

Es importante saber en que sentido está soplando el viento. Vientos de más de 160 kilómetros por hora son demasiado fuertes para hacer un buen trabajo aéreo así que pida que reduzca la velocidad en lo posible cuando Ud. está haciendo tomas.

Es importante saber que aunque los helicópteros pueden permanecer en el aire casi completamente parados, esta maniobra no es tan deseable como Ud. puede pensar. Un helicóptero en vuelo estacionario tiende a oscilar de lado a lado a menos que haya un viento de cabecera fuerte. Hay que darse cuenta que a baja altura, esta maniobra es muy peligros ya que le da poco margen de seguridad al piloto para recobrar control de la nave si es que ocurriera, por ejemplo, "tail-rotor stall" o pérdida de rotor de cola.

Use como alternativa al zoom (alejamiento o acercamiento rápido de cámara) una maniobra aérea conocida como auto-rotación. Esta maniobra le ofrece una toma de cámara rodante fluida, lenta y suave. Cuando el piloto le ejecuta con un incremento de potencia de la nave y un viraje cerrado sobre el objeto de interés, Ud. logrará una imagen visual de mucho impacto sin necesidad de hacer tomas panorámicas o usar el zoom.

(continua en la página 8)

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CONTINUA DE LA PAGINA 6

TÉCNICA PARA LAS TOMAS AÉREAS

Un viraje de 360 grados alrededor del objeto de interés no es una maniobra para los débiles de corazón, pero le ofrece una de las tomas más singulares e irresistibles que puede captar desde el aire. En esta maniobra, el piloto le "hecha" de lado al helicóptero y gira alrededor del eje proveído por el objeto de interés. Cierre el ojo izquierdo y concentrese en mantener su composición mientras el objeto gira lentamente en su visor.

Un viraje de pedal es la maniobra opuesta al viraje de 360 grados. En esta maniobra, el piloto

apunta la nariz del helicóptero perpendicular a la dirección en que están volando. Vista desde el suelo, el helicóptero parece estar volando como cangrejo, mirando hacia un lado y volando hacia otro. Virajes de pedal pueden ayudar a extender las tomas panorámicas cuando llega al límite de la toma en vuelo directo. En vez de mirar como se le escapa la toma, pida un poco de "pedal derecho" y observe como la cámara hace la toma panorámica hacia la derecha aunque Ud. no haya movido el lente.

Coloque un micrófono tipo corbata dentro del auricular para que pueda escucharle audio de los radios y del sistema interno del helicóptero. Puede usarlo para hacer una toma de un reportero en el campo, o una entrevista con el piloto. Al colocar al micrófono en su par de audífonos, le protege del ruido exterior—usando otro auricular no funciona tan bien.

Haga sus tomas con el obturador puesto en 1/250 o 1/500 y edite el montaje en cámara lenta. Este viejo truco de los noticiarios suaviza los temblores y extiende el tiempo de duración de las tomas

hechas a alta velocidad en el aire.

No es fácil subir a un helicóptero por primera vez armado de una cámara y regresar con video manual que no les cause mareos a sus televidentes—pero si es posible.

Espero que estas técnicas le ayuden. ■

John Premack ha sido el camarógrafo principal de WCVB-TV en Boston, Massachusetts durante 14 años y ha trabajado en la industria más de 25 años. Puede comunicarse con el escribiendo a TV Technology.

SHOW LISTINGS

FEBRUARY 1994 — BROADCAST THAILAND '94

Bangkok. The show follows the recent liberalization of broadcasting in Thailand. For information, contact Reed Tradex Co., 16th Floor, BB Building, Asoke Road, Bukhumvit, Bangkok, telephone: +66-260-7103-8; FAX: +66-260-7109.

28 FEBRUARY-2 MARCH — AES CONVENTION AND EXHIBITION

Amsterdam. For information, contact the Audio Engineering Society in Brussels, Belgium, telephone: +32-2-345-7971; FAX: +32-2-345-3419.

6-10 MARCH — SATIS '94

Paris. The annual European Image and Sound Technical Trade Show will be held for the 11th year. For information contact organizers in France at telephone: +33-1-47-20-8444; FAX: +33-1-49-52-0054.

22-25 MARCH — NAB 1994

Las Vegas, Nevada. The 1994 National Association of Broadcasters Convention, with exhibits and sessions, will be at the Las Vegas Convention Center. For information write NAB at 1771 N. Street, N.W., Washington, D.C. 20036-2891 U.S.A., telephone: +1-202-429-5409; FAX: +1-202-429-5343.

25-29 APRIL — AFRICA TELECOM '94

Cairo, Egypt. Organized by the International Telecommunication Union. For information, contact Tom DAHL-HANSEN or Suzan Hec-Sook LEE at the ITU at Place des Nations, CH1211, Geneva 20, Switzerland, telephone: +41-22-730-5811; FAX: +41-22-730-6444.

10-13 MAY — BROADCAST

Madrid, Spain. The seventh edition of Broadcast, the radio and television exposition for Spain is scheduled at the Juan Carlos I Exhibition Centre. For information contact IFEMA in Madrid at telephone: +34-1-722-5000 or FAX: +34-1-722-5792.

Send announcements and updates to TV Technology International, P.O. Box 1214, Falls Church, Virginia 22041 USA, or FAX: +1-703-998-2966.

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Premio de los Diez Mejores Productos de Nikkan Kogyo (Japan, Jan. '92)

Premio de Peter Wayne Design & Innovation (U.K., Sept. '90)



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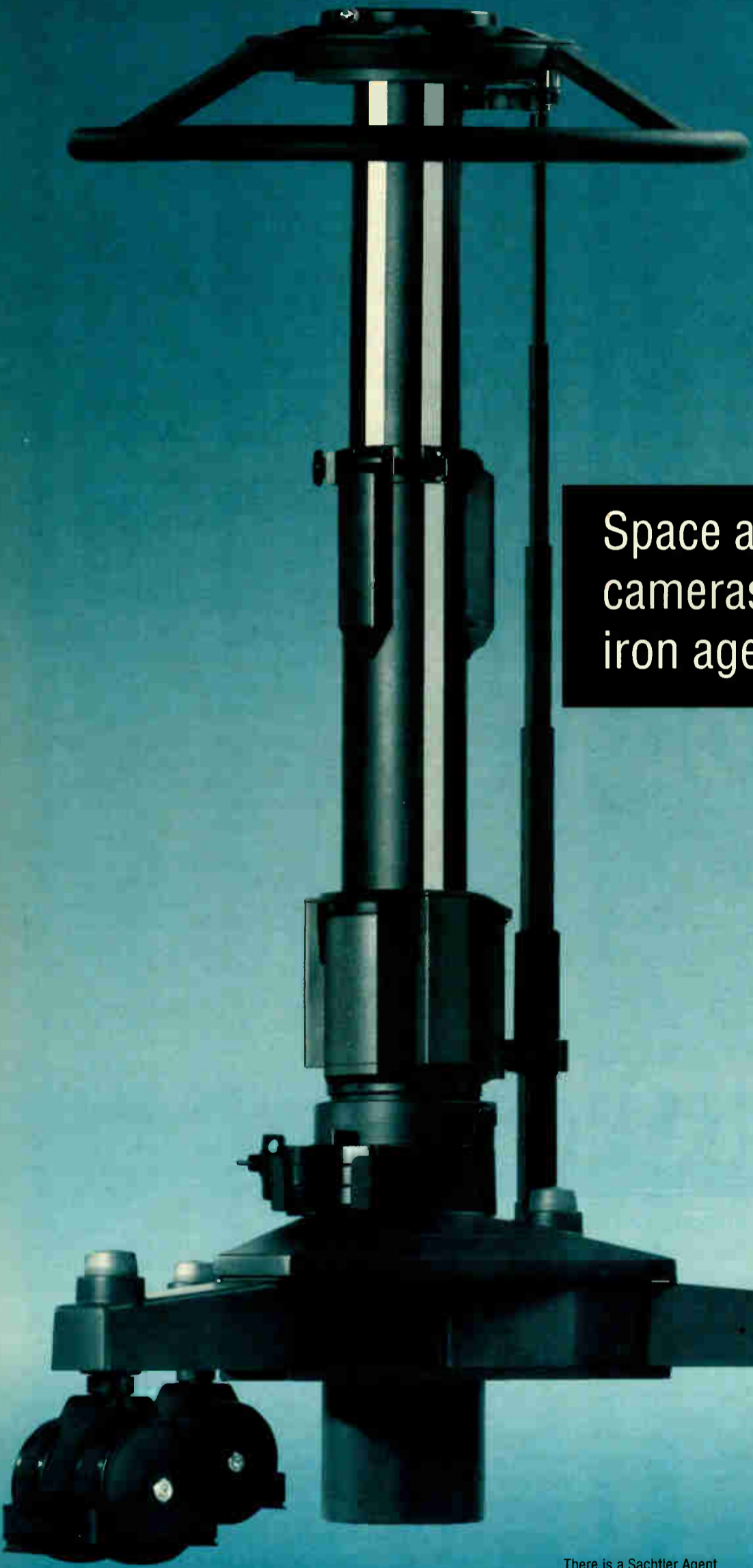
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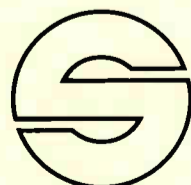


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Support & Lighting

CCBE Highlights Power Concerns

by Robert Findlay

SPECIAL REPORT

You don't usually associate a television or radio station's electrical power as the subject of an interesting technical paper. However, this was just the case during the 1993 42nd annual Central Canada Broadcast Engineers, Technologists and Technicians Association (CCBE) Convention and Exposition, held in Toronto 28-30 September.

A sessions paper entitled "Power Quality" was a part of the program offerings, and one of the best attended papers of the sessions.

The 1993 CCBE Papers Sessions featured three mornings of papers on the theme "Computers and Multimedia in Broadcasting." A one-hour digital work-

shop was held each morning. These workshops represent a new approach: CCBE delegates were encouraged to bring their problems to experts from companies that specialize in digital technology.

A few years ago, the need for a paper on power quality would have been unnecessary. But today there is a proliferation of computers and similar equipment, resulting in a substantial increase in the number of switching power supplies required to power this equipment. Switching power supplies reflect a third harmonic current into the neutral line of the power system. This third harmonic current is additive and overloads the neutral cable, causing overheating in

cables, transformers and panel connectors.

Neutral cable and connectors in most systems, according to Rhonda Wright, an engineer with Ontario Hydro, are usually designed to handle the very low current associated with stations with well-designed electrical systems where the loads are normally well balanced and 60 Hz sine waves cancel. How is the third harmonic neutral overload problem to be solved?

Manufacturers of switching supplies apparently can design them to reduce third harmonic reflections. However, this does not help stations with existing systems. For them, upgrading to higher quality transformers and distribution panels with improved neutral current carrying capacity is required. Unfortunately, according to Wright, there is no inexpensive solution.

Another interesting paper described decision list software that permits off-line computerization of video corrections to a standards converter.

Switching power supplies reflect a third harmonic current into the neutral line of the power system.

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Circle 117 On Reader Service Card

Guy Caplan of Alpha Video and Film, Montreal, described the problems that beset distributors as they attempt to provide programs to countries that have technical standards slightly different from the distributing country.

German audiences, for example, prefer black night scenes. The dark blue night scenes provided by Hollywood directors are not acceptable. Europeans find NTSC pictures lack resolution in some scenes as compared to PAL. Also, there are differences in black level between PAL and NTSC. All of these "faults" can be corrected, but usually at the expense of multiple tape generations.

However, with Alpha's decision list software, 12 parameters can be pre-set off line. The list is saved on disk for single-pass, on-line correction.

The CCBE Annual Exposition gives delegates and visitors the opportunity to see the latest technology. As well as the major international companies such as Sony, Panasonic and Scientific Atlanta, a large number of local companies were present. Video Design Systems Inc. of Toronto displayed a number of software items from Earthwatch. One, called Storm Warnings, can fly TV viewers over towns in the path of a storm. Earthwatch software is designed to use off-the-shelf hardware from Silicon Graphics.

Sony Canada presented a seminar on its view of how advanced television should be introduced into Canada and the United States. In a taped show, Sony demonstrated the quality of pictures that can be produced using present 525-line cameras modified for 16:9 widescreen. Pictures were displayed on line-doubled NTSC monitoring equipment. In Sony's view, widescreen 525 would enable stations to begin economical local programming and ENG integration into ATV transmissions. ■

Robert Findlay is publicity chairman of the CCBE and a retired TV engineering executive. He may be reached at +1-514-352-4038; FAX: +1-514-354-7514.

Building a Remote Transmitter Monitor

by Doug Lung

RF TECHNOLOGY

More than a year ago, I built an inexpensive remote control system useful for monitoring microwave sites and low power transmitters and as a backup remote for full power stations. Since then, I have built three more systems for LPTV (low power television) monitoring and have several more planned.

The demand for these systems prompted me to come up with a standard design for a unit that is easy to construct. This month I will show you a schematic of a complete interface/isolation circuit for use with Blue

the U.S. is +1-218-681-6674 (FAX: +1-218-681-3380). While the company does not directly ship international orders, it can work through either a freight forwarder or via Intertrans (attention Nancy Leitz, 1325 Eagandale, Suite 120, Eagan, MN, 55121, U.S.A.; telephone: +1-612-688-0838; FAX: +1-612-688-0841; Telex 4310142.) There is an extra US\$5 charge for international orders.

BASIC CONTROLLER

The basic microcontroller (BE-01E) costs US\$199 by itself or US\$299 with manual, serial cable, AC adapter and an "Applications Module" (package number BE-43E). If you cannot locate the BE-440e in your location, don't despair. While this article was written for this microcontroller, the voltage buffer/amp and the opto-isolator circuits can be used with other micro-computer-based systems as well.

Please note that I have no financial interest in Blue Earth Research. I send them money for parts, and I don't receive any special consideration as a result of these articles or your purchases.

As for the remote, I designed the original model several years ago and called it the

regulated by their own 78L05 100 mA regulator. These 100 mA regulators are cheap, so I used separate ones for the digital and analog portions of the circuit. It is an easy way to keep digital noise out of analog circuits.

Blue Earth research says series resistors are sufficient protection, in most cases, for the A/D converter inputs inside the Micro. However, outside the Micro box, I felt the inputs needed some additional protection — a first line of defense. I used two National Semiconductor LMC660CN quad op amps for this purpose.

The LMC660CNs solve two problems present with conventional op amps. First, I could eliminate the negative supply.

Second, by limiting the op amp supply voltage to +5 volts, the nasty tendency of A/D inputs on the Micro to "bleed" over into each other if an input exceeds 5 volts is prevented. The LMC660CN allows both input and output voltage swings from "rail to rail," so I can use a single 5 volt op amp supply to work with any permissible input to the A/D converter.

In the analog input circuitry, a 100K ohm resistor on the input works with the 0.1 uf capacitor to filter out noise on the incoming line. Don't worry about it slowing down the readings because the effect is not noticeable.

(Continued on page 13)

Because I like to design "bullet proof" circuits, I have used

opto-isolators on both the command and status inputs.

Earth Research's BE-440e micro controller. I also shot a few pictures of a unit I built for use at our K27EI low power station in Santa Maria, California.

CHOOSE YOUR BOARD

While this interface was specifically designed for the Blue Earth BE-440e, there are a number of 8051-based single board computers that should work as well.

What is special about the BE-440e? For one thing, it is small; the box is about the size of a pack of cigarettes. Second, it is unnecessary to add much to the unit to make it a useful item. Everything except the 9 to 25 volt DC supply is built in, including battery-backed up RAM and a real-time clock. Third, it is robust. It can write-protect the part of memory that programs are stored in, prevent Control-C interruption of programs and auto-execute a program in what is called "RomSim."

According to the ads, the Blue Earth "Micro" contains eight, 8-bit analog-to-digital converters and fourteen I/O lines. However, one of the A/D converters and two of the I/O lines are reserved for internal use, so only seven A/D converters and twelve I/O lines are actually available for remote use. The "Micro" also has two RS-232 serial ports, however, it seems that one port is limited to serving as a serial printer port, at least from Basic.

The I/O lines have limited source current capability, but they can sink enough current to light an LED. The A/D converter input range is from 0 to 5 volts. It can be programmed to work in a pseudo-differential mode, but at no time should the input voltages go below ground or above 5 volts.

The BE-440e is made by Blue Earth Research. The company's direct number in

Cheap Remote. Since then I have devised a new version. I suppose this one will be "Son of Cheap Remote." or perhaps CR-II to keep it short and save typing.

CR-II takes advantage of most of the Blue Earth Micro's features. I've configured it for three status inputs and three command outputs — two open collectors and one relay. The 8-bit A/D converter inside the Micro has eight multiplexed inputs. One is reserved for monitoring the supply voltage, so seven are available for our use.

COMMAND AND STATUS

Because I like to design "bullet proof" circuits, I have used opto-isolators on both the command and status inputs. On this board, I derived the voltages for the external side of the opto-isolators from the main supply voltage, isolated with a 1N4004 type diode and a 150 ohm 1/2 watt resistor. I figured over-voltages would not get past the diode, and, thanks to the series resistor, shorts to ground would not pull the supply down. This works fine with solid state transmitters.

When working with circuits where more isolation is needed, like tube transmitters, supply the external side of the optos with a separate, isolated power supply, or use power from the transmitter cabinet itself.

The LEDs on the status input side are very sensitive, but it should be possible to parallel them across panel LEDs or lights if necessary. Watch out for leakage currents that can keep them turned on. It may be necessary to add a diode or a zener in series with the input resistor to keep the LED's from turning on at low voltages.

The LED supply and the pull up resistors on the Micro side of the opto-isolators are

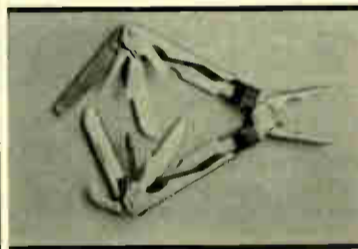


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Compression Is Not What It Seems

by Mario Orazio



SOMEWHERE OUT THERE you might not have noticed that you cannot always believe what you read, even if it is in TV Technology, especially if it is by me. Yes, you guessed it: this is yet another ranting on compression.

But first I want to elaborate on that reading business. Take note: all your meals are not going to be delicious, but you have to eat (unless you are one of those exceptionally rare individuals who have mastered the art of photosynthesis). Likewise, not everything you read is going to rank with Newton's "Principia," but, if you quit scanning pages, pretty soon you are not going to know how to scan images anymore.

And, since you are already giving these words the old once over, I figure that here is as good a place as any to mention a few texts that have recently caught my notice. Anyway, they were free.

RARE GEMS

Manufacturers will usually print anything that they think will sell products, no matter how blatantly false or asinine. I think I have mentioned a few of those before (and I plan to offer another tasty tidbit this month before my space runs out). But every now and then, something seems to snap, and they offer — absolutely free — some actually accurate reference material.

Ampex is one of my favorites. Back in 1986, they gave away a 149-page book called "Videotape Recording." Bar none, this is my candidate for best volume ever written on the subject. Too bad it came out just before digital VTRs. I guess you really *cannot* have everything. But at every NAB show, I pick up Ampex's latest edition of "A Guide To Media & Formats," a dry listing of reference data for just about every video or audio recording format being sold. I look forward to next year's edition, featuring DCT, D-5, and Digital Betacam (I hope).

I also cannot resist 3M's Technical Bulletins at NAB. Tektronix used to have great Application Notes, accompanying such other nifty freebies as

radial and chroma resolution charts for cameras. These days, I am usually only mildly whelmed by Tek's App Notes, but darn if they did not outdo themselves on one of their latest tomes, the 70-page "A Guide to Digital Television Systems and Measurements."

By page 7, in the *Digital Basics* section (my italics, not theirs), they are already comparing maximum and minimum hex values for eight- and ten-bit luminance and chrominance component quantizing levels; the next page has composite video and PAL. Three dozen pages later, there is a graph of serial digital errors correlated to lengths of coax that will send chills down the spine of anyone planning to combine just two BNC connectors with a reel of Belden 8281. I am not going to give away the punchline (again), but let me just say that it would be really, *really*, **REAL-LY**, worth all the effort you can put into it to whack at least 30 feet off any 950-foot run you are contemplating for component SDI. Really!

There are no prices on the Ampex or Tek books (nor on most of the other fine reading material you find at NAB — except at NAB's own outrageously overpriced bookstore, that is). The lower right corner of the cover of Audio Precision's 177-page "Audio Measurement Handbook" says "\$12.95," but they were giving them away at the AES show, and I will bet you that you can still get one just for the asking.

PERFECTLY PALPABLE

Oh momma, what a terrific find! I have done my share of studying the secrets of sonority, but this treatise is such an ear-opener that I have seen preeminent prodigies of phonology pressing proboscides to its pages.

Now that I have alliterated myself closer to illiteracy, I might as well start swinging back towards the topic. The "Audio Measurement Handbook" was *not* written by Audio Precision's Dr. Richard Cabot; it is by Bob Metzler. I have already praised his book, but I have to confess I don't know much else about the man — I cannot even tell you what he looks like.

Conversely, the good doctor and I have had personal discussions in the past about one of my favorite subjects: people who promote audiophilic products by making claims about happy electrons and similarly well-grounded scientific principles. I have touched on that stuff here before — the clock that improves sounds and pictures ten minutes after you plug it in the wall, the cream you spread on cables to improve clarity, the CDs that are ever so much better after a brief visit to the temperature of liquified nitrogen — you know, all those things you were taught in audio school.

CHEWING THE RAG

This is why I like "chewing the rag" with him: Even though these ideas seem absolutely Looney-Tunes right on the surface, even though they make anywhere from zero to negative infinity sense, even though some people would not sully their reputations by giving them a moment's thought, *he*

retains a positive slope. A camera's compressor lets highlights get brighter, just not as much brighter as they otherwise would have gotten; an audio compressor does the same thing to loud sounds.

There is no such thing as bit rate reduction in analog, but there is an equivalent: companding. Stereo TV uses dbx companding — the dynamic range of the stereo difference signal is reduced before transmission and restored in TV sets. What few analog radio networks are left do the exact same thing: National Public Radio in the U.S. reduces its dynamic range 3:1 prior to satellite uplink; radio stations expand it 1:3 when it comes down. *Then* some of them compress the heck out of it.

Like a lot of what is being called digital compression, these companding systems (Dolby A, B, C, ..., and SR, in addition to dbx) are supposed to be artifact-free. I recommend playing the *Frere Jacques* section of the EBU test CD through your favorite audio compander to see just how transparent it really is. Still, most of the time, they work fine, and the same can be said

to buy those (like, for instance, the possibility of a better, external BRR showing up in the future), but I do not think picture quality is going to be one of them. I even like Panasonic's new MAP audio BRR, although I am more cautious about its audio quality than I am about DCT or Digital Betacam's video quality.

"But Mario, what about what you said a few months ago?" What can I tell you? I lied.

Hey, I did not lie about the important stuff. When I wrote "There is no test signal that can guarantee the picture quality of a digital video compression system," the only lie was at the end. I should have said "of a BRR system."

DANCES WITH SEMANTICS

Do not get me wrong. I am not just dancing on semantics here. Calling BRR compression leads down the path to hysteria. Compression changes signals. Loud sounds do not get as loud as they used to; ditto bright images.

There is not necessarily any of that in BRR. On playback, Digital Betacam's highlights are just as bright as those of D-1;

Give me a random-noise generator and a subtractor, and I will be happy to prove to you that I can break any bit rate reduction system.

will not comment on them without at least giving them a listen. Bravo!

I, too, think the stuff I listed a couple of paragraphs back is garbage, but I was willing to give it a listen just in case. Yeah, I know, you cannot violate the "laws" of physics, but Einstein did just that. An awful lot of what we take for granted today seemed just as ludicrous not so very long ago. Fly through the air in a multi-ton metal contraption that does not even flap its wings? Create a high-quality VTR that uses bit rate reduction?

Whoops! Have I just said something about compression? Gee, I hope not. Try this statement, which I believe to be true, on for size: Neither DCT nor Digital Betacam makes use of compression, nor do JPEG, MPEG, H.261, and composite video.

There are plenty of products in our industry with compression. Just about every camera compresses highlights. One whole heck of a lot of audio processing equipment also includes a compression function. The compression can be either analog or digital. *But what has been called digital audio or video compression is not.* It is bit rate reduction. Period.

This is what a compression system does: it takes a signal and changes its input/output relationship in such a way that it becomes less than it was but

about a lot of the bit rate reduction systems out there.

BREAKING THE 'LAW'

Give me a random-noise generator and a subtractor, and I will be happy to prove to you that I can break any bit rate reduction system. Here is "law number one" of bit rate reduction: Random noise cannot be losslessly bit rate reduced. No way. No how.

Here is another "law" of BRR: Who cares about "law number one"? Everything other than random noise *can* be losslessly BRRed. Audio is not random, and most video is about as random as a pair of loaded dice. There is a heck of a good chance that the next sample of an audio or video signal is pretty darned close to the last. Plain old differential PCM makes one heck of a nice BRR engine. In a perfect world.

DPCM is great until you hit an error, at which point everything that follows is wrong. I am not going to do a dissertation on BRR here. They exist. Look them up. Suffice it to say, in a world of search modes and dropouts, BRR design is a little tougher than playing patty cake.

Following that preamble, let me add that I have now had a chance to kick the tires on both DCT and Digital Betacam, and I like them both (and D-5, too). There are reasons why you might not want

Panasonic's MAPed drum beats are just as loud. There can be lousy "artifacts" from any BRR system, but first, there does not have to be, and second, if there are, they are not going to be as predictable as the results of camera knees and audio limiters.

And that is not all. Composite video definitely is not compressed. It is not companded or BRRed, either. Composite video is truncated.

The filters that reduce composite video's luma and chroma bandwidths do so irreversibly. There is not any sense of more detail, like the sense of more brightness that knees give to highlights. The detail just is not there.

About the only relationship composite video has to BRR is that both can have artifacts, and those are dependent on picture content. Composite video cross-color only occurs at particular spatial frequencies of detail; in a lot of compression systems, artifacts appear only when picture content causes heavy buffer loading or overflow.

It is a lot easier to see this kind of thing in the transmission video BRR systems running at around 5 Mbps instead of the DVTRs running at over 100 Mbps. That is when it is legitimate to trade off composite video artifacts for those of BRR to try to second guess which consumers will like

(continued on page 13)

CONTINUED FROM PAGE 11

Building Your Own Remote Monitor

The DIP switch and second 100K resistor are useful if the incoming voltage is too high. Switching the resistor in drops the voltage into the op amp by at least half. Note that the source impedance will affect the drop. I used a DIP resistor network for these resistors and mounted it on a socket so I could easily modify the divider for different input voltage ranges. Finally, the 1 megohm resistor to ground on the non-inverting input prevents the op amp from drifting to the +5 volt rail with no input.

OFFSET FEEDBACK

The feedback network is simple. I designed it to use the least parts and be the easiest to construct. I know op amp purists will protest, but offset currents on the LMC660CN are low enough that it really isn't necessary to match inverting and non-inverting input resistances.

This design can be adjusted to work with full scale inputs from under 1 volt up to 10 volts. I put a 4.7K resistor in series with the output of each op amp, mainly to provide another level of protection for the Blue Earth Micro A/D inputs. The op amps

are powered by a separate 78L05 regulator, as noted above.

There are two transistors controlling the voltage to the command LEDs. This provides a way to disable the command outputs. A low on port 3, bit 5 turns off Q-1, which also turns off Q-2, a PNP transistor supplying the opto-isolators.

As I write this I am not using that line, however, I am looking for a way to keep all the commands from pulsing when power is first applied to the Blue Earth Micro and interface box. I thought this circuit might do it automatically if all output went low at the same time. However, there is still a minor glitch. It helped to add a 10 uf capacitor from the base to emitter of Q-2 to make it take longer for the voltage to drop low enough to turn on the relay, but I still notice a very short pulse on the relay.

Each of the three versions of the Cheap Remote were built differently using lessons learned from the previous one.

The current CR-II monitors an Acrodyne TLU-200 solid state transmitter and a Uniden CAT-100R satellite receiver. I put the visual and aural forward powers plus

total reflected power readings on the remote, as well as the two power supply voltages for the final amplifiers. Acrodyne makes these readings available on their remote control connector.

SATELLITE CHECK

I also monitor the satellite receiver AGC voltage, taken from the hot side of the AGC meter level potentiometer, isolated with a 100K resistor and an additional 0.1 uf capacitor inside the receiver. The last available input is a temperature monitor using the LM34DZ temperature sensor chip.

I have also connected the RF On and Video Present status indications to the status inputs on the remote. I normally control the transmitter by interrupting the input video with a relay, but I also have

the ability to turn it on or off using the two open collector outputs controlling the momentary On and Off remote commands.

In next month's column, I'll discuss details on constructing the unit, as well as software details and a parts list.

Since I have been very busy and it looks like I am going to be traveling more, CompuServe E-mail will be the best way to reach me, my number is 70255.460. You can also write me at 2265 Westwood Blvd., Suite 553, Los Angeles, CA 90064, phone me at +1-305-884-9664 or FAX to +1-305-884-9661.

Please do not be discouraged if I answer and put you on hold quickly. If you cannot hold, hang up and call back later. After 6 p.m. Eastern Standard Time is best, when things quiet down a bit.

CONTINUED FROM PAGE 12

Realities of Compression

better. Which would you like better, composite video's moire and crawling dots or, to pick a common BRR artifact, blockiness in fine moving diagonals? It is not an easy call.

AHEAD OF THE CURVE

That is why I try to read a lot (that and the fact that my no-longer-beautiful body does not seem to want to go to sleep much anymore). The world is changing pretty darned fast, and I do not have enough money stashed away to allow me to live in the manner to which I would like to become accustomed, so I try to keep up to fake my way into ongoing gainful employment. Manufacturer literature helps. Sometimes.

What I am about to present is taken verbatim from "Cable Design — Theory Versus Empirical Reality," a recent publication of AudioQuest, a manufacturer of audio cables. I am pretty sure you can get your own copy of the 12-page fact-filled guide by calling them in San Clemente, California at +1-714-498-2770.

"Fact: Like all audio components, all audio cables require a break-in period. Cables will continue to improve in sound quality over a period of two weeks. Break-in is required because it takes time for the electrical behavior of the dielectric (insulating) material to stabilize. This is the same reason electronics and speakers also require a break-in period.

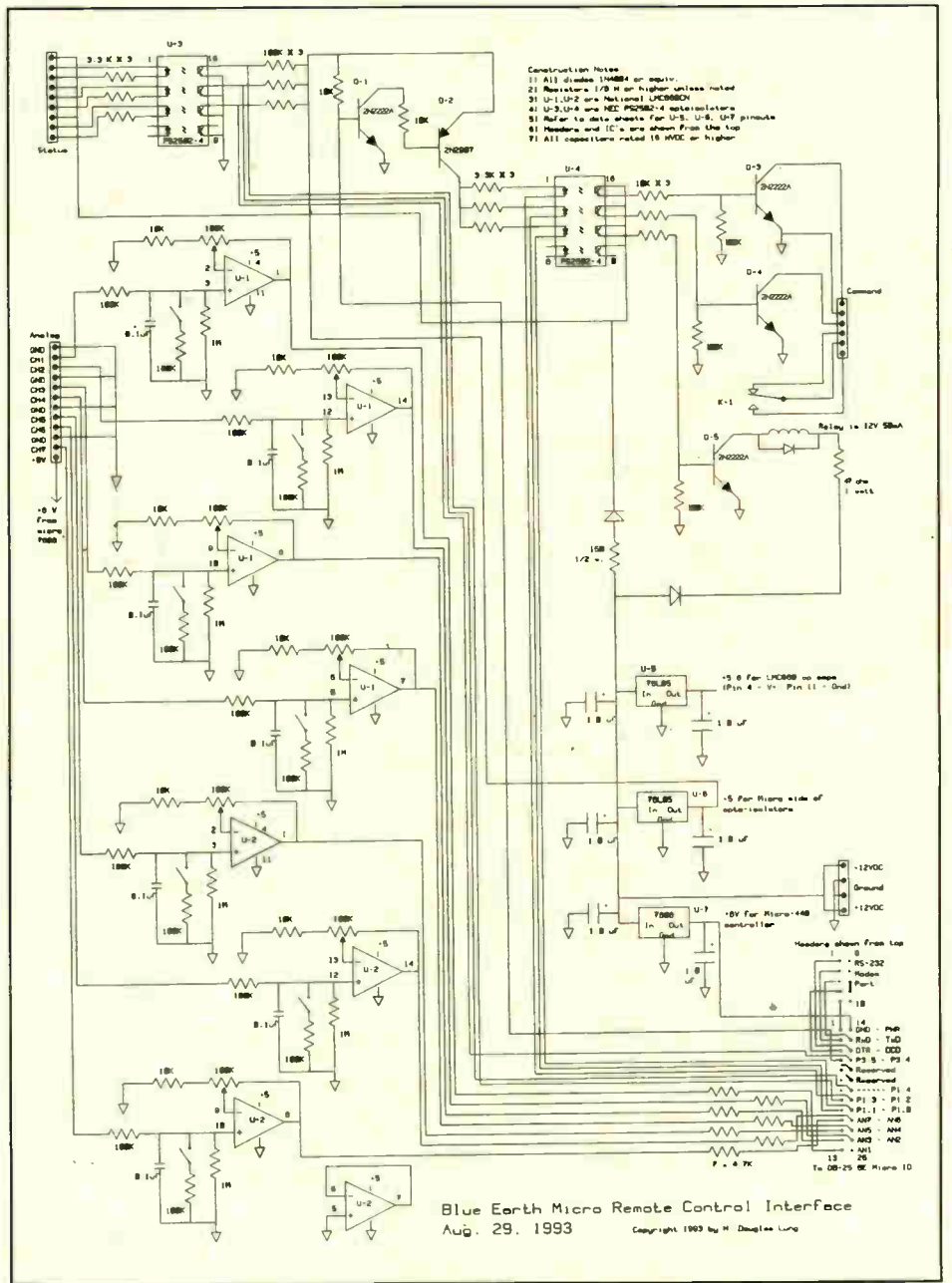
"Fact: All cables are directional, from hardware store electrical cable to the finest pure silver cables. Some cables should be used with the writing going in the same direction as the music (toward the speakers), some should be used in the opposite direction. If you are missing the instructions as to which way to orient your cables, check with your dealer (AudioQuest puts instructions on every spool of cable). If necessary you can determine which direction is best yourself, simply listen to the

cables in one direction and then the other. The difference will be clear, in the correct direction the music is more relaxed, pleasant and believable. While cable directionality is not fully understood, it is clear that the molecular structure of drawn metal is unsymmetrical, which does provide a physical explanation for directionality."

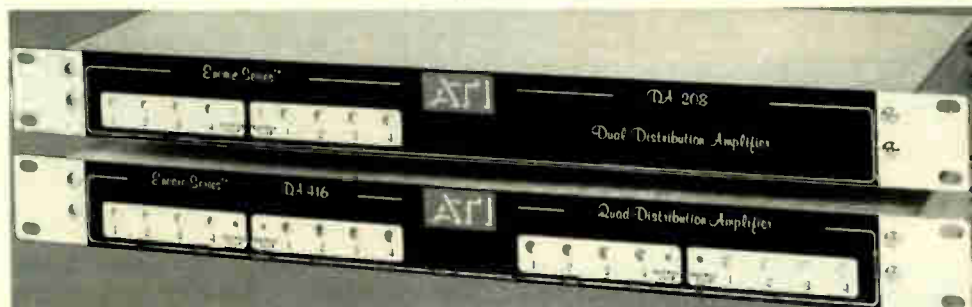
I am not ashamed to admit that I laughed the first time I read those two paragraphs (I guess it is not just music that has a hard time being believable). I also am not ashamed to admit that I tried the suggested experiment (it's easy enough) before laughing a second time.

Like I said (or meant to say, while I was under the influence of mass compression hysteria), there is no test signal that will prove a BRR system. That is not an excuse to avoid having your own audio and visual tests. ■

Mario Orazio is the pseudonym of a well-know television engineer who wishes to remain anonymous. Send your questions or comments to him by writing to TV Technology. Or drop him a note via electronic mail in MCI Mail (accessible through CompuServe) at 581-6729@MCIMail.com.



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IB '93 Blossoms in Jakarta

by Mark Timpany

JAKARTA, INDONESIA

An exhibition devoted exclusively to broadcast made its second appearance in Jakarta, and exhibitor support showed that Indonesia has come a long way in less than two years. International Broadcast '93, sponsored by PT Multi Media Promo, was held at the new Kemayoran International Exhibition Center the first five days in October.

Expanded floor space in the new facility was put to good use by over 170 manufacturers and vendors from 16 countries. The show was scheduled jointly with the related exhibits Interteltec '93 and Microcomputer Asia '93, but this time it was broadcast

booths that dominated this event.

The Indonesian broadcast scene has changed dramatically since the first International Broadcast show in September 1991. Within the last year, all five of the private television broadcasters were authorized to construct facilities across the whole of Indonesia. They switched from being operators of several broadcast stations to the role of national network.

RADIO GROWTH

Radio is also in a growth period, with changes in regulations that enable licensing of additional private FM stations. The exhibitor response to this show indicated that they expect this country to be a prime

market for broadcast products in the years to come.

All of the vendors and manufacturers familiar to the Southeast Asian scene were present. PKE arrived from Australia to show its line of audio gear, from on-air consoles to digital audio storage and radio program automation. Tektronix was represented by Mecomb Tehnik at one of the more popular booths for the television participants. Despite the strong local presence of Philips, Tektronix still dominates the market niche it has created in television test and monitoring equipment. Some of its local success may be due to the frequent seminars offered to its customers. For International Broadcast '93, the Tektronix

presentation was "Digital Television Systems and Measurements" from Tommy Tong of the Hong Kong office.

Catur Mitra Adhikara recently became the representative of the full line of Barco video and RF products. Previously, they had handled only the industrial projection television product line.

Digital technology was in abundance in Jakarta. One of the highlights at the PT Galva booth was a demonstration of the Sony Digital Betacam system. Notably absent from this Asian show was a display of broadcast products from the People's Republic of China.

AUSTRALIAN NEWCOMER

Radio Frequency Systems of Australia made its first appearance in Indonesia at this show. Its presence in the market has seen an upturn with the rapid expansion of private television in the country.

Thomson, Asea Brown Boveri and Comark came to the show under the new moniker Thomcast. Thomcast, a new company under Thomson-CSF, came about from the merger of the broadcast operations of Thomson-LGT and the RPA sector of Thomson-CSF, along with the recent acquisition of ABB Infocom. Many of the high power tube UHF transmitters are from Comark. Thomson is a popular choice for medium and low power solid state UHF.

PT LEN, a state-owned industry headquartered in Bandung, was on hand offering a range of television and radio transmitters, antennas and earth station hardware.

AIC Conferences was the organizer for a separate television industry conference held just before International Broadcast '93.

This management-oriented conference focused on what will be the next phase of development of the Indonesian television marketplace. DBS is planned for Indonesia in 1995. The government is currently reviewing its policies and is expected to produce regulations regarding pay television operations and what services might be delivered direct-to-home outside the current broadcast systems.

PRSSNI, the Indonesian Association of Private Radio Broadcasters, presented a seminar at the Kemayoran Exhibition site titled, "The Implementation of Future Technology for Increasing the Quality of Radio and Television Broadcasting in Indonesia." Industry leaders are very concerned that broadcast facilities constructed here not be made obsolete by the next wave of technological improvements. Palapa, Indonesia's domestic satellite system, is the distribution medium for numerous international television programs, and broadcasters are aware that their product must be "export quality."

ONE OF MANY

The only regret expressed by several vendors about International Broadcast '93 was the lower-than-anticipated attendance. There is already a plethora of regional shows to attract the attention of the broadcast equipment buyer, among them InterBEE, BroadcastAsia and shows in Thailand and India. The television management conference prepared by AIC for Jakarta was scheduled at the same time as the BroadcastTech seminar held in Singapore.

However, attendees were very pleased with the range of equipment on display at International Broadcast '93. The rapid expansion and growth potential of the Indonesian broadcast equipment marketplace likely will keep exhibitor support for this event at a high level.

NEWS

LINEAR

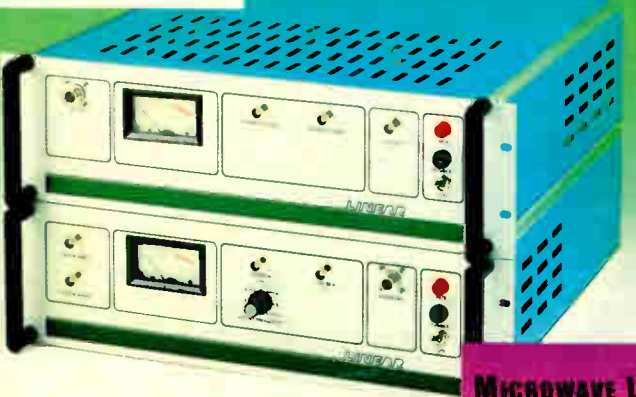
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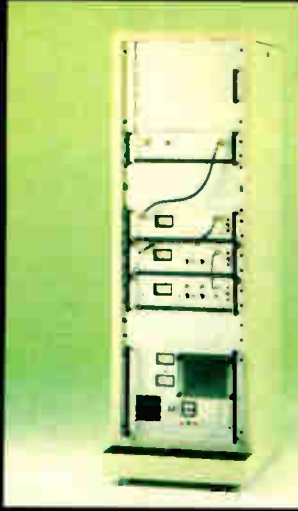
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MARKETPLACE

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

UHF TRANSMITTER TUBE

Philips Klystrons, Hamburg, has developed a new inductive output tube, type YK2000, offering an alternative to the UHF market.

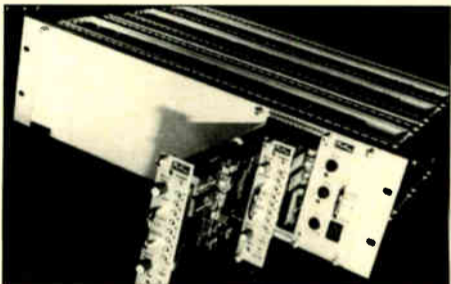
A negative grid-controlled inductive output amplifier delivers 40 kw for UHF IV/V transmitters. The Philips YK2000 has a frequency range of 470 to 810 MHz and features high efficiency, with a figure of merit up to 120%.

This water-cooled tube has a metal-ceramic construction and features electromagnetic focusing. Continuously-tunable external cavities are fitted with digital frequency indicators.

For more information, contact Brown Beezer in the U.S. at +1-401-767-4440; FAX: +1-767-4493, or circle Reader Service 46.

AMPLIFIERS

The 2500 Series of distribution amplifiers by Matthey Electronics are intended primarily for outside broadcast/mobile operations. This series gives the user system flexibility by providing a D.A. and delay D.A. on each card. The cards are contained in a 3U rack frame designed to reduce all modes of vibration.



For more information, contact Alan Holden in the U.K. at +44-782-577588; FAX: +44-782-838558, or circle Reader Service 95.

DIGITAL VIDEO ROUTER

Image Video Ltd. has introduced its 9910 series of serial digital video routing switchers. These ten switchers offer full compatibility with all current digital video standards.

The self-alignment feature automatically aligns the phase locked loop (PLL) oscillators to the center frequency of the respective incoming digital standard, allowing the switcher to be aligned without manual adjustments or removal of circuit modules.

For more information, contact the company in Canada at +1-416-438-3940; FAX: +1-416-438-8465, or circle Reader Service 102.

COMPOSITION SYSTEM

Ultimate has released CineFusion, a compositing system that works on the SGI family of workstations or as a stand-alone compositing program.

The system is resolution independent and supports most major file formats, including SGI, TIFF, RLA, PIXAR and Kodak.

CineFusion operates in an interactive mode and an off-line mode and features user-friendly interactive menu screens. Other features include Color Conformance, which automatically adjusts the color controls to achieve a realistic color balance between the foreground and background scenes.

For further information, contact Lynne Sauv  in the U.S. at +1-818-993-8007; FAX: +1-818-993-3762, or circle Reader Service 109.

VIDEOPROMPTER SOFTWARE

Smooth Talker is a videoprompting software program for the Amiga developed by Zen Computer Services in England.

The program features a 36-point font and variable scroll speeds accessible from a hand-held speed and index controller. Smooth Talker comes with a 12-ft.-wired handheld remote controller and a VHS tutorial video.



For more information, contact Shawn McDermott of Video Design Associates in the U.S. at +1-407-586-7266 or circle Reader Service 35.

STUDIO CAMERA LENSES

The Ah20X8ESM for 2/3-in. cameras and Sh20X6.2ESM for 1/2-in cameras are both Fujinon studio production lenses that feature fast maximum aperture and a close MOD, which makes them well-suited to close-up shots.

Both lenses employ Fujinon's Electron Beam Coatings (EBC), which provide control over ghosting and flare.

For further information, contact John Webb in the U.S. at +1-201-633-5600;



FAX: +1-201-633-5216, or circle Reader Service 131.

WIRELESS MIC

The HT-200 series of handheld microphone transmitters by Telex Communications Inc. offers impressive RF field strength, an antenna that prevents "hand interference" and an easily accessible battery compartment. All switches and controls are mounted at the base of the unit.



For more information, contact Terri Aberg in the U.S. at +1-312-884-4051; FAX: +1-612-884-0043, or circle Reader Service 41.

SERIAL DIGITAL FRAMESTORE

Tekniche's Genesis 8080 serial digital framestore functions primarily as a picture store and as a synchronizing/re-timing device. It is auto-sensing 625/525 and has been designed to work in both parallel (CCIR 656) and serial digital formats. The unit pays attention to input synchronization errors and errors in the sync area, flashing warnings on the input lock LED.

For more information, contact Bill Trevelyan in the U.K. at +44-483-728006; FAX: +44-483-770195, or circle Reader Service 74.

PAINT APPLICATION

Fractal Design has introduced Painter 2.0 for Macintosh and Windows, an upgrade of the original paint application.

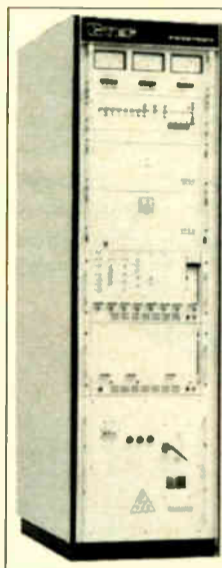
Painter's new brushes include scratch-board tools, an airbrush that actually spatters and the Cubist "brush look." New effects allow the user to apply a textured glass distortion, marbleize and more. Photo design basics, such as photo compositing,

advanced magic wand selections and color separation, are built in.



For more information, contact the company in the U.S. at +1-408-688-8800; FAX: +1-408-688-8836, or circle Reader Service 48.

UHF TV TRANSMITTER



The TDF-1K-IIA UHF TV transmitter from the Chendu TV Equipment Factory features an all solid state exciter and uses only one ceramic tetrode in the final power amplifier. The TDF-1K-IIA is equipped with video AGC, white clipper and advanced circuits for inter-modulation, cross-modulation and DG, DP and group delay correction.

For more information, contact CTEF in China at +86-2-858-4912; FAX: +86-2-858-4575, or circle Reader Service 69.

EDITING CONTROLLER

The GVE-200P from Instec is an inexpensive microprocessor-based automatic videotape editing control unit that features various dubbing modes, slow motion editing and CTL signal restoration.



For more information, contact Instec in China at +86-1-832-4305; FAX: +86-1-831-3898, or circle Reader Service 30.

BIT FRAMEBUFFER

Harlequin Plus, designed by Xi Electronics Ltd., is a graphics software for the Amiga platform. In addition to its inbuilt genlock, the Harlequin Plus provides a variety of additional display and output modes. 24-bit palette mapping allows real time adjustment of image hue, saturation and luminance. 8-bit palette mapped pseudo-color allows an 8-bit image in the board's video memory to be translated to a screen image using 256 colors from a palette of 16.8 million. This mode can be used to framestore up to six independent 8-bit images in the double-buffered Harlequin Plus 4000.

For more information, contact Martin Lowe at Amiga Centre Scotland in the U.K. at +44-89-687-583; FAX: +44-89-687-456, or circle Reader Service 18.

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

USER REPORT

Odetics Keeps Landmark Running Smoothly

by Walter Isley
 Technical Operations
 Supervisor
 Landmark Communications

ATLANTA, GEORGIA

Land-mark Communications is known in the United States for its two leading 24-hour-a-day cable television channels.

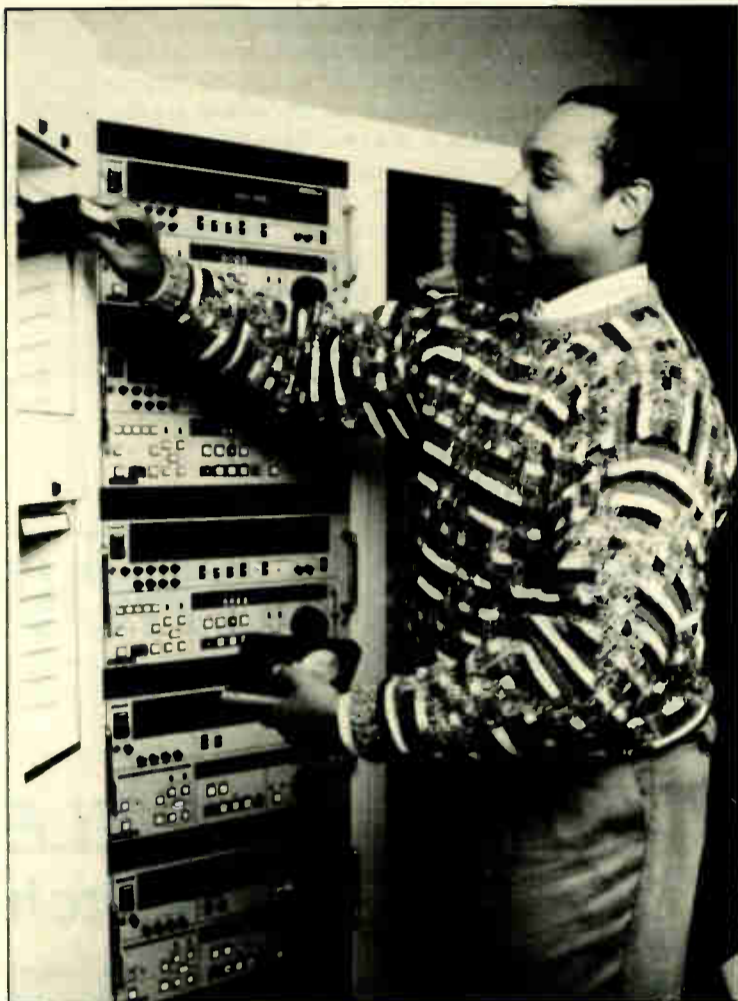
The Weather Channel provides up-to-the-minute weather information — including local forecasts, in-depth regional weather, severe-weather watches and live weather-condition coverage — to more than 5,550 cable systems throughout the U.S. Our other service, The Travel Channel, airs 24-hour travel and leisure programming to similar markets.

ACCURATE AND ON TIME

Both The Travel Channel and The Weather Channel require timeliness and accuracy from their individual staffing and their equipment. And both networks rely heavily upon Odetics TCS2000 cart machines.

The TCS2000 features a unique, four-robot design surrounded by a circular 280-cart library. It is a format-independent library management system that allows customers to specify the VTR that best suites their application.

With the ability to record, manage and play-to-air all forms of spots and programs ranging from seconds to hours, the TCS2000 was deemed the best suited for the high activity level of both operations. Coupled with an



Walter Isley carts up the Odetics TCS2000.

Odetics Cart Workstation, this large library management system has proved to be a variable work-horse.

The Odetics machine supports The Weather Channel's on-air commercial playback, along with audio-band playback. It also provides break-away video for the

network's news format forecast.

The TCS2000 is used to show different map locators and to key in automated maps behind the key wall for the on-camera meteorologists. It also provides a solution to an audio dilemma caused by one of The Weather Channel's unique features — customized local forecasts for the entire United States.

The Weather Channel has developed and patented a system for simultaneously broadcasting different local reports. Called The Weather STAR (Satellite Transponder Addressable Receiver), this unique system allows each local cable system to automatically receive and store weather data that is appropriate for viewers in that particular area.

Cable companies have a choice of two classes of STAR service. STAR 4000 includes local radar, while STAR 3 does not. Each class of STAR service receives different voice support mixed with a music bed. In addition, the network supports the home dish (TVRO) market, which receives only the national feed with a music bed that replaces the local forecast.

FOUR-TRACK AUDIO

To handle all these feeds, The Weather Channel specified its Odetics TCS2000 to feature four tracks of audio output. One channel feeds the STAR 3s, one channel feeds the STAR 4000s and one channel feeds the TVRO band.

The Travel Channel also makes extensive use of the TCS2000's unique features, specifically its ability to support multicut operation. The Travel Channel runs every minute of its programming and commercial playback through the Odetics machine, which allows multicuts to be done on the tape of the show itself. This eliminates source-to-source transitions as well as the need to use external VTRs to run programming. Also, potential queuing errors are non-existent.

Both the Weather Channel and The Travel Channel have found that recent software updates make the Odetics more convenient. Commands that previously required operators to physically search the database — such as locating the homebase location of each individual tape — are now incorporated into playlist mode. If for some reason, the operator needs to locate a spot's homebase, it is conveniently located on the playlist screen.

A forthcoming playlist interface from Utah Scientific will further streamline both network's operations by marrying the network's automation system with the Odetics.

The new automation interface will allow Utah's TAS (Total Automation System) to control the Odetics playlist. Once on-line, TAS will supply the Odetics its playlist, allowing the operator to use a single terminal to receive error messages or delete and insert events. This is preferable to making a change on TAS and then duplicating that effort on the Odetics. Both networks expect to be on-line with this new software in early 1994.

REGULAR UPKEEP

Tight adherence to weekly preventative maintenance on the TCS2000 helps keep service calls to a minimum. However, when duty calls, Odetics service and support departments have provided timely support.

Both networks currently do maintenance in the slower overnight hours. They take machines down one at a time for cleaning, then reset the system for seamless operation. ■

Editor's note: Walter Isley joined Landmark Communications in 1992, having previously worked with the Odetics TCS2000 when the very first model was delivered to WATL/Fox 36 in Atlanta in 1987.

The opinions expressed above are the author's alone. For further information on the TCS2000, contact Bill Keegan at Odetics (Telephone: +1-714-774-2200; FAX: +1-714-535-8532), or circle Reader Service 6.

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USER REPORT

Thomson Puts Euronews In Complete Control

by Jean-Yves Foucault

Technical Director
Euronews

PARIS

Euronews is a European station that broadcasts news and current events magazine shows in five languages simultaneously. We broadcast approximately 1,600 events per day, most of which are taped news briefs that are replayed every 30 minutes.

The preliminary scheduling is done under a BASYS NEWS management system. The master control room is without a

doubt the heart of our installation, and to satisfy our demand for high quality, we have chosen to work in component digital as much as possible.

This demand led us to choose Thomson Broadcast's digital master control room, which is the only equipment capable of properly handling up to eight output channels.

We have also chosen Thomson Broadcast automation to pilot the various pieces of equipment in the suite. This system, which was not complete at the time we placed our order, can also handle eight audio channels associated with one video.

The system architecture is based on an Ethernet system, which uses a main bus to convey all commands from the automation station to the master control switcher's control panel.

CONTROL PANEL IMAGES

While these two stations have the same level of priority in the system, the principal automation station can also be used as a control panel. In this case, the image of the control panel is displayed on the screen and controls are executed with a mouse.

In a general sense, all screens in each workstation connected to the main bus are graphics screens. The system uses four types of stations, each of which can exist in any number on the network. We ordered playlist editor, automation and log stations from Thomson Broadcast, as well as two stations for scheduling.

Due to their physical locations, each post in our installation is dedicated to one applica-

tion. However, through very open software and network capabilities, it is possible to use any station for any task as backup.

The news system sends preliminary schedules to the playlist editor, which accepts and stocks them automatically.

The coordination of the schedule with the segment data base is controlled by the playlist editor, which can also design a complete program from scratch. Very soon we will dress up the system by integrating secondary events, such as on-air logo insertion and title layering.

ALWAYS AT WORK

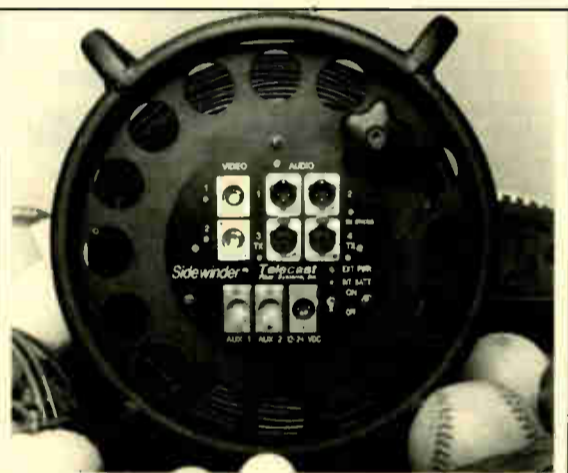
The automation system is able to work 24 hours a day. It feeds on the preliminary schedule in the news playlist editor.

Our automation system will pilot one of our two BASYS TCS90 cart machines and the various peripheral equipment in our suite, including VTRs, video disk recorders.

(continued on page 19)

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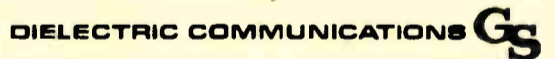
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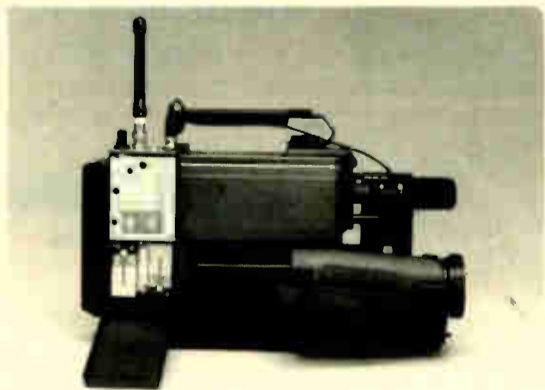
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18 BUYERS GUIDE

U S E R R E P O R T

EBU Turns to AAVS ONYX Switcher

by Brian Flowers

Project Manager
European Broadcasting Union

GENEVA

Having spent 33 years dealing with the technical aspects of international television transmission, I have often been required to set up feed points and coordination centers, either temporarily for important news events or as part of permanent facilities.

Regardless of the duration of the project, I always start by setting up the routing environment. So when I began designing the new Eurovision Control Centre here, my first consideration was what type of routing switcher to use.

CENTRAL HUB

The center coordinates international television transmissions between about 50 countries in the European Broadcasting Area. We coordinate an average of 150 transmissions per day, including six daily multi-origin/multi-destination news exchanges and many international sports events.

The ONYX switcher...

was chosen as the most

suitable unit for the

270 Mbps signal.

Our requirements include switching composite analog video signals (PAL, SECAM and NTSC), serial digital video signals (270 Mbps) and two-channel audio signals. The audio can be switched as an EBU/AES, 3 Mbps digital signal, but since most of the sources and destinations are analog, it is cheaper and simpler to switch two analog audio channels.

The ONYX switcher from AAVS of Montreuil, Paris, in conjunction with an Alpha Image switcher, was chosen as the most suitable unit for the 270 Mbps signal. Its present capacity is 48 inputs by 24 outputs for video (analog and digital), plus 48x48 for two-channel audio. The entire system can be expanded to 64x32 for video and

64x64 for audio by adding extra cards.

There are five incoming and one outgoing terrestrial circuits and eight incoming and one outgoing satellite circuits. The remaining inputs and outputs of the switcher are connected to local facilities.

A switching system must be flexible and easy to adapt to future requirements. The ONYX includes an IBM-compatible PC control panel with system-made software. This permits electronic labelling of UMDs (Under Monitor Displays) and push-buttons on the selection panels, as well as pre-programmed switching sequences.

PUSH OF A BUTTON

For selecting sources to monitoring facilities, we utilize a simple "push-button per source panel" with 64 buttons. However, for "hot switching," where the signal may be feeding a transmission to several hundred million viewers, a more sophisticated selection panel is used.

This panel has only 10 push-buttons, but each one is capable of performing a number of functions. A back-lit LCD label in each button indicates its chosen function. The operator normally starts in "destination" mode, where there is a choice of groups of destinations, such as VTRs, terrestrial outputs or satellite outputs. Having first selected the required group, the operator can change the functions of the 10 buttons to offer a choice of individual outputs in the group, such as VTR1, VTR2, VTR3, etc.

When the operator selects the individual output required, the same buttons then offer input selection. Once input and output have been chosen, the "take" button makes the connection. This system gives full control of a 64x64 multi-level matrix using only 20 push-buttons, and access can be limited to certain inputs and/or outputs if desired.

The UMDs of input monitors are normally preset for a given source. Output monitors have a fixed label for the destination con-



AAVS's ONYX switcher uses an IBM PC control panel.

cerned, but their UMDs change to show which source has been selected to each destination.

VARIABLE BIT RATES

With the advent of digital video compression, broadcasters may be required to switch serial digital video signals of various bit rates in the near future. Most existing serial digital switchers are designed for specific bit rates, which are usually accepted studio standards such as D-1.

These switchers cannot handle compressed digital signals of lower bit rates because they are designed to reclock and regenerate the higher bit rates only. An analog video switcher can handle the lower bit rate signals if its bandwidth is adequate and if it can handle the peak-to-peak amplitude of the digital signal.

With a bandwidth of 30 MHz (-0.3 dB) and 60 MHz (-3 dB), the ONYX is capable of routing compressed digital video signals up to 45 Mbps. However, the peak-to-peak headroom would have to be increased to (+1/0/-1) V for DS3 signals. We are presently talking to AAVS about this possibility. AAVS is also developing a wide band card with a flat response to 100 MHz for HDTV.

The new Eurovision Control Center began operating on 1 September 1993, and the ONYX switching system has given us completely reliable service so far. I can recommend it as a state-of-the-art switcher, which is future-proof and very flexible. ■

Editors note: After studying engineering at the University of Southampton and completing a two-year stint in the Royal Air Force, Brian Flowers joined the BBC in 1960. He was first assigned to the Eurovision Control Center (then located in Brussels) in 1962 and has since served as a technician, supervisor and engineer-in-charge.

The opinions expressed above are the author's alone. For further information on the ONYX switcher, contact Guillaume Duboc at AAVS (Telephone: +33-4857-2164; FAX: +33-4857-3358), or circle Reader Service 20.

CONTINUED FROM PAGE 18

Euronews Chooses Thomson

a picture box photo library, and a Chyron iNFiT! character generator.

Our system is the first Thomson Broadcast automation system of its size. The benefits of secondary events and GPIs are that they will allow us to execute specific requests from the programming staff.

Our application, a radical innovation in the domain of multilingual broadcasting, has particularly specific needs that are best fulfilled by the Thomson Broadcast system. We can, for example, have up to five commentators on-air simultaneously.

After 10 months of working in manual mode, we are at the point of starting up the automation system and utilizing the

intelligence of the TCS90 cart machines. We expect it to improve the user's comfort and the quality of our broadcasts, particularly at the level of layering. ■

Editor's note: Jean-Yves Foucault previously worked for the SFP in technical maintenance, where he oversaw the world's first 1250 HD mobile unit. He has been with Euronews in his current position since the beginning of last year.

The opinions expressed above are the author's alone. For further information on the Thomson Broadcast system, contact the company (Telephone: +33-3420-7430; FAX: +33-3420-7047), or circle Reader Service 40.



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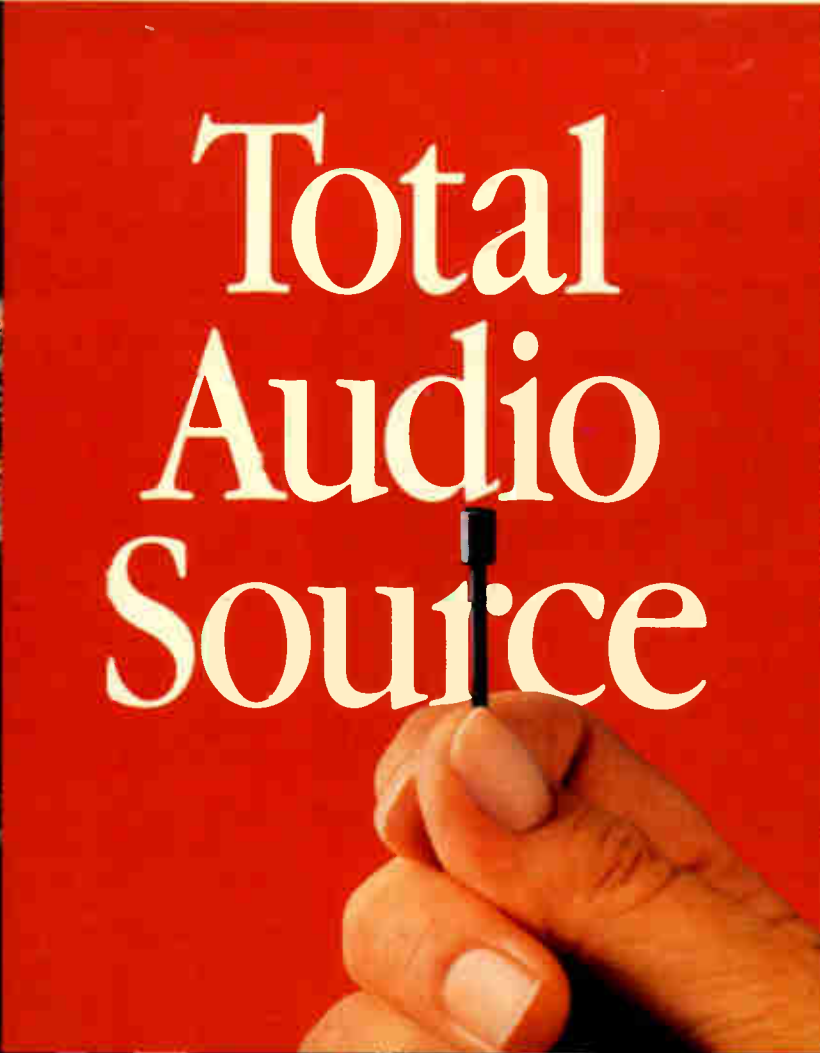
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I N F O R M E D E L O S U S U A R I O S

VIDEO OMEGA ALCANZA EXCELENCIA CON SONY

Por Antonio Bautista

Director Técnico
Video Omega

CIUDAD DE MEXICO

Hoy en día, las imágenes visuales exigen alta definición, transparencia y rapidez; pero son pocos los centros de post-producción con la capacidad de satisfacer estas necesidades en los sistemas tradicionales de edición no lineal. Por esta razón, la casa de post-producción Video Omega se ha esmerado en brindar a sus clientes el mejor servicio y constantemente está explorando la tecnología de punta.

A Video Omega le interesa hacer del medio de la post-producción un mercado competitivo como en el caso de nuestra nueva sala digital D1 4:2:2 de equipo Sony, que contiene: una DVR-2100 videograbadora D1, un DVS-8000C "switcher" (conmutador) de video digital por componentes con efectos especiales, una editora BVE-9100, un DME-5000 generador de efectos digitales y una DMX-E3000 mezcladora digital de audio.

En esta sala contamos con un proceso digitalizador con posibilidad de más de 100 generaciones con disolvencias y efectos, con patrones lineales y geométricos. El audio es completamente digital y dispone de dos canales de efectos digitales con una gran variedad de opciones.

MANIPULAR LA IMAGEN

Además, la reciente adaptación de Sparkle (BKDM-5050) de Sony al DME-5000 ha incrementado el potencial de manipulación de imagen, con efectos sumamente poderosos y

La suite digital D-1
cuenta con el equipo necesario para realizar sus post-producciones en video con la máxima calidad y rapidez.

no muy comunes en otros equipos.

La suite digital D-1 cuenta con el equipo necesario para realizar sus post-producciones en video con la máxima calidad y rapidez.

En este caso podemos mencionar el "switcher" (conmutador) digital Sony DVS-8000 que cuenta con dos "frame store" (almacenamiento de cuadro) con capacidad de memoria de cuatro cuadros de imagen y que pueden ser fácilmente utilizados para la creación de efectos y capas múltiples independientemente de las otras funciones del switcher.

También contamos con la ayuda de dos generadores de "backgrounds" (fondos) para la creación de colores y texturas, muy prácticos para la composición de imágenes, ya sea utilizando los bancos de mezcla y efectos M/E y las funciones de "normal mix," (mezcla normal) "non-additive mix," (mezcla no-aditiva) "super mix" y "wipes" (comutación de la imagen).

En este último también son tres los generadores de efectos que nos facilitan la creación de patrones de wipes no importando la forma, ya sea lineal, curva o geométrica, como fue el caso de un comercial que producimos en nuestras instalaciones y cuyo nombre es "QUESITO PETIT QUIK". Este servicio llevaba animación gráfica (un conejo moviéndose sobre la pantalla). Este cone-

jo se movía muy rápidamente y además llevaba luces, brillo y sombras. En esta ocasión los "mates" no estaban del tamaño correcto y estaban incompletos. Hubo que ayudarles con dos wipes para dar la forma correcta: una vez logrado, se grabaron en el frame store (cuadro por cuadro), con lo cual se realizó el trabajo.

PRODUCTO FINAL

Al lograr ésto, se introdujeron las luces y el brillo a través de una clave externa, finalizando con un sombreado de las figuras del conejo. Al final nos dimos cuenta que el proceso tomó

poco tiempo y que el cliente estaba a gusto con el resultado del mismo, así como también del potencial que el switcher había mostrado.

Cabe mencionar otra función muy importante que tenemos en el switcher — el "chroma key," (clave de cromas) que por su naturaleza de video digital por componentes, da una gran calidad y transparencia poco común en los switchers tradicionales. Como experiencia de este logro tenemos la nueva imagen de presentación del Canal 13, en donde se hicieron puros "composites" (compuestos — un fondo y un locutor a cuadro).

Recuerde que la suite digital D-1 presenta

un nuevo planeamiento para alcanzar la excelencia en post-producción, resultando en el uso óptimo de los recursos y una calidad de imagen superior. ■

Nota del director: El Ingeniero Antonio Bautista ocupa el cargo de director técnico del centro de post-producción Video Omega, ubicado en la Ciudad de México. El Ingeniero Bautista cuenta con muchos años de experiencia en el campo de la post-producción en México.

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

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USER REPORT

The Mill Goes Digital with Alpha

by Roy Trosh

Chief Engineer
The Mill

LONDON

The Mill opened in London four years ago at a time when digital video was still in its infancy. We were the only all-digital facility in London and one of only a handful in the entire world.

With that perspective, we have often found ourselves exploring new territory ahead of other facilities.

Routing switchers do not usually get much

attention in the trade press because they are not as glamorous as other products, like mixers, editors, effects machines, etc. However, the advent of digital video produced new problems in routing, as well as new possibilities.

A ROUTER WITH HEART

The Mill has two Harry suites, three Abekas A84 suites and one Sony System G suite with an Alpha Image Alphie switcher. In installing a routing system, our idea was to have a single central system so as not to end up with separate machine rooms for each edit suite. Our requirement called for a router

that would literally be the heart of the entire facility, with video from any source going to any destination through the central router.

Alpha Image's 128x128 DYN 128 is the only solution available that I feel can do the job.

With the number of routing switchers available today from so many manufacturers, it is important to make sure that you are getting what you need and also getting all you can for your money. Most facilities today have a house router with a series of smaller routers working in conjunction with it. The traditional facility would have a router for source

selection for each mixer, as well as separate routers for preview switching.

However, these multiple matrices are not only unnecessary, they are expensive and inflexible. With the DYN 128 you can get rid of all of that because the house router acts as the source selector for mixers and does all the preview switching.

To do this, of course, the routing switcher has to be able to switch in real time, and Alpha's routers are the only ones available with the RealTime Switch feature. All commands are processed so that any crosspoint (or group of crosspoints — there is no limit) is switched within one field.

ANALOG FRIENDLY

Another major consideration in a serial digital matrix is the ability of the system to be controlled as part of an existing analog audio and video matrix installation. Alpha Image has designed the DYN series to integrate with most other manufacturers' control systems, and this protects investments in existing matrices and does not interfere with any expansion needs in either analog or digital routers.

The control system of The Mill's Utah Scientific analog routers can control the DYN 128 as easily as can Abekas' Linc interface and Alpha's own Alphie interface. With Alpha's MCI multiplexing and mapping device, up to four controllers can control the routing switcher at the same time.

One of the things that makes all these features possible is Virtual Crosspoint technology. Virtual crosspoints allow the router to make connections between router partitions without having to patch between actual input and output connections. This allows me to map the output from the preview switcher partition to the input of the house router partition without making a physical coaxial connection. The result is that I save one input BNC and one output BNC per virtual crosspoint.

The virtual crosspoints are in addition to the standard crosspoints of the router. In our 128x128 router, for example, we have an additional 64 virtual crosspoints.

RANGE OF FORMATS

The DYN 128 handles all current formats of digital video — D-1, D-2 PAL, D-2 NTSC, D-3 PAL and D-3 NTSC. Now, Alpha says they even have a special upgrade kit for anyone who needs to go to 4:4:4, which is helpful to us because our URSA Gold telecine suite is already working in 4:4:4.

The DYN 128 is based on 12RU building blocks interconnected with lengths of high-density screened ribbon cables. A single rack will provide a 64x64 matrix and a two-rack system, like that at The Mill, will provide 128x128. In theory, additional racks can be added indefinitely to attain any desired matrix.

For us, the DYN 128 is the only choice. It is the only digital router that offers real time switching, and it is the only one that can handle source selection from mixers and do the routing for preview switching while still doing all the work of the house router.

Top that off with the most flexible control system imaginable and you have a routing system that is truly outstanding. ■

Editor's note: Roy Trosh received a degree in electronics from Brighton Polytechnic in 1983. He joined The Mill in 1990 after spending seven years at CAL Videographics.

The opinions expressed above are the author's alone. For further information on the DYN 128 router, contact Mike Andrews at Alpha Image (Telephone: +44-635-521-939; FAX: +44-635-528-387), or circle Reader Service 123.

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U S E R R E P O R T

Louth Brings PC-Control to Telepiù

by Mauro Cassanmagnago

Director of Engineering
Telepiù

MILAN, ITALY

Telepiù is Italy's first subscription-based terrestrial broadcaster. Transmitting since 1990 from a new center just outside Milan, it has recently introduced the first phase of a presentation automation program based on the Louth ADC-100 system.

Telepiù currently broadcasts three channels: a 24-hour-a-day movie channel, a sports channel utilizing numerous live feeds, and an arts and education channel.

AUTOMATION INTENTIONS

It was always the intention that, wherever possible, Telepiù should introduce automation systems to reduce operating costs without sacrificing quality. However, at the time of the station's original construction (1990), there were no proven presentation automation systems that met our requirements.

The station has standardized on the Betacam SP format, and has two Sony LMS 500s for both program material and commercials. Initially, they were controlled by Sony's standard 1100 series software, and it was important that any wider automation system should keep that functionality.

Operational staff also became accustomed to the Sony user interface. To minimize retraining, it was important that there should be no major changes in this area either.

Being a modern station, Telepiù makes extensive use of PCs, which we feel are a low-maintenance risk. Generally, our PCs can be repaired by in-house engineers, rather than outside specialists who are called in when necessary, resulting in extended downtime.

And with Telepiù's plans for the future, it was important that the system should be capable of extended growth.

The requirements of the automation system, then, were that it should run on standard PCs, have a flexible user interface, be capable of operating three channels of programming and commercials from two LMSs, support internal, external and shadowed (simultaneous internal and external) pre-compilation of commercial breaks as demanded by schedules, and have an architecture that allows it to support a wide range of devices.

LOVE AT FIRST SIGHT

We first saw the Louth ADC-100 system at the 1992 NAB exhibition and decided that it met many of our needs. It is based exclusively on PCs using NetLAN for communications.

Perhaps more importantly, its object-oriented software architecture makes the addition of devices and interfaces a simple matter.

At the same time, it was recognized that Louth had designed the system specifically to meet the needs of the company's home market, North America, and that some customization would be needed to match it to the specific needs of Telepiù.

Fortunately, Logica, Louth's European representative, was able to help us. As well as providing installation and integration, Logica acted as consultants to the new system's implementation. This consultancy included recommending to Louth new capabilities and modifications to existing software.

The initial installation of the ADC-100 was in the autumn of 1992. Over a period of six

months, a detailed requirements list was developed and the required software changes made. The system is now on the air.

In the first phase of the implementation, VTRs and routing were automated. Each of the three channels has a presentation suite containing four BVW-75 SP VTRs. Meanwhile, our two LMS units are used with all three channels; one is allocated to channels one and three, and the other is dedicated to channel two, the sports channel, where coverage of live events makes it less predictable. Presentation material will shortly move to video disk.

Also important to our system is audio routing. Telepiù transmits dual channel audio, which, for Hollywood movies, allows the original soundtrack to be placed on one channel and the dub on the other. For some sporting events, one channel transmits effects without commentary, allowing the viewer to check if the commentator really does add anything to the experience.

Although the ADC-100 system is capable of doing so, we have decided not to automate our Grass Valley Group Master 21 presentation mixers at this time. Being a subscription service, the quality of output is particularly critical to Telepiù, and the presentation controller in the suite serves as a final check. Manual control of the output mixer allows

current play and compile lists) if a tape is replaced. There is a constant monitoring of output quality, and material that falls below the technical threshold can be replaced simply.

In each presentation suite, there is also a workstation. This allows rapid reordering of events up to the last minute, with fully automatic schedule verification. Only instructions that can be followed within the time available, given the currently allocated resources, are accepted.

CLIENTS AND SERVERS

The ADC-100 is configured as a client-server network. This, and the use of object-oriented programming, makes the system very flexible, allowing simple expansion and extension to cover other devices.

It also allows a large amount of customization in the user interface. Screen layouts and colors, for instance, can be modified on site by the user, without requiring access to the operational software.

The workstations and servers at Telepiù are all standard 486 PCs, which makes the entire installation simple and cost-effective. In some cases, the PCs are needed for automation operations only part of the time, and the system allows them to be freed up for other operations.

The ADC-100 is configured

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system very flexible...

the operator to make doubly sure of the quality of the on-air product.

As implemented at Telepiù, the ADC-100 supports seven concurrent playlists. Currently, five are normally used: one for each of the three channels, plus emergency alternatives for the movie and sports channels. In addition, the system generates compilation lists to ensure that all commercial breaks are securely prepared in plenty of time.

The system allows resources to be reassigned where necessary. For instance, internal VTRs can be allocated to outputs. To achieve this, and for the necessary real-time control, Sony user software is bypassed and the automation system controls the LMS at the VCC level.

Data from the scheduling and sales computers is automatically requested and merged by the system. The final schedules are then checked in the presentation preparation area, or assemblaggio.

Each channel in assemblaggio has its own workstation that gives clear indications of any overruns or underruns between fixed events.

Also in assemblaggio is the bar-coding workstation. Here, new tapes are checked, entered into the system's library and bar-coded for use in the LMS. The system also includes the ability to record live events directly into the LMS.

The system is a powerful resource. It allows our entire presentation operation — transmission control, library and administration — to be run by only 20 people.

The successful installation of the ADC-100 at Telepiù is just the first phase of the program to introduce automation throughout the station, where it can be cost effective without risk to the quality of the output. There are already plans to extend it to cover the Utah Scientific routers employed in the center, as well as the graphics devices and our Irdeto scrambling system.

EYES ON THE FUTURE

Plans for the future include implementation of pay-per-view service for premium events (perhaps including major sporting exclusives or first-run movies) and parental control switches for the movie channel. These facilities would be controlled directly from the station automation system.

The Milan center includes two studios. One, currently being refurbished to accommodate an audience of 150, is used largely for sports discussion programs. The second is used for news and sports presentation.

The news studio is already fitted with Rademec-EPO automated camera pedestals and a Strand Galaxy lighting controller. This allows up to eight lighting presets to be defined and recalled from a simple control panel. These, too, could be integrated into the ADC-100.

A common requirement at Telepiù is the coverage of live sporting or late-breaking news events, where the sound is received

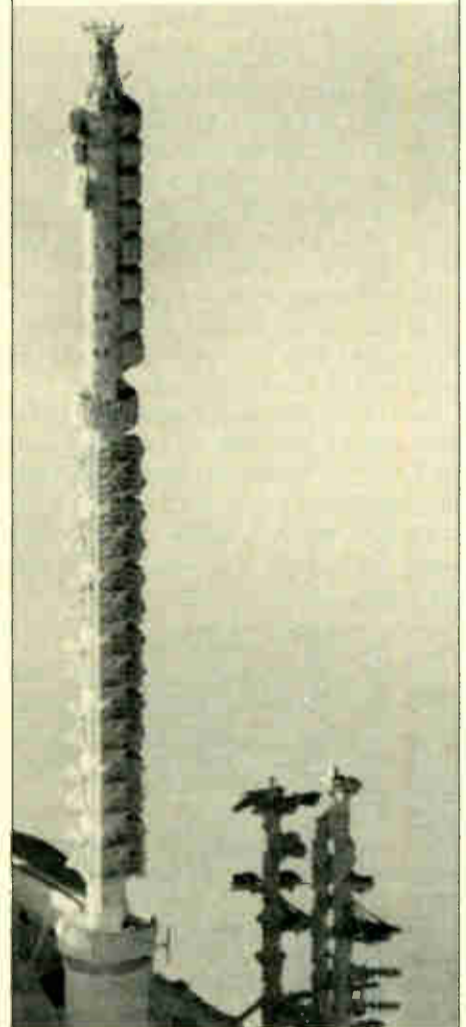
with the pictures by satellite and the commentary (or part of it) is added in a booth at the studio. The same presenter could also top and tail the program from the news studio.

With products like ADC-100 using a solid, cost effective PC platform, it is possible to remove from television transmission much of the mundane labor, the machine minding. Skilled and creative staff can concentrate on making better programs, while the new multiplicity of channels can benefit from true operational efficiencies. ■

Editors note: Mauro Cassanmagnago is the director of engineering at Telepiù.

The opinions expressed above are the author's alone. For further information, contact at Louth (Telephone: +1-415-329-9498; FAX: +1-415-329-9530), or circle Reader Service 107.

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USER REPORT

Grampian Looks to the Future with Pesa

by Iain MacDonald
**Technical Manager
 Grampian Television**

ABERDEEN, SCOTLAND

Grampian Tele-vision is part of the Independent Television Network (ITV) serving a population of 1.1 million in northern Scotland.

Our main studio complex is in Aberdeen and we have two small remote studios in Dundee and Inverness and a third larger remote studio in Stornoway, Isle of Lewis. The Aberdeen studio originates all the program transmission and commercial playouts. It also has two smaller studios, one dedicated to news and current affairs, the other to production.

A NEW HEART

The Pesa RM5000 routing system was purchased as the heart of a £3.5 million refurbishment of the Aberdeen studios. Its main attraction for us was the flexibility it offered at a competitive price.

At the time of the purchase, consideration was being given to future trends in television, particularly widescreen and HDTV. This led to the decision that our news and production studios would work in analog component (Y, Pb, Pr) through a high band router. The Pesa is 100 MHz and can encode whatever the final transmission format turns out to be.

The presentation and transmission areas operate in PAL and will continue to work in either PAL or PAL Plus for some time yet, so there was a need for a composite router as well.

Both of the Aberdeen studios have common sources. The main network incoming feed, Net 1, is handled in composite through the presentation mixer, while a comb filter component version is handled by the studio mixer. Stereo audio is common to both, and we wanted a router that allows the audio to follow the composite and the component video. The Pesa unit allows this.

We use seven levels of routing. Level One is component video with three 48x32 frames ganged together, one frame each for Y, Pb and Pr. Level Two is PAL composite video in a 48x32 matrix.

Level Three is a 70x52 stereo audio matrix configured from a 96x72 left and a 96x64 right matrix, with the remaining capacity being used for other purposes. The left and right are switched as Level Three, which means the channels cannot be split. However, this has not caused any operational difficulties.

Level Four is a 26x20 time code matrix that utilizes the spare capacity of the left audio frame. Inputs 71 to 96 are combined with outputs 53 to 72 of the left audio frame to form an independently assignable matrix. Inputs 1 to 48 are not needed for these outputs, and since the matrix cards are 48x8, the matrix card for inputs 1 to 48 can be omitted, saving costs. Outputs 49 to 52 have been chosen so that they only require inputs from 49 to 70, so there is no problem in omitting these cards. This ability to sector the matrix is one of the router's strengths.

Level Five is a 26x12 matrix using the spare capacity of the right audio frame for routing a

descriptive audio channel for the blind.

Level Six is a 20x9 key matrix configured from a 32x16 PAL matrix, while Level Seven is a small 12x7 video matrix dedicated to an edit suite using the spare capacity in the key frame.

RANGE OF CONTROLS

Pesa offers a range of control panels, some new for this system and some from the compatible 6600 system. We chose a mixture of panels, although the 6600 panels have some limitations.

The main panel used is the alphanumeric Model II. This panel only allows control of Levels One to Four, but it displays the four levels simultaneously, which is useful when breaking away different levels.

For our master control desk, we use the 10/20 Bus Alphanumeric, which is a variation of the Alphanumeric II. It allows the status of 10 buses to be seen at a glance and is excellent for master control.

KEY SHARING

These panels a drawback in that the keypad has letters and numbers sharing keys (I and A are the same, for example). The system cannot distinguish between VTR 1 and VTR A, which can cause limitations on the mnemonics used.

The system has worked very well since it was installed, and the support from Pesa has been excellent. They have listened to all our problems and have come back with solutions.

In our overall refurbishment project, we have been dealing with a number of major manufacturers, and Pesa has come out on top as far as response and backup are concerned. ■

Editor's note: Iain MacDonald has been with Grampian Television for 16 years.

The opinions expressed above are the author's alone. For further information on the RM5000, contact Ronald Curtis at Pesa U.K. (Telephone: +44-223-242-642; FAX: +44-223-410-007), or circle Reader Service 8.

USER REPORT

TV3 Puts Grass Valley On the Air

by Paul West
**Broadcast Supervisor
 TV3**

AUKLAND, NEW ZEALAND

TV3 is New Zealand's first private broadcaster, having gone on the air in November 1989.

We are a small, lean company expanding in a fairly small and static market. The total population of New Zealand is only about 3.3 million people, with approximately 1 million living in the greater Auckland area.

Our production is generally limited to daily news and current affairs, as well as weekly sports and information programs, which air live from our production control room. Other local programs are commissioned from outside broadcast companies.

The TV3 transmission suite (master control room) is a self-contained, one-person operation staffed by a transmission coordinator who is responsible for the operation of the suite and for monitoring its output. The equipment in this room includes a Grass Valley Group Master 21 switcher and Event Stacker semi-automation system, as well as two Sony D-2 VTRs for program playback and an Odetics cart machine for commercials and station promos.

ON-AIR SWITCHING

The Master 21 was chosen because it has the necessary functions for an on-air operation in a switching panel that can be operated by one person. It has 16 "married" inputs (video and audio), four key inputs and four audio over or breakaway inputs.

The TV3 Master 21 includes a Grass Valley Horizon router expansion switcher, which gives the master control room operator access to any of 128 sources at the station through the last of eight married inputs. Should our production control room ever fail, it is possible to take a studio camera and microphone as a split feed through one input on the Horizon direct to air through the Master 21.

The Master 21 itself can also split the video and audio from different inputs, and it also has the capacity to roll back-up VTRs.

The unit also provides a choice between five transition types and three transition speeds. These are pre-set during the system configuration.

The Event Stacker computer operates the Master 21 in auto mode most of the time by providing a list of events, five of which are stored in a buffer in the Master 21. As each event steps up to the program row, another event is loaded into the buffer. Each event airs either at the time it is programmed into the Event Stacker or after the pre-roll/transition button is pressed by the operator.

Each day, the event list for the day's transmission is loaded into the Event Stacker from a floppy disk. But before it is put to air, each of the durations and transitions in the list is reviewed so that the list airs without interruption.

Every program and commercial break is checked against a hard copy of the log and a decision is made about which transition is best for each situation. This allows the operator freedom to concentrate on loading and queuing the program VTRs, which is done manually, and monitoring the output of the suite.

In the TV3 application, late changes to the Event Stacker list are sometimes required and, if these are made while the event being edited is in the five-event buffer, the Master 21 can become confused about what it has been programmed to do. However, the buffer can be refreshed by taking the Master 21 out of, and then back into, auto mode, and operational problems only really occur when this has not been done.

MIX MATCHES

The only real fault with the Master 21 occurred when the system was installed: it would not do a proper audio mix, which TV3 uses to transition from a station ID to each program. The switcher would cut the ID audio off and fade the program audio up, which meant that transitions were not smooth in some cases.

However, several years ago, an operator discovered that patching the program VTR audio into an unused audio breakaway input made it possible to leave the ID audio (which ended naturally) on line and to add the program audio with a cut (as an over). This simulates an audio mix, allowing the first frames of the program to be aired cleanly.

Generally, the Master 21 has proven to be ideal for a one-person operation and has, along with the Odetics cart machine, allowed TV3 to structure the transmission suite in such a way that it is practical for one person to operate all the systems comfortably. ■

Editor's note: Paul West has worked in television for more than 13 years.

For further information on the Master 21, contact your nearest Grass Valley Group representative, or circle Reader Service 129.

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Panasonic AG-450, \$750. B Soneira, Creative Media Prod, 522 Ridge Rd, Annapolis MD 21401. 410-787-7112.

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NEC FS-15 DVE fully programmable, compression, expansion, frame sync/TBC, too many features to list, \$3000. G Larson, Advanced Media, HCR 31 Box 215, Sandy Valley NV 89019. 702-264-7065.

Video F/X non-linear video edit suite, Macintosh based, NTSC, \$7000. Phone or FAX 011-46-40-977578.

CEL Digital Effects system: MS304 (Maurice EFX-IV) incl, P152 touch screen controller, P148/3 SEG mixer/combiner, (2) P147-30 TBC/frame store synchronizers, all cables for hook up & power cords, \$3500/BO. Dunbar Video Prod, 313-634-8686.

LIGHTING

(Want to Sell)

Lowel TOTA (3) lights w/stands, gd cond, \$70/ea. B Soneira, Creative Media Prod, 522 Ridge Rd, Annapolis MD 21401. 410-787-7112.

Fairlight Computer video instrument, Rev 7, digital F/X, chromakey, paint box w/pad, CG w/keyboard, \$3200. Bob, 212-535-6126.

Pinnacle 2120 2-D composite DVE w/freeze file, new 2.03 software, cntrl panel, mint cond, \$11K. D Newman, KDN Videoworks, 313-546-3385.

DSC Eclipse DVE, \$9000. G Nelson, Maverick Prod, 4235 Centergate, San Antonio TX 78217. 512-655-1111.

EDITING EQUIPMENT

(Want to Sell)

JVC 3/4" toploader edit syst, 2 CR8500LU rcdrs w/RM85U cntrlr, just serviced, excel cond, \$995. 502-473-0406.

3/4" Time Code Edit Pkg, well maintained, BVU-820, 800, TBC, GVG-100, CMX, Quanta CG, complete audio, R-R, CD, cas, spkr, 8x4 brd, BO. 609-753-0142.

Panasonic NV-9240, NV-9600, NVA-500 3/4" edit syst w/2 CT-110MA 10" color monitors, excel cond, all cables incl, service manuals, belts, drive hubs, & pinch rollers just installed, \$3900/BO. Watermark Video, 813-530-0354.

Panasonic AG 7750 (2) AG7650 w/time-code, TBC, rackmounts, AG A800 multi-event editing cntrlr, AG SW800 audio/video switcher complete A/B-roll YC edit system, \$19000. C Bell, 800-922-2402.

Sony BVE-500A editing cntrlr, will trade for audio/video equip; Panasonic AG-A95 editing cntrlr. B Barrett, Barrett Audio/Video, 330 Blue Heron Ln, Missoula MT 59801. 406-542-2563.

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

Sony BVU-110 port 3/4" timecode gen w/Porta-Brace, XLR audio input/output, just serviced, \$875/BO; Sony BVE-500 3/4" edit cntrlr (3), works w/Sony BVU-200 decks, manuals & I/F cables, still in box \$100/BO. G Phipps, 164 E Eureka St, Lima OH 45804. 419-224-2472.

Panasonic AG-A770 multi-event edit controller, like new, 9 pin serial 128 multi event audio split editing, \$1500. Ahmad, A-Z Enterprises, 1370 E Bellline Rd, Richardson TX 75081. 214-234-8684.

CMX 3500 editor, \$8000; CMX 340 editor, \$1000; Datatron Tempo 76 editor, \$800. G Nelson, Maverick Prod, 4235 Centergate, San Antonio TX 78217. 512-655-1111.

Sony Editing System; VO-2650/2800 U-Matics with CAESAR edit cntrlr: low mileage, I'll pay the freight, \$1250. Joe, 608-838-9533.

Alpha Audio Boss II editor/synchronizer, incl 2 Lynx Timeline synchronizers, inline reader & interface cables. Los Angeles CA, 310-372-4329 or 818-763-2461.

Eico editor A/B roll time code, good for type 5 Sony & JVC, BO. BRT Audio Video, 505 NW 65th Ste 200, Ft Lauderdale FL 33309. 305-771-9003.

ICM 2000P video proc amp, color corrector w/fade to black, \$475. B Hines, IPS Inc, RD1 Box 413A, Export PA 15632. 412-468-4115.

SWITCHERS

(Want to Sell)

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.

MOVIE PRODUCTION EQUIPMENT

(Want to Sell)

Kodak Carousel projector w/RF wireless remote control units; AMX MX-40A receiver/MX-40AT hand held xmtr; controls power, forward, reverse, focus & TX-12 12-channel hand held RF wireless xmtr controls multiple MX-40 receivers, all included, like new, BO. MRG Prod Assoc, 516-447-1041.

Large movie screen, 20' wide, \$500. Dan, 617-630-0007.

Arri 16BL, gov motor, 9.5-95mm Angenieux, offset finder, magnetic SOF module & Bach Auricon mixer, (4) 400' magazines, filters, shade, ATA case, \$3500. J Bailey, 813-823-1257.

Cinemonta 6 plate flatbed edit mach for 16mm film, 2 pix & 1 sound, or 1 pix & 2 sound, \$4000. L Ponzek, Cypress Queen Rcrdg Studio, 1019 New Market St, Philadelphia PA 19123. 215-934-6414.

Magnasync Moviola 16mm edge track system rcrdr & 3 dubbbers, \$12K; Moviola JR film sys w/combined viewer & 3 gang synchronizer w/motor & amp/ speaker, \$2500. A Baker, BPA Inc, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

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SIGNAL PROCESSING

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

Videotek VSG-200 house sync gen, BO. BRT Audio Video, 505 NW 65th Ct Ste 200, Ft Lauderdale, FL 33309. 305-771-9003.

Pixes A/B roll TBC/switcher, BO BRT Audio Video, 505 NW 65th Ste 200, Ft Lauderdale FL 33309. 305-771-9003.

Sigma TSG-375A sync/test gen, source ID, count down, tone, 24 patterns, \$1400/BO; Sigma 500 DA tray & PS, 5 video DA, 2 audio DA, \$900/BO. Terry, 916-362-3964.

Video DA tray with 8 RCA TA-33 DAs/tray, fits 3 rack spaced, used, clean, BO. MRG Prod Assoc, 516-447-1041.

SWITCHERS

(Want to Sell)

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.

Panasonic WJ MX-10 AV switcher in vgc, \$750. B Soneira, Creative Media Prod, 522 Ridge Rd, Annapolis MD 21401. 410-787-7112.

Ampex 4000 switcher, \$4000. G Nelson, Maverick Productions, 4235 Centergate, San Antonio, TX 78217. 512-655-1111.

JVC KM-1200, AC/DC, DSK, good condition, \$1000/BO. Terry, 916-362-3964.

GVG 1600-A video prod switcher, 10 input, 1 full M/E & program/preset M/E, key, lumin & DS keyer, 32 position/wipes, boarders & modulation, all manuals, 10' & 35' I/F cable set, color BG generator, works great for mobile or small post suite, \$2250/Best Offer. G Phipps, 164 E Eureka St, Lima OH 45804. 419-224-2472.

Hedco TWS-200 router switcher 12x2 with internal DA providing 4 outputs for each 2 output channels, 19" x 1 RU, controlled by thumb wheel switch, new, \$450; TSI 3 channel audio monitor/amp panel, each channel has own monitor level controls, 3 full range LED level meters, line mic & aux balanced inputs & can drive external speakers with internal stereo speakers & front panel & remote mutes, used for 1" VTR audio monitoring, (4) available, \$300/each or Best Offer. MRG Productions 516-447-1041.

Grass Valley 1600 1X with Emem, \$6000; ISC/GVG universal switcher interface, \$300; Lenco vertical interval 12 input routing switcher with remote, \$300. Otterson TV, 212-695-7417.

Panasonic WJMX-12 digital mixer, excellent condition, sale for \$1000/or trade towards Panasonic AG7400 S-VHS port deck. Sutherland Video, 407-567-0600.

Echo Lab switcher with quad split/Grass interface, memory expansion, Best Offer; Sony SEG 2000 switcher, Best Offer. BRT Audio Video, 505 NW 65th Ct Ste 200, Ft Lauderdale FL 33309. 305-771-9003.

Echo Labs SE-2 special FX generator, \$900. Charlie, 813-535-5622 x68.

Alta Pyxis E video switcher, dual channel frame store/built-in TBC's with effects, 9 wipe patterns, dissolve, variable speeds, GPI, 3 digital effects, posterization, frame & field freeze, audio fade, good condition, 2 years old, \$3000/Best Offer. Andy/John, JL Video Prod, 8660 George F Highway, Endwell NY 13760.

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

TRANSMITTERS/EXCITERS

(Want to Sell)

RCA TTU-1B several older RCA TTU-1B transmitters, parts or as on-air, all came off air in major markets a few years ago, cheap, must sell, Best Offer. N Davis, TV24, POB 5180, Delunak Springs FL 32433. 904-892-4038.

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JVC KY-2000 (2) cameras & Hitachi SK-90. K O'Malley, WTKR, 804-446-1328.

Sony BVP-330 w/Fujinon A14x9.5 lens, many extras, vgc, \$1200 + shpg. Maya, Maya Sound, 1089 Curtis St, Albany CA 94706. 510-526-6090.

Ikegami ITC-350 3-tube camera w/lens & AC pwr sply, works OK, \$400. C Zell, WETM-TV, One Broadcast Center, Elmira NY 14901. 607-733-5518.

Sharp 3-tube color camera with Fujinon A12x9B with 2X & Anton Bauer AC power supply, great shape, \$900. G Hultman, Hultman Media Serv, 300 Limp Creek Rd, Grants Pass OR 97527. 503-474-6466.

Panasonic 5100 chip camera, \$900; JVC BY110, RS 110 camera & CCU, \$750; JVC 4900 3/4" port w/time code, \$500. M McGinn, Video Network, 166 Dayton St, Danvers MA 01923. 508-777-8004.

Panasonic DM7010 Mill dock syst, WV700 head, (3) 2/3" CCD, 750 lines, 62 dB S/N, digital processing, new-full warranty, \$12K. 607-687-0545.

CAMERA ACCESSORIES

(Want to Sell)

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

Sony RMM-1800 CCU rack mount kits (2) can hold CMA-7, DXF-40, CCU-1800 or other CCU, brand new, \$130/ea shpd; camera to CCU multi-core camera cable 2-200" lengths for Sony cameras & CCUs; VU-1 80C", new, BO. MRG Prod Assoc, 516-447-1041.

O'Connor fluid head, mdl 100 w/case & legs, \$1600; Sony TCD-D10 port DAT rcrdr w/ECM959 mic & 10 tapes, never used, \$1950. Newsreel Service, 212-243-5950.

TEMMEER VIDEO SPECIALS

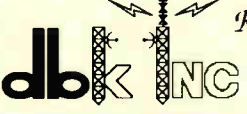
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RM-P200 (2) camera cntrl units w/cables, brand new, never used, \$3000. Jeff, Cinecan, Sudbury Ontario CANADA, 705-525-1801.

Sony EVV 9000 Hi-8 back for 325 or 327 camera, BO. BRT Audio Video, 505 NW 65th Ste 200, Ft Lauderdale FL 33309. 305-771-9003.



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TV FILM EQUIPMENT

(Want to Sell)

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

Adam-Smith 2600 TC generator/character insert/VITC reader/power supply with frame, BO. BRT Audio Video, 505 NW 65th Ste 200, Ft Lauderdale FL 33309. 305-771-9003.

BEI Marque 2000 character generator, \$2000; Knox character generator, \$100; Laird character generator, \$3000. G Nelson, Maverick Prod, 4235 Centergate, San Antonio TX 78217. 512-655-1111.

Panasonic MX-12 A/V mixer, mint, w/WV-KB12A char gen, \$1200. B Kidd, VPI, 510 W Second, Rayville LA 71269. 318-728-4574.

Chyron VP-1 (2), \$500; Chyron VP-2 no keybrd/disc drive, \$300; Shintron 641 port TC gen w/UB, \$500; Miller fluid head tripod, wooden legs, \$500/BO. Otterson TV, 212-695-7417.

VCR/VTRS/RECORDING MEDIA

(Want to Sell)

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

Sony ED Beta complete pkg incl (2) EDV-9500 rcdrs & EDC-55 2-chip camcorder, 2X batts chgr, hard case, rain jacket, tripod plate, very little use, \$6500. Tony, 813-549-9181.

Sony RM-580 B-roll, edit cntrlr for RM-440, excel cond, \$395; JVC BR-7000UR VHS duplicators in gd cond, \$295/ea. B Soneira, Creative Media Prod, 522 Ridge Rd, Annapolis MD 21401. 410-787-7112.

NEC 3/4" U-matic time lapse VCR, \$350. J Baltar, Maine Reel Video, 67 Green St, Augusta ME 04330.

Sony BVH 1100 1" editor w/DT + 2 hr Merlin conversion, TBC 2000 incl, excel cond, \$15K; Sony BVH500A 1" port w/color PB & pwr sply, excel cond, \$4500. E Stevens, 81 Lancaster Ave, Malvern PA 19355. 215-889-9676.

Sony VP 2000, good condition, \$300; Panasonic 9100, good condition, \$300; Sony BVV-75, good condition, \$23K. Gordon, Magnolia Video, 904-681-6677.

Sony VO 6800 3/4" U-Matic port video recorder with stock case & manual, 500 hours on head, \$1375/Best Offer. Dunbar Video Prod, 313-634-8686.

JVC CR-850U 3/4" U-matic, \$2300; JVC 8250U 3/4" U-matic with remote, \$1700/Best Offer; Ampex VPR-80 1" with TBC 6, including vertical rack, low hours, \$19K. Los Angeles CA, 310-372-4329 or 818-763-2461.

JVC BR6400U source deck, great shape, \$875. B Hines, IPS Inc, RD1 Box 413A, Export PA 15632. 412-468-4115.

JVC HR-S10U port VHS recorder with companion tuner/timer unit, \$300. R Streicher, 818-359-9012.

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Sony VP 7020 3/4" PB deck, Best Offer. BRT Audio Video, 505 NW 65th Ste 200, Ft Lauderdale FL 33309. 305-771-9003.

Sony BVU-110 3/4" port with time code & Porta-Brace case, low hours, like new, new case & manuals, \$1200/Best Offer; Sony BVU-150sp 3/4" SP with case, low hours, excellent condition, \$2100/Best Offer. MRG Prod Assoc, 516-447-1041.

Sony 8800 SP-TC, excellent condition, \$2500; Sony VP 7020, rack mount, excellent condition, \$1300; Sony VP 5000 with balanced audio, sync & SC inputs, rack mount, excellent condition, \$800; Panasonic AG 6300, \$750; Panasonic AG 6200, \$600. Jack, 612-429-5958.

Sony BVU-110 & case, \$400. K O'Malley, WTKR, 804-446-1328.

JVC CR-4400 port 3/4" recorder, AP power supply included, works, \$100/BO. G Phipps, 164 E Eureka St, Lima OH 45804. 419-224-2472.

BTS BCB-50 Betacam-SP port VTR, less than 50 hours recording time, including Porta-Brace case & service manual, excellent condition, \$12900/Best Offer. T Jeans, Prism Video, Rapid City SD. 605-399-9391.

Panasonic AG7500-A S-VHS editing deck, low hours, \$3500; IFP-45 interface 34/33 pin with cables for Sony RM450, \$500. B Petit, Petit Productions, 9 Talamora Trail, Brockport NY 14420. 716-637-7583.

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Sony 5850 3/4" machine, nice & clean, BO. J Kesler, WOBZ-TV, POB 220, Livingston KY. 606-843-2209.

Pioneer VDR-V1000 rewritable videodisc rcdr w/1 Laserdisc, 32 min component rcg time, mint cond, \$23K/BO. 808-875-8871.

IBTS Exhibition Highlights Italian Export Strength

by Alan Carter

MILAN, ITALY

The Italian broadcast market may be sluggish, but manufacturers here are aggressively exporting products and offering a variety of television gear that is very price competitive.

The 1993 International Audio, Video, Broadcasting and Telecommunications Show (IBTS) held in October in the suburbs of Milan provided evidence to the state of the industry in Italy.

Manufacturers were out in full force promoting their latest developments. However, there was little, if any, hesitation to have the IBTS organizers change the show from an annual to biennial trade fair. The next exhibit will be in 1995.

And on the floor, exhibitors gladly promoted the success of their businesses on the international market.

Linear highlighted a new 1 kW VHF solid state transmitter designed mainly for the South American market. The unit, FCC type accepted, has a video and audio splitter.

IRTE exhibited a variety of antenna and satellite systems. The product line includes UHF TV broadband antennas, radio relay systems, parabolic and cassegrain antennas, power splitters and automatic switching systems.

Advanced Broadcasting Electronics (ABE) promoted the "L" series of solid-state amplifiers designed for use as linear power amps in small and medium-sized TV stations, or as tube drivers in larger systems.

Aquila Broadcasting Sets (ABS) highlighted a new 1 kW solid-state UHF TV transmitter designed for operation in all standards and multisound systems.

Elca also showed a range of equipment including logo and character generators, and video and audio multilevel matrix units.

Teko Telecom is promoting a fiber optic system that interfaces directly with the point-to-point connections made by terrestrial or satellite links that complete the contribution network.

Itelco and its sister company Dolp marketed their full line of gear, both promoting efforts outside of Italy in Portugal and Russia.

Tecnologie Eletttroniche Milanese (TEM) exhibited a new TV amplifier in powers of 30, 60 and 100 W.

Aldena, expressing an interest in the Far East market, referred exhibitors to antenna systems and radio links for low-power broadcasting.

With a focus on South America and the Mediterranean, Ponti Radio highlighted a new line of 1 and 5 kW TV transmitters.

Elman exhibited a new video mixer with a variety of fade options and eight inputs.

Eletttronica exhibited a line of transmitting equipment ranging from antennas, to link and amplifiers. Other companies exhibiting TV gear included DB Eletttronica that offers amplifiers, transmitters, modulators and directional panel antennas.

Elit also promoted modulators, upconverters, power amplifiers, transposers, relay receivers and precision offset oscillators.

Suono Telecom had a range of video links, measurement converters, fiber optics systems and multiplexers.

Siel showed a new automatic change-over system that allows two TV transmitters to function as a hot or cold standby system.

CTE also promoted a full line of equipment that ranges from solid state amplifiers to upconverters and transposers.

In other areas, DeSiste Lighting showed a new range of studio lights for the studio and ENG. The lights, called the High Efficiency Cold Light System (H.E.C.L.S.), offer 200 W Fresnel spotlights for key and back lights and 200 W softlight for fill lighting and eventually background lighting.

Cartoni showed a new camera mount head, the Delta — a fully variable counterbalance system designed to accommodate offset payloads, such as long lenses, small prompters and top-mounted viewfinders. ■

Editor's note: Alan Carter is editor of the international edition of Radio World, sister publication to TV Technology.

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Which is a very good reason to specify Standard Communications Corp.'s new rebroadcast *Intercontinental* satellite TV receiver - but it's not the only reason.

It has all the features professional operators need most: total flexibility in both C/Ku-band operation, rebroadcast quality

certified video on NTSC, PAL and SECAM signals, and a universal power supply built for the rigorous demands of 24-hour-a-day operation.

Never before has one receiver worked so well from INTELSAT to all DOMSAT formats in C, Ku and S-band frequencies. The 800 MHz or optional 1 GHz input will work with all known LNBs on all worldwide ITU regions. And our synthesized PLL tuning circuit provides direct frequency selection with crystal tolerance - 100 KHz accuracy in a continuous, self-monitoring control loop. The new digital AFC circuit improves performance in low threshold, severe interference, and multiple carrier per transponder operation.

A unique 70 MHz I.F. spectrum inversion circuit allows Ku-band to C-band or vice versa I.F. uplink or downlink turnarounds.

The *Intercontinental* is built for knowledgeable and discriminating engineers and offers proof of performance RS250C and CCIR567 certification. It features six I.F. bandpass filters, from 36 MHz to 16 MHz, five audio filter selections from 880 to 75 KHz, and six audio de-emphasis circuits.

There is much more you should know about the *Intercontinental* - and Standard Communications - than we can tell you in a single ad. Call us or fax us. We'll send you more information showing you how to get the best performance and peace of mind. Link up with our new *Intercontinental*.



Standard Communications

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transmitters? No problem. We carry them, too, in power levels of 5 kW to 10 kW. And ours feature solid state broadband driver amplifiers, which require no tuning.

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