

# TV TECHNOLOGY™

International Edition

Buyers Guide:  
Editing Equipment  
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## Europe Eyes Life After MAC

by Chris Dickinson

**LONDON** Years of political intrigue, commercial obstinacy and technological rivalry appear to have finally killed off the MAC transmission standards, leaving European audiovisual policy in a shambles, its manufacturers further disheveled and the field wide open for the U.S. to dictate a de facto worldwide standard for advanced television broadcasting.

So reads the conventional wisdom on European widescreen and high definition television policies. But is the reality as bad as it seems?

### Light on the horizon

Certainly, D2-MAC is used by only a handful of broadcasters, and HD-MAC is unlikely to ever become a practical system. But while MAC was crippled by a dispute between the U.K. government and broadcasters over government subsidies, other projects within Europe have been quietly developing new advanced television standards that at least match any produced in the U.S. or Japan.

The European Commission (EC), the driving force behind MAC, has also been pivotal in most of these other projects; providing support for the Eureka and RACE projects, which encompass most of the advanced television research initiatives.

The latest blows to MAC came after a meeting of member state ministers in May, when the U.K. maintained its refusal to back any subsidy for the system's implementation.

The U.K. objected to the proposed package worth 285 million European Currency Units (ECUs) that the EC wanted to commit to the production of widescreen programs over the next three and a half years.

Agreement to the subsidy by the 11 other EC member states had given the EC hope that it could get the U.K. to agree on a slightly smaller figure at a further meeting planned for mid-June. That meeting had not yet taken place as we went to press. But regardless, the subsidy proposals under discussion are far lower than the bold ECU 850 million action plan the EC had on the table only last year.

### Dropping HD-MAC

In another blow for MAC, Germany has become the latest country to drop its backing for HD-MAC, following a decision to pull out of Europesat—a satellite system using D2-MAC and HD-MAC operated by the German, Swiss and French Post Offices.

The first satellite, TV-Sat 1, failed in orbit, and its replacement, TV-Sat 2, only managed to attract four

(continued on page 3)

## U.S. Seeks HD 'Grand Alliance'

by Mario Orazio

*You might not have noticed* that we Americans are so good at spreading hype that we sometimes believe it ourselves. I point this out because of what you may have been reading about a U.S. HDTV transmission system being pushed by a Grand Alliance of proponents.

I might as well start with a brief recap. HDTV, which was invented in (insert your favorite nation here—if I had to be nailed down to one, I'd say the U.K.) became a theoretically Japanese development in the late 1970s because the Japanese were pouring more money into that sink hole than anyone else. The figure 1125/60 (which, if that's a problem of division, would be 18.75) was tossed into the air as a possible (and reasonable, I must say, however much I don't care for HDTV) way to get the world to agree on one standard.

But 60 doesn't look a whole heck of a lot like 50, thus 1250/50, HD-MAC, and other things the world may soon wish to forget. And, heck, if the 50 field world could get 1250, then why not 1050/59.94 for NTSC

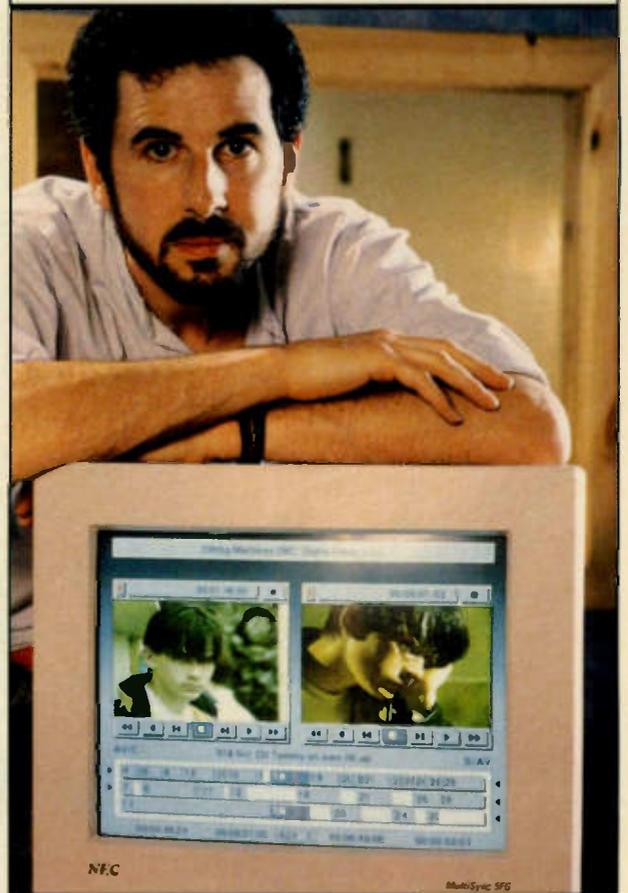
lands? Throw in 787.5/59.94 without interlace, and you get a fine kettle of fish for someone to turn into bouillabaisse. As the pot kept getting richer, more and more would-be HDTV systems fell by the wayside, until the U.S. FCC was faced with four proposed systems from three proponent groups, and not only the NTSC countries were curious to see what the Americans would pick.

Round one of the testing of said four systems came to no clear-cut decisions, so round two was scheduled to start in May. On the very day that retesting was supposed to begin, which would mean great cost to all concerned (and a pretty reasonable assumption of lawsuits from the non-winners, this being the U.S. after all), the long-awaited "Grand Alliance" (GA) suddenly happened. At least, that's what I heard on the radio and read in the funny papers.

Mine eyes and ears were treated to "news" to the effect that a single transmission system had been selected by the various proponents, thus speeding the whole HDTV process, and the computer people won.

(continued on page 8)

The EMC2 editor makes life easier for David Archibald at The Edit Suite.



## Scotland's Edit Suite Relies on EMC System

by David Archibald  
Editor  
The Edit Suite

**GLASGOW, Scotland** The Edit Suite was set up in late 1991 to provide a dedicated non-linear, off-line editing facility to the Glasgow area.

We chose the EMC2 editor from Editing Machines Corp. And after 18 months of operation, it appears we made the right decision.

The majority of our work is documentary and drama, so we generally need to handle large amounts of source footage. We recently cut a series about paramedics that had a shooting ratio of about 40 to

(continued on page 16)

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## ABU/IABM

## Group Established To Improve Communications

**SINGAPORE** The Asia-Pacific Broadcast Union (ABU) and the International Association of Broadcast Manufacturers (IABM) have established a liaison group to improve communication between broadcasters and manufacturers in the Far East.

The group will attempt to overcome problems common to the broadcast and manufacturing industries, including training and after-sale service.

The first meeting of the liaison group was expected to take place at the Eurotel Riviera in Montreux on June 13, during the Montreux Symposium.

The group will consist of John Bigeni, Om Khushu and V.K. Lamba, representing the ABU, and Tom McGann, chairman of the IABM, Jack O'Dear of Harris Allied, Ian Kinloch of IPK Broadcast Systems and Ben Stranger of the Grass Valley Group, representing the IABM.

The group is also expected to include Dato Abdullah Mohamad, director of the Asia-Pacific Institute for Broadcasting Development, as well as representatives from the ITU and EBU.

## BUSINESS

## Snell & Wilcox Reports Heavy Sales of Standards Converter

**HAMPSHIRE, U.K.** Snell & Wilcox reports sales of its Alchemist standards

converter have reached nearly US\$2.25 million since its introduction at the National Association of Broadcasters convention and exhibition (NAB) in April.

Joe Zaller, group marketing manager at the company, said the most recent delivery was to U.K.'s Tele-Cine. Other buyers include Image Transform in Hollywood, California, and Videotime in London. In addition, the music company Polygram plans to use the Alchemist to convert music videos.

The Alchemist utilizes the company's Phase Correlation (Ph.C) method of motion compensation, which was developed in conjunction with the British Broadcasting Corp. Ph.C is an advanced process that removes many of the artifacts usually found in standards converted material.

## ESE Names Distributor for Australia

**EL SEGUNDO, California** ESE, a manufacturer of master clock systems, time code products, desktop video accessories and audio/video distribution amplifiers, has appointed EAV Technology as its exclusive distributor in the Australian market.

Brian Way, director of marketing and sales, said EAV was chosen because of consumer recommendations.

EAV has provided products and services to the Australian market for the past 13 years.

For further information, contact Way at ESE (telephone: +1-310-322-2136) or Clive O'Brien at EAV (telephone: +1-613-417-1835), or circle Reader Service 135.

## Communications Specialties Comes To Europe

**HAUPPAUGE, New York** Communications Specialties Inc., a U.S.-based manufacturer of high-end video/computer peripherals, has signed Gernot Trathnigg as the company's European representative.

Trathnigg, a computer peripheral sales professional, will represent the full Communications Specialties product line in Germany, Switzerland, Austria and Eastern Europe.

Communications Specialties manufactures the Scan Do family of VGA- and MAC-to-video scan converters, as well as several lines of video splitters, mouse and keyboard extenders and video extenders.

"The ability to convert VGA or MAC computer output to the European PAL video standard and TUV-approved power supply makes (the Scan Do family) immediately usable in this market," Trathnigg said.

For information, contact Trathnigg at 8068 Pfaffenhofom, Schlehenhag 14b, Germany. Telephone: +49-8441-8843, or circle Reader Service 86.

## NEW TECHNOLOGY

## Canon Announces Prototype Digital Camera

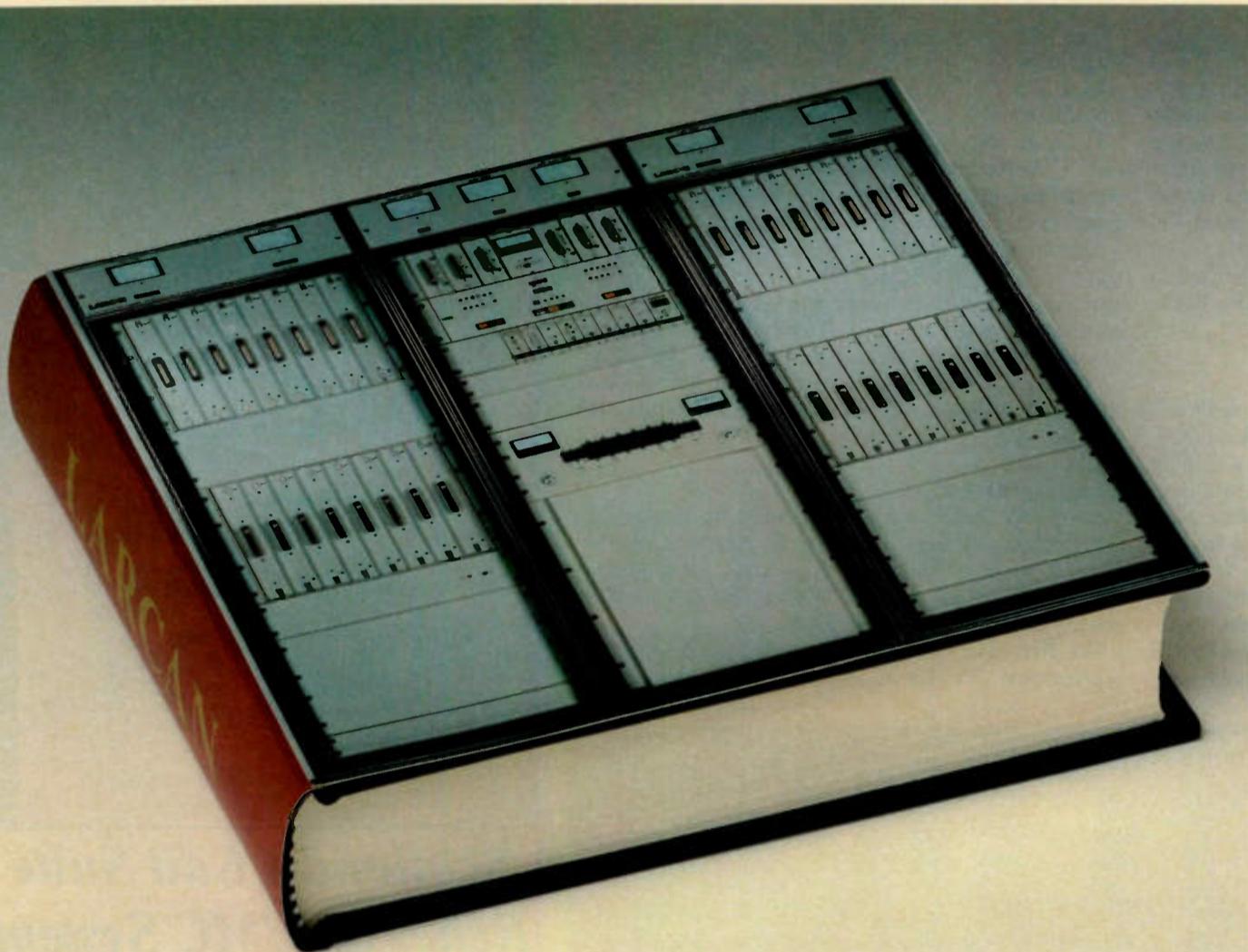
**NEW YORK** Canon USA has announced a prototype high definition digital still camera that records images in digital for output to any computer platform.

Originally developed as an engineering exercise to test new technologies, the system utilizes a 1.3 million pixel imaging sensor based on Canon's original BASIS technology. The sensor provides a sensitivity equal to ISO 200 film.

The camera records information on three types of memory packs—a 120 MB hard disk pack and two IC packs (40 and 80 MB). Digital information is created right in the camera, so it is unnecessary to convert information from analog to digital.

Powered by a NiCad battery pack, the prototype model measures 140mm x 111mm x 119mm and weighs 1 kg.

The company has not announced any plans to market the camera in the United States or Japan.



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# China Prepares for BIRTV '93

by Charles Taylor

**BEIJING, China** The biennial BIRTV '93 show, held in the China World Trade Center in Beijing 4-7 September 1993, will offer a showcase of advanced television and radio equipment and state-of-the-art technology.

BIRTV—the Beijing International Radio and TV Broadcasting Equipment Exhibition—was first organized in 1987, drawing more than 54 Chinese and 35 overseas manufacturers and companies from Australia, France, Germany, Holland, Hong Kong, Italy, Japan, Switzerland, the United Kingdom and the U.S. In 1989, more than 130 companies were represented from 15 nations. The 1991 show boasted more than 3,000 visitors a day.

This year, the show is expected to bring in delegations from all parts of China, including leaders of central, provincial and local radio and TV stations; thousands of professional policy-makers; and end users. The country's industry is made up of 521 television stations and 666 radio stations. More than 555 million TV and radio receivers are in use.

Manufacturer exhibits will include TV center systems, audio systems, TV lighting equipment, TV and radio transmission equipment; TV and radio satellite earth station equipment; film apparatus; test equipment; advanced TV broadcast

equipment and technology and satellite TV systems; telecommunications equipment; computer applications; cable television products and other advanced TV products suitable for China.

Seminar topics at BIRTV '93 will address equipment and technology issues, including picture processing post production, HDTV, digital audio broadcasting and trends in the entire broadcasting spectrum.

The show is organized by the China Radio and TV Co. for International Techno-Economic Cooperation and China Central Television; It was co-organized with the China World Trade Center.

For information, contact China Radio and TV Co. in Beijing at telephone: +861-327-1179; or FAX: +861-326-2823. In other nations, contact Technology Exchange Ltd in Hong Kong at telephone: +852-602-6300; or FAX: +852-609-1687.

*The following companies are scheduled to exhibit at BIRTV '93:*

- AAVS
- AKG Akustische u. Kino-Gerate GmbH
- Advanced Communications Equipment Co. Ltd.
- Asia Computer Consultants
- Audio Consultants Co. Ltd.

- Azimuth (Far East) Ltd.
- Beijing Dayang Image Technology Corp.
- Broadcast Technology Ltd.
- C&C Solutions Inc.
- Chinam Associates Ltd.
- Comstream Corp.
- Digital Media Technology Co. Ltd.
- Echosphere Corp.
- Efforts Technology Co.
- Hewlett-Packard Co.
- Hitachi Denshi Ltd.
- Itelco SpA
- Jolly Sound Ltd.
- Leader Instruments Ltd.
- Mackarl International Ltd.
- Matsushita Electric Ind. Co. Ltd.
- Maxell Asia Ltd.
- NEC Corp.
- Philips Hong Kong Ltd.
- Rohde & Schwarz
- Sony Corp. of Hong Kong Ltd.
- Stanley Productions Ltd.
- Technosystem SpA
- Tektronix Hong Kong Ltd.
- Thomson Tubes Electroniques
- Tom Lee Music Co. Ltd.
- Tremis Co. Ltd.
- Victor Co. of Japan Ltd.
- Videotech Consultants Co.
- Winlite Technology Ltd.

## European Community Studies HD Choices

(continued from page 1)

channels: RTL, Sat 1, 3 Sat and Eins Plus. The German Post Office will now write off DM 10 million spent on preliminary work for TV-Sat 3, and the long-term prospects of the whole project is now in doubt.

Elsewhere, however, the future is not so bleak. EC telecom policy, now in the hands of a new commissioner, is set for a fundamental shake-up. And under commissioner Martin Bangemann, the EC has started work on a paper analyzing the status of digital television. Also, the Eureka-funded VADIS project, which is developing a digital compression system, has made progress with its joint work on MPEG-2.

Meanwhile, three groups—Flash-TV, HD-Sat and ESA—are working on satellite transmission systems. And dTTb (Digital Terrestrial Television Broadcasting), one of the most exciting research projects under the RACE program, has thrown up several leading-edge terrestrial digital transmission systems. The dTTb project—made up of 25 European broadcasters, manufacturers, research groups and operators—has at least six different terrestrial digital transmission systems under development.

### Rough and ready

Of the six systems, Spectre is considered one of the most rugged, with a bit rate capacity of only about 13 megabits per second (Mbps). This compares to Diamond, which currently has a 60 Mbps capacity (though this is likely to be reduced to about 30 Mbps in practice), and HD-Divine, which sits roughly half way between the two.

According to dTTb participants, the technology in all the systems is being shared equally, with the aim of eventually producing a European-wide standard made up of the best elements of each one. A definitive digital standard is not likely

until 1996, and its implementation depends to a large degree on the political and commercial backing it is given. However, current backers claim the standard will be a generation higher than the digital standard in the U.S.

European researchers are also convinced that the U.S. standard is unlikely to be adopted in Europe because the continent's more crowded spectrum requires a system with less power consumption than is needed in the U.S.

However, what does threaten the early implementation of a digital transmission system in Europe are the ambitions of many broadcasters to adopt an enhanced PAL system in 1995 or 1996.

PAL-Plus—a consortium made up of U.K., German, Swiss and Austrian broadcasters, as well as manufacturers Philips, Thomson, Grundig and Nokia—aims to have an operational system ready by 1995.

### Building on PAL

PAL-Plus is designed to have a high level of compatibility with the conventional PAL transmission infrastructure and with existing PAL television receivers. Widescreen pictures are broadcast in the letterbox format, with 4:3 sets displaying the full widescreen image, but having blank bands at the top and bottom. Though originally the letterbox was 16:9, resistance to the format from viewers in the U.K. has led to a compromise 14:9 format.

PAL-Plus is likely to be used first in Germany, with the U.K. likely to follow by 1996.

An EC-funded report by Dutch-based consultants KPMG estimates that the market in Europe for widescreen and HDTV sets and recorders could be worth between ECU 2 billion and ECU 21 billion over the next ten years, depending on whether or not the industry is given state backing to help it get off the ground.

## SHOW LISTINGS

Upcoming conventions, meetings and exhibitions

### 1-5 October 1993 —

#### International Broadcast '93

Jakarta, Indonesia. A broadcast-only exhibition to be held in Jakarta at the Kemayoran Exhibition Center.

### 10-14 October 1993 —

#### VISION '93

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

### 18-20 October 1993 —

#### European Cable Communications '93

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

### 25-28 October 1993 —

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

Pragati Maidan, New Delhi. India's 1st International Broadcasting, Cable & Satellite India '93 exhibition and conference. 150 exhibitors from India, Europe, the U.S., Asia and Australia are expected to exhibit. A three-day technical conference will focus on trends in broadcasting, hardware and software, emerging technologies and non-governmental broadcasting. For information contact Broadcast Engineering Society (India): Room No. 410, Research Dept., All India Radio and Doordarshan. J.P. Estate., 14-B, Ring Road, New Delhi-110002, or Exhibitions India: telephone +91-4622710; FAX +91-11-4633506.

### 16-18 November 1993 —

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

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

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# U.K. Gets First Look at Spectre Digital Transmission System Shown in Live Demonstration

by Chris Dickinson

LONDON U.K. television's regulatory body, the Independent Television Commission (ITC), laid out its vision for the future of terrestrial broadcasting in May with the first public demonstration of Spectre, the advanced new digital transmission system it has developed.

Spectre (Special Purpose Extra Channels for Terrestrial Resolution Enhancements) is a digital transmission system that utilizes about a 20:1 compression ratio. Like other digital systems, it allows many more services to be broadcast in the same spectrum space as the current PAL channels.

## Live Spectre

The ITC gave a live demonstration of Spectre over the air from London's main transmitter site at Crystal Palace to ITC headquarters, opposite Harrod's in Knightsbridge. The purpose of the demonstration was to show what could be achieved with the technology if the political and commercial commitment was behind it.

For the May demonstration, enhanced widescreen pictures were compressed to a rate of about 10 megabits per second (Mbps) and broadcast at low power. Also shown were examples of three separate sub-regional news programs provided by Meridian, the ITV license holder in the South of England.

The news programs were shown in the normal 4:3 aspect ratio, and each was compressed to a rate of about 3.5 Mbps, enabling all three to be carried in a single digital channel.

The ITC says digital signals could be broadcast in the gaps between existing

television broadcasts in most parts of the U.K., however, further trials would be needed to establish exactly how much of the population could be covered.

The ITC would like to use Spectre to simulcast existing BBC1, BBC2, ITV, Channel 4 and S4C (Welsh language) services in widescreen, to be followed by up to six totally new regional channels.

Nick Lodge, head of standards and technology at the ITC, said the commission would like these digital services to be followed "in the long term" by the launch of up to 70 new ordinary channels or up to

Another possibility is for the proposed Channel 5 service in the U.K. to be allocated a digital frequency. This would negate the problems with the previous proposal for the service, which would have meant around 5 million domestic video recorders would have to be retuned. The expense of implementing this was a major reason that only one bid was received when the original license was advertised last year.

Spectre itself is being developed for the ITC by National Transcommunications Ltd. (NTL), the privatized engineering arm of the ITC's predecessor, the IBA. The work is part of the wider European dTTb (Digital Terrestrial Television Broadcasting) project, which is aiming to develop a new European digital transmis-

vidual carrier handling a very low rate of digital data, the signal is less prone to corruption and can be broadcast at power levels well below those of PAL transmissions.

This low power usage in turn opens up the possibilities for broadcasting in UHF slots, that cannot be used for PAL, thus creating extra channels.

The ITC says it is now carrying out further trials of Spectre in southwest England, to determine how many channels could be squeezed into the gaps between existing frequencies.

## Larger load

Also under study are the effects of transmitting a larger capacity signal (which would allow better quality channels) on the coverage potential, as well as advances in portable reception to see if a truly portable television could be developed. The ITC is also working on single-frequency relay operation, which potentially would reduce interference and allow more channels to be squeezed into the spectrum.

Further aspects of Spectre involve the study of scalable coding to facilitate reception at different quality levels, and the provision of multimedia information services.

A completed system is due to be ready by 1996 at the earliest. However, the ITC is at pains to stress Spectre is only a research project, and for a system to be adopted by broadcasters, the commercial and political will must be behind it.

Lodge says the ITC will present all its findings to dTTb, alongside the work being conducted by the BBC and Thomson, as well as the German Vidinet and HDTV-T projects the French Sterne project, and HD-Divine, which is being developed by a consortium of Scandinavian manufacturers, research groups and telecom companies.

But what Spectre has going for it is the ruggedness of the signal it can generate. Unless the other systems can match this with some other advantage, Spectre could well end up as the basis for a European digital transmission system to rival the U.S.

*For the May demonstration, enhanced widescreen pictures were compressed to a rate of about 10 megabits per second . . .*

20 high definition television channels.

"There needs to be a debate about how to best use the technology for launching new services," he said. "The current ITC position on digital TV is that existing broadcasters (ITV, C4, S4C and the BBC) should be offered capacity for broadcasting their services in parallel in a digital format in order to enable an orderly transition to an improved digital system. However, there should be the opportunity for launching new services in a digital format in those parts of the U.K. where there is channel availability to do so."

The BBC, which is also working on a rival digital system in partnership with French manufacturer Thomson CSF (See February 1993 issue), says it is "very interested" in Spectre. Whatever digital systems finally emerge, the BBC and ITC are likely to adopt the same one.

sion standard. (See related story, page 1.)

The Spectre system utilizes computer analysis techniques to discard around 95 percent of the picture information to leave the minimum amount required by a decoder to reconstruct the image. Like most other digital systems, Spectre uses the motion-compensated discrete cosine transform (DCT) coding system. For transmission, the digital signal is modulated with a UHF carrier wave.

## 400 carriers

Existing PAL signals have most of their energy concentrated on only three carriers: vision, color and sound. However, the digital modulation system in Spectre distributes the signal uniformly across more than 400 carriers using a process called orthogonal frequency division multiplexing (OFDM). With each indi-

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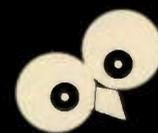


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# Wireless Cable Has Widespread Appeal

by Robert L. Schmidt, President  
Wireless Cable Association International

WASHINGTON, D.C. Wireless cable has clearly emerged as the technology of choice in the international multichannel video marketplace.

Using microwave frequencies to distribute video programming over the air, wireless cable now serves more than 2 million subscribers worldwide. In the United States, 140 systems are operating with approximately 500,000 subscribers and another 1.5 million subscribers are located in 38 countries.

## Up and coming

The explosion in growth over the past three years has put the wireless cable industry in a key position to be the primary provider worldwide of multichannel entertainment and information programming at the lowest cost to subscribers.

Microwave technology utilizes a transmitting microwave antenna to broadcast multiple channels of video programming to a small rooftop antenna installed at each subscriber location. The signal is then processed and relayed to a converter on top of the subscriber's television.

Although wireless cable requires "line-of-sight" transmission, placing the transmitting antenna on a tall building, tower or mountain will provide an unobstructed view of the transmitting antenna and maximize the area of coverage.

Membership in the Wireless Cable Association International (WCAI) provides the best representation for those in the wireless industry. In 1988, the Wireless Cable Association was reconstituted to represent the legislative concerns of wireless operators in the United States.

The Association's name was changed to the Wireless Cable Association International in 1991, as wireless cable grew quickly in the global marketplace.

Headquartered in Washington, D.C., the WCAI's current membership is international and consists of wireless cable operators, equipment manufacturers, program suppliers, educational institutions, licensees, engineers and attorneys.

Since I began serving the WCAI as president in 1988, the association has successfully led the wireless cable industry over a number of tough U.S. legislative hurdles, opening the U.S. marketplace to competi-



tion in an industry dominated by coaxial cable distributors. One of the highlights in this fight was passage of the 1992 cable consumer legislation.

But we are also playing a major role in expanding the wireless cable industry internationally. I recently travelled to Australia to reassure the Australian government and public that wireless cable is a high quality, cost effective means of delivering pay television to subscribers.

In addition to periodic seminars throughout the year, the WCAI sponsors an annual International Convention and Exposition featuring the latest in technology and trends in the industry. More than 2,000 people from around the world are expected to attend this year's convention 1-3 August at the Marriott Orlando World Center in Orlando, Florida. WCAI members register at the convention and seminars at reduced rates.

Members may also sit on the association's committees, which are chaired by a member of the Board of Directors. The technology, systems operations, education, regulatory, membership and convention

committees offer members the opportunity to come together to share information and discuss the concerns of the industry.

The WCAI Board of Directors is elected to two-year terms and include a cross section of leaders in the wireless cable industry from the U.S. and abroad. In addition, the WCAI staff works full-time to serve the needs of its members. Information such as membership, operator and attendee lists are maintained and updated for use by WCAI members.

## Watchful eyes

Representing the interests of the wireless industry domestically and abroad is a priority at the WCAI. For example, outside counsel continually monitors and addresses all legislative matters pertaining to the United States Congress and the Federal Communications Commission (FCC), as well as other U.S. federal agencies, such as the National Telecommunications and Information Administration, the Federal Trade Commission and the Department of Justice.

The WCAI successfully represented its membership in the creation and passage of the U.S.'s 1992 Cable Act, which enables wireless operators to receive satellite programming to compete in their markets.

The WCAI also develops business and technical standards for the industry. Currently, the WCAI is focused on the future of the industry—digital transmission, compression and HDTV.

The recent creation of the Wireless Cable Research and Development Center will test digital compression on wireless systems in the United States for implementation by 1994. The center will work to keep wireless cable on the cutting edge of technological developments.

Digital compression technology is the future of the communications industry and will allow wireless cable operators to offer as many as 300 channels of cable programming. Technological innovations in digital compression enable information to be delivered at such a high rate that multiple programs can be delivered

simultaneously on one channel.

## New opportunities

The extra spectrum that results will allow operators to expand their subscription services to include Personal Communication Services (PCS), interactive educational programming, movies-on-demand, shopping and banking in the home and other communications services.

Digital compression consists of breaking signals down into small "digits" and stringing them together at a high rate of speed to create digital television. The information delivered by digital television can be compressed (a process of removing the unnecessary components that cannot be comprehended by the eye) so that only the essential information remains. Once the compressed signal is delivered to the home, it is recreated in its original analog format.

The initial digital compression trials will take place in six separate markets. Merrill Weiss, a consultant in electronic media technology and management, is the principal consultant for the center and will work to ensure that digital transmissions do not disrupt existing analog operations in the wireless cable spectrum.

The center will report periodically to the FCC, which will establish new technical rules for digital transmission.

Over the past several years, the wireless cable industry has established that it can compete successfully by offering superior service and high quality pictures at a lower cost. This success has led to tremendous growth in the U.S. and abroad.

The Wireless Cable Association International is working to address the increased size and demands of this global industry. With the development of digital compression, wireless cable will stay in the forefront, securing its unique position as the fastest growing provider of subscription television worldwide.

For more information on the Wireless Cable Association International, contact the author at +1-202-452-7823.

## TV TECHNOLOGY

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## Se Celebró Seminario NAB-CIRT

Por César Hernández Espejo

CIUDAD DE MÉXICO Ante la presencia de más de 250 concesionarios, ejecutivos, ingenieros, técnicos, miembros de la CIRT e invitados especiales, el jueves 11 de marzo se celebró el Seminario sobre Nuevas Tecnologías en el salón "Murillo" del hotel Sevilla Palace, en la ciudad de México.

Este seminario contó con la participación del Vicepresidente de Operaciones de la NAB (Asociación Nacional de Radiodifusores de los EE.UU.) señor John Abel, y de Michael Rau, Vicepresidente de Ciencia y Tecnología de la NAB, quienes hicieron una detallada presentación sobre diversos temas. Entre éstos se destacaron la radiodifusión sonora digital (DAB), la televisión de alta definición, la cancelación de "fantasmas," el uso de las subportadoras para la transmisión de datos.

Esta magnífica presentación nos permitió tener información actualizada sobre las innovaciones tecnológicas que afectan a la radiodifusión, y conocer los puntos de

vista de los representantes de la organización más importante de radiodifusores en el mundo, sobre asuntos tan relevantes como el desarrollo del DAB en los Estados Unidos, donde la NAB mantiene una postura oficial de apoyo a los sistemas "in-band."

El propósito de la CIRT al organizar este evento fue, en palabras del Presidente del Consejo Directivo, Licenciado Javier Pérez de Anda, "estar actualizados sobre lo que pasa en los países más avanzados en relación con asuntos de importancia para la industria."

Quedó claro, entre los asistentes a este seminario, que México no puede darse el lujo de esperar a que otros países desarrollen y apliquen nuevas tecnologías en la radiodifusión, sin participar de alguna manera en este proceso y aprovechar las ventajas que representa para los radiodifusores mexicanos ir a la vanguardia en estos aspectos. Por esta razón, el Licenciado Pérez de Anda agradeció a los asistentes su participación en el Seminario.

Durante su visita a México para participar en el Seminario de Nuevas Tec-

nologías, los señores Eddie Fritts, Presidente Ejecutivo; John Abel, Vicepresidente de Operaciones; Michael Rau, Vicepresidente de Ciencia y Tecnología; William Haratunian, Asesor de Asuntos Internacionales, y la señora Terri Rabel, todos representantes de la NAB, hicieron una visita a Los Pinos para dialogar unos momentos con el señor Licenciado Carlos Salinas de Gortari, Presidente de la República, acompañados de un grupo de miembros del Consejo Directivo CIRT, encabezado por el Licenciado Javier Pérez de Anda.

Durante la reunión, que se realizó en un ambiente de gran cordialidad, el Presidente de los radiodifusores norteamericanos, Eddie Fritts, felicitó al Licenciado Salinas de Gortari por su éxito en el fortalecimiento de la economía de nuestro país, y por las acertadas medidas que llevan a cabo en México; también hizo una breve semblanza sobre el estado actual de la radio y la televisión en el vecino país del norte.

César Hernández Espejo es Gerente General CIRT de México.

# Lighting Multiple Camera Sets

I have enjoyed writing about the emotional qualities of light and the romance of color selection, but, every so often, we have to face the realities of: "How do we light something for multiple TV cameras?" When your director says "I cannot see his eyes," emotion and romance will not help.

A common set in television is the interview set. This may be the prime area of a talk show, a cozy setting for the discussion of homemaking or an afterthought attached to a news set for special interviews. There is a trend toward using such an informal arrangement for news itself, eliminating the bulky news desk that comes between news people and the audience.

Many local stations build a set and assign someone to light it in a few hours. This shortcut method works well enough and is cost effective, but a producer or director rarely insists on the better way, in the interest of creating a more professional-looking show.

The better way requires the producer and director to arrange a production meeting as soon as the set has been designed. The set designer can describe the setting to audio, lighting and camera people, with an open invitation for everyone to comment. The meeting will generate a ground plan of the set, with

ows from the sun or moon, which we will hang just out of camera view above the exterior backdrop.

Prop trees or shrubs can add realistic shadows on the curtain but must not shadow the backdrop. The backdrop should be at least two-and-a-half meters from the window and wide enough so

*Each wall will have two or three small accent spotlights to add dimension to pictures, props, plants and moldings . . .*

that cameras 1 and 3 can include the window from their side positions without shooting off. If the backdrop is to be simply a white cyc with blue light on it, the see-through curtains will need to be a little less see-through to help hide the fakery.

If we light the cyc with blue light from overhead and white light from the floor, the blend will help suggest a real sky that is less blue at the horizon and more blue at the top. Amber from the bottom can suggest sunrise or sunset.

All of these decisions can be made at

The lighting director will use a simplified version of the floor plan to develop a light plot. The plot of everything we would like to do will let us know that we have to repair some of the small fresnels with bad sockets or buy or rent some additional equipment before setup.

We will use our best equipment to light

the people first. This will let us see how much light falls on the lower areas of the set walls. Then we can see where accent lights are needed.

We will light the people with a 2,000-watt fresnel as a key or main light source over each camera. The key for the host (chair A) will hang just above camera 3. Unless we have a very low lighting grid, this key will have to be lowered on an extension rod.

The key for chairs B, C and D will hang just above camera 1. Another 2 kW fresnel will hang just over camera 2 and will cover all chairs. This "key" is closer to being a fill light for the wide shot, and it must not overpower the other lamp on close-ups on cameras 1 and 3. If we find we need to dim this center key more than 10 percent to reach a nice balance, I would insert a lightweight diffusion such as 1/2 tough spun or Rosco #112 opal frost. Then the light can be full intensity to retain proper color balance on the close-ups.

A low angle for these main keys assures light in the eyes. The lowest angle they can be is so that a camera on high pedestal can move freely under the light. They should also be just high enough so that the head shadow of the person being lit falls below shoulder height in close-up. A moving shadow is usually perceived as distracting; a lot of people hate it, and I have never found a good reason to argue for it.

## Take a seat

Each chair should have a 1 kW backlight at a steeper angle than the key lights. (But beware: too low, and we can get lens flares; too steep and we get a hot nose when the person leans back.) We also want to drop the top doors on the backlights to avoid a pile-up on the coffee table, which will probably have a shiny surface and books with shiny covers on it. It is true that one backlight can cover two or three chairs, but that way we lose individual control over different hair and costume colors unless we have one light for each chair.

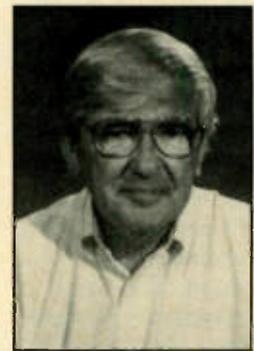
We are not quite finished with the people. Let us consider a close-up of chair A on camera 3. We note that the person in chair A will be seen facing chairs B, C or D. This reveals a slight fall off of light on the upstage side of the face. I suggest a low angle 1 kW upstage secondary key/fill that seems to be coming from the people being talked to. This key/fill should not be as strong as the main over-the-camera key. It should just fill in the upstage side of the nose and

the upstage eye. We must be careful, though, that the upstage secondary key for chairs B, C and D does not hit the head of the host in chair A and cause excessive backlight.

The other secondary key to chair A must miss the guests in chairs B, C and D. Cover shots on camera 2 will reveal these secondary keys as a facial rim light that adds a nice sparkle to the scene. We will probably use more lights on the background than we have on the people.

## Wall lights

Each wall gets a soft source such as a softlight or a frosted scoop at a steep enough angle to avoid hitting the people. On a small set, this is almost impossible. I choose to soft fill the set from low in front so that the fill is flattering to the people on its way to the scenery. The plot shows two scoops with diffusion



by  
David M.  
Clark

FOCUS ON

## LIGHTING

aimed so that each scoop covers half of the back wall and the opposite side wall.

Each wall will have two or three small accent spotlights to add dimension to pictures, props, plants and moldings by supplying highlights and shadows. These accent lights should be dimmable to adjust them down to blend behind close-ups.

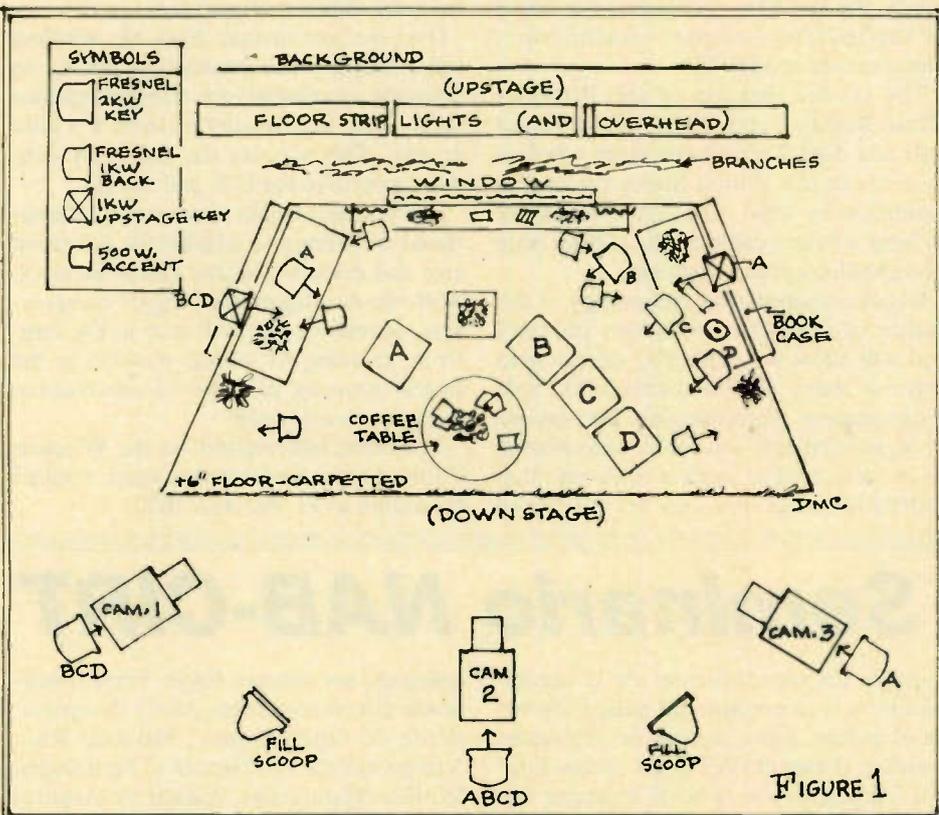
The warmth of the dimmed light is pleasant and cozy on the background. Backlights can also be dimmed without affecting the faces. We will strive to keep key lights on faces full up and white to maintain consistency in skin tone on all cameras.

One final hint. We will focus the keys on chairs B, C and D as if there were a fourth chair. This will allow the director to shift the seating a little without having to re-focus. The same goes for chair A. It does not hurt anything to leave the downstage side of the key light open to allow shifting the position of the host's chair to a better close-up background.

And now a warning to producers and directors: When we have done all of the above, we have finished with the lights but not the lighting! The lighting art starts when we see the show on camera. Only then can we balance the lights to get the best picture.

All of the above work merely makes an arrangement of tools laid out on a workbench ready to build the picture. If we simply turn them all on full, we will see a "contrasty" mess that even the most experienced video shader cannot reconcile. It will be even worse if the cameras are on automatic iris. It is only the on-camera eye of the lighting director that can make it all sing.

David M. Clark is lighting director for Imero Fiorentino Assoc. in New York. He has won two Emmys and received numerous additional nominations for his work, and he is also a creative graphic artist, photographer and scenic designer. He may be reached by writing TV Technology.



agreement reached on background colors, furniture and props.

## Explaining the plot

Figure 1 represents a ground plan and lighting plot for a typical interview show. Chair A is for the host and chairs B, C and D are for guests. Chairs B, C and D could combine to become a couch, but I hope not—a guest with his or her own chair feels more equal to the host and is likely to sit more erectly than on most soft couches. Individual chairs also allow the director to position each guest against the best background for close-ups.

A large window in the upstage center wall has drapery left and right with a valance across the top. See-through curtains cover the window to soften the image of the exterior and to act like a rear projection screen for mullion shad-

the production meeting on paper so that everyone involved will have time to order the necessary materials well before the actual set-up day. We have bookshelves in the side walls that can hold books and small props. Tables or cabinets in front of the bookcase, plus a wide shelf under the window, can hold sculptures, flowers, practical lamps or anything that is considered pleasant in the background of a close-up.

The two downstage wall sections are only there so that cameras 1 and 3 do not shoot off of the set. These walls should be treated carefully so as not to look like add-ons. Hanging plants, groups of small pictures (with glass removed), bas relief sculptures and large potted plants on the floor will cast interesting shadows and avoid the impression that the set stops where it does.

# Video Production Trends in the '90s

In the film industry, new technology has traditionally come at a snail's pace. Because of this, filmmakers have had time and tradition on their side in perfecting their craft. Video people have not been so lucky.

Since 1975, when portable video became a real business, video technology moved so rapidly that the only sure way to learn how to use the tools was to dive in and get daily hands-on experience. In those days, with catastrophic equipment breakdowns occurring almost daily, Rube Goldbergesque mechanical skills were often the most valuable in ensuring the videomaker's economic survival.

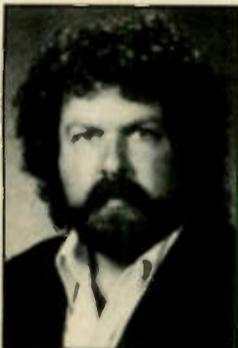
But times have changed.

This month, we will focus on some specific trends that are or will change the way video production works in the 1990s. No one knows how these trends will play out. But the videographer—in order to ride this wave of change—must learn new skills and master crafts not previously thought important in the video field. The knowledge that served us so well in 1975 has little to do with the survival skills of the '90s.

## Talking trends

Here are the major trends:

**Trend #1: Television is merging with the personal computer.** This may become the technology headline for the '90s. The impact of this merger is causing the first fundamental change in television broadcasting's 50-year history. What it means is



by  
Frank  
Beacham

## VideoCraft

this: The control and processing of television, which has traditionally been in the hands of the broadcaster, will soon shift to the individual television viewer. Because of the PC, television is about to become interactive. The era of video-on-demand, or "personalized media," is about to begin. This change will affect the kind of programs we make and how we make them.

The personal computer is already having an impact on the video production process. However, say technologists, "we haven't seen anything yet." Most video equipment manufacturers are predicting that the personal computer is about to do for video production what it did a few years ago for the publishing business. That is, it will move the video production process to the desktop. Some predict that most professional video editing and post production will be done on desktop computers within five years.

For the videomaker, this situation creates an imperative: Learn how computers work. You do not have to become a digital engineer or a computer science expert, but you need, at the very least, to have a conceptual idea of how computers are being used throughout the video process. No one—from the writer to the producer to the engineer in the truck—can escape the

growing impact of the personal computer on video production.

## Make way for DATV

**Trend #2: Digital advanced TV (DATV) has replaced HDTV (and this shift may be more important to you than you might think.)** The importance and implications of this transition (from HDTV) cannot be overstated. DATV will be of higher quality than HDTV, enable higher capacity, while at the same time using the radio spectrum more efficiently. It will be far more flexible than today's analog television. It will enable easier and cheaper transcoding among different display formats.

DATV will increase choice and provide viewers greater control over what, when and how they watch—maybe use—television. This could eventually lead to "customized" television.

The importance of this recent change of philosophy in television technology is significant to small scale video producers. While HDTV is a technology favoring Hollywood-style, high-end dramatic programming generally produced on 35mm film, DATV offers broader programming choices to viewers. New technologies such as direct broadcast satellite and telco "video dialtone" could reach millions of potential viewers.

Whether or not this expansive new distribution technology results in a treasure trove of creative new "niche" programming or simply adds more acreage to the "vast wasteland" remains to be seen. But at least there are new opportunities for creative producers to make an impact with their work. Never before in the history of television has there been a greater opportunity for a videomaker to gain access to mass media outlets.

## Expanding horizons

**Trend #3: Multimedia will broaden the use of video.** Depending upon the source. (continued on page 8)



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# Looking at the 'Grand Alliance'

(continued from page 1)

This interested me greatly. I was curious as to what it was, exactly, that we won. A Kewpie doll? Nah, nothing so valuable—just square pixels and progressive scanning.

If ever there was a non-issue in HDTV transmission, it's square pixels. Hey—I'm not saying it's a total non-issue. If you're designing a frame buffer (a common pastime in the world of digital pictures), you have to pick some number of active scanning lines and pixels per, and if those numbers yield little squares instead of little rectangles (on paper anyway) image manipulation is a bit easier than if they don't. I'm not talking make-or-break here—if so, there would be no such thing as a DVE. Digital NTSC, digital PAL and digital 4:2:2 all have unsquare pixels, but Ampex ADOs, Grass Valley Group Kaleidoscopes, and every other effects system anyone has ever come up with all work just fine.

That being said, if someone wants to design a new system (as in HDTV) with square pixels, I'm all for it, and if it makes us computer folks happy, so much the better. But think for a second about where square pixels mean something. I don't know about you, but I manipulate images exclusively in production and post production, and I can't think of anyone who does it anywhere else. I sure can't imagine manipulating images in transmission, and that's what the Grand Alliance (why does that name keep making me think of the Entente Cordiale?) was supposed to be hammering out.

Progressive scanning is just about as meaningful. Way back in the days of NTSC, PAL and SECAM, what a camera squirted out was what got transmitted and what got displayed. That isn't going to happen in HDTV. What gets transmitted is going to be maybe 2 percent of what squirts out of a camera, and who knows what is going to get displayed. Getting rid of 98 percent of a signal so you don't notice the difference is a lot tougher than converting interlace to progressive or vice versa. Remember those DVEs from two paragraphs ago? They go I-P-I all

the time. Progressive cameras are something worth arguing about; progressive transmission's nothing grand.

## Demand a recount

Some of the funny paper reports said the GA had gone for 787.5 scanning lines. Only, when I read one of the technical descriptions of the alliance (submitted to none other than the U.S. Congress), I found the figure 787 twice and 1050



by Mario Orazio

## Masked Engineer

thrice. I think you might be interested in these three sentences from the official Congressional technical description of the GA system, as provided by the first proponent in GA alphabetical order, AT&T (just to refresh your memories, AT&T, with Zenith, had been proposing 787.5 lines, progressive scanning and vestigial sideband transmission):

"The long-term standard will be built around a family of 1050-line progressive formats, at frame rates of 60, 30 and 24 frames per second."

And, "787-line progressive modes at 60, 30 and 24 frames per second will be supported. A 1050-line interlaced mode at 60 fields per second will also be supported."

If those three sentences mean the Grand Alliance has picked 787 lines, someone needs new bifocals, and I don't think it's me. Anyway, while those seven different source formats may look tough to deal with, in the Grand Scheme of things, they're not. When you're throwing out 98 percent of what you're starting with, you

can start with all sorts of different things, including 1125/60 and 1250/50.

That's about as far as the press reports ever got, but AT&T's Technical Description went on into the *real* issues: video compression, audio compression, data transport and transmission. AT&T didn't want to worry Congress's pretty little heads with details, so the video compression section just said the Grand Alliance plan has stuff from all four pre-GA proposals, some of it matches some parts of MPEG-2, and the GA members will push

the ISO to make the GA video compression plan "the MPEG-2 HDTV profile."

## Whats the scheme?

At least that video compression part has some indication of an alliance. I couldn't tell you what the compressor's schematic is going to look like, and I don't know anyone who can, but there seems to be a plan. That's more than I can say for the rest of the Wise And Benevolent Grand Alliance's model of the future of television. Here's the entire audio section:

"Three systems are under consideration and subject to further evaluation: Dolby AC-3, Musicam 5.1, and MIT-AC."

The Grand Alliance negotiators (who just might include me) must have worked day and night for months coming to that agreement. Thank heaven for committees!

The data transport section is almost as short and sweet:

"A packetized, prioritized data transport format with universal headers and descriptors will be used to promote system flexi-

bility and extensibility." The end.

And now, Maestro, if I may have a drum roll please... The Grand Alliance is a joining of the proposals of different *transmission* proponents. Key, therefore, is the *transmission* plan.

"Four transmission system approaches will be evaluated further before a final selection is made. The four are variations of Vestigial Sideband (VSB) and Quadrature Amplitude Modulation (QAM) approaches. Analyses based on the existing proponent systems as improved will be conducted. A competitive bakeoff may also be held, if necessary."

## Plans not final

Hey—I'm not making this stuff up. The technical plan of the Grand Alliance is about as firm as air and not as clear. What we have here is a case of overhyped vaporware, and that's not all, either. If you think the Grand Alliance is at least an alliance, you may yet be a victim of joy mongering.

Look: Without a supposed Grand Alliance, retesting was going to start. Was everybody ready for retesting? Did anybody expect the results of the retesting to be any more conclusive than the results of the testing? So a Grand Alliance was announced, and no one had to worry about testing for a good long time. But—heck—even inside individual proponents of the "alliance" there's plenty of dissension. At the very same U.S. Congress hearing on the Grand Alliance, of which the U.S. technical university M.I.T. is a member, the head of the M.I.T. Media Laboratory said, in effect, "The Grand Alliance is barking up the wrong tree."

Yes, no doubt about it: HDTV is now, once again, *just* around the corner. I understand that there are people who haven't the slightest doubt that HDTV will be a multibillion U.S. dollar industry by the year 2000. I also understand that there are millions of people around the world who believe in fairy tales.

Most of the latter are under five years of age.

*Mario Orazio is the pseudonym of a well-known television engineer who wishes to remain anonymous. You may send your comments to him in c/o TV Technology.*

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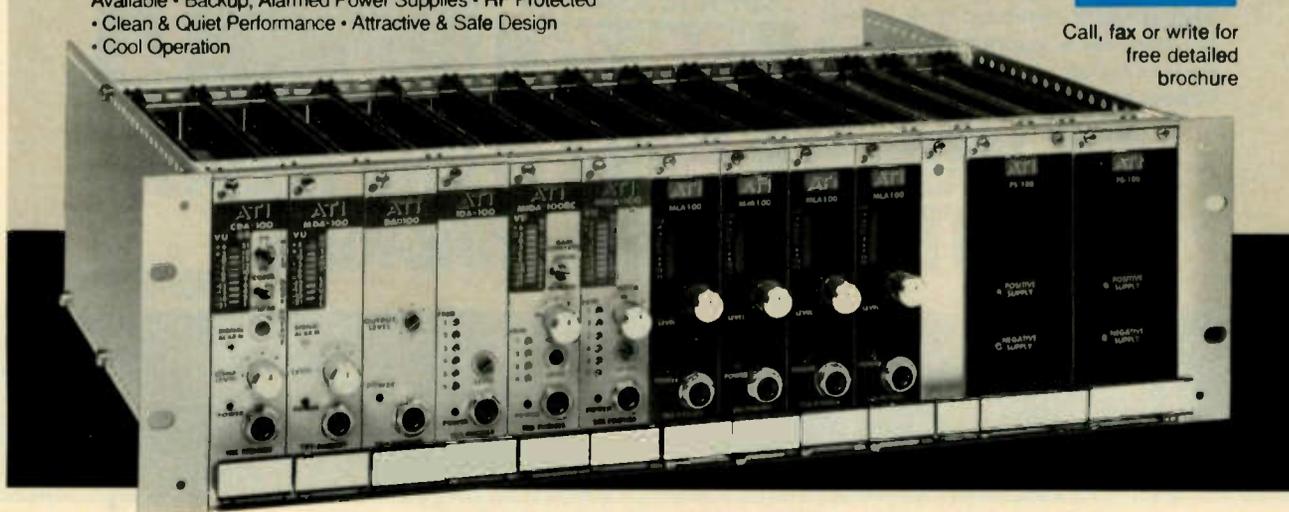
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## Video Trends in the 1990s

(continued from page 7)

multimedia is either going to be the world's next great communications revolution or simply another over-hyped new technology looking for a use in the real world.

But no matter how it turns out in the end, multimedia will have a profound impact on video production during this decade. The computer giants (Apple, IBM, etc.) are joining media giants (Time-Warner, Sony, etc.) to develop standards and interactive software that integrates video with digital audio, text and animation. The *big money* thinks multimedia is going big time. It is a potentially lucrative market for video producers and it should not be ignored.

*Frank Beacham, a New York-based writer, director, producer and consultant, is author of the American Cinematographer Video Manual from ASC Press, Hollywood, California. His address is 163 Amsterdam Ave. #361, New York, New York 10023.*

# Another Lesson in Arm-Waving Math

**Second in a Series**

In June's issue (page 12), we began using "arm-waving math"—a term used by mathematicians to describe derivations that are not absolutely complete and rigorous—to find the distance to the horizon from the tower top, given the height of the tower. This month, you will learn how to get dB figures without a calculator.

The ability to quickly approximate answers without a calculator is an acquired skill. In ancient times this skill was developed and used to determine the location of the decimal point when calculating with a slide rule. This need not become a lost art; it is still a useful skill.

When you need very accurate figures for relative levels in dB, you will still need to use your calculator or computer. But for those times when an answer within 1 dB is close enough, you can do it with just "arm waving" and a pencil.

This discussion will cover dB ratios for voltages. Voltage was chosen instead of power since it is more frequently used. A similar technique can be applied to power levels.

Level difference, in decibels, is defined:  
 $dB = 20 \times \log(\text{Voltage 1} \div \text{Voltage 2})$

Level in dB from a reference voltage then is:  
 $dB = 20 \times \log(\text{Voltage} \div \text{Reference Level})$

The dB is a ratio measurement, not an absolute measurement, which compares one signal level to another signal level. To emphasize this, consider a signal of 1

Voltage Ratio	.1	.5	.7	.85	1	1.2	1.4	2	10
Gain (dB)	-20	-6	-3	-1.5	0	+1.5	+3	+6	+20

lated. One is larger and one is smaller than the measured value. Multiply the smaller value by 1.4 (+ 3 dB) to obtain an intermediate value. Determine which two calculated values are nearest to the measured value.

You can use the approximation that 1 dB is about one-third of the difference between the two values. Add or subtract

the one-third difference to get a value as near reference as possible.

**Large steps method:**

Multiply reference level by 10 (+ 20 dB). Repeat until value is equal or greater than measured value. The large size of these steps (20 dB) usually will not yield the desired accuracy until we

get closer with smaller steps. To "close in," you will use the successive doubling method to more closely approach the measured value.

Now it is time to demonstrate these methods by example.

Given: 1 Volt = 0 dB

(This defines reference level.)

A signal is measured as 50 Volts.

What level in decibels is this, relative to the given reference?

**Demonstration of Successive Doubling Method:**

1 volt x 2 = 2 volts

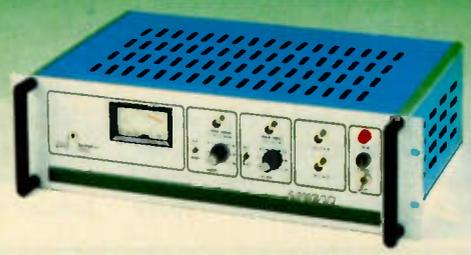
0 dB + 6 dB = 6 dB

(continued on page 10)

LINEAR



**TV REPEATER  
RPT-T**



**TV MODULATOR  
MD-AM**



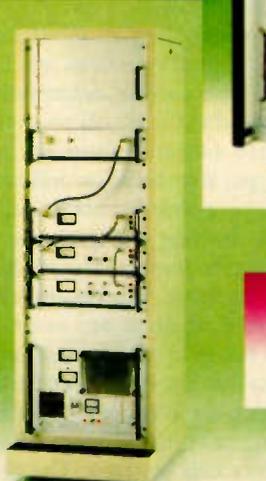
**TV AMPLIFIER  
100 W  
AMV**



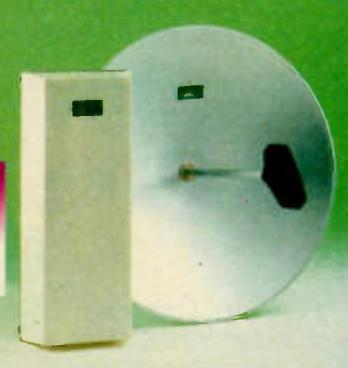
**MICROWAVE LINK  
TX  
MICROWAVE LINK  
RX**



**TV AMPLIFIER  
200 W  
AMV**



**TV AMPLIFIER  
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## TECH TIP

by Larry Albert

V which is 0 dB when compared to a 1 volt reference; but, the same 1 V signal is +60 dB when compared to a reference of 1 microvolt. It is the reference which has changed. The measured signal has not changed!

The fact that this is a ratio measurement allows the use of one simple table as a tutorial aid. Table 1 is designed for reference levels which are unity based and is applicable for any range of values.

The method to follow will use successive approximations to approach a final answer. Each step will get us closer. When we get "close enough," we have an answer and stop. Two methods of doing this will be shown below. The methods of successive doubling and large steps will both approach the same answer. There is only one correct answer! The explanations of method only cover the case where measured signal is larger than the reference. When the measured voltage is less than the reference the multiplying term will be less than 1.

**Successive doubling method:**

Multiple reference level by 2 (+ 6 dB). Repeat this procedure until the value is equal or greater than the measured value. For each doubling of the voltage ratio, the gain increases by 6 dB.

You will use the last two values calcu-

# Tracing Workstation Development

The first digital audio editors were introduced about 20 years ago, and numerous rapid advancements have transformed the systems into what we now refer to as disk-based digital audio workstations, or, simply, workstations. New products and product upgrades have yielded alternative storage and processor capabilities, and the digital audio workstation market is expanding and maturing.

## Workstation lineage

Let us examine the development of disk-based workstations. The first digital audio systems used limited amounts of RAM to digitally encode and store relatively short pieces of audio. Memory was prohibitively expensive at the time, and only those with a great deal of money could afford the luxury of extended memory capabilities. These early systems were designed to "sample" (record), edit (eliminate the unwanted beginning and end) and "trigger" (replay) sounds.

Typically, musical instruments were sampled and then reproduced by actuating the keys of a piano-style keyboard that triggered the specified sample. These RAM-based systems were easily adapted to sample and manipulate short sound effects instead of musical instruments.

These early systems were the predecessors of the workstation and helped identify many of the obstacles that would need to be overcome in order to make

them suitable for audio-for-picture applications.

The most significant growth area has been in memory capability. Early on, it became obvious that before traditional audio editing could be emulated the memory requirement necessary to digitize a sufficient length of full-bandwidth audio had to be satisfied. The ability to read and write directly to disk at a sufficient rate met the requirement. Since then, the speed and storage capacity of disk-related software and hardware have dramatically increased while prices have tumbled.

## Design decisions

It was also apparent to pioneering audio workstation designers that they had to make an elementary decision regarding the system's hardware. One choice was to design a system where at least some of the components could be acquired from any number of vendors. Proponents of this philosophy assert that they are software system designers and thus are not compelled to manufacture components they believe already exist.

This approach permits the designers to focus energy on their specific areas of expertise, they say. It also enables customers to utilize existing components

and purchase only those they feel they will require in order to optimize their particular application system. Under this scenario, the user typically provides the keyboard, video monitor, mainframe computer and associated memory, all of which must satisfy certain minimum operating specifications. The workstation

manufacturer in turn provides custom software and hardware that the user installs in the system.

Another approach adopted by some designers is to construct customized systems. This stance

promotes the notion that only through such dedicated systems can workstations function optimally. (Whether a system is completely customized or not can be reflected in broad variations in pricing.)

The merits of each design approach can only be measured by the individual user in relation to the application.

Regardless of the physical design, however, the ability to read, synchronize and edit via time code is another essential requirement to meet in order for a disk-based audio workstation to function in audio post production. Systems must manage every frame count, including drop and non-drop 30-frame and 24- and 25-frame code. The codes might appear either at standard rate or as typical "pull down" equivalents. Hence, at least a minimal amount of variable speed capability is necessary.

To further complicate synchronizing to time code, the systems also must properly input and output digital audio at the standard work clock rates and external sync.

How successfully these strict requirements are met determines the effectiveness of a system in audio-for-video applications.

## Interface concerns

The user interface employed by a particular workstation is one of the principal features used to differentiate between the diverse assortment of products. As suggested earlier, manufacturers have a choice between two basic design routes: to build custom keyboards or to let the user supply a QWERTY-style keyboard. Some incorporate a mouse or trackball. The ultimate goal is an intuitive human-machine linkage.

When designing an interface, a myriad of interrelated questions must be considered. These include determining the size of the surface that will accommodate the assorted buttons, switches and faders. The type, size, location and angle of each of these components must be determined. Striking a proper ratio of controls to space is important—if there are too many controls, the result is a cluttered keyboard, if there are not enough, one has to revert to multistroke operations.

Of no less importance is the display that provides the feedback from the system. Again, custom or stock displays and monitors can be used. The display must be large enough to present any important information and yet remain orderly enough to avoid confusion and prevent fatigue. The screen cannot be so large that it promotes a health hazard or inhibits viewing of a program monitor.

## Let us examine the development of disk-based workstations.

## How to Make Good Use Of Arm-Waving Math

(continued from page 9)

2 volts x 2 = 4 volts    6 dB + 6 dB = 12 dB  
4 volts x 2 = 8 volts    12 dB + 6 dB = 18 dB  
8 volts x 2 = 16 volts    18 dB + 6 dB = 24 dB  
16 volts x 2 = 32 volts    24 dB + 6 dB = 30 dB  
32 volts x 2 = 64 volts    30 dB + 6 dB = 36 dB

50 volts is seen to be between + 30 dB and +36 dB. We now will use smaller increments to close in.

32 volts x 1.4 = 44.8 volts  
30 dB + 3 dB = 33 dB

50 volts is between + 33 dB and + 36 dB.

44 volts = + 33 dB  
50 volts = + ?? dB  
64 volts = + 36 dB

(64 - 44) ÷ 3 = 20 ÷ 3 ≈ 7

Dangerous approximation: In this range 1 dB is approximately 7 volt change. (It really isn't this simple.)

44 volt + 7 volt = 50 volt  
33 dB + 1 dB = 34 dB

We can now state:

50 volts = 34 dB ± 1 dB

Demonstration of Large Steps Method:

1 volt x 10 = 10 volts  
0 dB + 20 dB = 20 dB  
10 volts x 2 = 100 volts  
20 dB + 20 dB = 40 dB

50 volts is seen to be between + 20 dB and +40 dB.

Use the successive doubling method to get closer to value.

100 volts x 0.5 = 50 volts  
40 dB + (- 6 dB) = 34 dB

We can now state:

50 volts = 34 dB

The large step method is a better starting point when the differences are large. The exception is when you recognize the ratio as a power of 2. (64 = 2<sup>6</sup>)

The table includes entries for 1.5 dB. These are not values that you would generally know, or remember. The numbers in brackets, [1.19] and [.84], are exact values.

The other numbers, 1.2 and .85, are more easily remembered. These approximate values are half way between the 0 dB and 3 dB values.

Most engineers never forget the voltage ratios for 3 dB and 6 dB. The 20 dB voltage ratio is prompted by the formula. This was all "inert knowledge." The only new information used were values for 1.5 dB ratio, calculated from old knowledge, and a demonstration of an application using this knowledge.

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

Of course, the display resolution must be adequate to properly present all information, including complex waveforms and other graphics.

Some interesting alternative solutions to interface issues are enjoying success with particular workstations. A touch-sensitive screen is employed on at least one popular system. Another widely-used system incorporates a wireless pen and tablet.

## More questions

After establishing that the system delivers high quality audio and is reliable, dependable and affordable, still more questions arise. How difficult is it to operate? How efficiently and quickly does it function? Does it perform the tasks delegated to it? All of these questions are used to gauge the overall usefulness of a workstation's operating programs.

How many keystrokes are needed to perform commonly used functions? Is the operation intuitive to the typical operator? Does the operator often wait for the machine, or is the machine awaiting further instructions? How steep is the learning curve?

These questions can only be properly addressed by a system that has had hundreds and hundreds of man-hours devoted to application software. "A fast



by  
Ken  
Hahn

AUDIO FOR

## VIDEO

processor with massive amounts of memory" is not an adequate description of a workstation.

Unfortunately, many manufacturers severely underestimate the amount of time and effort required to develop suitable user interfaces and operating software programs, though the situation is improving with time. Not only are there more manufacturers of systems, but there are also many more users, as the market encompasses even the most critical opponents to digital audio and disk-based technology.

What lies ahead for the audio workstation? A great deal. In fact, its very definition is still evolving, as more and more audio processes are integrated into the workstation concept. Recording, editing, conforming, sampling, synthesis, DSP (digital signal processing) and mixing are all being integrated into one unit. Initial steps are being taken toward industry-wide standards that may enable exchange of audio files, or at least edit information. The integration of removable storage media is another advancement appearing on the horizon.

These and other impending technologies serve to define the workstation as the digital audio system for both the present and the future.

Ken Hahn is co-founder of New York's Sync Sound and has received three Emmy awards and 12 ITS Monitor awards for his work. He may be reached c/o TV Technology.

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

#### Compositing software

Ultimatte's Cinefusion is a software compositing system compatible with the SGI family of workstations. It is available as a stand-alone compositing program or as an SGI object code library with integration capability.

It operates in an interactive mode for setting compositing parameters, and an off-line mode in the SGI platform for image processing.

Cinefusion's interactive menu, Ultimatte Intelligence, includes the Color Conformance feature, which automatically adjusts all background and foreground color controls.

For further information, contact Lynne Suave at +1-818-993-8007; FAX: +1-818-993-3762, or circle **Reader Service 66**.



#### Fiber transmission

Fiber Options Inc.'s Series 240B video and audio transmission system is used to transmit high-quality video and stereophonic audio signals over a single optical fiber throughout production centers and television stations.

The system has a video bandwidth of 20 Hz to 8 MHz, and audio loss is less than 3 dB from 20 Hz to 20 kHz. Signal-to-noise ratios for both audio and video are more than 66 dB.

For further information, contact Barbara Hamed at +1-516-567-8320; FAX: +1-516-567-8322, or circle **Reader Service at 25**.

#### Non-linear editor

The Hitchcock non-linear disk-based editor from Digital F/X features JPEG hardware compression, advanced productivity software and 24-bit, full screen resolution (640 x 480).

The editor supports animation and features PostScript fonts/graphics, QuickTime in/out and two-channel digital audio.

The unit digitizes and records video directly to disk at up to 30 fps. It also supports single-frame capture at full 640 x 480 NTSC resolution and 748 x 576 PAL and SECAM resolutions, exported as PICT files.

For further information, contact Richard Snee at +1-415-940-6747; FAX: +1-415-961-6990, or circle **Reader Service 99**.

#### Tilt corrector

The VTC-100 from Macrovision is an operator-controlled video line tilt correction unit for use in terrestrial microwave, satellite and other transmission circuits where compensation is required.

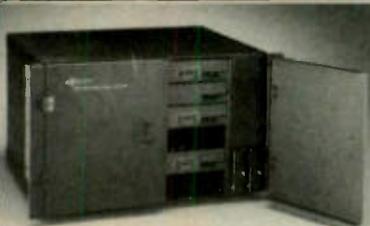
The unit disposes of frequency response problems that cause pulse distortions in a video signal path.

Separate controls enable alteration of bar tilt and time constants. By-pass switches allow the user to remove the complete correction network from the signal path at any time.

The VTC-100 can be attached to four other units, allowing for simultaneous equalization of four independent video sources.

The system is compatible with PAL, NTSC and SECAM formats.

For further information, contact Whit Jackson at +1-415-691-2954, or circle **Reader Service 1**.



#### Digital audio router

With a six-RU chassis and a non-blocking 64 x 64 matrix, the NV3064 Series digital audio router from NVision Inc. is designed to route either asynchronous digital audio signals or ANSI/SMPTE 12M-1986 time code.

For control, the NV3064 Series can be slaved to most existing router control systems to make installation easier into an existing system.

For further information, contact Sue Evans at +1-916-265-1000; FAX: +1-916-265-1010, or circle **Reader Service 119**.

#### Transmitter

The Digicast VHF/UHF transmitter line from Dolp S.r.l. features a microcomputer that can be programmed for the overall system configuration, so that it may become the actual logic unit providing redundancy at the exciter level and/or power amplifier level.

The unit features SMD internal circuits. Internal wiring is virtually eliminated using motherboards and plug-in connectors. Testing and parameter alignment are performed via microcomputer control.

The transmitter maintains harmonic attenuation of 60dB. Differential gain is less than 3 percent and differential phase is less than 3° (10 percent to 75 percent modulation).

For further information, contact the company at +39-690-57-997; FAX: 39-690-58-300 or circle **Reader Service 65**.



#### Satellite Receiver

Scientific-Atlanta Inc.'s 75301 international broadcast satellite video receiver features RS-232, RS-422 and SAbus interface for off-site remote control of receiver functions, and meets RS-250C, IESS-306 and ANSI international standards for video and audio quality.

It also has four selectable IF bandwidths or two selectable Intelsat mask IF filters, as well Ku- and C-band compatibility with automatic polarization selection.

For further information, contact Paul McKeon at +1-404-698-8650; FAX: +1-404-698-8651, or circle **Reader Service 103**.

#### Intercom system

The AA-332 digital talkback system from IRT Electronics is comprised of a centrally located three-RU frame and two to 32 control panels. It features single pair wiring from the matrix to the control panels.

Each panel contains a gooseneck mic, volume control, 16 three-position switches and an active LED. The panel requires 240 VAC, 50 Hz for operation.

The system offers optional two-wire or four-wire interfaces and provides non-blocking access and IFB. It is a totally digital system, and is covered by a five-year warranty by IRT.

For further information, contact IRT at +61-2-439-3744; FAX: +61-2-439-7439, or circle **Reader Service 122**.



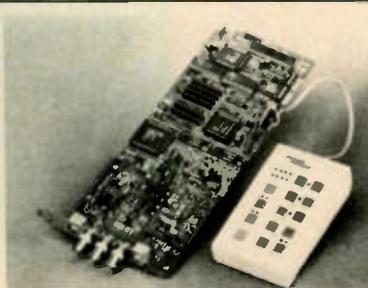
#### Waveform monitor

The MM-400 waveform/vector monitor from Magni Systems converts waveform or vector information for display on a standard picture monitor.

Measuring 1.75 x 14 inches, the MM-400 supports any analog video format, including S-video, and can automatically detect NTSC and PAL standards.

The MM-400 display includes Y/B-Y and Y/R-Y timing, as well as SC/H phase for composite signals.

For further information, contact Steve Talley at +1-503-626-8400; FAX: 503-626-6225, or circle **Reader Service 52**.



#### Desktop standards converter

Prime Image's new All-in-One board is a plug-in standards converter, time base corrector and synchronizer. It can convert NTSC, PAL, PAL-M, PAL-N, SECAM and NTSC 4.43.

It features Y/C or composite in and out, three-way adaptive comb filter and a full digital design so there is no drift and no alignment.

For further information, contact Bobbie Hendershot at +1-408-867-6519; FAX: +1-408-926-7294, or circle **Reader Service 23**.

#### Scan converter

The RGB/Videolink 1500 video scan converter from RGB Spectrum is available as a 9U VME-bus card that can be easily integrated into workstations offering 9U VME expansion slots. It is compatible with Sun, Silicon Graphics, DEC and Evans & Sutherland workstations.

The product converts both interlaced and non-interlaced computer signals to broadcast standard video (NTSC or PAL) for recording on any video tape recorder and connection to video projectors, teleconferencing systems and composite monitors.

Features include anti-aliasing, full 24-bit color processing and real-time operation.

For further information, contact Carol Fogel at +1-510-814-7000; FAX: +1-510-814-7026, or circle **Reader Service 50**.



#### Video synchronizer

Tektronix's VS211A PAL video synchronizer features an eight-field memory that provides synchronization of the incoming field without decoding.

The VS211A can also receive input signals in the presence of noise and continue tracking the signals in the 8 dB signal-to-noise range, even when noise from static interference or a fading microwave feed degrades the signal-to-noise ratio.

The unit features optional composite serial digital input and output.

For further information, contact your local Tektronix representative, or circle **Reader Service 36**.

MARKETPLACE

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

Barry Flannaghan, designer of the one rack unit CVR45, compares it with the 120 rack unit ACE.

# HONEY,



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- **Broadcast quality, 4-field, 4-line aperture standards converter**
- **Composite and component inputs and outputs**
- **Digital noise reduction**
- **On a single card - in a single rack unit**



# I SHRUNK THE ACE

The BBC-designed 4-field, 4-line aperture ACE is still considered by many to be the performance benchmark for top-end standards converters.

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# BUYERS GUIDE

## Editing Equipment

# The BBC Puts Avid System to Work

by David East  
Editor  
BBC

LONDON BBC News and Current Affairs acquired its Avid Media composer in July 1991 when the system was still in its infancy.

Avid is now well established at BBC News and Current Affairs, where it is used extensively for short documentaries, such as the "On the Record" programs, as well as "Public Eye" and the "Assignment" travel series.

### Up to date

Current affairs programs are, by nature, very time sensitive, and new developments can happen at any point, which means that programs need to reflect last-minute changes before they go on air.

Avid is excellent for coping with this problem because it allows changes to be made simply by deleting clips and dropping in new material.

Another advantage with the Avid is the disposal of waste footage that almost always accompanies news stories. Very often, events are filmed live, which involves a lot of standing around, waiting for things to happen. In some circumstances, the camera operator may be

filming while jostling for position with several other film crews, all the while keeping the camera rolling to make sure that nothing is missed. Interviews also contain large amounts of waste material, and we typically edit 20 minutes of film down to several short clips, each lasting only a few seconds.

We use the Avid to scan through the rushes, making instant decisions on which material to work with and which

shots are obviously unusable. We then create a log before digitizing the material we plan to use.

Before we acquired the Avid, we planned our edits as far as possible on a structured day-by-day basis. With the Avid, this has become much less rigid. It is more like a series of decisions in which we continually fine tune the sequences until we are fully satisfied with the result.

The Media Composer's audio facilities are also a great boon to the editing process.

### Sound editor

In our type of work, time is very short, and we find ourselves working on the program almost up until the last minute before broadcast. Prior to the Avid, we had to work with audio and pictures simultaneously. This meant that if scenes were scrapped at the last minute, we had not only wasted time editing the pictures, but we had also wasted the time spent on laying the sound.



## USER REPORT

With the Avid, we can concentrate on the pictures and then fine tune the audio at the end. This means we only work on the sound for the pictures that are actually used.

We are now extending this ability to all other weekly programs, including our flagship "Panorama" show, for which we will record the voiceover directly onto the Media Composer.

BBC News and Current Affairs also uses the Avid to overcome problems associated with cutting into sequences that do not have proper introductions. In interviews, for example, people often make an important point in the middle of a speech. But if we want to use the important part and edit out the rest, it may be difficult to cut into the interview smoothly.

With the Avid we can simply incorporate an audio dissolve at the beginning of the edit. This softens the effect for the viewer and improves the edit by making a much smoother transition.

### Changing attitudes

Although the Avid has made a tremendous impact at the BBC, I have noticed a wide range of attitudes toward the system and non-linear editing in general. Most editors are enthusiastic; however, some of the more traditional editors who are not endeared toward the use of computers tend to be more skeptical.

But I do not think anyone should be nervous about new technology. Once you have actually used the system, you will never want to go back to the old method. The end product can be produced faster and is of a higher quality.

In my opinion, everyone will be using non-linear editing within a couple of years.

*Editor's note: David East has worked at the BBC for a number of years.*

*The opinions expressed above are the author's alone. For further information on the Media Composer, contact Paul Basson at Avid (Telephone: +33-9205-3072; FAX: +33-9205-3073), or circle Reader Service 69.*

## Non-Linear Editing on the Rise

by Fumihisa Nobui

TOKYO Few areas of video technology have changed as dramatically as the edit suite since the onset of digital technology.

Clearly, the most direct impact of digital editing systems has been the rise of non-linear devices, which, up until very recently, have been strictly off-line. However, recent gains in compression technologies have added on-line functions as well.

Avid Technology Inc. of the U.S. has received a lot of attention in Japan as a pioneer of the non-linear concept and is now seen as a leader in the on-line field. Version 5.0 of the company's Media Composer offers on-line functions due to increased image resolution. The Media Composer models 2000 to 8000 were introduced to the Japanese market in May and have already seen substantial sales here.

### Going on line

Also touting a disk-based desktop non-linear on-line system is ImMix, a member of the Carlton Group of London, which recently unveiled the VideoCube. The VideoCube is a stand-alone cube-shaped hardware system with computer interface and provides on-line quality using a compression scheme featuring "wavelet transform" technology developed by Aware Inc. of the U.S.

The VideoCube also provides real-time DVE functions, such as transitioning, character generation and special effects. A fully configured model can store six hours of on-line quality video and 12 hours of CD-quality audio.

Abekas Video Systems, also a Carlton company, will sell the VideoCube in Japan. The system is expected to generate

¥800 million in sales by the end of the year.

Manufacturers of conventional editing systems have also moved into the desktop non-linear market. Sony, for example, has released its Desktop Editing System on a Gateway 2000 computer running DOS 5.0, while Matsushita is also developing a PC-based non-linear editing system. Currently, Sony is concentrating on distinguishing its system with its software and user interfaces.

Manufacturers of high end equipment are also sweeping into the Japanese market with non-linear editors. Quantel, another Carlton company, has released its MicroHenry as a non-linear off-line machine. The unit has the same basic processing functions as the larger and more expensive uncompressed Henry editor.

### Increased compression

Like other companies, Quantel has extended recording time using more advanced compression technology. At ¥40 million to ¥50 million, the cost of the MicroHenry is about one third of Henry. In Japan, sales are expected to begin around August.

Silicon Graphics of California is offering a video system named Digital Studio that loads software functions such as editing, paint and animation and DVE capabilities into the company's Iris workstation.

There is no doubt that the future of video editing is non-linear. With more powerful algorithms continuously under development and greater storage capacities on desktop computers, as well as ever-decreasing costs, the greater speed and ease-of-use of the non-linear editor will become more and more available.



# ZDF Turns to CMX OMNI 500

by Arnold Mueller  
Editor  
ZDF

**MAINZ, Germany** When I entered the world of electronic editing, the state-of-the-art required us to be on our knees in front of the machine trying to press the right buttons at the right millisecond during the Preroll.

I only mention this because this style of editing implied a certain physical component. You had to be in good condition.

The introduction of the first CMX systems shifted this to a rather psychological-rational level: you had to think about what you were doing.

Today, with the CMX OMNI, a new phase in editing starts. Suddenly, ambience enters the suites: mature editors start to set up the data monitor to match the colors of the jackets they wear.

At our facility, we have several rooms where news material is recorded and edited. These rooms have been equipped with CMX systems for many years, the standard system being the CMX 3500.

In our newsrooms, equipped with Beta SP, one-inch B-format, character generators and some DVEs, we recently installed the first three OMNI 500 systems.

We have decided in favor of the OMNI 500 because it keeps up operational continuity and opens the door to new technologies regarding, for example, switcher control, TBC remote control or the new SMPTE list format.

## Bare essentials

To us, the essential benefits of the OMNI 500 are its graphic monitor display, upload/download functions, sync groups and single field control.

When talking about the monitor, I have been waiting since 1980 for a screen that does not wear out my eyes. I have seen a fair share of editors whose eyes flash green INs and OUTs after hours of cutting, and I have to admit that I am part of this group.

The first system to come close to solving this problem is the OMNI 500 VGA display.

The upload/download functions are also highly valuable when calling up switcher effects automatically from the EDL. This is useful if, for example, analog switcher settings are needed repeatedly when coloring titles.

Former CMX systems were able to save E-MEM contents on floppy discs, but now the memory can be

linked to the EDL where the E-MEM contents can be kept as dummy edits. This makes it easy to access them for repeated effects for trailers or leaders.

It is also very easy to upload and download TBC settings to and from a TBC controller.

As for the sync groups function, we have been anticipating this feature almost as long as we have anticipated the VGA display. Mainly, it provides instant updates of timecode values on the display. It has, among other benefits, made the treatment of parallel tapes (e.g. interviews) much easier, especially when we are under a tight deadline.

The Roll Source function brings the time codes of the other linked machines into the EDL, which is another advantage. The update of the time code values also helps with Split Edits, saving brain activity when a machine has to be shifted.

The single field control has helped us during those times when we have had to cut material on the first or

*With the OMNI 500, we can follow the characteristics of the source material, overcoming the problems of lost fields.*

second field. With the OMNI 500, we can follow the characteristics of the source material, overcoming the problems of lost fields. Of course, this requires some practice.

## Room for improvement

Are there disadvantages to the machine? Yes. The slow booting process is one. The keyboard buffer, if you hit the STILL button too often, is another.

In addition, some of us preferred the performance of the old keyboard. But we have high hopes for the new model, since we couldn't become accustomed to joggling with a trackball.

Newcomers to the OMNI might not find it as difficult to learn as some might think.

Editors on previous CMX versions, starting with the CMX 340, had to be trained rather extensively, and it was easy for some people to forget certain functions during the holidays.

The reason was not the keyboard, as some people may

think, but the monitor display and the dialogues. OMNI menus give comprehensive information at one glance. The dialogues appear on the screen with all the necessary information and they remain until all questions are answered.

I found that newcomers have a much easier start if they begin on the OMNI and then proceed to the 3500. Progress is faster and more secure compared to the other way around.

How can the OMNI system still be improved? While many of our suggestions regarding single functions have been taken care of by CMX, a broader improvement

would be a modular extension strategy

## USER REPORT

toward non-linear editing. I think it is possible for modern non-linear functions of image-oriented editing to be integrated into the existing OMNI philosophy. This would provide the advantages of non-linear editing without forcing OMNI users to learn an entirely new system.

## Modular approach

How could this be done? The data monitor might be switchable to the non-linear software display, or a second monitor could be used.

It would be essential for the operation modes (key assignments) to stay as they are, or maybe extended by a flatbed-style control device.

Another requirement would be that the changeover from tapes to hard disk is "unnoticeable." Hard disk recorders would be configured as VTR replacements, but they would be much faster.

At the same time, users could devote their VTRs for archive purposes, and use the hard disk for fast news feeds (as soon as picture quality permits).

This concept would allow a "soft" approach to non-linear editing in the news area. It would avoid a large amount of training, but retain the same staff, rooms and systems just by adding hardware and software modules.

Thus, non-linear, on-line editing could conquer even the smaller ENG rooms.

*Editor's note: Arnold Mueller has worked at ZDF since 1963. His 1992 book entitled "Der Elektronische Schnitt" is a best-seller in the German electronics field.*

*The opinions expressed above are the author's alone. For further information on the OMNI 500, contact John Shike at CMX (Phone: +1-408-988-2000; FAX: +1-408-986-0452), or circle Reader Service 12.*

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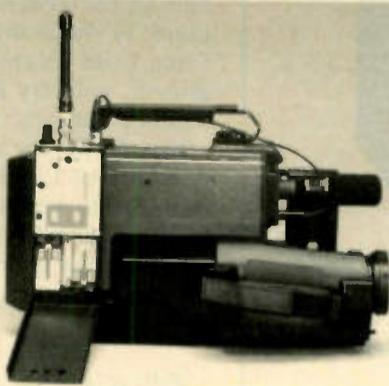
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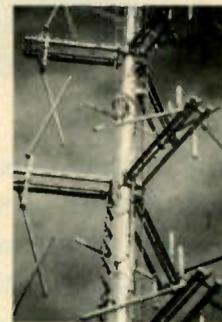
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READER SERVICE NO. 131

# O.L.E. Impresses BBC Scotland

by Bill Kirkwood  
Video Tape Editor  
BBC Scotland

**GLASGOW, Scotland** The Lightworks digital non-linear off-line editing system from O.L.E. Ltd. has made a strong impression on the videotape and film editing staff in Scotland's largest television company.

BBC Scotland has one of the biggest television post production departments outside London, capable of posting everything from small news items to major dramatic series.

## Video introduction

A few years ago we decided to replace film with video. We introduced several tape-based off-line systems with computer time code tracking. However, these were usually used only to structure programs. Fine tuning was done during the

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on-line edit, and the management of edit decision lists became an art in itself.

By the summer of 1991, some producers were considering using expensive on-line time as if it was off-line. But what we really needed was the flexibility of film editing with the advantages of video technology.

At that time, digital non-linear off-line

was officially seen as an infant technology; perhaps it would work in five years or so. However, I suggested that we take a look at the Lightworks editor.

O.L.E. Ltd. brought the machine to Glasgow where we put it through a rigorous test process. Could it edit several different takes together using sections of picture and sound to create a seamless edit? And could Lightworks cope with a director who keeps changing his mind, who wants to hear different versions and then decides to do something totally different?

Lightworks performed amazingly well as I threw everything at it that had ever been thrown at me in a cutting room.

It is also very easy to operate. After quickly familiarizing myself with the basics, I demonstrated the system to several producers who immediately saw the advantages of non-linear. With customers in place, Lightworks was purchased and I edited five 30-minute documentaries straight away.

## Editorial control

The crucial aspect of Lightworks is that it allows the editor to choose how to work. It imposes very little structure but provides many functions that can be deployed the way the editor wants. The editor controls the machine, the machine does not control the editor.

The operation of Lightworks is easily learned. It takes only about one day to get started.

The user interface combines primary function buttons with a remarkably responsive and tactile speed control which looks like a Steenbeck film editor. This controller is supplemented with a mouse and a comments keyboard.

The screen can be set up any way the editor chooses, with smaller viewing/recording screens and the tools for various functions located where they are most convenient. It can look like a cutting room with trim bins and shelves or like a multi-machine edit suite.

## The operation of Lightworks is easily learned.

In any editing situation, organizing the material is crucial. Lightworks has a data base that allows the editor to label shots and groups of shots to provide quick access.

Up to 40 mini-viewers can be displayed on the screen and activated at any time. Material can be cut into an edit directly from those viewers, and multicamera shoots can be slaved together in several viewers.

## Up and running

Once shots are assembled, Lightworks really takes off. The Stripview, which is a graphical representation of the cut audio and video tracks, becomes the main editing area. Apart from a "cut and paste" ability to move sequences around, it is also possible to instantly copy entire edits or sequences and immediately start to re-edit.

By opening a cut, a shot can be shortened or lengthened if sufficient material has been digitized. Trims are always available—no time is lost searching in the bottom of trim bins or spooling through a tape. And if it is not clear whether the newest cut is better than a previous one, they are easily compared using the undo/redo function.

Vision dissolves and audio crossfades are created at the click of a button. There is no time delay waiting for an effect to be rendered. It is also possible to trim shots on either side of a dissolve and to slide it about. There is no need to calculate and recalculate changes—just try it and see if it works.

Lightworks allows the editor to concentrate on the creative structuring of a program, to shape the picture and sound. Time code disappears into the background, and very little time or effort is required to manage the machine.

This flexibility and the user-friendly approach of Lightworks makes it very enjoyable to work with. Once the off-line has been completed, an EDL in an appropriate format is created and "auto-conforming" means a quick and unpressured on-line session.

*Editor's note: Bill Kirkwood was trained by the BBC as a film editor, but now also works as a video tape editor. Over the last 15 years he has worked on a wide range of program types but specializes in documentaries.*

*The opinions expressed above are the author's alone. For further information on the Lightworks editor, contact Keith Smith at O.L.E. Ltd. at telephone: +44-71-494-3084; FAX: +44-71-436-8934, or circle Reader Service 18.*

# Edit Suite Relies on The EMC2

(continued from page 1)

I as well as a very tight deadline.

The EMC2's powerful logging tools and good VTR control are essential for this kind of job because they allow us to automate the transfer of selected material into the system. Working this way, all the logged shots for sequence are displayed and are instantly available as soon as they have been digitized. This allows sequences to be blocked out amazingly quickly, and it keeps all the material readily to hand. And since the logging can be done using any PC, the main system is free to continue editing.

Non-linear also opens up totally new possibilities in the editing process. A number of items we had to edit for an international music series involved pieces shot with a single camera with up to seven passes to playback. The EMC2's ISO reel facility is normally used for editing multi-camera concerts. However, it also has the ability to handle time code offsets, and this allowed us to work while seeing all available options at each edit.

The degree of control this allows is incredible, and it changes what would otherwise be a very time-consuming and complex task into an absolute joy.

One of the crucial aspects of any non-linear system is the type of storage available—fixed or removable hard drives or optical disks. Hard drives can offer optimum picture quality,

## USER REPORT

but they tend to limit flexibility.

The EMC2 was specifically designed to use optical media for maximum flexibility, fast turnaround and low cost of ownership.

For example, when it comes to long-form editing, time is the most important commodity. I do not believe there is any point in offering slightly better pictures if that means clients are constantly watching the clock because of the cost. It would defeat the entire purpose of off-line, non-linear editing.

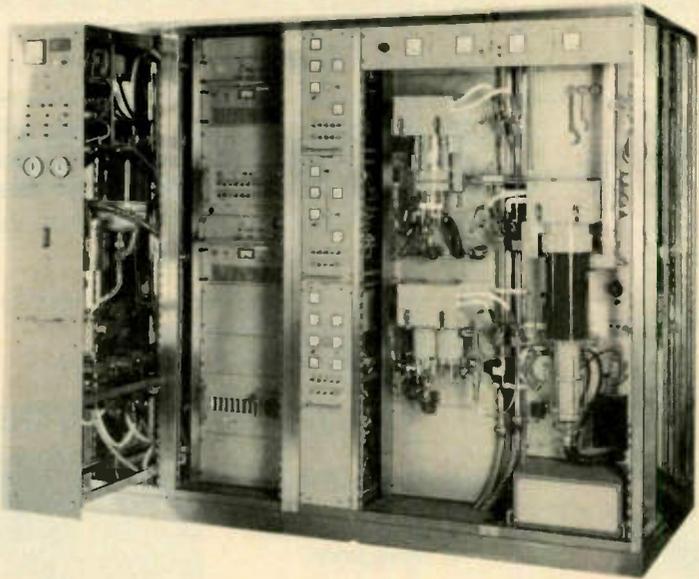
The EMC2 continues to meet our criteria. There is no question that it allows us to produce higher quality work. Its reliability and depth of development are impressive, and it is the only professional system that allows us to offer non-linear editing at realistic rates.

*Editor's note: David Archibald has more than 10 years of experience in broadcast television.*

*The opinions expressed above are the author's alone. For further information on the EMC2, contact John Schwan at Editing Machines Corp. at telephone: +1-708-695-9725; FAX: +1-708-695-7211, or circle Reader Service 117.*

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# Prolink Installs the FOR.A EC-780

by Andrew Dugard  
Director  
Prolink

**BROMLEY, U.K.** When Prolink first decided to install an off-line edit suite to support our own programs and to provide services to other companies, we developed a set of fairly straightforward requirements.

We needed VTRs that offered excellent picture quality and comprehensive facilities at a price that was within our bud-

get. We also needed comprehensive sound mixing and processing equipment to allow us to experiment with audio, as well as video, before going on-line.

### Controller requirements

Another requirement was an easy-to-use controller that offered considerably more facilities than those found in most off-line suites.

Overall, we were striving for an environment that gave the feel of an on-line suite, rather

than the traditional two machines stuck on a table.

The choice of VTR was simple. We selected the new JVC 22 series machine because it provides superb pictures and has a host of professional features. While they are not cheap, they provide excellent value for the money.

However, finding an edit controller was a much more difficult task. We knew what we wanted, but we did not know if

anyone had built it yet.

Our list of requirements was short but demanding. Although it

## USER REPORT

was to be initially installed in a two-machine suite, future expansion plans would require it to one day function as an A/B roll controller, as well as take control of a video mixer.

It also had to be able to control a variety of VTR makes and

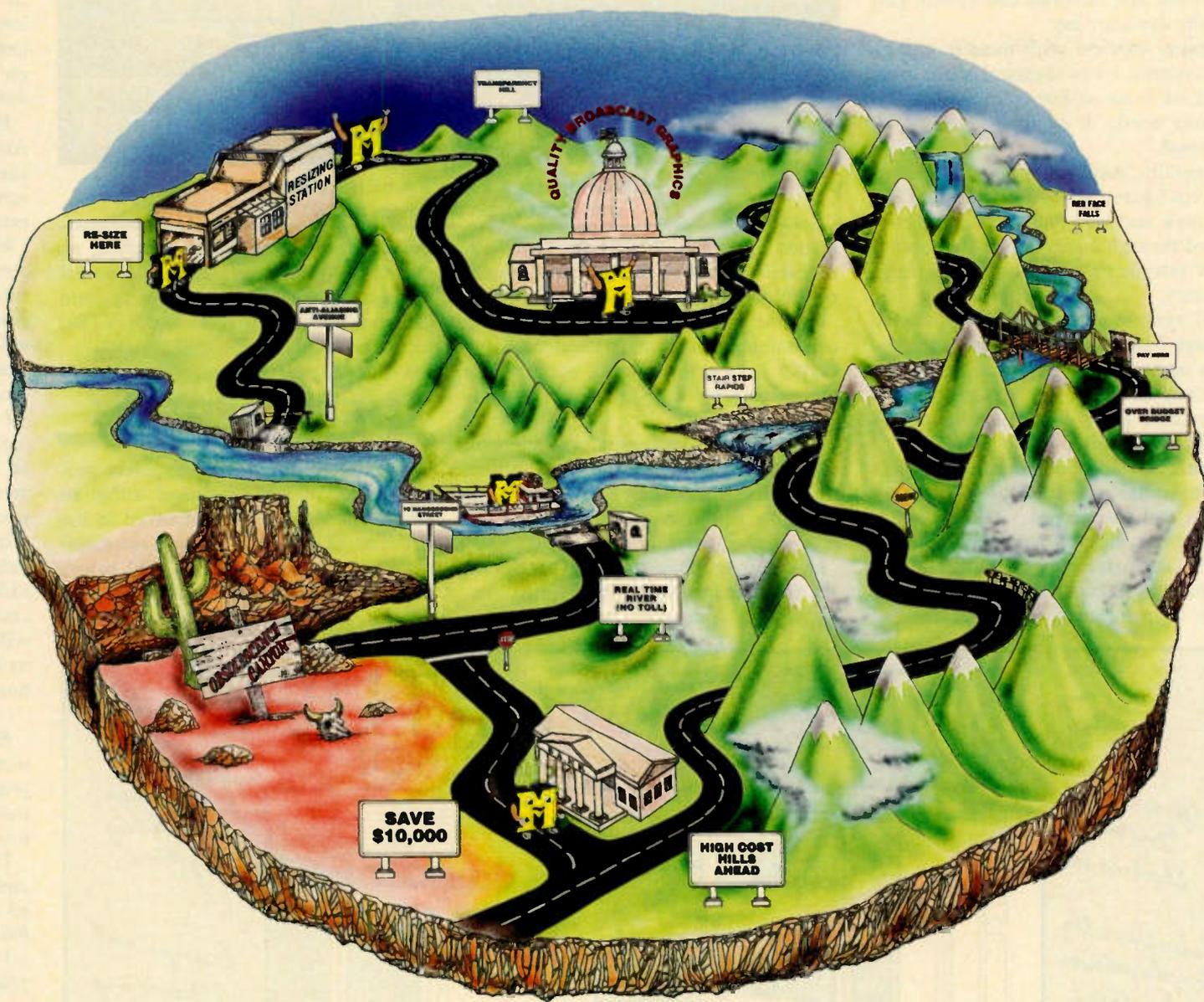
formats, not only to cover our own expansion plans but to accommodate potential clients' use of Hi-8, Betacam SP and other formats.

We also needed the ability to produce a computerized EDL in CMX format to speed up the on-line process, and we liked the concept of a user-friendly numeric keypad for entering in and out points and for trimming edit points.

However, the most demanding requirement of all was that we needed all these features for less than £3,000.

Having searched through mag-  
(continued on page 19)

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# RGB's AmiLink Satisfies WCFC

by Dan McGraw  
Senior Editor  
WCFC-TV

**CHICAGO, Illinois** When WCFC-TV built its new communications center in 1991, one of the goals was to establish an in-house post production department to provide producers and clients with on-line editing, graphics and animation.

When considering the purchase of an on-line editing system, we looked for a system that was highly capable, affordable and reliable. After looking at the larger systems and comparing costs and capabilities, it was obvious that RGB Computer & Video's AmiLink editing system could not be beaten.

## Amazing sessions

We have been using AmiLink with NewTek's Video Toaster for almost two years, and I am amazed at the variety of work and long sessions this system puts up with day after day.

Having worked with numerous high end systems, I was skeptical about using AmiLink in an on-line environment. But for our needs, it performs just as we expected.

Generally, AmiLink is simple to install and configure. All of our Betacam SP, 3/4-inch and one-inch VTRs are controlled through a network of standard V-LAN interfaces supporting zero frame accuracy.

All system setups are manipulated through friendly software commands and each operator can set up, change and save any number of personality options or machine patch control configurations quickly and easily.

AmiLink's approach to editing is both professional and intuitive. Up to 16 source and four record VTRs are available on line, and any mixture of serial or parallel decks is handled automatically.

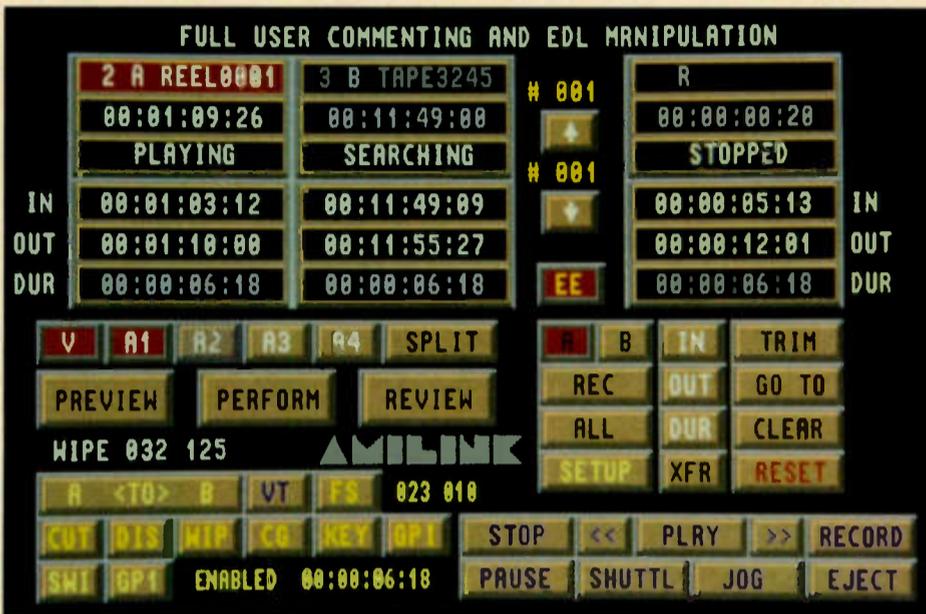
It handles four channels of audio, supports drop-frame, non-drop, mixed or

PAL/EBU, and it interfaces with most video switchers and VTRs. In my standard configuration, I route two Betacam SPs and one 3/4-inch as players through the Toaster to a Betacam SP recorder.

At a glance, AmiLink uses a CMX-style keyboard and a graphic display control panel using either a cuts-only or A/B roll configuration. Editing com-

keys. If a wipe is desired, the window asks for the from/to sources, pattern code, transition rate and any effects to be added (such as posterize, color filter, etc.) from the Toaster. As the values and edit directions are input, the edit list is updated.

The edit list is very manageable in terms of cutting and pasting, moving



RGB Computer & Video's AmiLink interfaces with most video switchers and VTRs.

mands are entered through the keyboard, mouse/trackball or through an optional control jog/shuttle control board.

On-line editing, in its simplest form, is determining edit points, transitions, overlaying keys and directing audio while maintaining repeatability and maneuverability within an EDL.

AmiLink allows an operator to maintain complete control over these operations through either "MARK" points or through the use of easy-to-follow requester windows.

Input through these windows are Set In, Set Out, Set Dur(ation) and Trim values, as well as comments, transitions and

events or whole blocks or matching an event to a location or comment. The list management also supports rippling, auto clean and sorting by reel, source VTRs, record in, etc.

## USER REPORT

In addition to its readily apparent procedures, additional operations within an edit event are entered and saved in the list. The EDL will recall and automatically load framestore pages, CG pages, clip levels and around 50 GPI settings.

With some additional training, E-

MEM/E-FILE style scripts (ARexx) can be generated and saved in these lists as well.

Where AmiLink bests other systems as far as I am concerned is in the split edit feature. Up to five independent splits are supported by track.

This means that if I want to cut to video first, bring in audio channel A1 after two seconds, bring in channels A2 and A3 while dropping the video at five seconds, then bring back the video and drop A1 and A2 at eight seconds, there is no problem. Each split is then saved in the list automatically. This really must be seen to be believed.

Other features include an on-line help manual, dynamic tracking control, extensive match framing controls, color framing and the ability to pre-load edit points and auto-assemble. It can also import/export CMX 3600 lists through MS-DOS or AmigaDOS.

## Suggestions

Despite its positive influence on our post work, there are some disadvantages in our system configuration. For instance, the editing control panel is controlled in tandem with our Video Toaster on the same computer, although this is not the fault of the AmiLink.

Because most configurations using AmiLink and the Toaster reside in the same CPU, we must constantly swap screens through either keyboard commands or on-screen buttons.

We will soon upgrade our system to run AmiLink on a separate computer while still controlling the switcher on another computer through remote control. This will avoid the screen swapping and generate a more traditional feel for our editors.

I highly recommend purchasing the jog/shuttle control board when outfitting an AmiLink system. This board makes zeroing in on a point much easier than using a keyboard as a shuttle.

In general, I think the AmiLink provides two main advantages. First, it provides high capability at a reasonable cost. Secondly, the future of AmiLink will provide a viable upgrade path into new technologies, such as professional non-linear systems.

*Editor's note: Dan McGraw started working at WCFC-TV38 in Chicago last year and has worked in broadcast and industrial facilities as a producer, on-line editor and production manager.*

*The opinions expressed above are the author's alone. For further information on the AmiLink, contact Mike Rowe at RGB Computer & Video (Telephone: +1-407-844-3348; FAX: +1-407-844-3699), or circle Reader Service 127.*

## BUYERS BRIEF

The new Ediflex Digital non-linear editor from Ediflex Systems operates on a 486 PC motherboard running Microsoft Windows.

The device allows actual scripts to be imported using a scanner or disk, allowing new material to be added to keep scenes in order.

Also included is the new "capture-and-go" capability in which raw footage is digitized and stored in files where they can be accessed without prior logging.

For further information, circle Reader Service 79.

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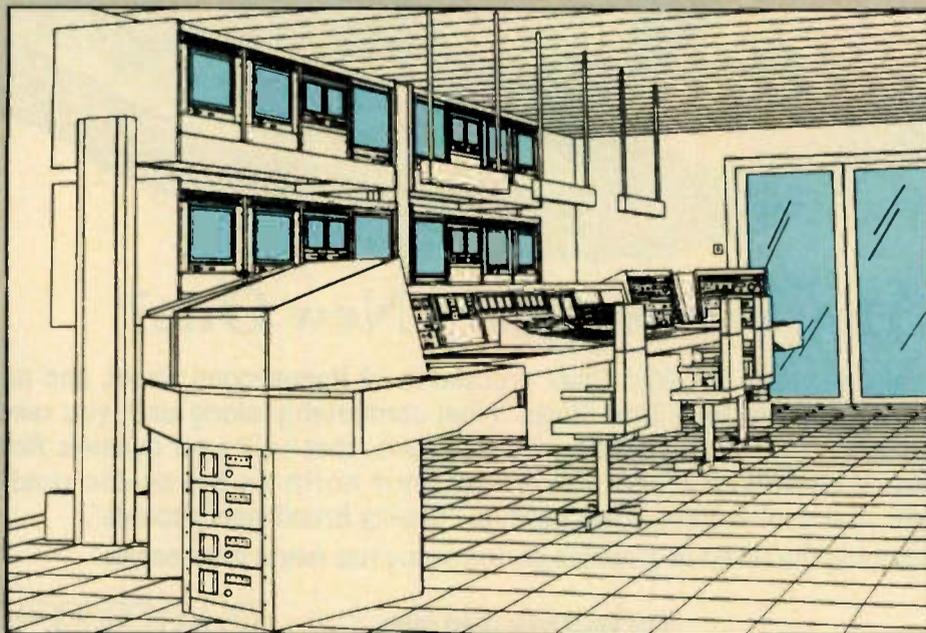
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### FOR.A EC-780 Edit Controller Put to Work at Prolink

(continued from page 17)

azines and brochures and consulted our regular equipment dealer, we found only one suitable controller: the FOR.A EC-780.

We have been working with the system for three months, and it has more than met the requirements on our original list.

The unit can be connected to a maximum of six VTRs, four of which can be selected for use at any one time. The unit will control a suite made up of a mixture of U-matic, Betacam, Hi8/8mm, S-VHS/VHS and M-II VTRs and will even handle digital machines with future software upgrades.

Complete control over any GVG 100 protocol mixer is provided, as is a GPI port to trigger external DVEs and other devices.

The 255-event memory can be downloaded to a PC where a menu selection within the FOR.A software creates a CMX format diskette.

Editing is a complete joy with a full numeric keypad supplementing the traditional in and out keys. Anyone who has off-lined on a controller that requires the minus key to be pressed 24 times to trim an edit by a second will envy the luxury of the 780, which allows the editor to simply type in "-24."

Of course, the unit has one or two deficiencies as well. The button marked "Audio Split" gets the pulse racing with thoughts of specifying in and out points on both the recorder and/or player for video and audio. Sadly, this enthusiasm is rather dashed, as the EC-780 currently limits the user to defining the audio split point with reference to the record VTR.

#### Shuttle smoothness

Also, it is a shame that the overall operational smoothness of the EC-780 is not reflected in the use of the jog/shuttle dial, which has a very mechanical feel as you reach the park position.

In addition, the shuttle dial "remembers" the speed at which it was left when going directly from shuttle into play mode. This means that as soon as the shuttle mode is accessed again, the VTR spins off in the direction and speed last used. We would prefer the shuttle dial to automatically return to a zero value whenever play or jog is selected.

All in all though, the EC-780 is an excellent product that we would happily recommend to anybody and one that we will be using for years to come thanks to its built-in future proofing.

*Editor's note: Andrew Dugard founded Prolink five years ago after establishing a career as a still photographer.*

*The opinions expressed above are the author's alone. For further information on the EC-780, contact your nearest FOR.A representative, or circle Reader Service 80.*

# WTWO-TV Invests in Panasonic

by Christopher Strobel  
Creative Services Director  
WTWO-TV

**FARMERSBURG, Indiana** When WTWO-TV changed ownership several years ago, one of our top priorities was to get news off 3/4-inch and onto another format. The former owners did not invest much in equipment, and our 3/4-inch gear was pretty archaic.

We looked at a number of formats and visited stations in other markets, one of which was using S-VHS for news. S-VHS seemed like a good prospect, especially because news is only dealing with first-, second- or third-generation material.

We examined Panasonic's S-VHS equipment and liked many of its features.

#### Round-the-clock operation

Panasonic's AG-A770 multi-event edit controller is designed for easy operation



WTWO-TV uses the Panasonic AG-A770, which has separate Jog/Shuttle dials and dual controls.

without the need for extensive training and practice. A total of 23 people in our news department require access to the edit controllers.

Everyone in news—reporters, shooters, meteorologists and even our news director—is a hands-on editor. It is important for us to have an edit controller that is easy to use and meets the needs of a department working virtually around the clock.

We do one hour of news at 6 a.m., cut-ins during morning network feeds, weather updates during syndicated talk shows in the afternoon, a half-hour newscast at 6 p.m., a 35-minute newscast at 10 p.m. and cut-ins overnight. About 95 percent of our news stories are breaking and need to be shot and aired the same day.

We previously had a single large edit room, but we built separate edit bays when we purchased our three AG-A770s last summer. Each room is outfitted with a Panasonic AG-7750 S-VHS editing VCR and an AG-7650 S-VHS player. In addition, there is a four-channel Shure audio mixer and a small router to pull in CNN and NBC news feeds so we can get everything on the machines during the day.

We are largely a cuts-only editing environment. We do not use SMPTE time

code; we just control track with a history of slipping. But with the AG-A770's editing precision, we have had no complaints about slippage.

#### Push-button editing

Our editors think the AG-A770s are great. They like the ability to enter edit points at the push of a button. They also like the separate Jog/Shuttle dials and the dual controls: Mark In/Out buttons for both the player and recorder side.

We use the AG-A770's standard 9-pin connector with the AG-7750s and 7650s; the same connector allows us to configure the edit system with Panasonic M-II

## USER REPORT

equipment or a combination of S-VHS and M-II gear.

The AG-A770 offers a number of features we have not taken advantage of yet.

editing events in the system's memory for automatic editing.

The auto tag function makes assemble editing simple—the Mark In/Out edit points are simply entered in sequence

*With the AG-A770's editing precision, we have had no complaints about slippage.*

for the player side. It enables us to record at the specified stop and start points without re-entering them on the recorder side.

The AG-A770 is also equipped with a video switcher that can be activated by the AUX switch.

Last September, we debuted an advertising campaign reflecting the upgraded quality of everything in the news arena. In addition to our new edit bays, we purchased four Panasonic WV-F250BH three-CCD color video cameras docked to AG-7450 Hi-Fi S-VHS VCRs for ENG/EFP operations. We redesigned the news set and lighting and introduced a new anchor team.

Viewers immediately noticed how much cleaner everything looked. It was obvious to the layman that the quality of our video and production was much improved.

Our three AG-A770s have been problem-free since they went on line. In fact, we hope to acquire another one for sports, making WTWO-TV completely S-VHS for news.

*Editor's note: Indiana-native Christopher Strobel joined WTWO-TV in 1988 on a part-time basis as a student. He has since served as production manager and creative services director.*

*The opinions expressed above are the author's alone. For further information on the AG-A770, contact your nearest Panasonic or Matsushita representative.*

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# Cell Boasts the Quantel Henry

by Paul O'Hagan  
Managing Director  
Cell

LONDON In the summer of 1992, Cell became the first user of the Quantel Henry concurrent editor. More recently, we have become the first to install a second system.

Cell, which recently celebrated its 20th birthday, is a special effects facilities company devoted mainly to high-end commercials.

In recent years, there has been a dramatic increase in demand for sophisticated

## Henry auto-conforms from CMX-compatible EDLs (edit decision lists).

ed systems to create these advertisements, and Henry is undoubtedly brilliant in this field. It is extremely fast and the quality of results is second to none. But to assess it fully, it should be seen in the context of the entire film-making process.

### From the beginning

Most of our commercials begin with multiple passes on our high speed, live-action, motion-controlled cameras. Images from these cameras are used by our 3-D department as they render using an SGI/Soft Image combination, while animators produce further elements for inclusion in the final commercial.

Editing this material is the final and crucial stage. Clients are always keen that this process is creative and flexible. The focus of their attention is always the image on the monitor, and being distracted by banks of buttons and boxes, with operators' chairs wheeling up and down in front of them, does not help.

This is the magic of Henry. Just a single monitor with on-screen menus, all under pen control, makes Henry refreshingly user-friendly.

For commercials, non-linear editing is surely the way of the future. Radical developments in off-line techniques have thrown previous tape-based systems into the stone age. What client, having had the speed and flexibility of random access at the off-line stage, will want to go back to linear technology in the on-line suite?

Henry auto-conforms from CMX-compatible EDLs (edit decision lists). Elements for a commercial may be scattered across several D-1 master tapes, and the clips and associated audio are automatically loaded in the order they come off the tape. Using Henry's non-linear technology, however, these elements are instantly re-ordered and conformed.

As soon as the relevant contents of a particular D-1 have been loaded, a prompt appears on Henry's on-screen menu instructing the operator to change the tape. Thus, there is no need to support Henry with more than a single VTR, which is an important cost factor.

Henry is an extremely fast editing tool, and, with complex jobs, most of our clients do not bother with off-line. Instead, they prefer to load their material

directly into Henry's 15 minutes of random access memory.

Quantel's "pen editing," in which edit functions are directed with a light pen, is very efficient, and the most commonly used functions can be performed by tapping or flicking the pen. The results are instantaneous and ready for immediate viewing, and there is no need to pre-roll and run VTRs.

Facilities like reverse, stretch and repeat require the selection of a menu box. Henry processes stretches so quickly that they appear to be happening virtually in real time.

Each edit point, cut or mix retains an invisible top and tail, the length of which can be determined by the operator. This allows timings to be changed, clips and audio to be rearranged, edit decisions, such as mixes to be processed instantaneously, and different versions to be swiftly produced and stored.

### Auto-storage

All sequences are adjustable and nothing is irrevocably committed, since keys, color grades, effects and edit decisions are stored on magneto-optical disk.

For instance, a series of cut downs from a 60-second master commercial was quickly achieved recently by recalling the unconfirmed edit and stripping out the required scenes.

The re-edited material in its various lengths was again archived off to tape to await confirmation the following week when the edits were recalled and then confirmed or adjusted.

The true power of Henry lies in its ability to simultaneously multi-layer five

## USER REPORT

foregrounds and their mattes over a background. Each layer and its associated matte can be independently keyed, color corrected, textured and put through the DVE (the equivalent of 49 conventional layers).

Recently, we completed two 20-second spots for some foot care products. The director and production company brought us a storyboard showing a woman walking across ever changing landscapes—volcanic rocks, a green orchard, the desert, and other scenes—

created using replacement models built on six levels.

Each level was shot on 40 separate overlapping sections with matched lighting effects and moves. To complicate matters further, some levels were shot in reverse non-real time and had to match precisely with the sky and the woman's legs filmed as live action.

With all the elements cut to length with their respective mattes, each 20 second commercial contained about 15 minutes of material.

Henry is undoubtedly in a class of its own. It is still evolving—we took delivery of the world's first Dylan storage option and we are about to receive the new custom editor's software—but it is already brilliant. And if Quantel's track record is anything to go by, we are only scratching the surface of future possibilities.

*Editor's note: Paul O'Hagan trained at Filmfex Animation as a rostrum and optical cameraman. He founded Cell in 1973.*

*The opinions expressed above are the author's alone. For further information on the Henry concurrent editor, contact Dominic Lunney at Quantel at telephone: +44-635-48222; FAX: +44-635-46361, or circle Reader Service 13.*

# Sony BVE-9100 Editor Selected By Sonus A/V

by Ken Cosi  
Senior Editor  
Sonus Audio/Video

SANTIAGO, Chile When Al Cohen, our chief engineer, and I sat down to design Sonus, we looked at numerous systems and formats: composite analog, component analog, composite digital (D-2) and component digital (D-1).

Although D-1 had not yet entered Chile at the time, we felt that it was the only way to make sure our investment

## USER REPORT

did not become obsolete as new technologies emerged. We also felt that no other company could approach the "total system" concept that Sony had put together. In fact, 90 percent of Sonus is comprised of Sony gear.

It was this total system concept that attracted us to Sony. For example, our BVE-9100 edit controller talks to our DVS-8000C switcher, as well as our DME-5000 DVE machine, MXP-390S audio board, and of course, our DVR-211, BVW-D75, BVH-3100, and BVU-950 VTRs.

The BVE-9100 editor is capable of storing a tremendous amount of information within each edit. In one edit, I can save color corrector and TBC settings, a snap shot of the switcher's current settings (including clip levels, fader bar positions, auto transitions, etc.) and DVE and switcher memory events, all on a 3.5-inch disk.

### No more analog

The thing that threw me when I started working with D-1 was that I had to stop thinking analog and all that it entails:

generational loss, color framing and even to some degree, video levels. The D-1 process is remarkably different.

In analog, it is necessary to cram in as many effects as a switcher will allow in one edit. This often requires many sources to be rolled at once, along with multiple effects channels.

With D-1, it all becomes so simple because you do not get bogged down with the switcher and all that time code. Instead, you can concentrate on one or two effects at a time and then let the master become your source to add still more effects.

Another great thing about D-1 is that it provides the ability to easily create multiple versions. It only requires another pass, layer, generation, dub, clone or whatever you want to call it. This is a tremendous benefit for us at Sonus, since 99 percent of what we edit are spots.

When I edit a spot, I often edit a clean version of it without characters. Then, on the next pass, I add all the characters. In this way, if I misspell anything (my Spanish still isn't that great) or the client wishes to change something (a sale date, for instance), corrections are easily made.

### Non-linear aspects

To some degree, D-1 has non-linear aspects to it. If it becomes necessary to extend a shot early in the spot, there is no need to alter the list and reassemble it after the extension. All that is required is another pass.

When a client needs to make a B-roll of shots from Betacam, for example, we B-roll to D-1, saving a generation. Once, by mistake, I matched into the B-roll when I should have matched into the A-roll, but there was absolutely no

difference at all.

The nice thing about Sonus is that we had the opportunity to construct a facility from the ground up with serial digital video equipment. The central router, Digital F/X Paint system and color correctors, for example, are all D-1 digital. And the equipment that is not D-1 has dedicated decoders and analog-to-digital converters (and vice versa, if necessary).

As for audio, we do not take full advantage of the digital audio of the D-1 format. All our audio is analog because we do not edit audio in the on-line room. All audio is finished digitally in our mix-to-pix and sweetening audio rooms and then recorded with time code on DAT (Digital Audio Tape). Afterwards, either in the machine room or the on-line room, we use the digital outputs and inputs of the DAT and D-1 VTR to digitally dub the finished audio.

Although we have digital video monitors, I rarely monitor digitally because, to be honest, it is too crisp and clean.

Although editing systems have seen the rise of computer video workstations in the past several years, I feel more comfortable with a traditional on-line room, and I think my clients do also. The entire process is similar to what we have been accustomed to for years, and I enjoy having all those buttons and knobs, rather than the pens, tablets and menus found on workstations. With the workstation, it is not possible to simply look at the switcher and see what is going on, or have an assistant type a page of text during an edit.

*Editor's note: In addition to his post as senior editor, Ken Cosi is also a partner and director of video post production at Sonus Audio/Video. He is also a member of ITS and SMPTE.*

*The opinions expressed above are the author's alone. For further information on the BVE-9100 edit controller, contact your nearest Sony Business and Professional Group representative.*

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Sony DXC 3000 12x zoom, case, tripod adapter, CMA-8 AC pwr, like new, \$2350. L Elliott, EPI, POB 12138, Atlanta GA 30355. 404-351-1659.

Sony BVP-3 (2) Betacam cameras w/BVU 1 videotape back rcd, Fuji 14X lens w/2X extender, \$3500 w/rcdr; \$2500 w/o. J Polikoff, JP Productions, 444 E 82nd St, NY NY 10028. 212-879-3521.

Sony BVP-150, VO-6800 like new, lw hrs, pwr sply, 15X Canon lens w/grip, manual, shpg case, original owner, \$2500. P Stallonis, PTS Films, 8000 Neighbors Ave, Baltimore MD 21237. 410-866-5363.

JVC RGB KY-M280 prof video camera, 650 line resolution, internal & external genlock, separate cntrl unit w/20 ft cord, Pluss copystand, \$2500/BO. 510-428-4902.

Want to Trade (2) Panasonic 555 video cameras w/full EFP pkg, 5" EVFs, RCUs, AC/DC supplies, misc access, needs work, trade for misc prod/AV equip. M Nolte, MiraCosta College, 1 Barnard Dr, Oceanside CA 92056. 619-757-2121 ext 408.

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Canon VC-40A color camera, stereo mic, title gen, mint cond; Quasar VHS 3-spd tape deck, 4 head HiFi, mint cond, \$600/BO. Blue Diamond, Box 102C Chubbick Rd RD1, Canonsburg PA 15317. 412-746-3455.

Sony XC-999 1/2" CCD syst w/2 lenses, camera & RGB adapters, SC/H, genlock, cables, extras, \$1850. J Strouse, 410-757-6679.

CEI Model 287 (2) studio cameras w/2 CCUs & all cables, plumbs (2), large viewfinder(2), \$600/both. C Poyori, 10005 Lacy Ave, Morrisville PA 19067. 215-945-3990.

Panasonic WV-F700/AU-410 camera w/microphone & 10:1 lens, hard charger & battery, 6 mths old, under warranty, \$11000. A Nguyen, 714-531-8896.

Panasonic AG-450 6 mths old, hard case, 4 batts, excel cond, \$999/pls shlp. T Causland, Auburn ETV, Auburn University, Auburn AL 36849. 205-844-4110.

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Sony VO 9800 Umatic SP with TC; Sony VO 9850 Umatic SP with TC & Insert editing; Sony RM 450 controller with all cables; Video Toaster with 2 TBCs complete system with lots of extra software. Roman, Video Voice Productions, 718-769-6767.

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A/B roll edit cntrl w/time code reader, monitor, 6 machine selector, interface cables, 3 VHS edit-rod/players. G Stennett, ARS Video, 89 West Ave, Tallmadge OH 44278. 216-633-2255.

Harris 550 TBC w/DOC, Ilke new, \$725. 614-882-2228.

Sigma CSG-365A sync gen, gd cond, \$500/BO. D Broomfield, Mtn View Comm TV 6, 950 N Rengstorff Ave, Mtn View CA 94043. 415-968-1540.

Lenco PFM600 & PSS 602 DA rack, pwr sply, (2) PSD-340 delay modules, PBB-321 black burst gen, vgc, \$680. D Stewart, MRI Video, 216-696-1122 x260.

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Panasonic WJ4700 SEG w/genlock, \$500. B Allen, CAV, 8711 Damascus Rd, Damascus MD 20872. 301-253-2734.

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Sony DXC 3000 3-chip w/case, cord, tripod, plate, \$3900. E Stevens, 81 Lancaster Ave, Malvern PA 19355. 215-889-9676.

Hitachi FPZ31U 3-tube camera w/microphone & 10:1 lens, hard case, cables, AC/DC. Roman, Video Voice Productions, 718-769-6767.

Sharp XC-800 (3) systs w/7" viewfinders, 12:1 zoom lens, \$1000 each/BO; JVC KY-2700 (3) systs w/5" viewfinders, 10"1 zoom lens, \$750 each/BO; both systs w/CCU w/cables & focus & zoom cntrls. D Broomfield, Mtn View Comm TV 6, 950 N Rengstorff Ave, Mtn View CA 94043. 415-968-1540.

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JVC SAT400 TBC (2) S-VHS or composite, freeze frame, exc cond, \$1500/ea. E Stevens, 81 Lancaster Ave, Malvern PA 19355. 215-889-9676.

Microtime S-230 frame sync & TBC, frame or field freeze, extra S-230 for parts, all manuals & extender card, \$580. D Stewart, MRI Video, 216-696-1122 x260.

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Uher 500 reel-to-reel, \$80 + shpg. J Baltar, Maine Reel, 67 Green St, Augusta ME 04330. 207-623-1941.

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JVC CR8500LU (2) & RM-85U 3/4" edit system, \$500; Sony VO-2610 3/4", \$175; Panasonic NV-9500A (2) edit decks, \$65/both. B Allen, CAV, 8711 Damascus Rd, Damascus MD 20872. 301-253-2734.

Chyron VP-1 4 fonts w/Apple computer & software, gd cond, \$795. Dale, Lambers Video, 809 Turnpike St, N Andover MA 01845. 508-685-5002.

3M D-3600 like new, 4096 colors, 3.5 dual disc, 100 spds roll & crawl, clock, \$2000. L Elliott, EPI, POB 12138, Atlanta GA 30355. 404-351-1659.

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Sony BVH-1000 1" w/BVT-1000 TBC, plays fine, one rcd board needs work, \$5000. 206-932-7280.

Sony VO-5850, we went Beta, take shape, \$2495. R Bruno, The Video-house Inc, 975 Greentree Rd, Pittsburgh PA 15220. 412-921-7577.

Sony VO 4800 3/4" portable U-matic, \$500; Ampex VPR-80 1" P/R, edit, \$9500; Panasonic NV-9300 top load 3/4" U-matic, \$200. Jerry, 800-748-4982.

JVC CR4400 3/4" port w/Portabrace case, AAP44U pwr sply, (2) 12v3Ah bat, \$400; Panasonic AG6400 VHS port w/pwr sply, \$500. B Allen, CAV, 8711 Damascus Rd, Damascus MD 20872. 301-253-2734.

Sony 6800 3/4" U-matic port, Portabrace case, 500 hrs, vgc, \$690; Sony BVU-150 3/4" SP U-matic port, Portabrace case, 2 batls, vgc, \$2200. D Stewart, MRI Video, 216-696-1122 x260.

Sony BVU-110 port 3/4" VCR with Portabrace case, record & playback capability, good condition, complete with AC power adapter, \$750. B Ellis, KOZK-TV, MPO Box 21, Spfld MO

65801. 417-865-2100.

Magnasync Moviola 3000 Series 16MM edge track recording system, slaved to a master selsyn control xmr motor, maln units are mounted to 2 8' Magnasync Moviola racks, used only 150 hrs, like new, \$15000; Moviola Jr film system which has a combined viewer & 3 gang sync w/motor & amp/speaker, \$3000. A Baker, Bdct Prod of America, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

JVC CR600 VCR light use, very clean, w/cables & maintenance manual, \$3000. B Jones, Dapsho TV Prod, NW 1015 Clifford St, Pullman WA 99163. 509-332-5858.

Panasonic 7400 S-VHS port deck, excel cond, \$1800; JVC 6650 3/4" edit deck, excel cond, \$1700. E Stevens, 81 Lancaster Ave, Malvern PA 19355. 215-889-9676.

Panasonic AG-7450A 2-hr S-VHS VCR w/SMPTE time code & Anton Bauer battery mount, docked to Sony DXC-537 camera + current mdl Fujinon 16x9.5 lens, Sony DXF-501 viewfinder, Sony CA-512 camera adapter interface w/Genlock, Panasonic AG-S745 VCR adaptor for stand-alone operation with Y/C In & out & 14-pin connector, Sony LC-421 hard case, excel cond w/manuals, \$7500. B Shourt, Box 4400, San Francisco CA 94101. 415-282-6100.

Sony VO-5600 3/4" R/P, built-in RF, audio ch 1 dubbing, search/scan, extra low hours, recently tweaked & calibrated, excellent cond, \$1400/+ shpg via UPS. Shawn, VideoDesign, 1825 N "M" St, Lakewood FL 33460. 407-586-7266.

Sony BVV-1 Betacam docking VCR, good condition, \$1500/BO; Ampex VPR 80 1" C VTR with 1" C TBC, great condition, \$2000/BO. L Allread, Rave Video Prod, 611 N Orchard Dr, Burbank CA 91506. 818-841-8277.

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Panasonic AG1970 SVHS HiFi editor with built-in TBC, \$1178. Ralph, AVS Productions, RD #2 Roots Lane, Owego NY 13827. 607-687-0545.

Sony VO-5800 3/4" intermittent problem, \$1000/BO; JVC BR-6200U VHS port with Portapak case, power adapter/charger, vgc, \$500/BO; Panasonic AG-155 VHS camcorder, good condition, \$300/BO. D Broomfield, Mtn View Comm TV 6, 950 N Rengstorff Ave, Mtn View CA 94043. 415-968-1540.

## EDITMAN Picks GVG

by Bruce Eagles  
Editor  
EDITMAN Post Production

AUCKLAND, New Zealand As a freelance editor, I have torn out a fair share of my own hair working with frustrating, unfriendly equipment.

But when it comes to Grass Valley Group's VPE line of editors, I usually find that the jobs go smoothly and easily.

The VPE line consists of four models. The VPE 131 has four serial ports, a 1,000-line EDL and a 3.5-inch floppy drive in a three-RU frame. Also with a 3.5-inch floppy in a three-RU frame is the VPE 141, which has seven machine ports and a 2,000-line EDL.

## Next in line

The VPE 241 is the next step up with 12 machine ports, four EDLs (BINS) of 2,000 lines each and two floppy drives. Finally, the top of the line is the VPE 251 with 14 machine ports, eight 2,000-line BINS, two floppy drives and an internal hard drive.

The great thing about these editors is that they all share the same software platform, called SuperEdit. This allows me to go from place to place with the same keyboard layout, the same monitor display and the same software controls.

For the owners of the facilities, the VPE line offers the ability to upgrade to the next level of machine without replacing the entire editor or retraining the staff.

GVG is constantly upgrading the software and enhancing the performance of the VPE series. These upgrades are generally supplied free of charge for a certain period and then at a very nominal rate.

I have just completed a job in Hong Kong where I was using a VPE 251 with the latest software, version 7.0. I was able to perform flawless slow motion matchframe edits, which was a problem in earlier software versions.

The slow motion PEGS command is stored with a reel number, so if an edit is recalled later, and the reel has changed to another VTR, the slo-mo will change as well.

The initialization menu has been rebuilt with a larger range of setup parameters, and there are now multiple slave groups that allow separate slaving of devices.

## Team player

A major benefit of GVG editors is their ability to integrate and communicate with switchers and DVEs. In my part of the world, about 90 percent of the switchers are also GVGs, and the switcher operation from the VPEs is similar for each model.

The E-MEM storage to the EDL is also very helpful. With AUTO E-MEM on, I do not even need to think about saving registers. I just kick the E-MEM from PEGS and it is done. I use a macro to make this switch, and I use the same E-MEM register each time. If I should have to revisit that edit again, even months later, the E-MEM data is pumped back into the same register as if it never left.

This EDL data storage also applies to several brands of audio mixers and TBC controllers. It is also possible to use PEGS to store the effect number of the GVG Kaleidoscope or DPM, as well as GPI triggers, slo-mos and the current page or sequence number of the character generator.

Another feature that takes away the drudgery of searching through the EDL and number-crunching time codes is Match. With this feature, I can play down my record tape and mark an in-point anywhere in the program. When I hit a button, the editor searches the EDL and highlights the edit that the shot came from. It then provides the matchframe.

With all of the wondrous editing machines out there and their long lists of impressive features, the reality is that somebody has to sit down and operate them. GVG has made this task painless and easy without compromising power or performance.

*Editor's note: Bruce Eagles has been an editor since 1975, working in post production facilities throughout the Asia/Pacific region.*

*The opinions expressed above are the author's alone. For further information on the VPE line of editors, contact your nearest Grass Valley Group representative, or circle Reader Service 30.*

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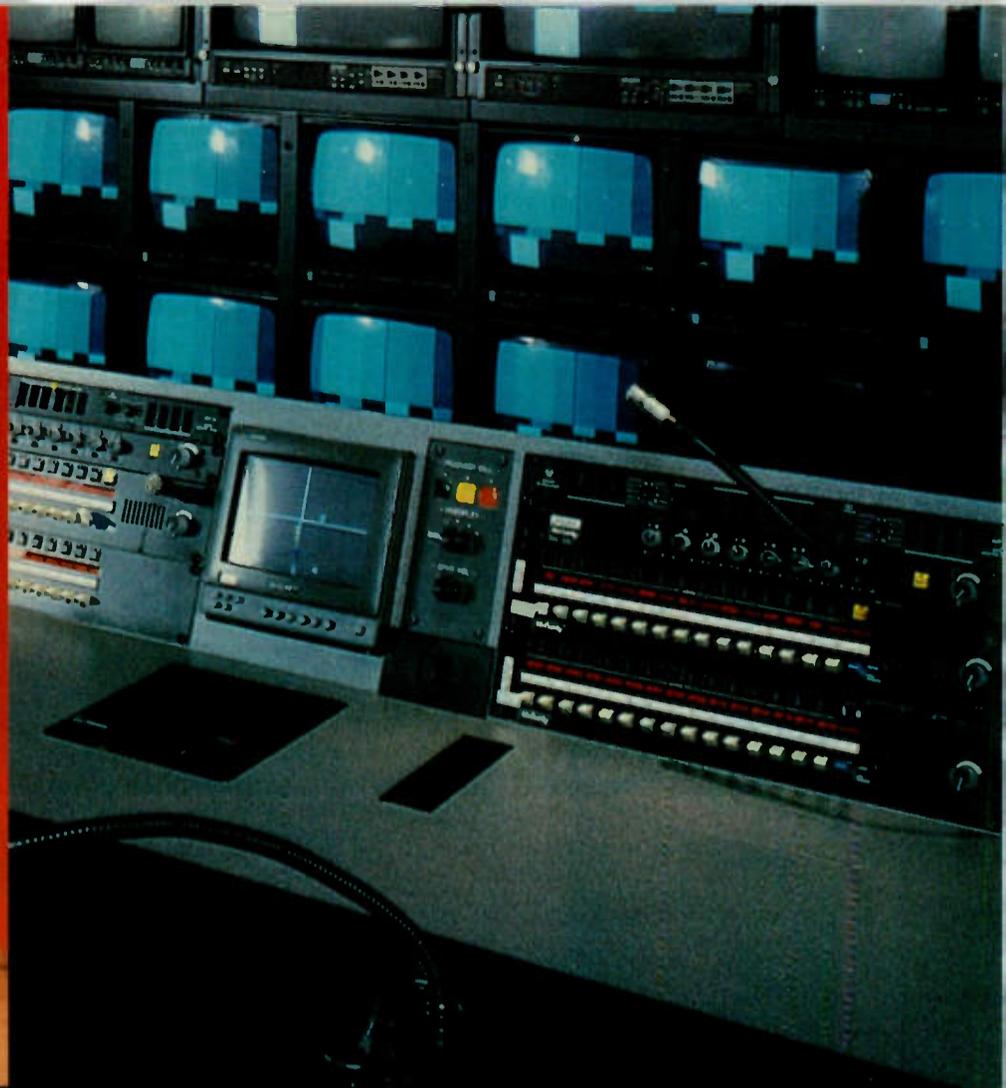
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