TV TECHNOLOGY™

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Buyers Guide: Video Recording See Page 17

The Cineon digital film system permits digital image manipulation and transparent re-recording back to the original media format.

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Kodak Brings Digital Art to Film

by Bruce N. Goren

BURBANK, California As the ultimate mastering medium, 35mm film is here to stay. New film stocks continue to push the envelope of contrast range and sensitivity, while the physical resolution of the fastest formulations is almost unmeasurable.

Add to that the ability to crank a camera beyond the standard 24 fps and you have a bandwidth that high resolution video systems will be hard pressed to approach in the foreseeable future.

Good chemistry

Kodak says the future of film is chemical—emulsion for camera original, emulsion for theatrical release. What goes on in between though—what is known as the intermediate stage—is going to be one wild computer-generated digital ride.

Don Miskowich, vice president, sales and marketing for Cinesite, a wholly-owned subsidiary of Eastman Kodak Company, offered an in-depth look at the technology behind the Kodak Cineon digital film system, formerly known as Kodak's electronic intermediate system.

The Cinesite Digital Film Center, tucked away on the second floor of a bank building in Burbank, California was opened for beta-site testing at the end of September. Because of the uncertainties of release dates and respect for client secrets, it is not possible to say which upcoming motion picture will be the first to exhibit with Cineon composited effects work.

Video graphics artists and pre-print image processing veterans will find the basic "digital intermediate" idea familiar. For instance, in the video graphics suite, a Quantel Harry operator might digitize camera original video frames for rotoscope paint and touch-up for eventual layback to the edit master.

A Mac user would use a flatbed or drum scanner to input a photo for cropping, filtering or special effects image processing, with PhotoShop or Aldus Gallery effects, and would later make separation films for printing.

Tools of the trade

Kodak's Cineon brings to the realm of motion picture filmmaking this same tool set of scanning, digital image manipulation and transparent re-recording back to the original media format.

Why bother? For the same reason that video special effects work has evolved from the analog to the digital domain. Optical film effects work, scene salvage work (removing wires, telephone poles, jet contrails, etc.), matte layering, re-framing

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The Story from InterBEE

by Mike Ueda

MAKUHARI MESSE, Japan With themes like "Digital System Solution" (Sony), "Now on the Digital Wave" (NEC) and "Digital Magic" (Matsushita), manufacturers were putting their best digital foot forward at InterBEE '92, held here 11-13 November.

Although broadcasters are faced with a tough economic climate in Japan, the technology revolution in broadcast equipment is surging, mainly in the development of desktop computer systems. However, there was a significant presence of complete digital systems, as well as digital VTRs and switchers, at the show. An increase in CCD cameras was also apparent.

D-3 draw

Drawing substantial interest was Matsushita, which showed its Emmy-winning D-3 VCR, which was used at the Barcelona Olympics.

The company also presented a new product in the D-3 line—a compact studio recorder, which will be available in the middle of 1993 for about Y5 million (US$40,000). The recorder, which does not have editing functions, is a four rack unit weighing about 28 kg.

Matsushita's half-inch component digital VTR, which is now called DX10, was shown at a Matsushita suite. Although company officials had shied away from giving the format the "D-5" label, it was confirmed that Matsushita hopes to name it D-5 after the format is authorized by SMPTE and EBU.

The VTR on display featured 10-bit processing in 14.3 MHz and can be linked with a D-3 VTR that uses 8-bit processing in 18 MHz. Based on the D-3 design, the component VTR is the same six rack unit size as the AJ-D350 VTR. However, the component format provides only half the recording time of the D-3 format.

"The product will come to the market at the end of 1993, and the price will be not

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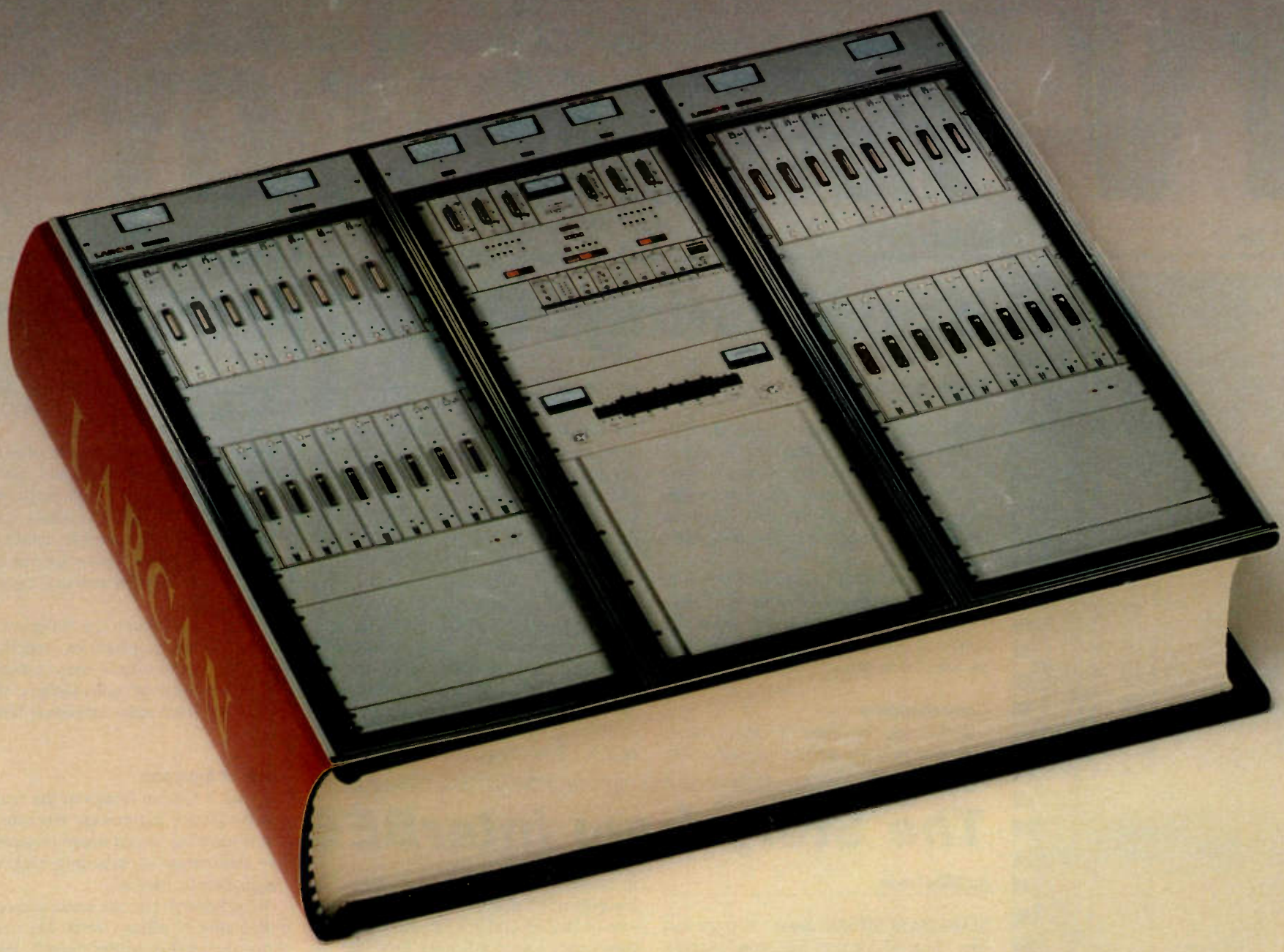

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BUSINESS

Sony Selected to Design Hughes Broadcast Facility

MONTVALE, New Jersey Sony Corp. of America has been chosen to design and build the broadcast plant for Hughes Communications Inc.'s DirecTv direct broadcast satellite network.

The 50,000 square-foot facility, to be located in Castle Rock, Colorado, is expected to house more than 400 racks of equipment, including more than 300 video recorders, 50 Flexicart systems, a digital routing system that includes five digital video switchers with more than 900 inputs and 800 outputs, and control systems for up to 300 channels.

As part of the contract, which exceeds US$50 million, Sony will provide project management, system engineering, integration and installation, customized software and hardware development, as well as training and support at the facility.

Hughes is scheduled to launch the first of two satellites for the service in December 1993.

At the onset, DirecTv will offer 80 channels of programming to customers with 18-inch satellite dishes, with plans to increase the channels to 150 by mid-1994.

BBC Orders Radamec EPO Robotics

SURREY, U.K. The BBC will be receiving 10 new Radamec EPO camera robotic systems for its two new news studios. The order includes five RP2 pedestals, five EPO Height Drives, and 10 Type 435 pan-and-tilt heads with two Cue computers, each fitted with dual EPO See and Select touch screens. The See and Select touch screens permit automatic recall of X-Y position, height, pan, tilt, zoom and focus for up to 16 shots per screen.

In addition to being used for news, the BBC studios will also produce special programs. Thus the ability of switching the Type 435 heads and RP2 pedestals to manual mode quickly was an important consideration for the BBC.

For more information, contact Mike Wolfe at Radamec EPO at telephone: +44-932-561181, or FAX: +44-932-568775, or circle **Reader Service 42**.

Radamec EPO's "See and Select' removes the need for labeling shots

EQUIPMENT

PESA Awarded US$50 Million Televisa Contract

MADRID, Spain PESA Electronica, S.A. recently announced a US$50 million award for 67 television transmitters and turnkey installations from Televisa in Mexico for its new television network, Channel 9.

The new network was recently licensed to Televisa by the Mexican government. The project is scheduled for completion by June 1994. The first station on-air date is scheduled for June 1993.

The all-solid-state transmitters range in power from 2 kW to 60 kW. Operating configurations include dual drive systems up to 30 kW and parallel operating systems at the 40 kW and 60 kW levels. Thirty-three VHF 2 kW to 30 kW transmitters and 34 UHF 2 kW to 60 kW transmitters will be installed.

The turnkey contract provides for all test and monitoring equipment, dummy loads, waveguides and installation. Towers and antennas are not included in the contract.

SSL Announces ScreenSound Installation

OXFORD, U.K. Solid State Logic recently announced that ESPE Studio in Bratislava, Czechoslovakia, has installed a ScreenSound digital audio editing system.

ESPE was established last year to provide dubbing and post production services for private and state companies.

ESPE Studio owner Silos Pohanka said a second ScreenSound or Scenaria digital audio/video production system purchase is being planned for the near future. The facility makes its own productions, and also does promotions, light entertainment programs and dubbing work for European television companies.

For more information, contact Colin Pringle at SSL: +44-865-842300; FAX: +44-865-842118, or circle **Reader Service 125**.

More Broadcasters Opt for D-3 Format

OSAKA, Japan Panasonic D-3 is the format of choice for two more broadcasters, Antena 3 of Spain and Singapore Broadcasting Corporation.

Antena 3, a private broadcaster, has purchased both VTRs and digital signal processing (DSP) cameras. It placed an order for 22 AJ-D350s, three AJ-D310s; four AQ-225s and two AQ-20Ds.

Singapore Broadcasting Corporation's order is for 16 AJ-D350 VTRs.

For more information, contact Panasonic at telephone: +81-6-901-1161, or FAX: +81-6-908-5969, or circle **Reader Service 61**.

EXHIBITION

Montreux Show Plans Unveiled

NEW YORK The 18th Montreux International Television Symposium and Technical Exhibition has been scheduled for 10-15 June 1993 at the recently completed Convention and Exhibition Centre in Montreux, Switzerland.

The 1993 show will run concurrently with the International Electronic Cinema Festival.

The 1993 show will include two new programs, Advanced Technology Day, which will highlight new technologies under development, and a Weekend Forum, geared to executives unable to attend the weekday sessions.

Keynote speakers at the opening ceremony will be Dr. Robert Lucky, vice president of applied research at Bellcore, and Dr. P. Tarjanne, secretary general of the ITU.

For more information, call +41-21-963-3220, or FAX +41-21-963-8851.

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SHOW LISTING

Upcoming conventions, meetings and exhibitions:

17-20 February
Indonesia 93

Jakarta, Indonesia. The 5th International Professional Sound, Film, Video and Lighting Exhibition covering Southeast Asia. Contact worldwide organizers: Overseas Exhibition Services in London at telephone: +44-71-486-1951; or FAX: +44-71-486-8773.

19-22 April
IAB '93

Las Vegas, Nevada. The 23rd General Assembly of the International Association of Broadcasters will be held in conjunction with the 1993 National Association of Broadcasters Convention. Three days of meetings will be held at the Las Vegas Convention Center.

19-22 April
NAB 1993

Las Vegas, Nevada. The 1993 National Association of Broadcasters Convention, with exhibits and sessions, will be at the Las Vegas Convention Center. For information write NAB at 1771 N. Street, N.W., Washington, D.C. 20036-2891 USA, or contact at telephone: +1-202-429-5409; FAX: +1-202-429-5343. [Future show: All located in Las Vegas, Nevada\22-25 March 1994].

13-21 May
SVIAZ '93

Moscow, Russia. The 6th biannual Communication, Data Transfer and Processing Equipment Show held in the EXPOCENTR in Moscow. For information on SVIAZ '93 contact Ms. Susanne Hess, Exposition Manager at TNT Productions Inc. P.O. Box 717, Callao, Virginia, 22435, USA; telephone: +1-804-529-5510; FAX: +1-804-529-5057.

10-15 June
Montreux '93

Montreux, Switzerland. The 18th International Television Symposium and Technical Exhibition. For information contact: +41-21-963-3220; FAX: +41-21-963-8851.

8-10 July
Broadcast '93

Hong Kong. The 2nd Hong Kong International Broadcasting, Sound, Film and Video Exhibition. For exhibiting information contact: Overseas Exhibition Services in London at telephone: +44-71-486-1951; or FAX: +44-71-413-8230.

3-4 November
SBES/Techcon

Birmingham, U.K. 18th Sound Broadcasting Equipment Show and the Radio Academy Techcon '93 conference at the Metropole Hotel. For information contact Point Promotions, P.O. Box Wallingford, OXI0 0XP; telephone/FAX: +44-491-38575.

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

BBC Weighs Terrestrial Options

by Phil Parker

LONDON The BBC is actively pursuing research into terrestrial distribution of extended and high definition television at a time when Europe has begun to sour on satellite-based systems.

With the satellite-based HD-MAC giving a lackluster performance during the summer Olympics and widespread disagreement over the future of satellite HDTV in Europe, terrestrial broadcasters across the continent are prepared to accept the PAL-Plus EDTV plan by 1995.

Back to Earth

The terrestrial movement is backed by the BBC, which is conducting a number of research efforts aimed not only at improving PAL-Plus, but making the most of the terrestrial environment for a possible digital transmission system in the future.

As a composite video coding standard, PAL, and its extension, PAL-Plus, has a number of disadvantages, mainly luminance and chrominance resolution and cross color and cross luminance artifacts. These drawbacks have led some people to argue that PAL-based systems might not be the most "future proof" methods for advanced television.

In addition, CCIR Rec. 601 calls for both MAC and PAL-Plus transmissions to be in component form.

However, the BBC has demonstrated hardware developed over the past year that enables high quality component television signals to be conveyed through composite PAL equipment systems. This allows a component CCIR 601 signal to be recovered and decoded. An MkII version of the hardware using VLSI technology is currently under construction.

The new coding technique combines the advantages of extended definition and the removal of cross artifacts. It also removes the need for sharp cutoff filters, making it easier to optimally shape the luminance and chrominance pass bands.

In the studio

The method is specifically aimed at studio systems and those where the existing signal paths are liable to have a pass band that exceeds the demand of conventional composite PAL.

Digital processing is employed throughout the process, and special techniques have been developed to enable clean coding and decoding of the extended PAL signal.

Looking ahead to digital terrestrial HDTV transmission, the BBC recently teamed up with Thomson-CSF to demonstrate that at least one, and possibly two, HDTV services can be transmitted in a standard 8 MHz TV channel.

Using the Orthogonal Frequency Division Modulation (OFDM) technique, the two organizations recently broadcast a digital HDTV signal from a low power transmitter situated at the BBC's Crystal Palace London transmitter site to various locations in South London and southern England.

OFDM, which proved highly successful in BBC-sponsored DAB (Digital Audio Broadcasting) experiments in 1990, is currently used in the Scandinavian HD-DIVINE terrestrial digital HDTV transmission proposal. It is reported to offer significant advantages over conventional modulation techniques, including high spectral efficiency and immunity to multipath propagation.

60 Mbps per channel

The modulation technique and the transmission and receiving equipment developed by Thomson-CSF at its Rennes laboratories is capable of delivering 60 Mbps in a single 8 MHz UHF television channel (7.5 bps per Hz). The system transmits two separate 30 Mbps signals, one polarized vertically, the other horizontally. Each 30 Mbps signal consists of an OFDM ensemble of around 500 closely spaced carriers digitally modulated using 64-QAM.

Besides terrestrial broadcasting, the successful OFDM tests are seen as offering enormous potential for increased efficiency in another area of HDTV service being studied by the BBC and Thomson-CSF—point-to-point links.

Under the European HIVITS Project, [High quality Video-Telephone and (High Definition) Television], the two groups are developing a motion compensated hybrid DCT codec working at 140 Mbps.

The codec uses six sub-coders and decoders operating in parallel on adjacent stripes of the HDTV picture, each stripe comprising 8 adjacent field lines. The parallel operation is necessary to reduce the processing speed to a practical value, while the stripe-based technique provides compatibility with decoders that operate with a different number of parallel sub-decoders.

Use of a 140 Mbps bit rate for an HDTV contribution link allows downstream production processes to be carried out without degradation and provides head room to accommodate any increase in picture quality that technology development may bring.

The missing link

The HIVITS 140 Mbps codec has been successfully demonstrated with transparent transmission of an HDTV signal over a wideband satellite link. It is also possible to operate the codec at lower bit rates without significant loss of transparency and has been demonstrated at 70 Mbps.

A more sophisticated version of the motion compensated hybrid DCT algorithm used in the HIVITS codec has been used to deliver compressed HDTV over an 8 MHz UHF channel, providing a more than adequate domestic HDTV picture.

The BBC has also demonstrated compression of HDTV pictures to 25 Mbps using the MPEG algorithm for digitally coded high quality conventional definition picture signals in the range of 2-10 Mbps.

Indonesia '93 Show Holds Great Promise

by Mark Timpany

JAKARTA, Indonesia Jakarta's Kemayoran Exhibition Center will be the site of a new exhibition, Electronic Media Indonesia '93, to be held 17-20 February. The show, which will feature professional sound, video, film and lighting equipment, will take place alongside the well-established Communications Technology Indonesia '93 show. That exhibit will be the fifth International telecommunications exhibition in Jakarta. It is expected that some of the same manufacturers and trade visitors will be attracted to both shows.

BPPT, Indonesia's Agency for the Assessment and Application of Technology, is the host for the communications conference to be held in conjunction with the two shows. Sponsorship by BPPT guarantees a sophisticated treatment of topics on Indonesia's communications sector and will attract delegates worldwide from among those active and knowledgeable in the field.

Large turnout

The first Indonesian broadcast exhibition in 1991 attracted over 120 companies from 11 countries and over 8,000 trade visitors. For 1992, show organizers PT Pamerindo Buana Abadi expect a bigger turnout.

Only one of the Indonesian exhibitors contacted who were present in 1991 said they were not planning for the 1993 event. This was a systems integrator and consultant whose work is well established here and has no "new product" to show off.

Chuck Kelly, international sales manager for U.S.-based Broadcast Electronics, commented that Indonesia has been a good marketplace for his company and, "that marketplace is growing." He stated BE's commitment to Indonesian broadcasters, saying that in this country he considers many of his contacts friends as well as customers. An example of that commitment is the fact that he was available to make the comments while here in Jakarta to assist the Indonesian BE agent, Catur Mitra Adhikara, in presenting a training seminar coincident with the PRSSNI meeting. He had some words of caution for Indonesian broadcasters, pointing out that the competition spawned by government deregulation will impose higher standards for both programming and technical quality.

Expanded services

1992 was a big year in broadcasting in Indonesia. The national radio service (RR) began construction on its US$50 million improvements to its domestic shortwave service. The educational television service (TPI) started operations in Jakarta with transmitter facilities independent from TVRI, the government service. And, plans for Indostar were made public. Indostar will provide a radio and television DBS system early in 1995.

More than a dozen new television station licenses were granted to two new entrants to the broadcast market. One of the licenses was granted a national license and plans many more stations after the first phase of construction. The broadcast community anticipates that further deregulation by the Indonesian government will keep the pace of media development active for several years to come.

Indonesia's development has been slowed by the problems of a population scattered across three time zones and 13,700 islands. The next few years, though, are shaping up to be a strong period of growth for the broadcast industry here. Electronics Media Indonesia '93 should provide some direction for that growth.

Desktop Video's Future In Japan

GUEST COMMENTARY

by Jaime Chee

TOKYO As conventional Japanese video production and post production companies rewind their videotapes, push analog sliders, and press analog buttons, few are aware of the information tsunami about to sweep down upon them.

Nippon Telephone and Telegraph (NTT), Mitsubishi, Fujitsu, Intel Japan, IBM Japan and many other major companies traditionally uninvolved with the video industry are investing heavily in the areas of digital video research and in-house video production facilities.

As desktop video production becomes more and more automated, we will see people using the computer like a word processor.

This development has been triggered by the recent technological advances in digital image and sound compression as well as rapid microprocessor improvements that place power on the desktop which previously was found only in high-end workstations.

To understand the implications of these developments, we can look to a paradigm proposed by Alan Kay, a computer visionary whose work with user friendly interfaces at Xerox Palo Alto Research Center during the 1960's inspired the popular Macintosh computer interface of Apple Computer, Inc.

A paradigm

Kay likened the developments in printing to the developments in the computer industry. At first we were in the manuscript age—only a few thousand people were able to produce books. A line can be drawn from this to the mainframe computer age, in which only a few highly skilled people could utilize a computer. Next came the Guttenberg press, which allowed thousands more to have access to books. This is similar to the computer industry in the last few years, in which millions of people now have personal, desktop computing power.

The third stage he described was the Aldus stage. Aldus Manutius is the person credited with making books the portable size they are now. This stage, called "intimate computing" by Kay, is the stage where computers are no longer tools for specialized operators but instead have become a medium for communication among the masses over high speed networks.

This correlation can clearly be extended to the video and video production industries. Television started as a live medium that was managed by a few very specialized video engineers. At that time, very few homes had televisions and people tended to congregate at the homes of these privileged families. As recording equipment was developed and equipment shrank to a manageable size, what we know as the current video production industry developed. Thousands of production companies can now function as independent units with their own resources. Televisions can now be found in great numbers. Giant televisions can be found in every major square of Tokyo. And the industry has come to be based on viewer ratings.

Aldus age

Digital video is bringing with it the advent of the Aldus age of video production and viewing. The production studio is moving into the home and the office.

Recently, NHK, Japan's public broadcasting company, aired a show about multimedia in use in Japan. It showed many examples of people who had bought Macintoshes simply for the pleasure of editing their home videos. The focus of these amateurs laid not on the final product but instead on the pleasure of using the editing system itself. It seems digital video is already on the way to universal acceptance as is its purely aural counterpart, the CD.

The very nature of digital video is in itself a new form of expression. Because a digital image is just a series of numbers, it is easier to be compressed through mathematical formulas. This same quality also allows it to be stored, transmitted and copied without any loss of quality.

In addition, digital video is easy to use. Editing, playback, and all the "undo" commands can be performed though one machine.

If we zoom back the lens of our camera for a moment we can see that what we actually have going on around us is a triple helix of information, communications and computer power—inseparable from one another—spiraling up to the same point.

Although there will always be a need for traditional video skills, we must take into consideration how production companies place themselves in the new industry that is being born of digital video.

The need for digital video

Japan is a country with more than half the population of the U.S. in an archipelago the size of the state of California. Much of the land mass is volcanic and uninhabitable. This density puts tremendous pressures on public utilities, space, time and transportation. The Japanese are to be commended in the way they have developed social and technological solutions to compensate for these problems, and digital video will be another of these.

Each year, Japanese corporations produce thousands of new products. For each of these products there are thousands of documents, descriptions, pamphlets, price lists, instruction manuals, promotional videos and other types of information. This volume can be overwhelming to the staff managing a product as well as to a prospective user; thus it is being realized that new ways must be found to handle the sheer volume of information.

Companies realize that the best way to describe a product or an idea quickly and efficiently is to use the most advanced form of communication available today—video. Unfortunately, with the pace that Japanese companies create and update products, traditional video production is too expensive and time consuming; it requires highly skilled professionals and expensive high-end video equipment. Of course, the result is excellent but can only used for the most crucial of products.

The major players creating the desktop video market in Japan are the same as in the U.S.: Apple Computer, Inc., IBM Japan, Intel, and Silicon Graphics.

Digital video is seen as a way to make companies more productive in this area. Executives and managers do not have time to read the mountains of paper that come to their desks. They need information fast. Translating this information into video form allows it to be quickly produced and delivered in a timely fashion.

As desktop video production becomes more and more automated, we will see people using the computer like a word processor. The manager of the widget will just turn on his TV and watch the information flow by, stopping only for the points that interest him the most.

Storage developments

In terms of storage, digital media is unbeatable. The industry has gone from tape drive to floppy disk to optical disc. Next will be static memory which, as prices continue to drop, will be the medium of choice in a few years. Its benefit is that it has no moving parts and, therefore, is infinitely more resilient. Using compression, a CD-ROM can hold up to 72 minutes of digital video.

As a time saver, digital video's value is realized in several ways. If one has experience being stuck in Tokyo traffic on the way to an important meeting, it would be a first priority to set up efficient teleconferencing. The computer takes this one step further; it allows prerecorded video segments to be transmitted as well as live signals.

Recently, IBM Japan and Intel have demonstrated the capability for transmitting live and prerecorded video over networks at trade fairs in Tokyo.

Digital mediums also take advantage of the computer's editing capability. The computer is an expert at rearranging digital data, moving it around, and shuffling it. It can do all these things and, if properly programmed, it can also undo them.

Emerging technologies

As was stated before, we have three industries growing into each other: the communications, information (or video production) industry and the computer industry. The Japanese market is progressing toward this goal and the signs are already visible.

The major players creating the desktop video market in Japan are the same as in the U.S.: Apple Computer, Inc., IBM Japan, Intel, and Silicon Graphics.

QuickTime is Apple's system software that contains all the facilities needed by software makers to create their own video editing systems. It had no trouble in finding its way into Japan, as the buyers here had already embraced the Macintosh even before it supported Kanji, the Japanese character set. Software packages that run on U.S. Macs run readily on the Japanese version.

Digital Video Interactive (DVI) is the technology developed by Intel and IBM. It is a hardware-based video compression, playback and capture system. DVI can capture and play back video in real time at 150 kilobytes per second, which is a manageable amount by the capabilities of today's storage devices. Although it has just recently been released here, DVI's presence in Japan is significant.

IBM Japan, in the same manner as its parent, has demonstrated its desire to promote digital video over communication networks. At the OS/2 festival in Tokyo and the Multimedia '92 trade show at Makuhari, it demonstrated its strength in communications and DVI technology by sending video, spreadsheets and other information live over LANS and high speed telephone lines using the features of its powerful new OS/2 operating system.

At Multimedia '92, Intel Japan also had two important announcements. First, it displayed a DVI adapter for the NEC PC 9800 series desktop computers. This is significant because NEC is number one in the personal computer market in Japan and the 9800 series is not compatible

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Cinesite Offers Digital Film Service

(continued from page 1)
and scene transitions, besides being very time consuming, tend to result in a build-up of noise, artifacts and the kind of detail degradation attendant to generational loss in analog media.

Film effects rendering turnaround time is also very frustrating to anyone who has ever worked in video or computer graphics. Kodak's idea was to bring to film optical effects work the interactivity and transparent generational freedom available to video producers in state-of-the-art D-1 suites.

The difference, of course, is that inputting the master and outputting the final product are not real-time operations. Scanning from and printing back to film at camera negative quality takes about three seconds per frame. Anyone who has ever suffered through scanning in a photo for a PC on a flatbed or outputting a picture file to a 35mm digital film recorder will recognize that Cineon has scored an engineering breakthrough by scanning and writing at these resolutions and speeds.

Breakthrough designs

The engineers at Kodak had to re-invent every component of the system over the short course of a two-year development period. In the end, Kodak defined new design specifications that go far beyond anything found in HDTV or computer graphics work. The company had to digitally capture and preserve as much of the camera negative's quality as was economically feasible, while not exceeding available computing technology's ability to manipulate images in near real time for user interactivity.

Off-the-shelf scanners, data recorders, computer workstations, software and film recorders—and even video monitors—simply could not meet the demanding specifications of film flatness, noise threshold, storage medium capacity, processing power, data transfer rate and color stability required by Kodak scientists to keep the digital intermediate transparent and the system interactive.

The Cineon pin-registered scanner (See photo) must move film past the three linear CCD arrays with extreme precision. Conventional camera and telecine gates and movements would not ensure stability and perfect flatness at these resolutions. To ensure film flatness, Kodak engineers found they had to wrap the film around a drum in both the scanner and the laser beam printer and then rotate the entire pin and drum assembly past the CCD array or laser beam printer guns.

Filter formulation

The RGB filters for the CCD arrays had to be formulated to precisely match the characteristics of motion picture film stock. In order to compensate for minute smearing during sampling due to media travel, image processing routines similar to the edge detection and detail enhancement circuitry of video CCUs had to be developed.

Exotic lens and mirror technology had to be pioneered to control the scanning mechanics and dot geometry of the digital optical printer.

The amount of data the Cineon system handles is enormous. By way of comparison, a typical frame of video digitized to 32-bit RGB takes up less than 1MB of storage medium. I could put a frame of video on a floppy (two or three frames, using D-2 or D-1 specs), but at 30 fps, the megabytes add up fast. Pre-press still images at 4K resolution and true color bit depth typically run around 36MB and comfortably fit, one image per cartridge, onto a Syquest 44MB removable drive.

Scanning in

The Cineon tri-linear, pin-registered 3 x 4096 one-pass scanner generates files of 30MB to 40MB per frame of 35mm, 4 perf film (Academy 2664 x 3656, Cinemascope 3112 x 3656, Super 35 3112 x 4096) and over 75MB scanning from 35mm 8 perf (VistaVision 6144 x 4096). These various pixel dimension measurements represent an equal scanned resolution in actual digital samples (167 pixels) per millimeter, regardless of film format.

If you plan on releasing to HDTV or NTSC and don't mind not having the data necessary for 35mm print mastering, you can save money by scanning at half or quarter resolution. Theme park ride footage and other specialty applications shot in 65mm need to be duped over to the VistaVision format, since the Cineon system only handles 35mm film stock.

These are not the 8-bit per color channel files we are used to working with in video. The typical 256 levels of video RGB exceed the human capacity to perceive differences in adjacent, differently colored pixels. Kodak engineers felt they needed 1,000 levels, or 10 bits per color channel per pixel, to accommodate film's higher contrast range and to satisfy the requirement for clean matte separations used in compositing work.

Going to the matte

The linear luminance values are actually measured by the scanner at 14 bits. Scan data is stored in printing density format to better represent the light transmission characteristics of film. The added bonus is that these logarithmic numbers require only 10 bits for representation. This extra headroom promises to revolutionize color correction and motion picture blue-screen work, allowing for quicker, less critical lighting setups.

Kodak Cineon licensed the equations for its computer-generated matte work from Ultimatte. In fact, the user interface software completely duplicates, with on-screen slider bars, all 80 or so tweakable parameters of the rack-mounted Ultimatte System 6 hardware.

Just as on a PC-based pre-press system, the Cineon workstation is in a sense an off-line session. You are working at a screen resolution somewhat lower than the data file itself. The Cineon canvas screen uses a 1280 x 1024 computer monitor that has been color corrected to accurately represent film. It is only by virtue of being able to operate on less screen data that any kind of interactivity is possible when painting and matting such huge digital images.

As with making an EDL off-line, an instruction log is applied to the full resolution files for on-line image processing. The log can later be either re-tweaked in this lower resolution interactive mode, or sent on to the laser beam film recorder for output.

Laser advances

With regard to the recorder, it was originally envisioned as a three-strip infrared laser recorder, but recent advances in technology prompted a switch to a more elegant design that utilizes three visible gas lasers. Using the same drum wrap for flatness and pin-registered movement as the scanner, the three primaries are built up by blue argon, green helium and red helium lasers using precision motors and exotic optics for film transport, beam deflection, and spot geometry.

The Kodak vision of a working Cineon suite is a bit more genteel than most edit bays. The client has his own set of system and canvas monitors set back, and away from, the operator.

Kodak uses a file format for the Cineon that is based on a future standard work-in-progress in a SMPTE ad hoc group on digital pictures. The Cineon picture data file is a derivative of the TIFF (Tagged Image File Format) files typically used in computer graphics print workstations.

Once the new file format is formally defined, it is expected that most major computer/video graphics manufacturers will incorporate bi-directional picture file translation into their software packages to accommodate image interchange capability. Miskowich envisions high end 3-D animation systems (typically 24- or 32-bit Targa format) sending matte element output to Cinesite for compositing, or importing Cineon scans into computer graphic scenes requiring rotoscoped texture maps.

An open mind

During my tour, I noted some work being performed with rotoscoped Wavefront images. This non-proprietary attitude about the file format for Cineon's images is in keeping with an evolving computer industry philosophy that stresses an open systems approach to best serve users with a mix of installed hardware.

For now, customers with an immediate need are provided the specs on Cineon's image data protocol so they can translate their own computer pictures into Cineon compatible image files for use on digital optical projects taking place at Cinesite.

The pre-production model of Cineon currently on-line at Cinesite is built around a workstation boasting 120 INMOS transputers arranged in a ring architecture. Managed by a SUN host, the parallel CPUs share a bulging 400MB of RAM and a 60GB hard drive array for on-line picture data. High-speed data recorders for archival storage are expected to be able to accept data at up to SCSI-2's maximum transfer rate of 15MB per second.

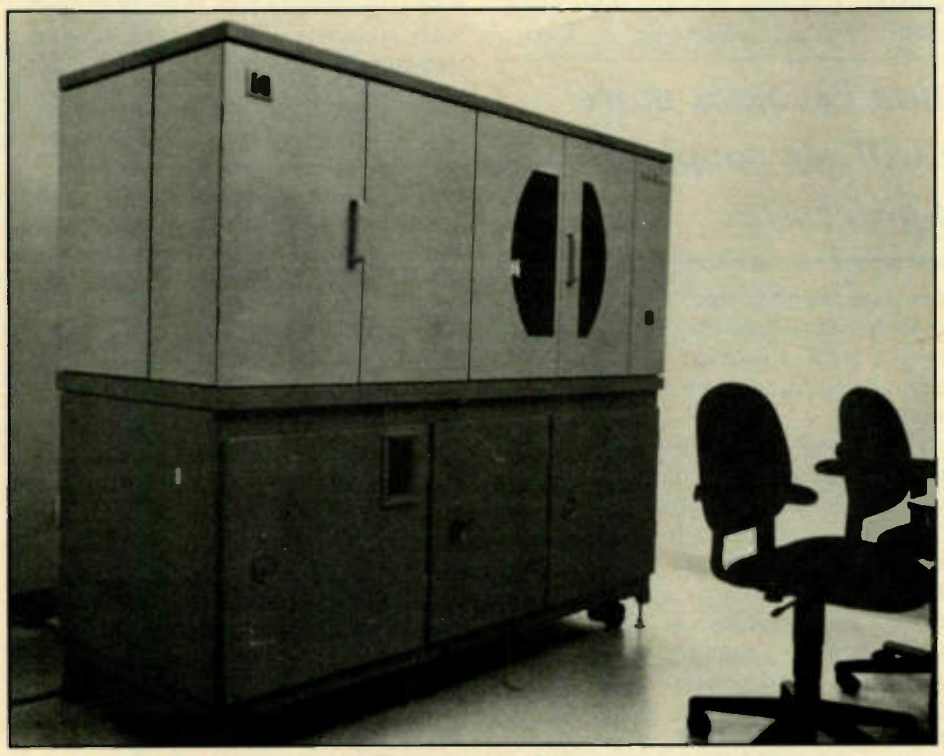
In the future, it is anticipated that entire stock footage libraries could be maintained using these data cartridges and high-speed recorders.

A second pre-production Cineon will go on-line early in 1993.

Kodak expects to be ready to begin manufacturing and selling its million-dollar Cineon workstation sometime in middle to late 1993.

The production version software will implement final tweaks indicated by Cineon prototype number two. The hardware configuration will harness the power of the soon to be released Silicon Graphics power series computers using SMP (symmetric multiprocessing) technology and the RealityEngine (TM) graphics accelerator.

These R4000-based machines will replace the transputer arrays currently running the Cineon prototypes, resulting in major cost savings and better upgradeability. Customers will also have access to the more than 1,300 software application titles featuring video editing, 3-D animation, and image processing available from third-party vendors for the SGI family of computers.



The Cineon digital film scanner digitizes motion picture images at up to 4096 x 6144 resolution and 10 bits per color.

The Cineon picture data file is a derivative of the TIFF files typically used in computer graphics print workstations.

Japan's Desktop Video Future

(continued from page 5)

with the IBM architecture. Secondly, Intel Japan also demonstrated a system for Computer Supported Collaboration (CSC), which is a DVI-based system for sharing data and video data over a LAN and high speed communication lines.

The power to transmit

Now that we have the computer power to manage digital data, we need the communications power to transmit it. NTT, the Japanese counterpart of ATT, has actively been promoting and researching the use of Integrated Digital Services Networks (ISDN) high speed phone lines. NTT already offers two types of ISDN lines, 64 kilobit per second, and 1.5 Megabit per second lines (which are really ten 64 kilobit lines combined). Conventional telephone lines are only 8 kilobits per second. By October 1992, NTT had already installed an incredible 147,000 ISDN lines. If we do the mathematics we can see that the 1.5 Megabit per second lines are more than enough to send digital video by telephone.

Production implications

Now that we have the needed computer and communications power well on its way to becoming a part of everyday life, there is still need for something to send over the communication lines. Video production is more than just pointing a camera at someone and saying "do something interesting," and most people in the computer and telecommunications industries do not have in-depth knowledge about just what skills it requires. They need help in this area.

While traditional video production will naturally continue to flourish based on traditional needs and advances in HDTV, a huge new digital video market is developing in which video production ability is the weak link in the chain.

As video production moves into the hands of the masses, the industry has already begun to change its focus; not on the technology and tools, but on how to use them.

Large corporations will want to set up their own in-house production facilities to produce product information, news and training videos. How productions houses can profit from this market will depend on how quickly they can grasp the inherent strengths and weaknesses of digital video production and how much time and money they invest in supporting them. They can do this in a number of ways.

In Japan there is an insatiable desire for education. Parents send their children to "jukus" (cram schools) from as early as five years old in preparation for difficult tests to enter the "right" grade school. Adults and children alike can be seen reading everywhere; illiteracy is virtually non-existent. As in-house production facilities spring up, the need for the know-how of skilled video engineers will grow. Production houses that set up schools for teaching the basics of production will find great acceptance in corporate Japan.

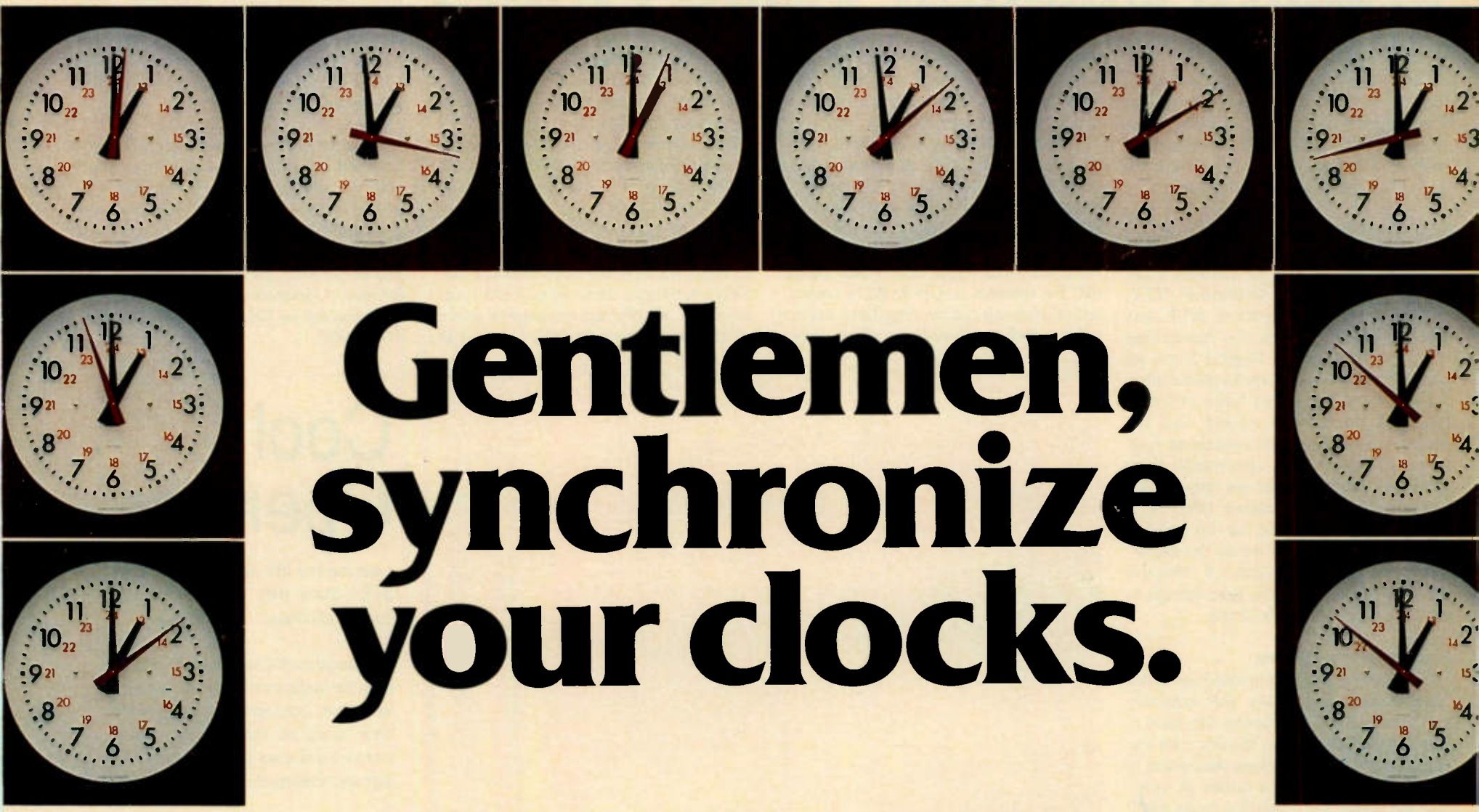
A matter of quantity

Desktop digital video will shift the focus of production from quality to quantity. Those who can develop production templates and strategies for quickly finishing any video about anything, and at a reasonable price, will be in demand as certain unmanageable jobs are outsourced. Making video that looks good on a desktop, even though the resolution is poor, is also a part of this.

Production houses in Japan will also need to understand the value of the interactivity that the computer offers. As computer companies are crossing the border into video technology, so should video producers enter the heuristics world. It has to be understood that digital video is not sequential! For instance, a CD-ROM or computerized training course may have several video windows opened on a single screen, simultaneously. How these look next to each other and affect each other, and how to organize training courses should be taken into consideration.

New ties between companies of the video and computer industry will be needed, though not necessarily on the scale of the IBM-Time Warner agreement. The ideal combination would be the mating of a production company, a software house and a LAN services company. Although there have been recent examples of software developers joining video production companies, as yet the video side of the equation still seems reluctant to embrace the new technology here. This will probably result in a video renaissance, with many new desktop production companies starting up. Perhaps if Aldus Manutius were alive today, he would be searching out venture capital for just this very purpose.

A native of New York, Jaime Chee co-founded a multimedia, animation and video production company in Tokyo in 1985. In the past eight years, he has developed multimedia software, directed training videos, created a CAI course and performed research in digital video for major Japanese corporations. He can be contacted in Tokyo by FAX at +81-3-3481-0497.



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Computer VIDEO TECHNOLOGY
Examining the Applications of Microcomputers in Professional Video

ALADDIN Enhances Creativity on Amiga

by R. Shamms Mortier

A few years ago, the Amiga's graphics potential was moving along at a snail's pace. There just wasn't enough software available to take it seriously, especially compared to the state-of-the-art mega systems being used to produce truly "professional" results. Software responds to hardware, and it wasn't until recently that 24-bit graphics became a recognized and workable standard on the Amiga.

Twenty-four-bit graphics are now available on the Amiga due to numerous third-party graphics boards and "black boxes." Impulse's Imagine software was a direct link to its 24-bit FireCracker board, as surely as Octree's Caligari software was made possible by its connection to the MS/DOS-based Targa boards. Digital Creations' DCTV unit, though giving less than true 24-bit quality, is the choice of many animators for industrial and instructional Amiga-based computer animation.

The ALADDIN 4D package is setting the pace for 3-D design on the Amiga.

Pushing to the limit

Now the trend seems to be toward development of new software that pushes current 24-bit hardware to the limit, and the race is on to develop new creative options for the Amiga artist/animator so that one person's work can demonstrate his or her unique style rather then just looking like unisex "computer art."

With that in mind, ADSPEC Programming, of Salem, Ohio, is setting the pace for Amiga 3-D design and animation software with the release of its ALADDIN 4D package.

ALADDIN's "edit" screen is the place where objects are designed and assigned various attributes or lists of attributes, where the screen resolution and rendering engine (IFF, FireCracker, Resolver Board, DCTV) is set, and where fonts are imported and manipulated. The edit screen is balanced by the "render" screen, where objects are in fact rendered in the chosen format.

To one side of this edit screen is a "toolbox." ALADDIN 4D's icons are designed so that they visually represent (as close as possible) the actions they initiate, which aids the learning process.

The top of the toolbox contains numeric degree markers that show the orientation of each of the X, Y, Z planes. An "isometric" gadget changes the drawing plane to an "engineering" view, which is useful for CAD and other approaches. The "Q" toggle next to it means "Quick," and it reduces the number of visible lines in a drawing.

Next is the X, Y, Z plane toggle. If used in conjunction with the space bar (or with the left mouse click on the primary angle gadget), you are presented with the view of that particular orientation (X, Y, or Z). ALADDIN 4D is not a three- or four-view-at-the-same-time type of modeler, but it offers Amiga-designed, maximized tool usage in a virtual reality environment.

The drawing pencil, when chosen with a left mouse click, draws a line from the attach point. In this way, linear objects can be sketched out a step at a time. The "Primary Angle Gadget" responds to a right mouse click, bringing up a small requester that allows you to set the viewing angle numerically. The icon that shows a hammer hitting a nail "sets" an object in place, telling the program it is "finished." The hammer pulling out the nail icon is an "undo" function that removes the results of the last operation.

An "Area Select" tool allows you to select an area of the screen that you want to work on and creates a resizing rectangle. The "Multiple Select Gadget" allows you to select all or some of the polygons its rubber-band box encloses. Selected polys may be rotated in real time on a selected axis. The "Snap" gadget can be initiated by pressing the F1 or F2 function keys. It "snaps" a chosen point or an entire object

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to another selected point. There is a "Pipe Extrusion" tool that moves polys along a path (for picture frames and other more bizarre creations). There is a "Sweep" or "Lathing" operator, wherein 2-D polys can be given sculpted 3-D personalities by spinning them around an attach point. There are "Resizing" and "Cloning" gadgets as well as "Slant," "Stretch," and "Mirror" tools.

At the bottom of the toolbox is the space (page) selection area. ALADDIN 4D allows you to work on several stacked "spaces" at the same time, so you can move parts and pieces back and forth in the creative design process.

ALADDIN 4D can import any Postscript file, allowing you to add 3-D depth by extruding the file.

ALADDIN requesters

Requesters in ALADDIN 4D (such as the "Attributes" requester, which controls an object's color, brightness, reflectivity and much more) allow multiple levels of operation. An attribute such as an object's hardness can be set via a requester, but it is also possible to vary this attribute along a time line. This creates an object whose characteristics change during the course of an animation.

All of the requesters connected with most of ALADDIN 4D's features allow you to build animations that have an infinite variety of internal elements, and all of these attributes and textures can be "stacked." Features are additive and can be stacked on the same 3-D object.

Backgrounds, foregrounds, overlays

Much like the compositing done with ASDG's Art Department Pro, background pictures can be combined in an almost infinite variety of ways. This whole process can be animated, giving you complete control over your background graphics. Multiple fades can be part of the process, all targeted to a variable animation time-line.

Textures are first loaded into a "list," so that any member can be chosen and time- or frame-mapped onto a selected object. This "list" appears when you ask ALADDIN 4D to set a texture for a selected object, and alternate lists may be mapped to a single surface.

(continued on page 11)

Matrox Provides 'All-in-One' System

Products Like the Matrox Studio Ensure that Desktop Video Will Have a Growing Influence on TV Production

by Terence Dyke and Paul Smolen

There is still some debate about just how to define desktop video, but one element seems to be constant in any definition: desktop video means computers. And usually, computers mean major changes in the shape of everyday life. Their impact on the world of video is no exception.

Consider the two cultures. Video types, it seems, are long on concept, they think visually, and maybe they have a little bit of Hollywood in their hearts. For them, hardware is basically warm furniture: take it out of the box, plug it in, and it functions. Computer types obsess on the details, they think abstractly, and they often carry a large assortment of writing instruments. For them, hardware is a "platform" with myriad possible configurations—there can be any number of add-on circuit boards, and of course, there are layers and layers of software. The potential for complication is almost unlimited. Moreover, the products they create often require that the customer share their willingness to tinker and "get under the hood."

The learning process

So dealers who plan to sell desktop video, as well as media shops that plan to start using it, may need to brace themselves for some rude surprises as they start moving into computer territory. They will be learning two things, perhaps the hard way, that successful managers have learned about computerizing: 1) even "simple" applications can take an astonishing amount of time and fuss to get running and 2) success is possible only with a strong commitment from top management.

Typically, the installation process is a barrage of details, often conflicting. There may be hardware jumpers and DIP switches to set; perhaps a portion of high memory must be reconfigured. Maybe the software creates a system-configuration file that you end up having to customize for your particular system; maybe there's a bad connection in one of the serial ports that makes the software appear to misbehave. It is a study in patience and persistence.

A desktop professional

Of course, the good news is that computer-based production equipment has an exciting potential for increased productivity, sophistication, and ease of use, while dramatically reducing price. Some of the new names and players might be unfamiliar to old video hands, but as computer-oriented companies move into the video business, they can bring a fresh view to the field, along with cheaper hardware.

In this article, we will be looking at one particular product, the Matrox Studio system. It is the one that, so far, comes closest to providing all of the capabilities of a professional post production suite in one "desktop" package (mind you, it is still a pretty crowded desk).

The full Studio system is capable of controlling three source decks for A/B/C rolls; it also includes an eight-input video switcher, five layers of video and graphics mix effects, luminance and chroma keyers, a character generator, graphics and title keyers, three 2D DVE channels (both on-line and stills), complete VCR/VTR motion control, three time base correctors, a six-channel stereo mixer, digital audio card, and quite a few other features usually found in professional post production systems. The list price is US$15,990.

We were able to get our hands on an early version of the system at a local dealer, and participated in the installation of it. The software was still in its "pre-release" stage, and we did run into a few problems, some of which were traced back to a faulty VCR-controller board. However, we found we could rely on Matrox's excellent technical support for help and a replacement board. We also found the documentation to be clearly written and reasonably thorough. Surprisingly, however, the manual did not have an index.

The Matrox Studio system is available right now, and improvements and variants of the system are coming.

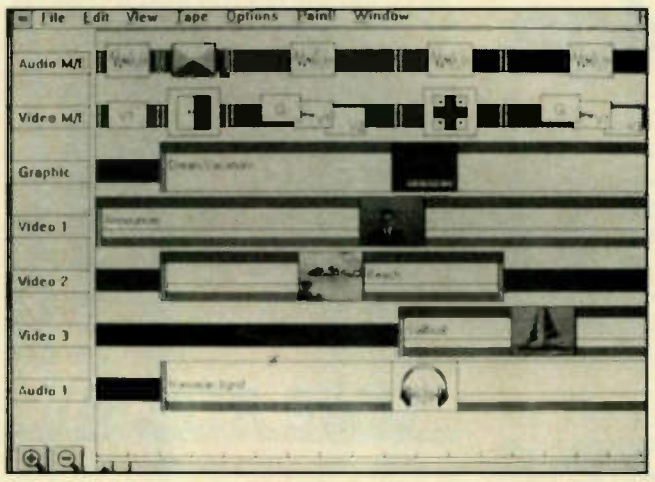
The Personal Producer

The software, called The Personal Producer, shows software design at its intuitive best. It uses a graphic "time line" or "storyboard" approach to editing: you gather the video clips that you want to use, and assign each of them a representative icon. You then arrange the icons along a time line in the desired order, and the system puts together the corresponding clips. Sound and graphics are handled in much the same way.

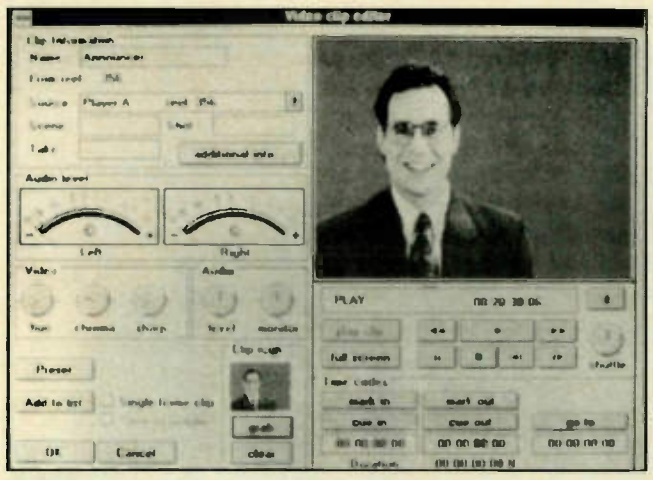
The time line metaphor goes even further: if, for example, you want to have a transition between two particular clips, you just overlap their icons slightly. At that point, a box pops up to ask you about the length and type of transition. There is also a calibrated scale at the bottom of the screen so that you can gauge elapsed time accurately. At a local demonstration, we overheard appreciative audience members saying "Now this is the way it is supposed to be."

Getting the right computer

The hardware part of the Matrox Studio consists of several circuit boards that go into the extra slots of an IBM-compatible computer. Note that Matrox sells only boards; you have to supply the computer.



The Matrox Studio Storyboard (left) and Video Clip Editor (below).



This is a product that pushes the PC technology to the limit, so you need a state-of-the-art machine: a 486 processor running at 33 MHz, eight megabytes of memory, an 80 megabyte hard disk, five open slots and an EISA bus. This last requirement is the kicker, because relatively few office computers, even 486s, have the high-capacity EISA bus; most of them are based on the older ISA bus. ("Bus" refers to the physical organization of the computer—it is like a transit system for electrical signals among the various system components.) So do not count on being able to use a computer that you already have.

Furthermore, not all brands of PC-compatibles function identically. There are, in fact, only a handful of brands that Matrox will guarantee to work properly with their boards. These brands are Everex, AST and Logic Research. With all other brands, you take your chances.

We took an unscientific poll of a few dealers in the U.S. who are handling Matrox. All of them have designation "point" people specifically to handle the Matrox and computer-based multimedia systems; for the most part, these are salespeople with strong computer backgrounds.

There were two cases in which dealers ignored the manufacturer's specifications and decided to go with a cut-rate computer. As we just noted, this is a risky move, and in fact the rogue machines proved to be the cause of numerous problems during installation. This ended up wasting many days of the salespeople's time and surely did more damage to the bottom line than if management had gone ahead and bought the certified computer; it was a case of incomplete commitment at the top.

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The dealers seemed generally prepared for the time-consuming aspect of installing computer equipment. The average time for getting their first demo systems up and running was about a week. Even after the product becomes a mature one, setup time will still be significant; so if you buy, plan on either spending the time, or paying for setup services if the dealer offers them.

More coming

The Matrox Studio system is available right now, and improvements and variants of the system are coming. At the NAB show in Las Vegas in April, according to company sources, Matrox will debut a non-linear option for Studio for US$5,000; this allows you to put your source video on the computer's hard disk, greatly increasing editing speed and flexibility. At Infocomm next February, Matrox will also introduce a scaled-down configuration of the Studio priced at US$9,995. This one has essentially the same features, except that it does only A/B rolls, has two channels of DVE and two time base correctors, and a four stereo channel audio card.

On a smaller scale

Matrox also offers a small-scale system called "Personal Producer for the Illuminator-16" that has been shipping for about eight months. The board and software bundle lists for US$2,000; users supply desk control and audio boards of their own choice. This system controls a single source deck and has a narrower range of features than the Studio; however, its editing capabilities go beyond cuts-only—it will perform A/B-type transitions, such as wipes and slides. They are calling it the "A/X roll," using a stored frame in combination with rolling video to complete the transition effect. Best of all, it will work on a computer with the ISA bus. With products like these coming out, it is a sure thing that desktop video is going to have a growing influence on "business as usual," and eventually most technical people in the television and video business will find themselves dealing with computer-based systems.

Paul Smolen and Terence Dyke are the principals of Media Methods, a communications design and production firm in Austin, Texas. They may be reached at +1-512-476-0422.

For more information on the Matrox Studio, contact Janet Matey at +1-514-685-2630, FAX +1-514-685-2853, or circle **Reader Service 82.**

ALADDIN Works Wonders on Amiga

(continued from page 9)

ALADDIN 4D has the best procedural textures around, geometric configurations that can be painted and animated on your 3-D objects. Unlike bit-mapped textures, they take virtually no disk space and render as quickly as standard bit-maps. ALADDIN 4D comes with 36 procedural textures in place as "primitives," each of which can be edited in hundreds of ways. There are up to eight color textures whose dimensions can vary over time, whose colors can be changed, and whose edges can be set to a very fine "blend." The amount of "turbulence" (random change) can also be set in a procedural application.

ALADDIN 4D also handles mapping any "normal" Amiga image (IFF, 24-bit, and DCTV) to any object. If saved out as single frames numbered in consecutive order, you can also map full animations on any object. The images may be projected from any view (including a "free angle" projection), cylinder wrapped (for cans, etc.), spherical wrapped (for mapping textures to your revolving, "planets"), and/or shingled. You can even stack different methods one on another, using the same image or animated frames. The images can be X- or Y-flipped and can exhibit color and strength changes over time. 2DENV ("two dimensional environment") is a completely editable setting that allows you to set the "sky" and "ground" colors, including the degree of blend involved. Obviously, a 24-bit or DCTV output would give you smoother results than would a standard IFF image.

Reflection mapping targeted at an ALADDIN 4D object is geared toward surfaces that are "chromed," meaning that they reflect all (or most) light back and are usually painted pure black (though other colors will look like shiny plastic or other metals). A reflection map is projected from behind the viewer's head and, unlike bit-mapping a texture, it remains steady in space as the object moves.

In ALADDIN 4D, a genlock toggle allows the bit-map textured poly to be invisible where it is touched by color 0. This can also be accomplished with the "decal" routine. The color 0 of a bit-mapped IFF then disappears, leaving the texture and/or color of the object showing through.

You have to see the results of an ALADDIN 4D bump map up close when the "filter" or smoothing option is turned on in order to appreciate the quality of the bump mapping. ALADDIN 4D allows you to stack effects, so it is easy to put a full color bit-map over the bump map, creating full-color bumps. An "opacity" setting allows the user to simulate laced effects like those found in lacy curtains. There is also an anti-aliasing mode that truly has to be seen to be believed. With it turned on, you can zoom all you want to on a bit-map, even to a couple of pixels that fill the screen, and the jaggies will all be smoothed!

Attributes list

One of the most magical features of the attributes list is the ability to create background polys. I am sure many Amiga animators have, at one time, wanted a 3-D object to interact with a background in their animation, perhaps to have a 3-D object passing through it or appearing from it. Up to now, though, there was no way to do this except to paint the "background" on an intervening plane. But a true background takes its size from the screen size, not from the size of a plane, so it remains the same size no matter how "far" you get from it, and it is usually impenetrable. But ALADDIN 4D allows you to interact with a background picture. Intervening planes take on the image of the background and can be used as opaque walls in your animation.

ALADDIN 4D creates real ray-traced shadows. Ray tracing of any sort adds a lot of rendering time: If you absolutely need shadows, then increased rendering time is the price you pay. Shadows can respond to any light source and can be "received" by any selected object. Multicolored and animated shadows can move across any surface as the lights themselves are set upon an animation path.

ADSPEC Programming, of Salem, Ohio, is setting the pace for Amiga 3-D design and animation software with the release of its ALADDIN 4D package.

No other computer software gives you this kind of control over wave generation and animation. Seeing how ALADDIN 4D projects animated waves on a 3-D object is awe-inspiring. As with other attributes, you have maximum control over all parameters, including the capability to generate a number of waves (a "multi" option) from the same source. Ripples on a pond, waves at the ocean, rain gently stirring up a lake—all of these and more are the playthings of ALADDIN 4D.

ALADDIN 4D creates animated gases, too. A gas can be air, flame, stars, fog, clouds or even a vaporous neo-solid that exists somewhere out in the cosmos. When you see these gases in 24-bit (such as on a FireCracker), you will agree that they are good enough for broadcast.

These gaseous objects are created in a cubic space, a space that can be morphed over time. The density and color of the space can be modified over time, and the gas can take on the "personality" of bit-maps projected on the sides of the cube (including animations!). In fact, each face of the cube can have a separate attribute list. Have you ever seen a video logo made of shifting flame or fog? Now it is possible. The anti-aliasing component of a gas, which affects observed screen resolution, can be so fine as to obliterate the jaggies in an 80 x 50 pixel bit-map.

Camera/target animations

ALADDIN 4D also includes camera/ target operations, including multiple targets (meaning multiple "look points"). What does this mean to the Amiga animator?

It means animations that pan from one subject to another in 3-D space can be achieved.

ALADDIN 4D writes both three- and four-bit-plane images in either laced or non-laced formats. I always use an eight-color (three bit-plane) laced option when rendering an animation. This is because a four-bit-plane animation (16 colors) will not run smoothly in a playback (I usually use Electronic Art's DeluxePaintIV as the playback software—see the article on DeluxePaint in the January issue of TV Technology.)

I do use the four bit-plane option, however, when rendering a background picture. ALADDIN 4D now also wraps a DCTV image on a selected surface. ALADDIN 4D also imports DEM (Digital Elevation Map) fields from Natural Graphics' "Scenery Animator." Because these scenery maps are imported as 3-D objects, they can also be targeted with all of the other fancy attributes and options (texture maps, wave, bumps, etc.) offered by the program. ALADDIN 4D writes and saves in 24-bit. It addresses the Impulse FireCracker board and the Resolve board directly, allowing complete interactive operation with the FireCracker 24-bit paint program as well.

In conclusion

ALADDIN 4D's watchword is "creativity." All who use it can imprint their own artistic style—their own unique animation signature—on their work. This is the class of professional animation software that the Amiga community has been waiting for. ALADDIN 4D is not a "ray tracer" (except for the present "shadow routines"). But ray tracers render slowly, and ALADDIN 4D is anything but slow, rendering animation frames in anything from five to 50 percent (depending on what attributes are being addressed) of any other Amiga package. You can make ALADDIN 4D do all the things that a ray tracer does while saving a lot of time, too.

ALADDIN 4D has a nearly infinite array of options; all of the necessary sculpting tools, animated gases, multi-mapping features (procedural, texture, bump, environment, and more); single-frame IFF animation mapping; camera/target capability; Postscript transport (fonts, structured drawings, and clip art); full object morphing, path-to-path animation; background, foreground, overlap animation features; multiple time-line controls; total DCTV and FireCracker support; a "tiny" preview screen available in any mode (including DCTV); lightning fast rendering; a quarterly newsletter that is bulging with tutorials and a disk full of objects and other neat stuff; a staff that is dedicated to service for its Amiga customers; and (not to be forgotten) a reasonable price.

ALADDIN 4D is the premier video software for Amiga graphics and animation applications.

R. Shamms Mortier has written over 250 articles and two books on the Amiga, with topics ranging from computer graphics and animation to MIDI music. He Beta tests Amiga software, manages the Graphics Service at the University of Vermont, and heads a personal videographic and software business (Eyeful Tower Communications in Bristol, Vt.). He can be reached at 15 Rockydale, Bristol, VT 05443.

For more information on ADSPEC Programming's ALADDIN 4D, call +1-216-337-3325, +1-216-337-1158 or circle **Reader Service 111.**

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

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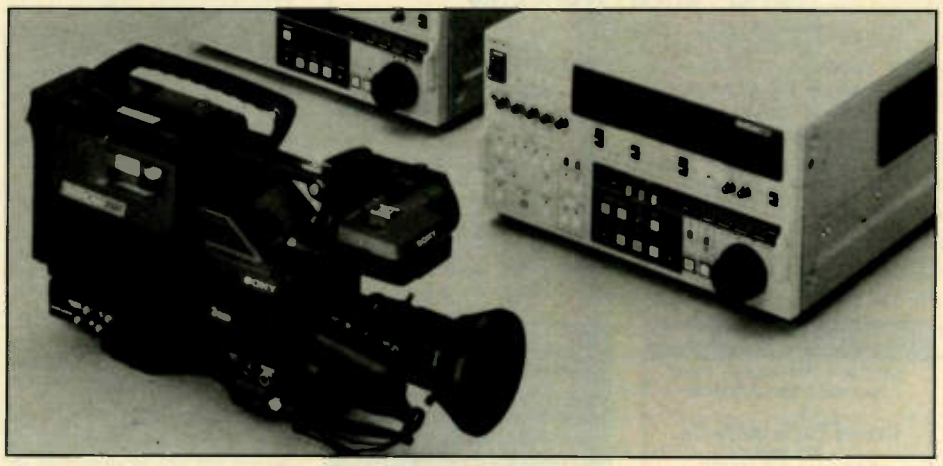
Sony Outfits ChicagoLand TV News

by Randy Davis
Operations Manager
ChicagoLand Television News

CHICAGO, Illinois During the initial design phase of ChicagoLand Television News, our equipment battlecry centered upon two factors: speed to air and image quality.

Upon reviewing our need to tie together field acquisition, editing and on-air operation in our facility, we went with Sony's Betacam SP 2000PRO series.



Sony's Betacam SP 2000PRO series

News in a bottleneck

Because of our experience with the slow editing speed of some formats, we were concerned with bottlenecks in the production process.

But the speed, as well as the quality, of Sony's PVW-2800 recorder/players and PVW-2600 players is comparable to Sony's BVW series for our needs.

The cost is also somewhat less, and in light of our extensive demand for these machines, we had to keep cost in mind.

ChicagoLand's eight news edit rooms and one sports edit room employ Sony PVW-2800 recorder/players. The facility's two ENG vans are each equipped with a PVW-2600 player and a PVW-2800 editing recorder, in addition to a Sony DXC-537 camera. For commercial production, Sony's BVW-300A Betacam SP camcorders are used.

Our decision to purchase the new line was further based on the reputation of the BVW series, which is known for its superior head life and duty cycle. Editors can shuttle from scene to scene or sound bite to sound bite with the VTRs at higher speeds and still view the picture or hear the soundtrack.

The VTRs also have extremely fast machine control. The internal menu setups allow for changes in the shuttle speed and cue points, increasing our speed and improving our creative capabilities.

We decided to put Sony's BVV-5 Betacam SP recorders on the backs of our Sony DXC-537 cameras for ENG use. This enables us to record on oxide tape for field acquisition, which is beneficial because metal tape costs are much higher. We record on oxide in the field, edit to metal, and air the master from a metal tape. Metal tapes are also being used for archival purposes.

The interchangeability of Betacam SP equipment, whether BVW or PVW series, with other news organizations and its position as a news standard were also strong considerations in making our format choice for acquisition and on-air playback. Even with the competitive environment of a down-and-dirty news town like Chicago, there are often striking moments of good will between competitive news gatherers.

Interchangeability between news operations becomes of vital importance when a crew is shooting live on-site and its battery or tape supply runs dangerously low. The battery used in Betacam SP gear is standard in the field, and Betacam tapes are equally accessible.

In addition, the combined Sony camera/recorder is lighter and requires less power than others on the market.

Interface ease

The PVW series is equally user friendly. I'm most impressed with the fact that the interface of the PVW series VTRs is similar to that of Sony's edit controllers, making it possible to use the VTR face plate in lieu of an edit controller.

One of the reasons we went with Betacam was the experience of nearby station WGN-TV, owned by our parent company, Tribune Broadcasting. The news operation at the station began purchasing Sony BVW products in 1986, and just last month became a fully dedicated Betacam facility.

Record and playback is now conducted on Betacam machines and final edited versions are on Betacam tape, not 3/4-inch as was previously the case.

The equipment list at WGN includes seven BVW-70 and nine BVW-75 recorder/players, two BVW-65 players, three BVU-800 and two BVU-820 U-matic recorder/players, and three BVW-15 and two BVW-40 recorder/players for the station's ENG vans. There are also five BVV-5 Betacam SP recorders and three BVW-300 Betacam field cameras.

The VTRs at WGN are used for the station's hourly weekday newscasts and its weekend news broadcasts. Maintenance records have been excellent at the station.

USER REPORT

There are plans to purchase more Betacam SP VTRs for the station's vans and travel pack, a portable, cuts-only edit facility.

The success of WGN's operations inspires my confidence that our decision to purchase Sony's Betacam SP 2000PRO line will prove a sound one in the coming months.

Editor's note: Randy Davis has been working as a consultant for ChicagoLand since early 1990. He was previously chief engineer at WGNO-TV in New Orleans, Louisiana.

The opinions expressed above are the author's alone. For further information, contact your nearest Sony Business and Professional Group representative.

Station Enhanced by M-II

by Andrew Suk
Director of Engineering
Cordillera Communications

BOISE, Idaho I have to admit, I came around to M-II reluctantly at first.

Back in 1987, we were doing field production on one-inch at KIVI-TV and obviously needed another format. We used Beta SP for field acquisition and off-line and a Betacart for spot delivery, but our news department remained 3/4-inch.

We really weren't interested in M-II, but when we first examined some M-II equipment, it sold itself.

Late in 1991, we saw the new EnHanced Series of M-II products. We abandoned the idea of a common format for the station and decided in favor of M-II.

We are currently using Panasonic's WV-F250 three-CCD color video cameras docked to AU-410 portable M-II VTRs for ENG. We have configured three edit bays with two AU-65H studio recorder/editors and an AU-63H studio player with Auto-Tracking from the EnHanced M-II Series.

We are editing from M-II over to 3/4-inch and have found that, with our switching matrix, the two formats talk beautifully. When we had been editing 3/4" to 3/4" and needed a still frame or slo mo, we had to route signals to production, do it on one-inch, feed it back up and record it. It took a lot of time.

With the EnHanced M-II machines, we can do slo mo, still frames, and special effects right in the bay without affecting production. And with the built-in, three-dimensional, digital TBCs, we can even do still frames off the AU-65Hs.

We are really impressed with the quality of the video coming out of the M-II decks.

The layout of the machines impressed us, too. The physical layout of the machine means we can pop the control panel out and get at all the controls. Functionally, there is no trouble adjusting the controls because the menu can be changed to any configuration.

The biggest thing the news department has been taking advantage of is time code. Our producers are able to call out the shots they want or give the editors a shot sheet.

We are looking at a three-year plan to convert news to M-II. Next year, we hope to buy two more AU-65Hs and one more AU-63H to begin editing onto M-II. And we want to increase our field units to four. At that point, we'll be about 80 percent M-II. The third year, we'll finish eliminating 3/4".

USER REPORT

Our station group in Montana is taking a hard look at M-II VTRs for spot delivery and network delay.

Although we don't plan on going to HDTV any time soon, the 16:9 aspect ratio capabilities of the EnHanced M-II series decks gives us the feeling that we're addressing the issue of advanced television standards.

Editors note: Andrew Suk was chief engineer at KIVI-TV for nine years before moving to Cordillera in 1990.

The opinions expressed above are the author's alone. For further information in the EnHanced M-II series, contact Panasonic customer service at 1-800-524-0864.

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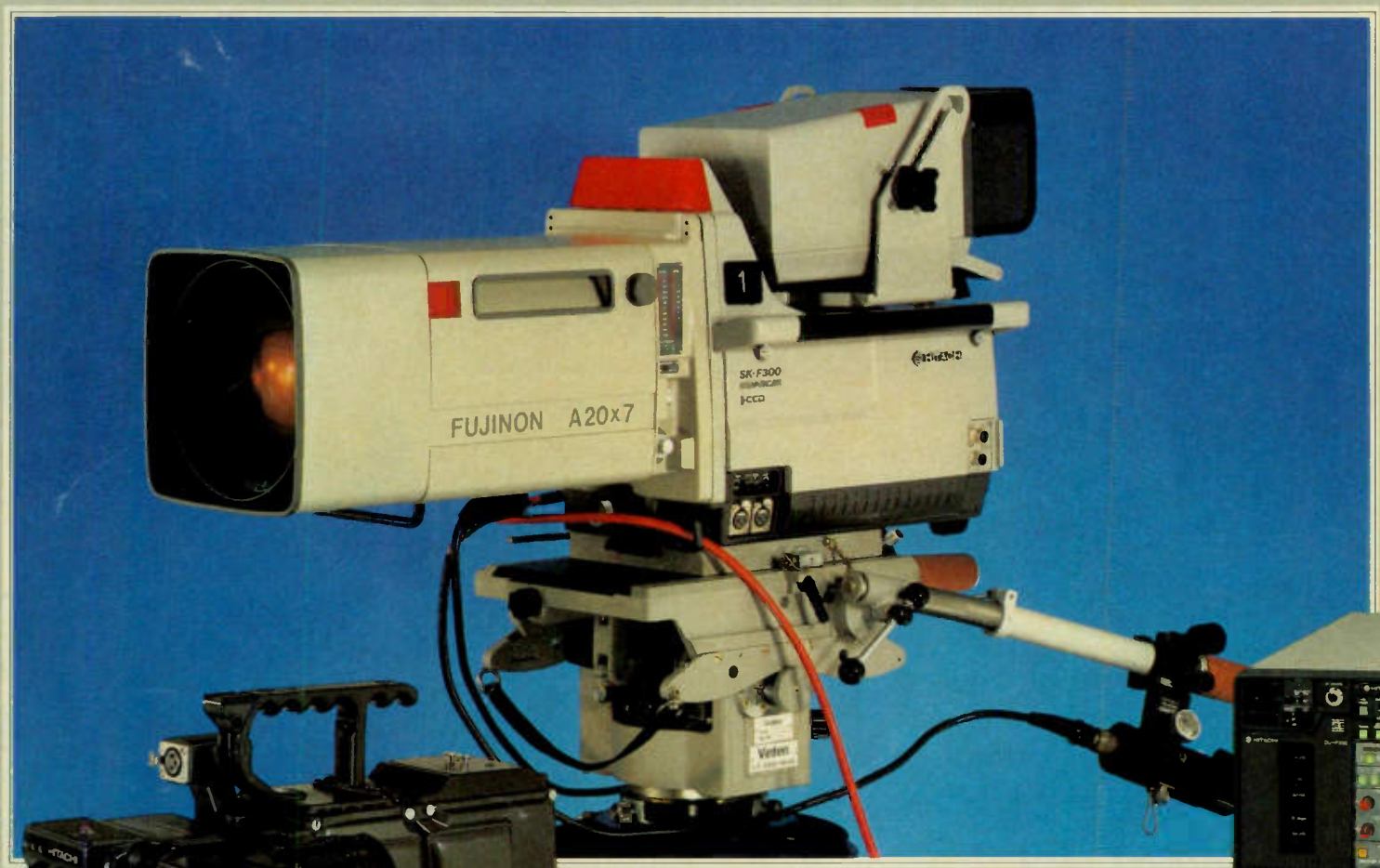

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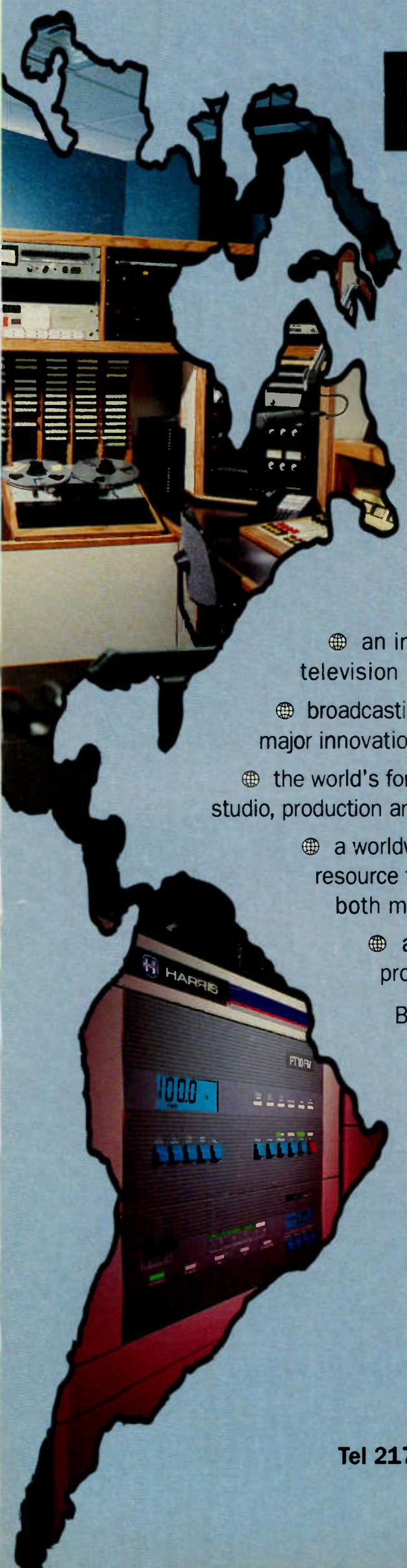

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