New Products

Audio Equipment

The SBL128 and SBL256 range of point-to-point digital wireless transceivers, introduced by Audio Processing Technology, incorporate apt-X100 digital audio data 4:1 compression technology and RF spread spectrum technology (SST). The 128 kbit/sec unit has the capability to simultaneously send and receive 7.5-kHz dual mono/stereo or 15-kHz mono while the 256 kbit/sec system is configured for 15-kHz dual mono/stereo. Audio performance is further enhanced by the J17 pre-emphasis protocol. These self-contained 19-in. x 2-RU devices have a number of standard and optional analog and digital interfaces. The optional integrated services digital network (ISDN) bridging unit is capable of transferring the compressed data to an external, locally approved terminal adapter (TA) for onward exchange over dial-up digital telephone circuits. Also, 9.6 kbit/sec auxiliary data can be inserted into the data stream via an RS-232 interface without incurring any discernible audio bandwidth penalties. Typical operational applications include studio-to-transmitter links (STL) and point-to-point setups related to remote or outside broadcast (OB) locations.

Audio Processing Technology also announced its BCF256 digital transceiver. This full duplex unit, incorporating apt-X100 data compression technology, can be configured to operate over temporary or leased digital circuits at bit rates ranging from 56 to 256 kbits/sec. Audio bandwidths ranging from 7.5 kHz to 15 kHz are configurable for mono, stereo, or discrete dual channels. A 20-kHz, mono-only channel can also be set up. The primary path integrity can be guaranteed with an optional automatic ISDN backup facility running at either 64 or 128 kbits/sec. The unit can be fitted with a range of standard and optional analog audio and digital input/output (I/O) interfaces, including X21/V35. An RS-232 port enables auxiliary data up to 9.6 kbits/sec to be imbedded into the data stream with no discernible effect on the audio bandwidths. A local or remote loopback facility allows test/monitoring procedures and diagnostics to be conducted.

Denecke, Inc., announced the TB-1 TalkBack (Fig. AE-1), a battery-operated talkback system for microphone boom operators. The TB-1 enables the mixer and two boom locations to maintain full duplex telephone-style communication. The TB-1 also features a call light to signal all operators in the system. A low-voltage indicator alerts the user when the 9-V battery in the quick-release battery compartment needs to be replaced. The TB-1 system operates on a single pair using standard XLR 3-pin microphone cables. Other features include full duplex talkback between all stations, including an internal microphone when an external mic is not needed; a call light for signaling any station when momentary talk is pressed; left and right program input to mix left and right, making the TB-1 a standalone monitor system; a three-level volume switch using standard stereo headphones; and a quick-change battery compartment for standard 9-V batteries.

Leitch, Inc., introduced the DAR-6880 AES/EBU digital audio reference and test generator. This unit generates an AES digital audio reference signal for use with a variety of digital audio devices such as analog-to-digital (A/D) converters, sample rate converters, reframers, and mixers. The DAR-6880 is capable of generating the AES reference signal, AES word clock, or AES test signal. It provides eight 75-Ω coaxial AES outputs, which may be configured to output either reference or test signals. Also, this product features an external reference input that can be configured to accept either a video reference or external AES reference signal. In the absence of an external signal, the card will free-run.

Also from Leitch was the ATF-3600, an A/D and digital-to-analog (D/A) audio translator. Part of the DigiBus product line, this unit features functional groups for independent conversion and the ability to handle audio synchronization problems.

The Nagra-D Series 2000 digital recorder from Nagra USA, Inc., was developed with dCS Ltd., and is a high-resolution recording platform able to meet the requirements of future-enhanced digital audio media. The recorder delievers a sustained signal-to-noise ratio (SNR) of less than 108 dB and unmatched linearity to -130 dB.

NHK (Japan Broadcasting Corp.) has developed a device (Fig. AE-2) for embedding audio signals from two stereo channels and superimposed information data (RS-232C standard) into the ancillary data space of video signals, thereby making it possible to transmit all of these data through a single cable. The RS-232C data are sampled at 384 kHz (48 Khz x 8) and are embedded into the Aux area (4 bits) of AES/EBU signals. The maximum transmission rate of data to be embedded is 192 kBits/sec. Then the AES/EBU signals carrying the data are embedded in video signals according to SMPTE 272M. This device is also capable of embedding a 16-bit ID signal, such as transmission resources, in the audio control packet. Superimposed information embedded in video signals can be extracted and then superimposed in various languages by means of a link to a character generator.

The AD3000 audio lip sync corrector from Pixel Instruments Corp. is intended for automatic lip sync correction or general purpose audio delay with stereo analog or AES/EBU digital audio. The built-in pitch corrector allows rapid response to delay changes while minimizing audible artifacts.

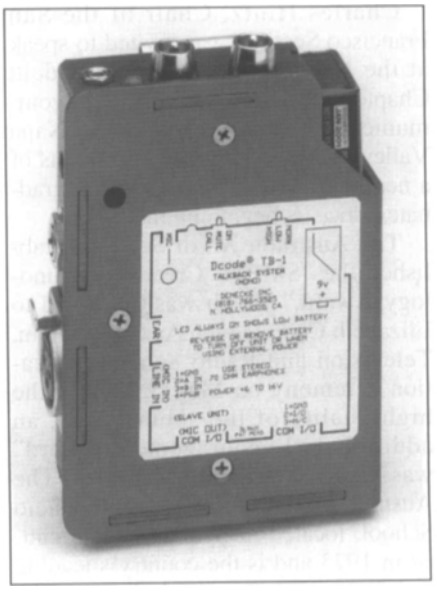

Figure AE-1. TB-1 TalkBack battery-operated talkback system from Denecke, Inc.

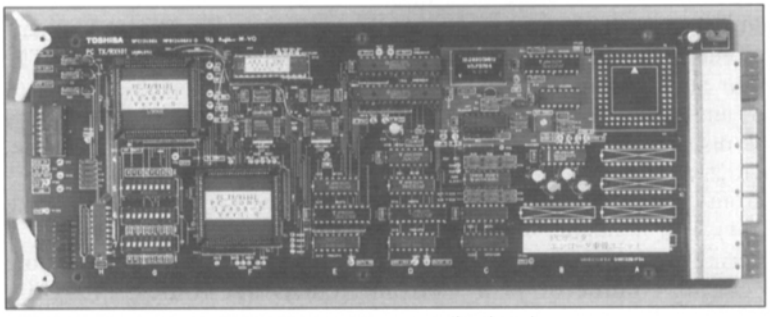

Figure AE-2. NHK's device for embedding audio signals.

Figure AE-4. FP33 portable stereo mixer.

Figure AE-3. The microprocessor-controlled UHF wireless microphone system from Shure Brothers, Inc.

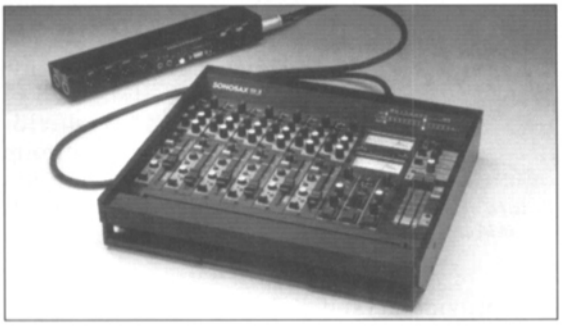

Figure AE-5. Sonosax USA's Sonosax SX-S mixer.

The AD3000 will track any video processor that outputs a transistor-to-transistor logic (TTL) delay pulse or can be steered by Pixel's DD3100 video delay detector.

Shure Brothers, Inc., introduced a new frequency-agile, microprocessor-controlled UHF wireless microphone system (Fig. AE-3) that offers a sound quality suitable for a wide variety of audio applications. Available in single-channel and dual-channel configurations, the system uses tone-key squelch and Shure's proprietary MARCAD circuitry. The receivers and trasmitters are each capable of selecting 191 separate frequencies throughout the system's 782 to 806-MHz range. As many as 20 systems can be operated simultaneously. The receivers provide RF and audio metering LEDs as well as headphone monitoring capabilities. In addition, receivers and transmitters include user-programmable LCD displays for setup, information, and control.

Shure also announced the FP33 portable stereo mixer (Fig. AE-4), a three-input/two-output portable unit designed specifically for electronic news gathering (ENG), electronic field production (EFP), and on-location film production. The FP33 is compatible with virtually any type of dynamic or condenser microphone and is capable of providing 48-V phantom, 12-V phantom, and 12-V A-B power. With an extended frequency response of 20 Hz to 20 kHz and dynamic range greater than 100 dB, the unit is equipped with transformer-balanced I/O, a wide range of input gain controls, pop-up pan pots, switchable low-cut filters on each output, and a link switch that can be used to gang inputs for use with a stereo mic.

The Sonosax SX-S mixer (Fig. AE-5) was introduced by Sonosax USA, Inc. Its input stages do not reduce the microphone level before amplification; instead, the user controls the amount of amplification. The "limiter threshold," "aux level," and "pan" controls have been recessed to remove any obstacles beside the P & G faders. The input module has dip switches on the back to change several parameters of its operation. The film/extension module features include M/S decoding for both the engineer and boom operator, a slate microphone, and a sub-tone generator.

The Virtua from Soundtracs PLC (Fig. AE-6) has a fully digital 64-channel mixer, featuring 4-band fully parametric EQ, compressors, and gates on every channel; 8 auxiliaries; and 24 tape outlets. It is a standalone unit and requires no external computer. It provides a touch-sensitive motorized fader control surface combined with a high-resolution visual display unit (VDU) and LCD display. The internal architecture is 32-bit floating point with a 105-dB dynamic range on the outputs. The console provides full dynamic automation and snapshot recall of all functions, LCRS panning, and professional digital interfacing in a variety of formats including ADAT optical, S/PDIF, and AES/EBU. The external rack of A/D and D/A converters connects to the desk optically with standard 32 midline inputs on balanced XLR/jack, 8 group outputs, 8 aux outputs, and 16 direct outputs. An additional 16 inputs can be used as eight stereo effects returns or monitor returns. The Soundtracs Virtua provides such professional features as two-track returns, master inserts, MIDI and nine-pin machine control, and integral digital multieffects. The console is suitable for 24-way multitracking and can provide a total of 64 inputs on mixdown.

The ENG-500/UT-500 wireless microphone system from Telex Communications offers the ENG-500 diversity receiver, which features Posi-Phase true-diversity operation, tone-coded squelch, and single 9-V battery operation, and the UT-500 plug-in transmitter, which plugs into any standard microphone. Both items

Figure AE-6. Virtua digital 64-channel mixer from Soundtracs PLC.

also provide crystal-controlled frequency agility.

Wheatstone Corp. has announced its SP-8 television audio console designed for mid-market television stations. It incorporates such features as an 8-input/channel overbridge, a complete switch-selectable internal logic structure, mix-minus capability, and group muting. The SP-8 has both a dedicated relay-operated machine control port for overseas clients, as well as traditional U.S.-type opto-isolated control ports.

Also from Wheatstone was the TV-600 high-end television audio console. The console is designed for live-to-air and live-to-tape production requirements. It features Wheatstone's Bus-Minus technology, which allows for every input channel to produce its own output to an IFB. The console provides two stereo outputs for separate local and satellite feeds, plus two mono outputs for mono and future second audio program (SAP) requirements.

Cables and Connectors

Canare Cable announced its FP-C 75-Ω F-type crimp and bulkhead connector. The plug uses a separate crimp pin and sleeve and provides a stable, reliable performance.

The Install Plenum cable from Extron Electronics incorporates computer video, composite video, audio, and control in one single-jacketed plenum-rated cable. It includes six mini, high-resolution coax conductors as well as four sets of twisted pair wires. RGBS, audio, video, and control can all be distributed from a wall plate/podium to a rack.

The 7537 from Gepco International, Inc. (Fig. CC-1), is a miniature 75-Ω analog and serial digital video coax cable. The center conductor is a stranded 25-AWG (7 in. x .011 in.) bare copper that provides flexibility without fine strands that cause grounds or shorts. The dielectric is constructed of polyethylene, providing a 78% velocity of propagation. The shielding consists of a 100% aluminum/polyester foil and a 93% tinned copper braid. The flame-retardant PVC jacket conforms to Article #800 and is UL-listed Type CM. The cable comes with sequential footage markers for easy identification of cable lengths and remaining reel footage.

Gepco's 4200 Series multipair cable (Fig. CC-2) has individually shielded and jacketed pairs. Each pair is 22-AWG tinned copper with a 22-AWG tinned copper drain wire and has a foil shield bonded to the pair jacket for ease of stripping. The pair jackets are color coded and printed alphanumerically for ease of identification. The cable has an overall foil shield and 16-AWG tinned copper drain. There is a rip cord located under the flexible, matte-finish jacket. This cable is UL-listed Type CM and is available in 2, 4, 6, 8, 10, 12, and 16 pair.

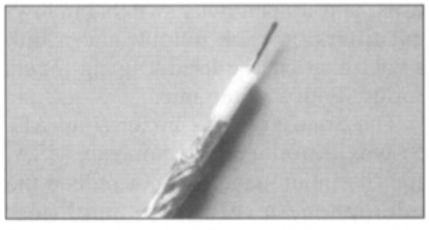

Figure CC-1. The 7537 miniature analog and serial digital video coax cable from Gepco International, Inc.

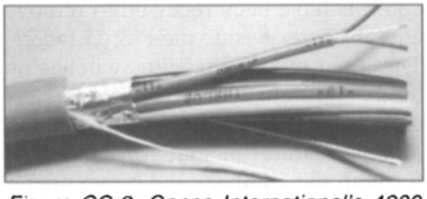

Figure CC-2. Gepco International's 4200 Series multipair cable.

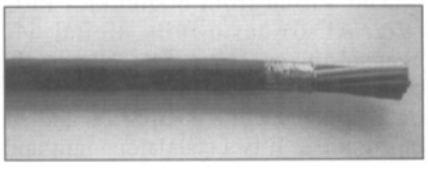

Figure CC-3. A high-performance camera cable from Nemal Electronics, Inc.

A high-performance camera cable from Nemal Electronics, Inc. (Fig. CC-3), is designed for Sony, Hitachi, Ikegami, and other television cameras. Video cables are double-shielded and foam-insulated to reduce losses and provide maximum operating range. Outer jacket is 105°C TPR for maximum flexibility throughout operating temperature range. The cable is available in bulk or terminated.

Camcorders

Thomson Broadcast Systems introduced three Betacam SX digital camcorders. The 1490 is fitted with a 4:3 formal FIT charge-coupled device (CCD) sensor and 1000 pixels/line; the 1490 WS has a 16:9 format FIT CCD sensor and 1000 pixels/line. The 1407 is fitted with a 4:3 format IT CCD. Video processing is digital at 10-bit resolution, and recording is done in 4:2:2 digital component at 8-bit resolution using the MPEG-2 4:2:2 studio profile level compression algorithm to preserve the full quality of the picture.

Cart Machines

The Pro-Cart broadcast cart machine from Thomson Broadcast Systems combines a broadcast automation system with a cart machine that has a capacity of 96 small or 64 large Betacam cassettes and four internal VTRs. It can also control external equipment such as a video server, a presentation mixer, and external VTRs. Because it has its own control system, Pro-Cart can be used for local stations and theme channels. Its control interface also facilitates the development of specific applications and integration into a complete automation system.

Character Generators

Chyron Corp. announced that the Toronto-based Video Design Systems produced Weather Radio Interface and

OpenCaptioning, two software packages that interface with Chyron's CODI and pc-Codi graphics systems. WeatherRadio Interface is a complete weather alert crawl controller for text generation. A direct radio service interface extracts digital data transmissions from weather broadcasts. A radio receiver transmits data that is sent to a PC and decoded into text, which is displayed on-screen by the Chyron pc-Codi as text crawl. OpenCaptioning is an integrated on-line/off-line open-captioning/subtitling system that features a live video monitor window, internal time code reader, and multiple language support.

Digital Graphix, Inc., announced several new character generators. TypeDeko is based on an open platform, running on a standard, powerful PC under Microsoft Windows NT. TitleDeko is an option for TypeDeko that lets the user add high-quality titles to the video output from a nonlinear editor. WriteDeko offers all the tools necessary for titling and simple character generation jobs, combined with superb broadcast-quality output. PostDeko is an off-line graphic and title design system that allows the designer to work on titles and graphics with all the fonts, graphics, and sequencing tools available on a full TypeDeko system without the need for expensive hardware. NetDeko provides on-line access to TypeDeko character generators and other Deko family products from multiple edit suites at a cost significantly less than installing a dedicated character generator for each suite.

Compression Equipment

Matrox Video Products Group announced the implementation of a mathematically lossless M-JPEG encoding mode on the Matrox DigiSuite hardware platform. Matrox DigiSuite provides a high-performance platform for many professional editing and animation applications like Softimage Digital Studio, D-Vision PostSUITE-XED/II, Kinetix 3D Studio MAX, and others. It features five digital video effects (DVE) processors with subpixel motion; an ultrahigh-speed 32-bit RGB-alpha graphics frame buffer; one alpha channel keyer and two luminance keyers, plus two wipe/tile generators, all with anti-aliased edges; two chroma keyers with chroma suppression and shadow preservation; seven background generators for dynamic color ramps; advanced analog and digital filters to ensure ultrahigh-quality ITU-601 video; and a full-blown digital audio mixer.

Minerva Systems, Inc., developed the Minerva Publisher, a desktop MPEG video publishing system that features a high-performance MPEG-1 video processing and encoding engine as well as the Minerva Studio control software suite. Minerva Studio features a plug-in architecture for easy integration of third-party application software and features customizable keyboard options, simplified video cuing, and extensive "drag and drop" capabilities, in a time-code-based environment. Minerva Publisher is designed for enterprise-wide, server-based video applications such as training, presentations, and video archival and retrieval.

Minerva also announced its Compressionist 250 commercial digital videodisk (DVD) encoding system. It offers constant bit rate (CBR) and variable bit rate (VBR) MPEG-2 encoding technology combined with Minerva Studios video preprocessing and control software tools. The system also supports leading third-party AC-3 and MPEG-2 audio encoders and DVD authoring and disk formatting tools. To provide users with the highest quality output, the Compressionist 250's preprocessing subsystem features noise reduction tools optimized specifically for MPEG compression. When encoding film-originated content for NTSC delivery, the Compressionist's inverse telecine feature accurately restores the incoming video's 24 frames/sec during the encoding process. The Compressionist 250 supports D-1, YUV, S-Video, and composite video input and video resolutions up to the ITU-R 601 digital standard for NTSC (720 x 240 at 60 fields/sec) and PAL (720 x 288 at 50 fields/sec) and variable compressed data rates ranging from 2 to 10 Mbits/sec.

Snell & Wilcox debuted a number of compression products in 1996. The MSA100 MPEG-2 transport stream analyzer is a compact, rack-mounted, dedicated hardware engine designed to work with any level, any profile MPEG-2. It performs detailed monitoring, recording, and analysis of MPEG-2 transport stream information in real time, enabling the user to have immediate and continuous assessment of all parameters of an MPEG-2 transport stream. The MSA100's real-time analysis capabilities are complemented by a powerful off-line facility, which allows the user to review and analyze in greater detail specifically selected material recorded during an on-line session. The MSA100 can isolate an entire multiplexed data stream or any part of the datastream such as the audio, video, or data components of a single channel.

The MVA100 video stream analyzer from Snell & Wilcox is a complementary product to the MSA100 that concentrates on the way in which pictures are encoded in the video stream. It gives visual access to any piece of information in the MPEG signal and presents it in a way that is easy to understand, thereby facilitating investigation of coding quality and helping to optimize MPEG encoder performance. With the increasing use of MPEG-2, potentially catastrophic compatibility problems are beginning to emerge between different designs of encoder and decoder; with the MVA100, the performance of any MPEG-2 encoder can be instantly verified.

The MSP100 real-time MPEG-2 transport stream player from Snell & Wilcox is an MPEG-2 reference test pattern generator that enables simple and immediate visual identification of noncompliant MPEG-2 decoders. Because it provides reliable, repeatable, and conformant MPEG-2 transport streams, it is ideal for all types of test applications, such as conformance of new products and testing system performance of multichannel streams, and as a laboratory bitstream player.

Snell & Wilcox's Prefix all-digital compression pre-processing system provides a comprehensive range of signal analysis and conditioning tools to ensure that the signals delivered to the compression engine are as clean and artifact-free as possible. The Prefix range is able to work interactively with compression engines; details about the incoming video sig-

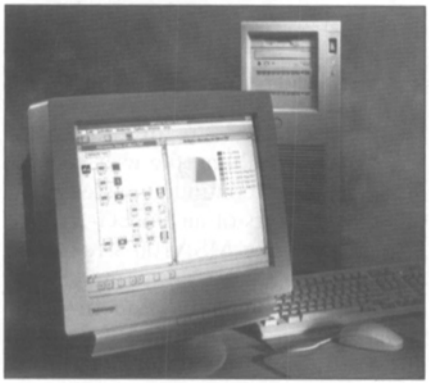

Figure COMP-1. MTS100 MPEG test system from Tektronix, Inc.

nals such as 3:2 pulldown sequence, decoder phase data, and video edit information can be extracted and passed on to the compression engine. This information can then be used to "steer" the compression device by alerting it to forthcoming characteristics in the input signal. This interactivity increases the accuracy of subjective decisions made by the compression device, thus improving the overall compression performance at any given bit rate.

The MTS100 MPEG test system from Tektronix, Inc. (Fig. COMP-1), features an integration of both signal generation and analyses of MPEG-2 transport streams. Useful in multimedia, video, compressed digital video, and telecommunications applications, the MTS100 can be used in encoder/decoder compliance and stressing; multiplexer operation, repair, and stressing; transmission system testing; manufacturing quality assurance; and MPEG system training.

Computer Accessories

Viewgraphics, Inc., announced its Dataview SDA-50/51 series of serial digital adapters (SDAs) for the desktop (Fig. CA-1), which allow desktop computers from Silicon Graphics to access D-1 or D-5 tape recorders for data archiving and video transfer. The SDA-50 is designed for digital video transfer operations, while the SDA-51 provides a selection of data archival or digital video transfer modes. This technology includes on-board error correction, data block checksum, and read-after-write capabilities to ensure data integrity.

Also from Viewgraphics was the

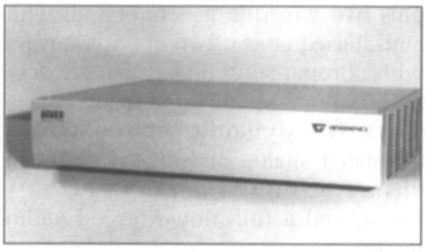

Figure CA-1. Dataview SDA-50/51 series of serial digital adapters from Viewgraphics, Inc.

DataManager 4.0 for the Dataview adapter, which provides a new graphical user interface (GUI) for the Dataview adapter to allow non-UNIX-trained computer operators to back up and archive image data files through the Dataview adapter to industry standard D-1 and D-5 digital tape recorders. DataManager 4.0 will also translate data between a UNIX-based file system and the Discreet Logic file format as a background operation.

Control Systems

The Imaging Control Panel (ICP) from Miranda Technologies provides the remote control and monitoring of all Miranda Imaging products. The GUI stems from the ICP software (ICP-S), which continuously monitors the status of all Imaging cards connected to the workstation. Through the three menu levels of ICP, users have access to all configuration and calibration parameters of every Imaging product present on the RS-422 daisy chain. ICP-S currently runs on IRIX and is being further developed for Mac OS and Windows environments.

Pulizzi Engineering introduced the Intelligent Power Controllers (IPCs), shown in Fig. CS-1, which provide individual outlet control via an RS-232 port connected to a modem/computer or a hard-line/computer. Up to 256 IPCs may be networked together via RS-485/RS-422 serial ports to provide up to 4,000 continuous feet of communication between each unit. Each IPC in the network is individually addressable, allowing direct access to its corresponding outputs. Features and options include local/remote control, IEC or NEMA receptacles, Form "C" dry contact, password security, watch-dog (self-boot), EMI/RFI filter, spike/surge suppression, and customer-specified power-up sequencing.

The TM-9660 component triax camera control from Telemetrics allows up to 5,000 feet of standard triax cable to be run between the system's base station and camera adapter. It provides comprehensive remote camera setup and adjustment capabilities along with video, return video, microphone audio, program audio, intercom, tally, genlock, and power.

Utah Scientific announced its SC-3 advanced router control system. The SC-3 was designed to complement the company's UTAH-300 router, but it also maintains compatibility with all previous Utah Scientific, Alpha Image, and Dynatech routers as well as with old routers from other manufacturers. The SC-3's control panel bus runs at 2-MHz, and two-level tie line management allows facilities to incorporate existing matrices and makes multiformat switching transparent to the user. The SC-3 also incorporates Utah Scientific's RealTime Switch, allowing the router to switch in real time for advanced applications.

Desktop Video

New from RGB Spectrum in 1996 was the RGB/Videolink 1700D-1 scan converter, which features such outputs as ITU-R 601 digital component video. The 1700D-1 transforms computer signals to broadcast video format in real time. Computer-generated

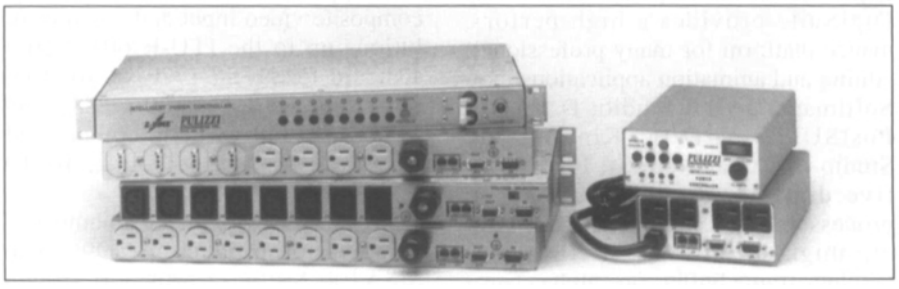

Figure CS-1. Intelligent Power Controllers from Pulizzi Engineering.

images can be recorded on videotape or displayed on video projectors, teleconferencing systems, and composite monitors. A powerful zoom function lets the user scale a portion of the image to fill the video screen. Graphics can be overlaid on video using either a built-in linear luminance keyer or a chroma keyer.

Digital Video Effects

Snell & Wilcox introduced the Magus DVE and digital switcher, a high-quality 3-D digital effects system designed for creative post-production and production environments. It is modular in concept, going from a basic 3-D digital effects frame store up to a multichannel system with an integrated digital component layering mixer with wipe and transparency. All the processing is done in the industry-standard digital 4:2:2:4 domain, with optional interfaces to almost any analog or digital format to meet present and future requirements.

Also from Snell & Wilcox was the Magic DaVE DVE and switcher, which is housed in a 2-RU mainframe and controlled by a compact standalone control unit, making it equally useful in post-production, studio, and sports environments. Features include program/preset mixed effects (M/E) architecture; 8-bit 4:2:2 processing; component and composite analog interfaces; four inputs; an internal pattern generator; two-sided page turns from a single source; Dynamic Rounding; warp effects; shading and lighting effects; 16:9/4:3 capability; IBM-compatible floppy-disk drive for backup and transfer of sequences, machine states, and stills; dual-source page turns/rolls and double page turns/rolls; dual source page peels and quad peels; and 3-D rotation with perspective.

Distribution Systems

The DV6000 multichannel fiber-optic video transmission system from ADC Video Systems offers a multichannel SMPTE-259M video transport platform, so that up to eight uncompressed, full-bandwidth, 270 Mbit/sec signals can be transported over a single optical fiber. Each signal is independently clocked, so signals from different sources can be combined, transported, switched, and routed to multiple customers in multiple locations. In addition to SMPTE-259M signals, the DV6000 can carry high-quality baseband analog video (and associated audios), scrambled video signals (many different formats), and signals from different standards (NTSC, PAL, or SECAM) on a single system. Digital DS-3 telephony data signals (44.376 Mbits/sec) can be transported on the DV6000 2.4-Gbit optical backbone.

Extron Electronics has introduced a number of new audio/visual distribution amplifiers (DAs). The CVDA 6 MX (one input) and CVDA 6 MX dual (two inputs) are six-output composite video (line video) DAs; the SVDA 6 MX is a one-input, six-output S-Video (S-VHS or Hi-8) video DA; and the SADA 6 MX (one input) and SADA 6 MX dual (two inputs) are six-output, two-channel audio DAs. All that allow a video source (i.e., camera, VCR, laser disc, etc.) with an NTSC, PAL, or SECAM video output to be split into six different independently buffered and amplified outputs and driven up to 150 feet.

Hewlett-Packard Co. announced its support for clustered networking of its broadcast servers (Fig. DS-1), using its HP MediaStream Server-Broadcast Series as the core building block and allowing up to 24 on-air channels. These server clusters are based on multiple HP broadcast servers connected together via Fibre Channel, giving broadcasters the ability to start small and expand their systems as their on-air channel needs grow. Additionally, large broadcasters now have a multichannel server complex that offers true scalability while taking advantage of digital technology; features include MPEG compression and multiple-channel support within each server. A variety of broadcast application needs can be met by clustered server configurations, and clustered server systems also are useful for new applications, such as pay-per-view or near video-on-demand (NVOD).

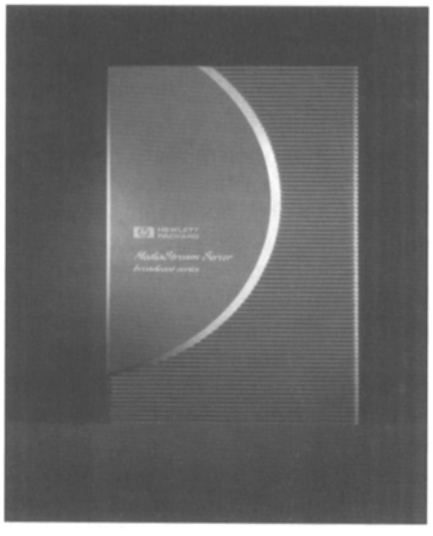

Figure DS-1. MediaStream Server-Broadcast Series servers from Hewlett-Packard Co.

Leitch, Inc., introduced a number of DAs during the year. The VDA-6830 analog video DA features excellent linearity and gain stability for solving common mode errors. It can handle nominally 0.7-V p-p noncomposite video to 2-V p-p subcarrier. Low power consumption and high temperature stability add to the DA's reliability.

The VDA-683 video DA from Leitch provides a differential input when equalization and clamping are not required. Although normally used as a unity gain amplifier, a variable gain control on the module front edge with a range from ±3 dB allows compensation for nonstandard input levels or line losses.

Leitch's VCM-6801 serial component D/A converter/serial DA combines the functions of an equalizing, reclocking serial DA and a 4:2:2-to-component analog video D/A converter on a single DA-sized card. The component analog outputs permit monitoring of 270 Mbit/sec signals without the added expense of serial digital monitors. Card edge selectors control a custom universal color space converter, allowing analog outputs to be configured in a wide-range of CAV standards.

Finally, the AES-6800 and AES-880 AES/EBU digital audio DAs from Leitch offer one input to eight outputs, auto cable equalization, data reclocking, jitter reduction, and extensive error indication. Both the 110-Ω and 75-Ω DAs feature automatic compensation for cable loss up to 2,000 feet of 8281 Belden cable. These DAs can be housed in the same frames as Leitch's Digital Glue products, which allows easy integration of digital AES and video.

Minerva Systems, Inc., and *emotion,* Inc., have collaborated on a complete

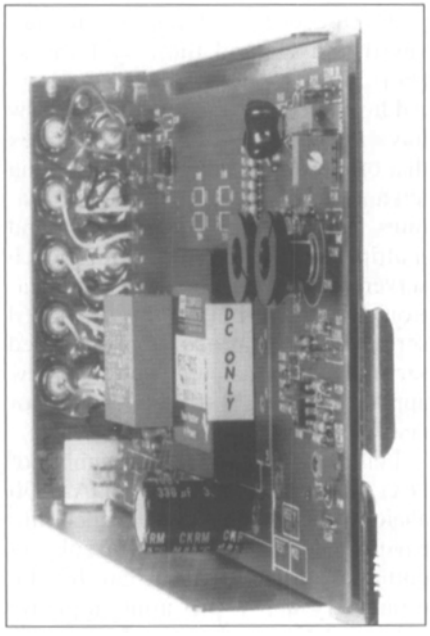

Figure DS-2. VDA-18FDC video and audio DAs from Videotek, Inc.

plug-and-play solution for digital video. The Minerva VideoShare integrates the Minerva Publisher desktop MPEG video publishing system and *emotion*'s CreativePartner cross-platform creative content distribution and reviewing software. Three standard preset parameters are provided, giving users a selection of options for capturing video from within the Creative Partner application, which incorporates Minerva Studio QuickRecord software. VideoShare offers quick and easy video capture, MPEG encoding, distribution, and archiving of digital video files via existing LANs or WANs.

Sonosax USA, Inc., introduced the SX-DA2, a battery-powered, portable, miniature D/A. The unit has XLR inputs for the AES/EBU digital input and coaxial and optical inputs for S/PDIF signals. The outputs are two XLR connectors providing balanced line output signals. A 3.5-mm mini jack for stereo headphones and headphone level control is provided. The SX-DA2 can also be used to analyze a digital signal. It incorporates LEDs to indicate professional or consumer formats, 44.1 or 48-kHz sampling rate, validity bit, confidence bit, emphasis, SCMS, stereo, and error flags.

Videotek, Inc., introduced the RS-12A 12 x 1 video and stereo audio routing switcher, which includes 12 loopthrough video inputs, 12 stereo audio inputs, contact closure remote control, RS-232 or RS-422 (internally selectable) remote computer control, and V-bus ports for remote control panels. The RS-12A features easily adjustable video and audio gains, and switches on the proper point in the vertical interval to prevent loss of vertical interval data or disruption of VTR servos.

The VDA-18FDC and ADS-24FDC -48-V DC video and audio DAs (Fig. DS-2) from Videotek are for the company's Omniframe, for use in telephone and cable TV distribution applications. The Omniframe has been modified to accept -48 V DC as the input power and two modules have been adapted to run from -48-V DC input.

Videotek's DDA-144 and DDA-144F component serial digital DAs with composite video from Videotek has an input of SMPTE 259-C (serial 601) only. The composite output is NTSC or PAL, depending upon the input format. The DDA-144 is a standalone unit and can be mounted in a rack mount tray for three modules or next to a waveform monitor with another similar module. The DDA-144F is a similar module for use in Videotek's Omniframe system, where any ten modules of any format (analog or digital, audio or video) may be housed.

Editing Equipment — Film

Moviecode Jastram Filmtechnik introduced the Moviecode Cutmatrix digital system to support negative-cutting recording to edit/key number decision lists (EDL/KDL) for electronic editing systems. This system replaces the traditional workprint with a graph of motion picture film, synchronized to a film transport, on an LCD screen. The additional time code output via standard RS-422 provides frame-accurate synchronization of video machines. The simple and colored design of the graphic, the clear sync marks, the position of the display, and the 640-frame time line all ensure and secure ways of cutting a high number of negatives. A small monitor screens the actual position of the EDL, addressing each frame and synchronizing it to Cutmatrix and video within seconds. The system is offered in a mobile version and as a built-in kit for existing negative cutting benches. To cut positive dailies, the mobile version can be used at flatbed editing tables or editing benches. The system accepts EDLs containing key numbers in all formats.

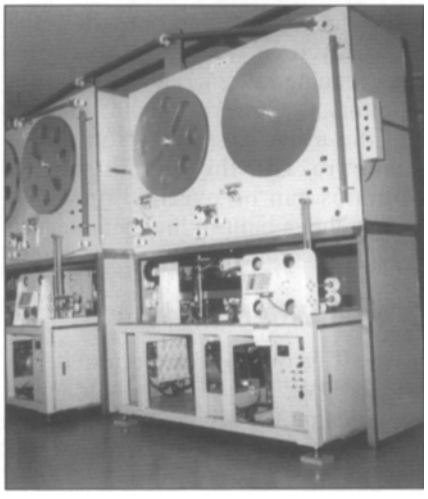

Figure EEF-1. JG-20 automatic film splicer from Sony Precision Technology.

Sony Precision Technology announced the JG-20 automatic film splicer (Fig. EEF-1) for both 35mm and 16mm film. A roll of film that has been printed but not yet developed is sent into the developer, and when its end is detected and captured, the unnecessary leader is cut off. Then the beginning part of the next roll of film is prepared, eliminating unnecessary portions, and the two rolls are sewn together with polyester thread. This entire process takes approximately one minute to complete.

Editing Equipment — Video

JVC Professional Products Co. introduced Digital-S (Fig. EEV-1), an 8-bit processing, 4:2:2 component digital recording and editing system using mild 3.3:1 compression. The Digital-S product line includes the BR-D85, a digital VTR with pre-read and digital serial I/O; the BR-D80, an editing recorder for full-feature digital editing; the BR-D50, a player with high-quality on-air playback; and the BR-D40, a dockable recorder designed to interface with professional cameras from all major manufacturers. The RS-422A control interface provides seamless integration with Betacam and S-VHS systems, as well as computer

Figure EEV-1. Digital-S digital recording and editing system from JVC Professional Products Co.

Figure EEV-2. HDTV/NTSC simul-production helicopter from NHK.

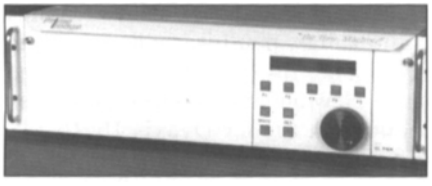

Figure EEV-3. The Time Machine from Prime Image, Inc.

editing and graphics tools. All of the decks are equipped with variable slow motion.

NHK has developed a helicopter designed to take air pictures for both HDTV and NTSC programs (Fig. EEV-2). The high-performance equipment is systematically mounted in the stringent environmental conditions of the helicopter, which has an active camera stabilizer containing a new 2/3-in., 2-million-pixel CCD HDTV camera with a high-quality lens. Pictures taken as HDTV images are recorded to HDTV VCR and are converted to NTSC through a downconverter.

The Time Machine from Prime Image, Inc. (Fig. EEV-3), uses solid-state digital technology that reduces program time without changing video or audio content. It is a self-contained, 3-U, rack-mountable unit that uses no data compression. The machine changes time without changing the pitch (frequency) of the audio or video programming. A maximum of 30 sec of video and two channels of time-reduced audio is available. It is capable of reducing time in real time for soccer games or other events that have no break times for commercials. The output signals can be fully genlocked and mixed with other television sources.

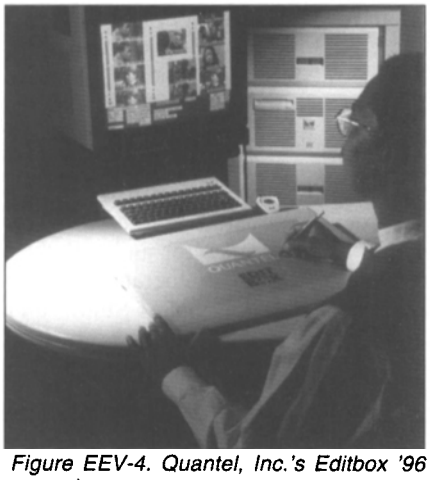

Figure EEV-4. Quantel, Inc.'s Editbox '96 upgrade.

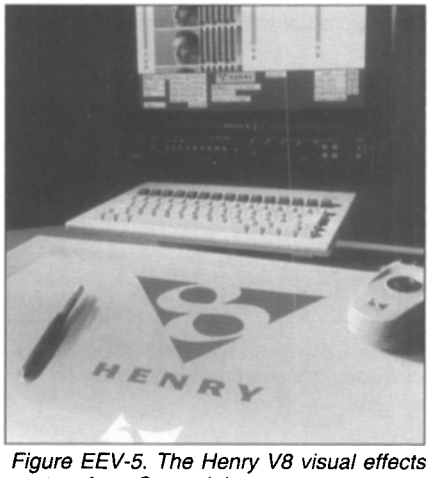

Figure EEV-5. The Henry V8 visual effects system from Quantel, Inc.

Editbox '96 from Quantel, Inc. (Fig. EEV-4), is a hardware and software upgrade for the nonlinear, on-line Editbox system. It focuses on video and audio editing functionality, connectivity, paint integration, and mix/FX. The new hardware delivers an overall speed improvement for faster keying, faster DVEs, and faster color correction. Connectivity is enhanced with Quantel's open platform exchange network (OPEN), so images can be exchanged with a range of computer products as well as with other Quantel equipment. Audio is embedded into the serial digital interface (SDI) video data stream. Paint/retouch and matte now includes 1,085 vector-based fonts, variable brush size, and RGB/YUV/HSL color mixing.

In 1996, Quantel launched a new, fully upgradable Henry family. The Henry V8 (Fig. EEV-5) is an ultra-fast visual effects system for high-end post-production. It features eight concurrent super layers and offers more than 72 simultaneous processes online to the operator. Also introduced were the V6 and V4 models, possessing six and four layers respectively. The entire Henry range comes fully specified with Quantel's OPEN technology and a TCP/IP interface, which provides rapid transfer of pictures between Quantel products and computer-based equipment. OPEN uses 100-base-TX Ethernet, enabling local or wide area networking, with distributed storage for over 4,000 images. Full integration is also possible into the Quantel Picturenet Plus Network.

Sony Corp. of America developed the DNE-50 handheld nonlinear editor (Fig. EEV-6), which can be connected to a notebook personal computer. It runs on a lithium-ion battery and is switchable between 525/60 and 625/50.

Sony's DNE-1000 broadcast-use nonlinear editing system (Fig. EEV-7) consists of a hard disk, an editor, a

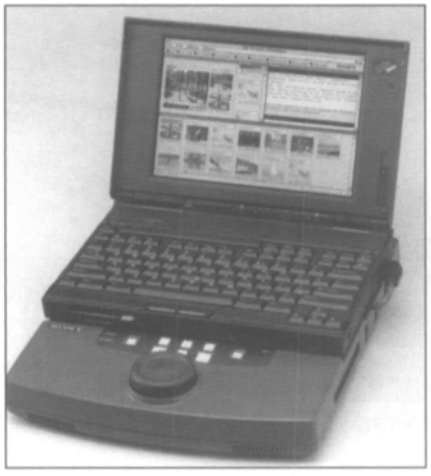

Figure EEV-6. DNE-50 handheld nonlinear editor from Sony Corp. of America.

Figure EEV-7. Sony's DNE-1000 broadcast-use nonlinear editing system.

switching unit, and a mixing unit, all connected to a personal computer. Functions such as mosaic, tone changing, and noise elimination are available. Options include 70 wipe patterns, 180 enlarging and shrinking patterns, and 110 page turns.

Videomedia, Inc., introduced the OZ-PCE version 3.1, an advanced video editing software application for Microsoft Windows that uses the industry-standard V-LAN network to frame-accurately control and synchronize professional broadcast and post-production video devices. OZ allows the user to combine a variety of videotape and videodisk devices with a video switcher and audio mixer for frame-accurate roll editing and single-frame animation.

Facilities

A. F. Associates, Inc., developed FoxTrax, a 40-ft mobile unit that integrates Silicon Graphics computers and custom software from Fox Sports. The entire unit, designed to highlight hockey pucks with graphics effects, is serial digital and includes sophisticated tally-based control systems, digital signal distribution and monitoring, and a comprehensive communications network. A system of audio and video delays works in tandem with the Silicon Graphics computers to enable the puck-tracking graphics to be inserted on the program feed.

Throughout 1996, Camera Service Center, Inc., expanded its film production facilities in New York City. New pieces of equipment include ARRI 435ES 35mm MOS cameras, ARRI variable prime lenses, shift and tilt lenses, ARRI 6-K compact Fresnels, Leonetti 12/18-K HMIs, Mole-Richardson lightweight "big eyes,î" Mole-Richardson "Betweenies," and Kinoflo 4-ft bank lights. CSC now features support equipment in its inventory, including Fisher Model 11 dollies, Fisher Crossover arms, and a lightweight aluminum dolly track. Also new are tractors with a 32-ft box and a 1400-A generator and a flatbed truck with a 1400-A generator.

The Chapman/Leonard Studio and Production Center is a complete one-stop production facility located in Orlando, Fla. The 37,000-sq. ft. facility accommodates products and services from Chapman/Leonard Studio Equipment Companies, a manufacturer and distributor of camera cranes, dollies, arms, bases, remote camera systems, and pedestals; BEC Technologies, which designs digital fiber-optic audio systems; David Alfonso, a professional composer whose work includes various musical scoring for features, commercials, and television; Barber/Myrick Films, a producer of independent feature films; Coming Attractions Grip & Electric, a full-service grip, electric, and expendable business; Vaughn Duplication, which offers video duplication services; and Vaughn Broadcast Rentals, which has film and video cameras, editing equipment, and a variety of online computer editing equipment. The center houses a fully equipped 9,000-sq. ft. sound stage (Fig. F-1) complimented by a 50 ft x 60 ft corner hard cyc with 26 ft of height. The stage has a 29-ft ceiling height and incorporates lighting, hardwood floors, climate control, private dressing rooms, showers, wardrobe space, over 2,000 sq. ft. of production office space, a green room, and a kitchen. Additionally, the production center offers space for prop building and/or storage.

NHK has developed a new HDTV OB van (Fig. F-2) that is capable of producing both HDTV and NTSC programs simultaneously with a digital video switcher that manipulates both signals by wiping the two types of pictures with different aspect ratios. This compact van accommodates a newly developed digital video switcher; five cameras with 2/3-in., 2-million-pixel CCDs; and three 1/2-in. digital VCRs.

In May 1996, Post Edge moved its Hollywood, Fla., facility to a new 10,000-sq. ft. location. With seven redesigned suites, the facility features audio suites, nonlinear edit suites, an Avid suite, film transfer, and a Flame suite. New audio equipment purchases included a Studer-Dyaxis IIi 16 x 8 digital workstation with removable drives and "plug and play" Mo storage; a Studer-Dyaxis II 8 x 4 digital workstation; a Yamaha 02R 40-input fully-automated digital console with digital reverb and dynamics; a Yamaha 02R digital console; a Sony PCM 800/DA88 18 ft x 10 ft x 10 ft announce/Foley/ADR stage with a

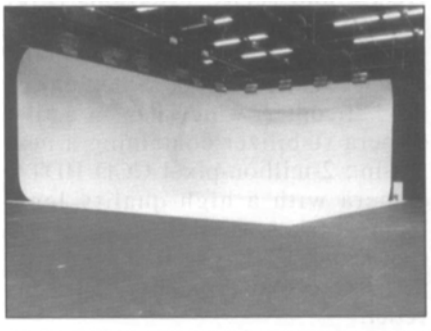

Figure F-1. The sound stage at the Chapman/Leonard Studio and Production Center in Orlando, Fla.

Figure F-2. NHK's NTSC/HDTV outside broadcast van.

Mitsubishi 60-in. rear-projection video screen; and an Ed Net 3D2 digital phone patch. Post Edge also added five Sony DME 7000s, a Discreet Logic Flame with an SGI Onyx computer, a Rank Cintel MarkIIIC Digiscan with Meta-Speed, and a Copernicus 4:4:4 color corrector with Prime Window.

Film

Fujifilm added several new film stocks to its Super F-Series of motion picture film; included among them are the F-125/F-250 tungsten and F-64D/F-250-D daylight-balanced type color negative film. In addition, the Fujicolor positive film FCP is a color print film that has a rich, realistic gradation that produces lifelike, natural images. Expanded exposure latitude produces reliable performance under varied conditions, while anti-scratch, anti-static, and camera behavior properties are enhanced by a black resin backing on the film base. Finally, the Fuji color intermediate film is a high-definition, ultrafine grain designed to preserve all the color and gradation of the original negative.

Fujifilm also announced its negative film F-500, available in 35mm Type 8571 and 16mm 8671. This tungsten-type, high-speed film has an exposure index (EI) of 500 and features a very high speed-to-graininess ratio, high sharpness, ample gradation, and faithful color reproduction. The film is suitable for shooting indoors, under low light conditions, outdoor evening and night scenes, underwater, and at high speed. Improved grain quality in the shadow areas help the film provide suitable material for the transfer from motion picture to videotape.

Film Archiving

Sondor of Switzerland, in cooperation with Chace, has developed an addition to the OMA S magfilm reproducer, designed for the preservation of previously lost soundtracks. The headstack has been designed to perfectly reproduce shrunken and heavily warped magnetic film. A special sprocket arrangement is also used for up to 4% of shrinkage. Severely deformed magnetic film is perfectly reproduced with less than 0.05% wow and flutter (weighted).

Film Camera Accessories

ARRI has designed a new Steadicam hang-on attachment for the Arriflex 16SR 3. To film from a particularly low position, a special Steadicam adapter is fastened to the camera; the adapter is fixed to both rosettes on the front half of the camera, and using a spirit level on the attachment plate, the exact positioning is determined. The camera is fastened to the Steadicam with three 3/8-in. threaded bushings. Due to the stable center of gravity, handling of the Arriflex 16SR 3 is well balanced and the camera "lies" very well on the Steadicam in filming position.

ARRI's MB-19 production matte box is a lightweight and compact matte box developed for the Arriflex 16SR 3. If the MB-19 is attached to the new lightweight support, LWS-3 graduated filters can be slid through easily. The minimum focal length for 16mm lenses in the Super 16 format is 6 mm, making the MB-19 particularly suited to short focal length lenses. The box is equipped with a filter stage for two 4-in. x 5.65-in. filters in the standard version; both filters can be pivoted and slid through. The filter stage has a reverse mount for 138-mm filter rings and an additional filter stage for a 4-in. x 5.65-in. filter. With a reduction ring, four 1/2-in. filter rings can be used. To facilitate lens changes, the matte box can be pivoted forward.

Hydroflex, Inc., has developed a spray-deflecting matte box to clear a camera lens of rain or any other water splash. A wide variety of matte boxes can be adapted by Hydroflex to incorporate an air nozzle powered by a standard scuba or nitrogen tank. The air can be run continuously through a shot or turned on and off as necessary, with an instant clearing of the lens viewing area.

Schneider Corp. of America introduced their soft-centric filter, which is designed to soften the subject without significantly affecting image quality. The filters are available in several strengths and are supplied in all professional motion picture sizes.

Scubacam, Ltd., announced its latex environmental housing for the ARRI 35mm camera, made from 2.5 mm thick natural latex and sealed using two heavy duty-watertight zips. Features include a tripod mount, 10-m power and video loom, a leak alarm, film speed up to 130 frames/sec, follow focus, and viewing ports for camera and lens functions.

The SkyFire and Twilight color grad filters from Tiffen Manufacturing Corp. were designed for cinematographers looking to enhance outdoor scenes. They feature a blend of several colors and can be used to simulate dusk or dawn during regular daylight hours. SkyFire starts at the top with an ND/red combination, shifts to salmon, gradually turns to straw, and then fades to clear. Twilight begins with a deep lavender that gradually shifts to pink and then clear. Both filters are available in sizes to fit all professional motion picture and video lenses.

Tobin Cinema Systems, Inc., introduced a number of new products for motion picture production. For the Arri 35mm 2A-2B-2C cameras, the TXM-18 crystal motor base gives 30 speeds from 10 to 75 frames/sec. The motor runs forward and in reverse, and a DE-9 socket accepts an external speed control with 3,200 5-V pulses/frame. A phase button lowers the internal or external speed by .45% while pressed to move the shutter bar to the bottom of the video frame when filming with a video monitor in the shot. Operation is on 12 V DC for speeds up through 40 frames/sec and on two 12-V supplies for speeds from 40 to 75 frames/sec via 4-pin XLR connectors. The motor is sized and configured to accept a sliding bridge plate.

For Arri 16-S and 16-M cameras, the TXM-17 crystal drive from Tobin gives 12 crystal speeds from 10 to 50 frames/sec on 12-V DC power. With 14.4 V, 60 frames/sec is also possible. The motor is a one-piece unit that fits in place of the original motors.

Tobin developed the TXM-14 crystal motor for the Eclair NPR camera. The motor gives 15 crystal speeds, including every 50-Hz HMI speed from 10 to 33-1/3 frames/sec and every 60-Hz HMI speed from 12 to 40 frames/sec. In addition, the motor accepts an Aaton-compatible 100 pulse/frame signal from a Milliframe Controller or equivalent for filming from video or computers, and it outputs a frame pulse as required by other brands of precision controller. The

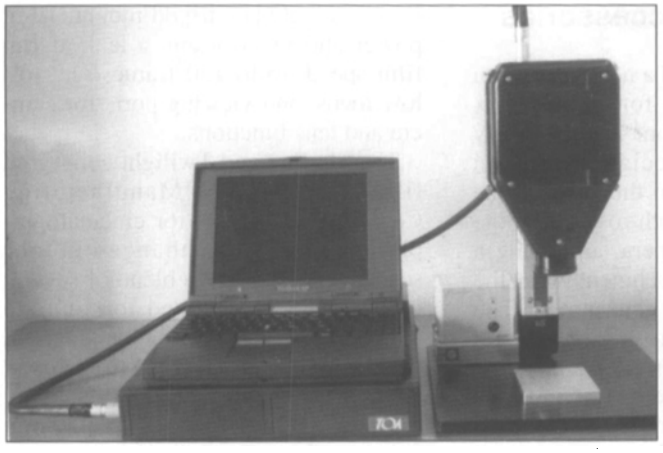

Figure FLE-1. PLID-2, an instrument for identifying cine film from Toa Electronics Corp.

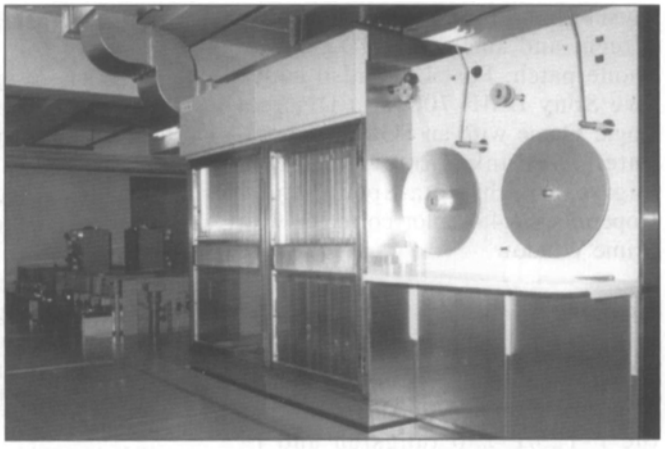

Figure FLE-2. EDP-2B color positive film-developing machine from Toei Chemical Industry Co., Ltd., and Ohtomo Manufactory Co., Ltd.

unit operates on 12 V DC via an XLR-4 connector, and includes shutter parking so the mirror always stops in the viewing position, with battery power then completely turned off.

Film Laboratory Equipment

The D4000 film cleaning system from Magnasonic Corp. is designed for use with original negatives, interpositives, and prints. The unit has a film speed of 200 ft/min and a capacity of 4000 ft. A microprocessor controls operations using a 16-bit Intel processor with a fuzzy logic coprocessor for a fully closed digital servo tension motor control loop. Film is supported on a double bearing block and the system uses distilled water as a cleaning fluid.

The Verité digital optical system from Pthalo Systems, Inc., provides high-speed and high-quality scanning and recording for 35mm motion picture film. The same laser light source, film transport, and electronics handle both the scanning and recording process, providing a unified and transparent digital film result. The scanner provides laser film scanning and uses a three-color gas laser that is continuously self-checked and self-calibrating. It has a 1000-ft. capacity, is pin-registered and has a registration accuracy of ±0.25 pixel at 4096 pixels/line. It scans at a rate of 750 lines/sec and has a variable resolution of 50 to 200 lines/mm. The recorder allows the user to record on intermediate film or camera negative stocks with no light limitations, flare, or artifacts. The Verité system supports 35mm Academy, full aperture as well as 35mm VistaVision. The resolution is a variable 50 to 200 lines/mm and the variable data rate ranges from 3.5 to 30 Mbytes/sec.

RTI/Lipsner-Smith introduced the Excel 1100 enhanced nonimmersion film cleaning system. The machine uses a process of particle transfer rollers combined with buffers wetted with isopropanol to safely and effectively clean motion picture film. The fluid delivery system permits the user to clean up to 25,000 ft of film with one quart of isopropanol.

Toa Electronics Corp. announced the PLID-2 (Fig. FLE-1), an instrument used to identify types of cine film. First, a near-infrared ray is projected onto the film and the absorption spectra are measured. The second-derivative spectra are calculated and converted to a code resembling a bar code.

Toei Chemical Industry Co., Ltd., and Ohtomo Manufactory Co., Ltd., announced the EDP-2B color positive film-developing machine for 35mm and 16mm film (Fig. FLE-2) that, under the control of a demand drive method, uses an immersed floating roller and operates at a speed of 230 ft/min. The driving roller is constructed from stainless steel to prevent being damaged by the developing liquid. In addition, the tank for the developer has a drain on top so that the tar that accumulates on the surface can be removed.

Graphics/Special Effects

Chyron Corp. has announced two new options for its MAXINE! single-channel graphics system. Transform Lite gives MAXINE! users real-time character and graphic animation, enabling real-time animation of 2-D objects in 3-D space. Meanwhile, the preview channel is designed for broadcast and still-store applications where a full-color preview output is essential.

The WiNFiNiT! GUI from Chyron allows its iNFiNiT! family of graphics systems to be compatible with the Microsoft Windows NT-based operating system. The video component is a separate, rack-mount system that provides professional-quality signals and real-time performance. It can be used with any of the current Chyron hardware platforms. WiNFiNiT! utilizes standard Ethernet protocol for local or remote communication between the keyboard and the iNFiNiT! family graphics system. The WiNFiNiT! GUI supports Windows Clipboard for direct cut and paste of text and 24-bit graphics into Chyron frame buffers. It also provides automatic .bmp, .tga, and .tif file conversions into a Chyron RGBA file format.

The graphics division of Chyron Corp., chyronGraphics, introduced Infinite Freedom, an integrated digital production and design studio. The Infinite Freedom system integrates Chyron's character generators; Liberty paint and animation software; IMAGESTOR! still-store management system; a digital disk recorder from Sierra Design, Abekas, or Accom; and the iNFiNET! graphics file server with networking capabilities. Each of the individual components of Infinite Freedom are scalable in their hardware configurations.

The Oxygen 102 3-D graphics accelerator from Dynamic Pictures, Inc., integrates the Dynamic Pictures Oxygen chip, the graphics engine that delivers rapid smooth shading, lighting, and texture mapping calculations. Oxygen 102 also offers image scaling, atmospheric effects, transparency, alpha buffering, anti-aliasing, alpha blending, and Z-buffer calculations. Optimized software drivers enable seamless operation on Intel, Alpha, and MIPS platforms running Windows NT or Windows 95.

The Future Cap from IMMAD Broadcast Services is a nonlinear, Windows-based captioning system with both sound and pictures at the workstation. Synchronization is easier when the user can see the captions relate to the video and audio information.

NHK and Matsushita Electric Industrial Co., Ltd., have jointly produced a virtual studio set system that generates 3-D computer graphics images in real time. The relative front-rear positions of the camera objects and the images are compared pixel by pixel. The computer graphics generating section uses a dedicated hardware that is characterized by its high-speed and high-functional performance, small size, and low power consumption. Texture-mapped and intensity-mapped polygons can be rendered at a rate of 1.44 million polygons/sec. The speed can be increased further by increasing the number of generating units.

Information Services

Point Broadcast GmbH has built an Internet web site database for broadcasters, featuring many manufacturer and product line listings. The database contains product specification and offers sophisticated search algorithms and comparison tools. The advanced search function allows users to scan the entire database for a particular set of specifications. A deeper look into the product shows pictures, drawings, and a manufacturer's application description. The Web site addresses are http://www.point-broadcast.com or http://www.broadcast.org.

Lenses/Optics

The Shift-and-Tilt lens system from Arriflex Corp. has gear-driven movements, indexed scales, a mechanical interface for remote control, and a white disc for individual markings. With color-coded controls for quick and easy adjustment, it is compatible with both 16mm and 35mm formats for both standard and macro photography. The system is capable of either extending the field of focus or providing alternative planes of focus; it can also achieve creative distortion or a softened image.

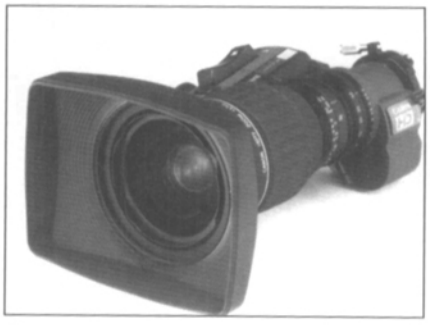

Figure LO-1. HJ 9x5.5 B wide zoom lens from Canon, Inc.

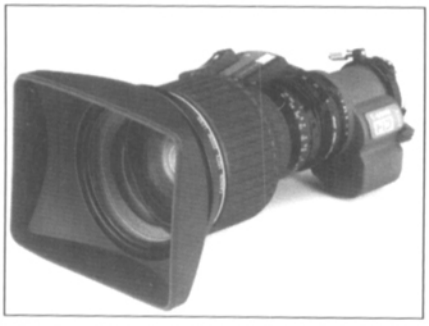

Figure LO-2. Canon's handheld HJ18x7.8 B ENG/EFP lens.

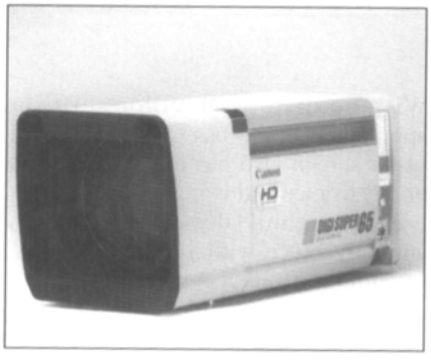

Figure LO-3. UJ 65x9.5 B field zoom lens from Canon.

Figure LO-4. IS-20 B optical image stabilizer from Canon.

Canon, Inc., introduced three types of lenses for Hi-Vision cameras. The HJ 9x5.5 B wide zoom lens (Fig. LO-1) provides an angle of 5.5 to 50 mm. The chroma aberration and distortion are suppressed, a minimum distance of 0.6 m is possible, and there is a facilitated 2x extender. The handheld HJ 18x7.8 B ENG/EFP lens (Fig. LO-2) provides 18x magnification, a 7.8-mm focal length, a 1:2.2 aperture ratio, a 1.2-m minimum distance, and a 2x extender. The UJ 65x9.5 B field zoom lens (Fig. LO-3) provides 65x magnification, a focal range of 9.5 to 620 mm, and a 1:2.2 aperture ratio.

Also from Canon was the IS-20 B optical image stabilizer (Fig. LO-4). When placed in front of a lens, the IS-20 B optically eliminates the fluctuation of the picture caused by mechanical vibration. The stabilizer detects and processes vibrations and then changes the angle of the variangle prism to compensate, thus maintaining high picture quality. The range of compensation is 1 to 20 Hz. The IS-20 B is useful for such outdoor shooting as that done in a car or in a helicopter.

The Clairmont Camera Swing/Shift System from Century Precision Optics uses bellows, swings, tilts, rises, falls, and shifts to provide view camera controls to motion picture cameras. Users can distort the shape of a subject, remove unwanted objects from the frame, or shoot straight into a mirror without catching the camera's reflection. Access to shifts and swings also provides nearly total control over the focus plane for extremely deep or shallow depth of field. Both distant and extremely close objects can be sharp in the same frame. Focus can also be limited to a particular object, isolating it even from objects the same distance from the lens.

Innovision Optics introduced the Probe II lens system (Fig. LO-5). By incorporating a 15 in. long lens barrel with a diameter of just 1.7-in., the Probe II lets the operator get over,

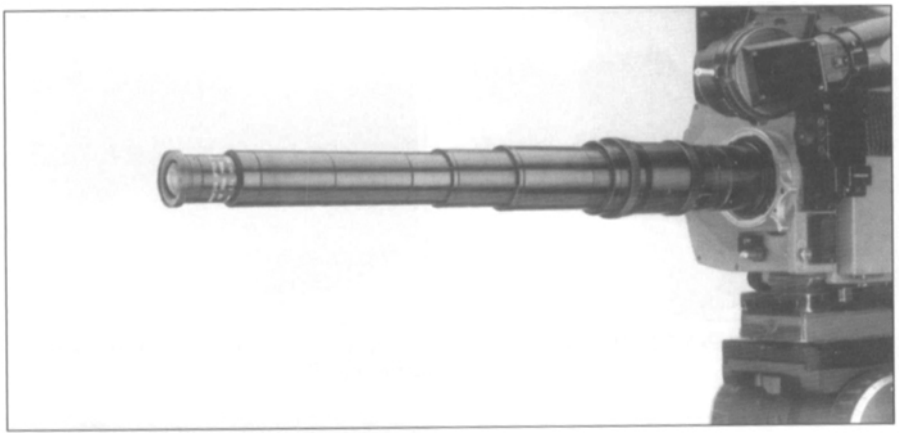

Figure LO-5. Probe II lens from Innovision Optics.

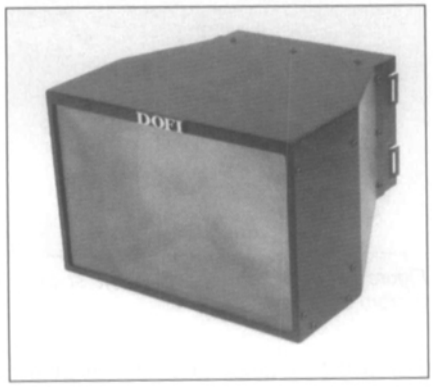

Figure LO-6. DOFI raster screen from I'Optics.

under, and even through objects, allowing for a wider range of shooting possibilities. The Probe II offers a flatter overall field and dramatically improved edge-to-edge sharpness. Available in both 35mm film and 16mm/video versions, the Probe II features interchangeable front objectives in a variety of focal lengths. The Probe II for 35mm film work, has a speed of T5.6 and provides focal lengths stretching from 8 to 75mm. The 16mm/video unit offers a range of focal lengths from 6 to 60mm with a speed of T2.2.

The DOFI raster screen from I'Optics (Fig. LO-6) is an optical device used in conjunction with a video monitor or computer screen for the purpose of enhancing and improving the video image. This is achieved by enlarging the image, improving clarity, increasing contrast, and adding depth of field to the image. Additionally, a reduction of grain, video noise, and radiation produces a substantial reduction in eye strain. With no distortion, color shift, or appreciable light loss (3%), the DOFI raster screen also has no moving parts or electronics and is maintenance free.

P+S Technik developed a wide-angle eyepiece with 10x enlargement. In addition to its use with Arri 35 BL cameras, this eyepiece is especially suitable for Super 16 Arri SR I and II cameras. An anamorphic viewfinder that can be switched from standard to anamorphic use is also available.

Lighting Equipment

Arriflex Corp. has expanded its Compact range with the ARRI Daylight Compact 200. With the use of the single-ended discharge bulb technology, the luminaires are up to 75% smaller and about half the weight of the two-ended versions. Despite the small volume and light weight, a high light output can be achieved. The luminaires are available in 575-W, 1200-W, 2500-W, 4000-W, and 6000-W sizes.

Cotech Sensitising, Ltd., introduced the Polybounce and Blackout lighting filter gels. Polybounce is a white reflective polyester-base material, supplied in rolls of 48 in. x 25 ft, and can be used as an alternative to polystyrene or fiber board as a white soft-light bounce reflector. Blackout, made of a similar material, is black and can be used for blacking out light from windows.

New from the F. J. Westcott Co. was the Westcott Box for professional image makers. Available in two sizes (24 in. x 32 in. and 36 in. x 48 in.) and with optional louvers and accessory kit, the Westcott Box is heat-vented and attaches easily to lights with most industry speed rings. Standard features include flat or recessed front diffusion panels; removable baffles; and specialized, flame-proof fabric close to the light, allowing up to 1 K of continuous lighting. The accessory kit has interchangeable white, gold, and silver interior panels; black strips to facilitate strip lighting; and an attachable circular face mask. Optional louvers, compatible with almost any industry softbox, attach with Velcro tabs and are available in sets of six.

The Fluorescent Co. introduced a number of new products. The Lamp Harness Kit allows the user to operate any T-12, 2-ft, or 4-ft single lamp without a fixture. The harness has self-clamping, impact-resistant lampholders that connect to a flicker-free, high-frequency ballast. The kit is also available with a DC ballast for T-8 lamps.

The Uni-Fluorescent is a single-lamp fixture with a remote, flicker-free, high-frequency ballast. It is a rugged lightweight unit constructed of aluminum and stainless steel. The unit has self-locking lampholders and can be screwed directly onto a surface or used with a removable baby-pin mount. The Uni-Fluorescent is available in 2-ft and 4-ft lengths and uses T-12 lamps.

The Pencil-Fluorescent from the Fluorescent Co. is an extremely bright 32-K fluorescent that has the diameter of a pencil and is available in 8-in., 12-in., 16-in., and 20-in. lengths. It is ideal for lighting very small or tight areas and is powered by an external, flicker-free, high-frequency ballast available in both AC and DC versions.

The Fluorescent Co. also introduced its Flexi-Fuorescent (Fig. LE-1), a fixture that comes with a flexible arm and clamp that allows the user to mount and position the 12-in., T-5 lamp. It also features a directional tube housed around the lamp in order to aim the light source. It has an external flicker-free ballast and is available in both AC and DC versions.

The Toothpick Fluorescent (Fig. LE-2) is a high-output fluorescent lamp approximately the diameter of a toothpick. It has an external flicker-free ballast with both dimming controls and a candle-flicker effect built in. Lamps are available in 4-in. and 6-in. lengths. This product is also available

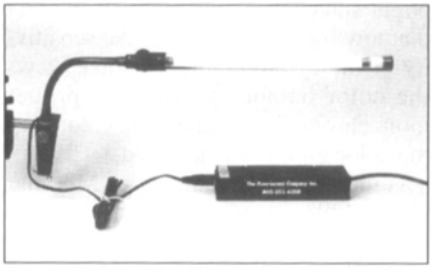

Figure LE-1. Flexi-Fluorescent fixture from the Fluorescent Co.

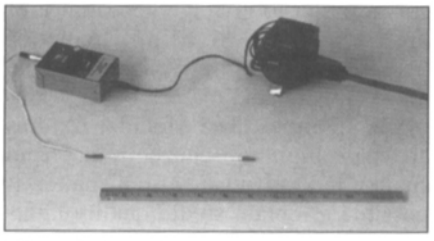

Figure LE-2. Fluorescent Co.'s Toothpick Fluorescent.

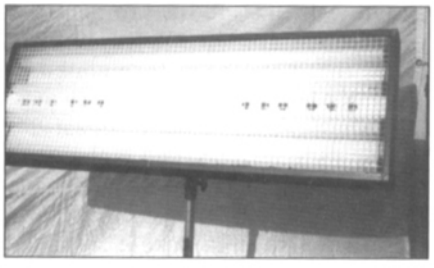

Figure LE-3. 2-Lamp and 4-Lamp digital fixtures from Fluorescent Co.

Figure LE-4. X3 Flickermaster from the Great American Market.

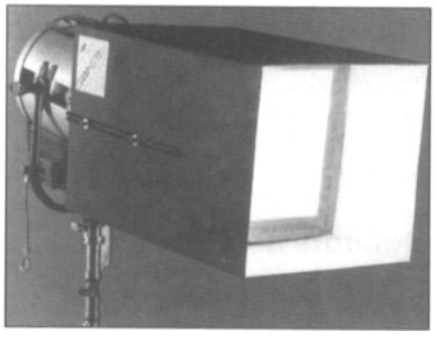

Figure LE-5. Gam-Litt softbox from the Great American Market.

in a five-lamp, nondimming Toothpick Cluster and a single-lamp, underwater Aqua Fluorescent. The ballast can be run with either a 12-V DC adapter or batteries.

Finally, the 2-Lamp and 4-Lamp fixture from the Fluorescent Co. (Fig. LE-3) is a flicker-free, high-output fluorescent fixture that is rugged and lightweight with a built-in ballast. A wireless remote control allows the user to turn individual lamps on or off via a handheld controller, resulting in complete control when balancing a blue or green screen. The device works with any 4-ft, T-12 lamps. It is also available with digital blue and green lamps.

The Model MFANP1-HC arc light from Frezzi Energy Systems features a built-in battery bracket accepting NP-type batteries directly into a wireless design. Other configurations connect to on-board brick batteries via power tap connectors or from external battery sources, or utilize BP90s as well as other standard batteries and power supplies. It is a compact, miniature arc light powered by DC power sources (12-V NiCd battery packs). The arc bulb draws 24 W of power, providing over 100 W of tungsten light output, balanced at daylight temperature. Startup time is approximately 15 sec. The one-piece design easily mounts on broadcast camcorders or film cameras.

The X3 Flickermaster triple flicker generator (Fig. LE-4) from The Great American Market has a 60-A, single-phase input divided into three independent 2000-W outputs for a total load capacity of 6000 W. Each of the three independent control channels utilizes a dedicated on/off switch, built-in dimmer, and variable-speed control. The device features independent outputs for setting lights/dimmers, variable speeds, random flicker from all three outputs in sync, and 16 memory modes for storing strobe/flicker effects.

The Great American Market also debuted its GamLitt lightweight portable softbox (Fig. LE-5), which diffuses and contains directional light sources. The complete package includes a telescoping snoot, color/diffusion frame, adjustable mounting hardware, and simple assembly instructions. The GamRing mounting ring is sold separately and is available in six sizes to fit most fixture diffusion clips (ears).

HydroFlex, Inc., introduced two underwater lighting systems. The HydroPar 1800W HMI and the HydroPar 2000W are both depth-rated to 120 ft. The HydroFlex custom underwater-mateable connectors incorporate the "mate first/break last" grounding circuit. The 1800W is designed to allow the lamp head to rotate in the yoke assembly, and the 2000W can be powered by both AC and DC.

The Bug-Lite 200 from K 5600, Inc., is a 200-W daylight HMI system without optics. Designed to work in any position, the Bug-Lite system is intended for use as traditional lightbanks as well as lanterns. The safety glass breaker is frosted to diffuse the 5-mm arc from the lamp. The unit works on a solid-state electronic power supply from 110-V and 240-V mains.

Kino Flo, Inc., developed several new pieces of lighting equipment this year. The Dimming Single System and Double System are portable dimming (0 to 100%) lighting systems with a noiseless, high-put, remote ballast; a 25-ft head extension; a mounting plate; and a complete fixture with lamp harness, reflector, and louver. It is DMX-controllable and takes two 48-in., medium-base, bi-pin lamps (tungsten and daylight balanced). The Dimming 4Bank System has many of the same features except it takes four 48-in., medium-base, bi-pin lamps.

The Dimming Image 20 Studio Fixture has four lamps and can be used as a controllable fill source that can be worked in close to the subject; it uses four 24-in., medium-base, bi-pin lamps. The Image 40 is a four-lamp fixture that puts out more illumination than a 1-K softlight, and the Image 80, an eight-lamp studio fixture, puts out more illumination than a 3-K softlight. The fixtures are all DMX-controllable, cool, power-factored fluorescent sources used to light everything from tabletop subjects to broadcast studios to huge cycs. Each comes with a yoke, gel frame, and louver.

The Mega-Flo Systems from Kino-Flo are 6-ft and 8-ft fluorescent luminaires for location and studio use and come with barn doors, reflectors, louvers, removable lamp wiring harnesses, mounting plates, head extensions,

and high-output, flicker-free "select" ballasts. Mega-Flo light output can be controlled in 1/2 F-stop increments. The 6-ft fixtures take 72-in., medium-base bi-pin lamps, and the 8-ft fixtures take 96-in., medium-base bi-pin lamps.

The Dimming Wall-O-Lite is a dimming (0 to 100%) 10-bulb, high-output, flicker-free lighting instrument for location and studio applications. It is DMX-controllable and comes with a built-in, power-factored electronic ballast, accessory frame, frame brackets, gel frame, and louver. The fixture takes ten 48-in., medium-base, bi-pin lamps.

Kino Flo's Dimming Trans-Flo System dims via a system clock reference (SCR) dimmer rack (120 V AC) and is used for rear lighting Chromatrans images or other rear-lit set designs. The Trans-Flo takes 48-in., 24-in., or 15-in., medium-base, bi-pin lamps, and the ballast operates two at a time.

Finally, the KF29 full-spectrum lamp from Kino Flo is a 2900-K H.O. lamp with phosphors that have been designed to match the spectral sensitivity curves of live action film, still photos, and video capturing equipment. The warm Kelvin rating is intended to match the operating temperatures of the quartz studio lighting instruments commonly used with Kino Flo fluorescent lighting systems on location and in the studio. The medium-base, tungsten-balanced, bi-pin lamps are available in 48-in., 24-in., or 15-in. sizes.

Mole-Richardson Co. announced three new lights. The Type 6491 575-W single-ended par HMI has a small, compact size, features instant hot restrike, and has an extremely brief illuminator. The Type 6411 200-W single-ended par incorporates a small ignitor with instant hot restrike; the solid-state, flicker-free ballast is small and lightweight. Finally, the Type 3101 Inbetweenie is a small, compact, 2-in. Fresnel fixture that uses GCA 250-W or FSH 125-W globes.

The Starlite FV from Photoflex, Inc., is a halogen light specifically designed to work with a softbox. This compact light for film and video (available in 150-W, 250-W, 500-W, or 1000-W sizes) contains an extra-long bulb that provides more efficient diffusion by extending the light source itself into the center of the softbox. The light is then evenly directed into the corners of the box, allowing it to exit with softer shadows and minimum loss. The reflection of the softbox's interior is maximized, producing a brighter, softer, and more natural-looking light.

Photoflex's Silverdome FV softbox was designed for use with constant light sources and is heat resistant. The Silverdome FV is equipped with four heat vents that use a chimney-flow effect for cooling, thus extending the life of the lights and dome. The softbox creates a directional soft light from a hard, continuous light source. Its highly reflective silver interior is double-laminated for a durable, long-lasting surface. An interior removable baffle, a recessed and removable front diffusion face, flexible aluminum rods (4 plus 1 extra), and a handled carrying bag are standard features. Photoflex also introduced the small (16 in. x 22-in.) and extra-small (12-in. x 16-in.) Silverdome FV softboxes, which are useful for smaller subjects, or as a hair-light, background light, or spotlight. Because they are compact and portable, these smaller Silverdomes can also be used for on-location shoots.

The IPS Silent Single 6-kW electronic dimmer from Rosco Entertainment Technology is absolutely silent, and features chokeless IGBT dimming with no magnetics and low energy loss. Versatile control options include a local slider, remote analog, and an optional DMX-512. The IPS Silent Single has a recessed slider that provides local control of light level.

The CalColor calibrated color effects filters from Rosco were developed specifically for the spectral sensitivity of color film. The series includes the primary colors red, blue, and green, along with secondary colors yellow, magenta, and cyan. Each color is designed in four densities: 15, 30, 60, and 90.

Tiffen Manufacturing announced its Day-for-Night filters, which create a nighttime appearance when filming during the day. The design of the Cool Day-for-Night is based on the perception that moonlight is cool, and therefore bluish in color; a particular shade of lavendar is used, producing visual coolness while maintaining realistic flesh tones. The Monochrome Day-for-Night filter takes advantage of the fact that low light levels reduce the sensitivity of the eye to color; the filter skews the color balance so that the proper monochromatic effect can be created as the color timing is fine-tuned.

Videssence announced its Modular studio lighting products. The fixtures are linear extrusion bodies that incorporate lamps, reflectors, and electronics within the fixture body. Each lamp has its own individual reflector and lens in order to give the appearance of multiple source lighting. Dovetail tracks run the length of each fixture so they can be mated to each other, forming large arrays. The Modular fixtures are 4 in. high and can be hung from suspended ceilings, which makes it possible to obtain studio-quality lighting in low-ceiling or office environments where hot or traditional stage lighting would not be acceptable.

The Vidlux media lamps from Videssence are SRGB fluorescent lamps that have been formulated to match Kodak and Fuji film emulsions. The lamps are available in linear 24-in. and 48-in. heights, and high-output T-5, T-8, and T12, as well as T-5 and T-8 compact configurations. These units are also compatible with the Videssence Studio 2000 television and motion picture production lighting product lines.

With Videssence's Vista Dimming/Power Distribution product line, power distribution is achieved through a series of terminal strips; these units can be configured to house multiple outlets or circuits of triax, DMX, or analog-controlled power. Dimming control is available through three consoles, which range from a DMX/analog, 192-channel board to a computerized and programmable computer system.

Wildlife, Inc., introduced its 401 UV flood fixture, which projects up to 175 ft. The light comes with integral ballast, mounting bracket, safety cable, clamp, and a built-in digital lamp-life meter. It also features a precision-quality black glass filter that cannot fade or scratch.

Monitors and Displays

A 40-in.-diagonal, 1920 x 1035, color plasma display (Fig. MD-1) has been jointly developed by NHK and Matsushita Electric Industrial Co.,

Figure MD-1. A 40-in. color plasma display from NHK and Matsushita Electric Industrial Co., Inc.

Inc., to reproduce high-resolution HDTV pictures. Panel fabrication technology has made it possible to realize a smaller cell pitch of 0.48 mm (H) x 0.5 mm (V). The panel reaches a luminance of 150 cd/m^2, a picture resolution of over 650 TV lines, and a lifetime of over 10,000 hours. Signal processing was also improved to reproduce high-quality pictures.

Multimedia

The VGA Producer 16 from Magni Systems, Inc., is a PC-based genlock/encoder board for high-end broadcast and post-production. Sixteen-bit color is available for high-color graphics and flicker-stabilized output. The standard system is available in NTSC or PAL and generates composite or S-VHS output or overlay. A component option adds Beta and MII RGB. Video signal output meets broadcast specifications for television, cable, or post-production applications.

News Gathering

A Ku-band mobile digital satellite news gathering (SNG) RF terminal from NHK (Fig. NG-1) ensures stable transmission of TV programs from a ship or a vehicle to a broadcasting center in real time via a communications satellite. The terminal consists of a transmitter using an electronic beam steering flat antenna with 16 subarrays and a turntable and pitch-roll stabilizer for mechanical tracking; a beam tracking accuracy of 0.05° can be achieved. The link margin is approximately 7 dB, the video information rate is 7 Mbits/sec, and the transmission rate is 17 Mbits/sec. The size of the flat antenna is 60 cm x 60 cm. The terminal has been successful in remaining stable during a 2-hr television transmission from a ship.

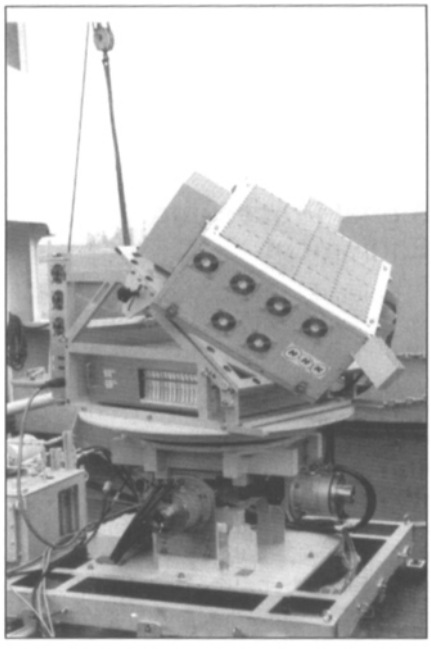

Figure NG-1. Ku-band mobile SNG system from NHK.

Figure NG-2. NTS's HDTV helicopter camera system.

NHK has also developed a mobile terminal for digital SNG, in cooperation with NEC and TOKIMEC. This equipment can be loaded onto a vehicle or a ship and can transmit digital signals (NTSC or HDTV) to a communications satellite even when the vehicle or ship is moving. The diameter of the offset antenna is 75 cm, and saturated output power of the high power amplifier is 300 W. It employs two tracking schemes, monopulse tracking, and an attitude-heading reference system. The tracking accuracy is within +0.3°. To prevent negative effects, the equipment suspends transmission when the path is cut off or tracking mechanism cannot move.

NTS, an affiliate of NHK, developed a new anti-judder HDTV helicopter camera system (Fig. NG-2). The system consists of an AS-355 helicopter with an ACE-601 camera pad stabilized by multi-axis gimbals and a fiber-optic gyroscope, an Ikegami HDL-30A camera, and a Panasonic AU-HD1400/1500 VCR. The system's stability is 5-μ radian rms, which assures a stable bust shot of a passenger in the window of a train running at 100 km/hr.

Post-Production

NetFX hardware and software for digital post-production from Prisa Networks provides configurations using Fibre Channel technology to achieve high-speed transfer of large data blocks among a wide variety of workstations, personal and large computers, disk drives, peripherals, and display devices. NetFX adapter software offers plug-and-play convenience for IRIX operating systems and supports standard protocols such as IP and SCSI. Applications for NetFX include computer-to-computer transfers, computer-to-disk transfers, nonlinear editing, and interfacing to video servers and DDRs.

Projectors

The Linear-Loop projector from Pioneer Technology Corp. (Fig. P-1) can be used for conventional feature-film theaters, simulated thrill rides, and large-format film cinemas. The design features improved image quality on screen, high shutter efficiency, virtually no maintenance, automatic film cooling and cleaning, longer print life, and high-speed rewind through the gate.

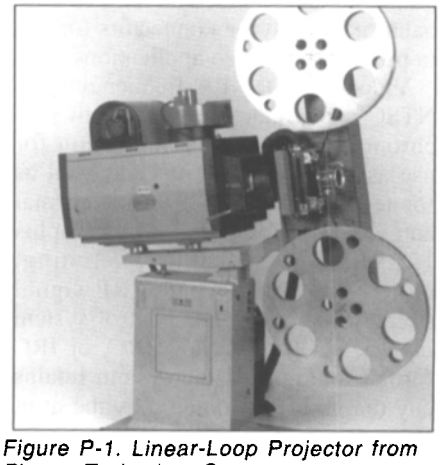

Figure P-1. Linear-Loop Projector from Pioneer Technology Corp.

Receivers

The Grundig Planatron uses Plasma AC technology to generate a picture as light emission directly on the surface. This technology also produces a high level of background brightness that requires no background lighting as well as picture quality that is independent of the viewing angle. A plasma display consists of individual chambers for each primary color (red, green, and blue) for each picture point. The brightness of the plasma display is determined by the time length of the resulting UV light. The TV receiver, which contains the power supply, receiver, signal processor, and display control, can be mounted on the specially designed rack. All necessary interfaces, such as Euro-AV sockets (with RGB protective circuits), VGA interface, TTL input, and video/audio sockets, are located on the TV receiver. Other features include PALplus signal processing, Dolby surround sound with Prologic, Megatext, and picture-in-picture.

The DM-145 frequency-agile NTSC demodulator with simultaneous stereo and SAP outputs from Videotek, Inc., is designed for use in the cable and industrial television markets to provide simultaneous primary stereo audio that accompanies the video and the SAP, which broadcasters are using for second language or alternate program source audio. The DM-145 equips the user with two baseband video outputs (on BNCs), with a front-panel control for setting levels, a stereo pair of audio outputs with front panel controls for both gain and balance, and an SAP output. All audio output connectors are standard 600-Ω-balanced XLR-type connectors for use in professional video applications.

Videotek's DM-192 frequency-agile NTSC demodulator features both synchronous and envelope detection for use as a high-quality tuner as well as for testing. The DM-192 has normal antenna broadcast tuning ranges plus 125 channels of cable TV tuning, along with a front panel RF signal strength indicator. The control system may be set for normal, HRC, or IRC format tuning, and the system retains any tuning offsets entered by the user. Remote control via an RS-232 port allows access to all of the DM-192 features. The DM-192 also provides a zero carrier pulse, quadrature output, full-time and separate BTSC stereo, SAP, pro channel, and composite audio outputs as well as an IF loop and a 4.5-MHz output.

Signal Processing Equipment

Colorado Video developed the 442 Video Subtractor, which eliminates stationary backgrounds and displays only movements that occur in the scene. The 443 Video Peak store accepts the 442 output and makes a long-term "video time exposure," showing activity in the television camera's field of view. Applications for these devices, both shown in Fig. SP-1, include aircraft or missile tracking, and motion studies of animals, insects, or other creatures.

Pebbles from Discreet Logic is a sophisticated hardware I/O subsystem offering advanced real-time acquisition, playback, and storage as well as a user-friendly quick-start interface to complement Discreet Logic's Flint. Pebbles features sustained real-time video and audio I/O with full machine control; real-time, high-quality color space conversion; on-the-fly proxy generation; full-quality 4:4:4 RGB image manipulation throughout; 45 Gbytes of hot-swappable RAID-3-protected image storage; mirrored audio storage drives; fragmentation-proof random access to any frame in any order in real time; high-speed D-1 archiving; and high-bandwidth future network expandability.

Discreet Logic combined its Stone disk array with its Wire network, forming a complete data management, storage, and networking solution specifically intended for the digital film and video industry. This system offers high-speed, reliable data transfer and multiple real-time uncompressed ITU-R 601 resolution video streams. Stone provides scalable, resolution-independent storage for hours of noncompressed video. Wire is designed to offer real-time transfer and transparent sharing of noncompressed video, film, and audio data among Discreet Logic systems.

Leitch, Inc., has developed several pieces of signal processing equipment. The DEC-8601 NTSC/PAL decoder and DES-6801 decoder/synchronizer/TBC were designed for conversion of conventional composite analog video material into signals needed by the evolving digital world. These items are available as circuit cards for the standard 6800 or 7000 series of digital frames, and also as dedicated 1/3-RU standalone products with front panel displays.

The VFS-3610P-AA PAL/NTSC video frame synchronizer is part of Leitch's DigiBus product line and combines a decoder, frame synchronizer, and encoder into one unit. This product synchronizes composite analog signals with the in-house sync system and provides a 4:2:2 serial output for interface with modern equipment. NTSC, PAL, and PAL-M versions are available and up to two 4:2:2 frame synchronizers with audio can be housed in one DigiBus frame.

Leitch's DAC-6800 and DAC-880 AES/EBU D/A converters provide high digital audio conversion through 20-bit signal processing. The units, available in both balanced and coax versions, accept and convert a standard 20-bit AES 3-1992 digital signal to analog audio. These converters also feature flat frequency response from 20 Hz to 20 kHz, excellent linearity, and signal-to-noise specifications.

The ADC-6800 and ADC-880 AES/EBU A/D converters provide economical, high-quality, 20-bit conversion of two channels of analog audio signal to an AES digital audio stream. Supporting both balanced and coax interfaces, the converters' dual outputs eliminate the need for a DA after conversion, cutting down on the amount of equipment and rack space needed. Both DAC and ADC converters can also be housed in the same frames as Leitch's Digital Glue products.

The Matrox QMPEG-2 from Matrox Video Products Group is a four-channel PCI-bus MPEG-2 audio/video decoder board, designed for OEMs and systems integrators of MPEG-2 video servers. The QMPEG-2 provides delivery of MPEG-2 material for commercial insertion, video-on-demand (VOD), interactive television systems, financial information networks, distance learning, and other professional media applications. QMPEG-2 cards are integrated directly into low-cost PC-platform servers,

enabling system suppliers to replace "black box" decoders and substantially reduce overall system cost. The decoder features full ITU-R 601-resolution composite and Y/C video, full-screen overlay for menus and graphics, and independent genlock on each channel. It offers transport demultiplexing and program, PES, audio, and video elementary stream decoding.

Miranda Technologies introduced Digilinx, a DigiSuite and Movie-2 Bus-compatible 4:2:2 interface board. This high-end serial 4:2:2 I/O provides three 4:2:2 inputs and two 4:2:2 outputs for main program and key signals. Digilinx also provides DigiSuite and Movie-2 Bus products with broadcast-quality genlock from the external reference input.

The Miranda μLinks product line consists of the ASD-25lu and the SDM-25lu. The ASD-25lu is a micro NTSC/PAL decoder in a WECO-compliant video jackfield format that can automatically detect input standards as well as accept signals from analog VTRs without time base correction. The ASD-25lu provides two serial 4:2:2 output signals, one at the back of the unit and the other at the top front jack. The lower jack can be used to bypass the decoder and insert a 4:2:2 signal from the patchfield. The SDM-25lu is a micro NTSC/PAL encoder with powerful capabilities that facilitate verification and reconfiguration, particularly in monitor wall applications. This module automatically detects 525 or 625-line formats from incoming serial 4:2:2 signals to provide one analog NTSC/PAL or luminance signal at the rear and one 4:2:2 feed at the front upper jack. The lower jack can be used to send a different 4:2:2 input signal from the patchfield to the encoder.

Miranda's FRS-101i frame synchronizer synchronizes serial 4:2:2 video to a local reference input and provides an infinite phasing adjustment window. If no external reference is detected, the FRS-101i locks onto the 4:2:2 input. Ancillary data is processed without alteration to provide complete transparency and prevent lip-sync errors with embedded audio. Error detection and handling (EDH) circuitry accommodates conditions where no EDH is present or freeze frame is enabled. If the input signal degrades or disappears, the FRS-101i can freeze on the last error-free field or switch to black. During freeze frame, embedded ancillary data is muted to prevent undesirable audio artifacts. The FRS-101i has a built-in color bar and also offers an optional split-screen/frame memory feature for comparing reference frames.

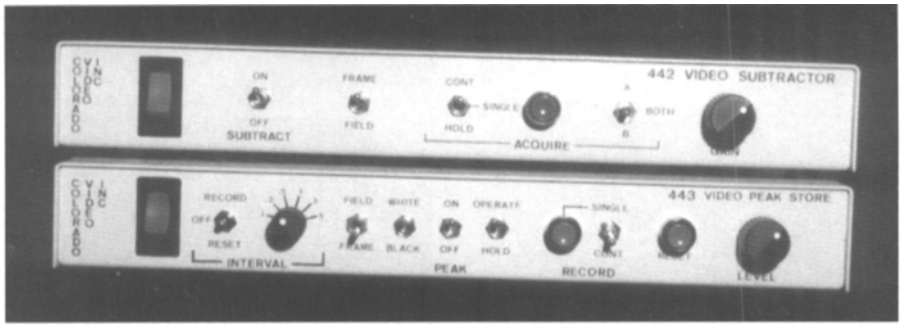

Figure SP-1. The 442 Video Subtractor (top) and 443 Video Peak Store from Colorado Video, Inc.

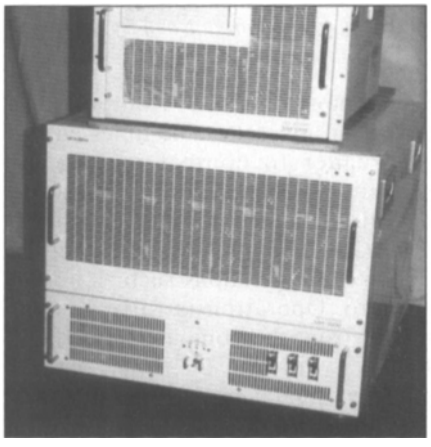

Figure SP-2. MP@HL codec from NHK and Mistubishi Electric Corp.: the decoder is on the top and the encoder is on the bottom.

NHK and Mitsubishi Electric Corp. jointly developed an MP@HL codec (Fig. SP-2) to be used for investigating the ability of digital HDTV broadcasting and assessing the picture quality at various bit rates for contribution and emission applications. The codec supports both the 4:2:0 and 4:2:2 chroma formats, while the MPEG-2 main profile does only the 4:2:0 format. Having two sampling frequencies that correspond to the coded picture area of 1920 or 1440 pixels, the codec can run at video bit rates ranging from 15 to 120 Mbits/sec. It generates the MPEG-2 transport stream, which is made up of packetized elementary streams of video, 5-channel audio, and data.

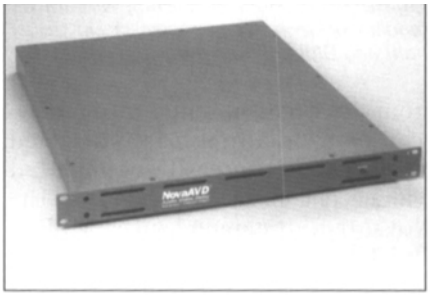

Figure SP-3. NovaAVD audio video delay system from Nova Systems.

The NovaAVD audio/video delay system from Nova Systems (Fig. SP-3) provides up to 10 sec of real-time, uncompressed audio and video programming delay. The 1-RU system accommodates composite video inputs and outputs and incorporates a video frame synchronizer to genlock all remote feeds and assure proper color framing. Wideband, uncompressed video processing is utilized throughout. A 2 x 1 output switch allows for selection of the delayed program or an auxiliary input. It features audio-follow-video, video-only, or audio-only switch capabilities. The balanced stereo audio output is always synchronous with the video output. Applications include live program profanity monitoring, momentary delay of network feeds, lip-sync correction, amphitheater video/audio matching, and system synchronization. PAL, PAL-M, and NTSC versions are available.

Nova's NovaMNR impulse/transmission noise reduction system (Fig. SP-4) is designed to eliminate a wide variety of impulse and transmission noise from satellite, microwave, and fiber-optic feeds. The system incorporates an adaptive 3-D digital median filter that analyzes pixels across several fields of video. In addition, it also functions as an universal drop-out compensator. Missing video information, whether

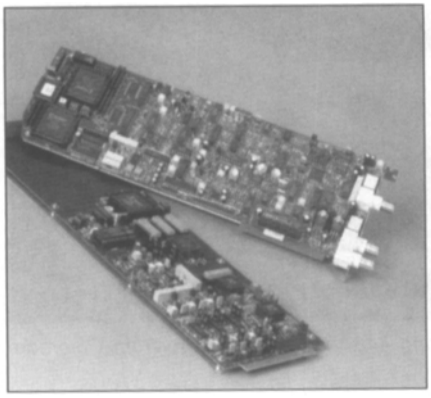

Figure SP-4. Nova Systems' NovaMNR median noise reducer shown in NovaBlox (left) and StudioFrame card configurations.

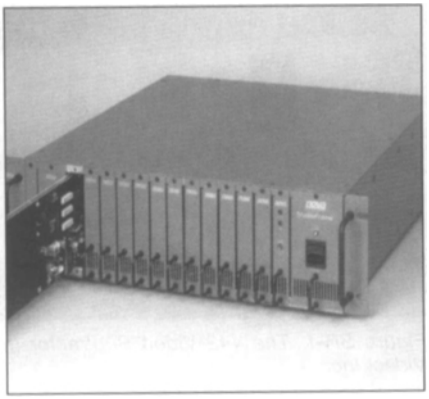

Figure SP-5. StudioFrame series signal processing sytem from Nova Systems.

from the decoded output of a codec feed or from a time-base-corrected VCR source, can easily be replaced with uncontaminated clean video. The NovaMNR system enhances MPEG/JPEG encoding by reducing noise on input, allowing for more efficient video compression.

The StudioFrame Series signal processing system from Nova Systems (Fig. SP-5) was designed as a system of modular building blocks in a flexible packaging format, and it efficiently combines a wide variety of function modules into more complex function groups, all in one equipment mainframe. The scaleable nature of the StudioFrame design allows it to be easily reconfigured and/or upgraded as today's video standards and requirements continue to evolve. Up to 13 front-loading function modules and 13 rear-mounted passive interface cards can be accommodated in a single chassis.

The DD3100 video delay detector from Pixel Instruments Corp. measures video processing delays by correlating the delayed and undelayed video signals. The DD3100 is used as a measurement instrument or can be used to steer an audio delay for automatic lip sync correction. The DD3100 operates with serial digital video, composite analog video, or component analog video.

Skotel Corp. introduced its Little Red, which converts linear time code (LTC) to RS-232. Self-powered from the RS-232 port, this micro-sized reader can be used for such applications as logging, time stamping, timing, time code verification, computer clock synchronization, and automation control. Four opto-isolated GPI outputs that trigger at user-selectable times enable the reader to control multievent sequences. These GPIs may also be directly activated via the serial port. Two GPI inputs may be assigned as triggers for operations such as a time capture. Operation is fully configurable from the computer; the Little Red can work on PC, Mac, or SGI platforms, and computer software utilities are included.

Snell & Wilcox introduced many new products relating to signal processing. The NRS50 noise reducer offers a combination of recursive, spatial low pass, and median filtering with threshold control to tailor the noise reduction for all applications. It accepts all analog composite and component formats as inputs and provides all analog composite and components formats as outputs with an additional output of 4:2:2 SDI. The NRS500 all-digital noise reducer analyzes input video to find repeat fields and cuts; this analysis is then used to optimize the noise reduction stage by dynamically controlling the parameters. Impulsive noise and dropouts are handled in a 3-D median filter that has a variable aperture and an adaptive threshold.

The COM3 (component compatible composite) PAL encoder/decoder works by exploiting the extra bandwidth present in D-2/D-3 VCRs that is above the nominal system values of NTSC and PAL in order to achieve enhanced luminance and chrominance resolution. 4:2:2 signals are specially encoded by a COM3 encoder into a $4f_{sc}$ signal that can then be used by existing composite equipment such as vision mixers and routing switchers. This PAL/NTSC-compatible signal can be decoded later by a COM3 decoder to yield a very high quality SDI component signal that is free from decoding artifacts.

The MDD500 multistandard digital decoder is an adaptive, field-based comb decoder with two modes of operation. The aperture can be configured to operate over three fields to produce an exceptionally sharp picture with a nominal delay of one frame. A minimum delay mode over two fields retains sharp resolution associated with a field-based comb decoder but has an overall delay of one line. In both cases comb failure artifacts are minimized by a sophisticated temporal adaption algorithm.

The MDE2000 multistandard digital encoder is a precision digital encoder delivering analog and digital composite outputs from a digital component source. Optional luminance and chrominance prefiltering allows minimization of cross effects at the decoder. An integral legal color checker can be used to eliminate illegal color inputs from DVEs or other sources prior to encoding.

The Kudos IQ three-channel decoder/ADC provides three decoders with integral A/D converters; each of the separate channels accepts analog composite video and simultaneously outputs analog component and SDI. NTSC inputs are output as 525/60 component and PAL inputs are output as 625/50 component; the additional analog component output is YPbPr. The Kudos IQ three-channel monitoring encoder offers conversion from 4:2:2 to analog component and composite. The digital input is demultiplexed and 10-bit converters provide analog component outputs in RGB or YPbPr formats. The analog components are also converted to PAL or NTSC according to the line standard input.

The Kudos TBS24D series of transcoding TBC synchronizers offer transcoding multistandard synchronization with optional digital noise reduction and SECAM output. The TBS24 and TBS24T are powerful frame-based transcoding time base correctors and synchronizers. The TBS24T's recursive noise filter is useful for eliminating wideband (white)

noise. Its PAL-to-SECAM, PAL-to-PAL-N, or NTSC-to-PAL-M transcoding capabilities make it useful as a bridge between these standards. The TBS24T can also be used for compression pre-processing applications.

The Kudos IQ D1FSY D-1 frame synchronizer and the Kudos IQ D1LSY D-1 line synchronizer both feature a 10-bit component SDI frame synchronizer, genlock to analog black, optional EDH monitoring and insertion, and picture position and YC timing adjustment. Both may be used as a programmable delay. The D1FSY has a minimum delay of 28 μsec and a maximum delay of one frame, while the D1LSY has a minimum delay of 400 nsec and maximum delay of two lines.

The Kudos IQ D1SDE D-1 reclocker with composite encoder has a component SDI input reclocked to up to eight serial outputs, up to two composite monitor-quality NTSC/PAL/PAL-N/PAL-M outputs, optional EDH detection, and automatic 525/625 detection and "no signal" indication.

The Kudos IQ DSP D-1/D-2 deserializer from Snell & Wilcox features format conversion from serial to parallel; six buffered SDI outputs; conversion of D-1 component, D-2 NTSC composite, and D-2 PAL composite formats; automatic detection of input format; and an input equalizer and reclocker for use as a line receiver and DA. The Kudos IQ (DPS) D-1/D-2 serializer performs format conversion from parallel to serial and has 8 or 10-bit parallel input (with automatic detection) and seven buffered 10-bit D-1/D-2 outputs driving up to 200 m of PSF1/2 cable. It converts digital component (D-1), NTSC composite (D-2), and PAL composite (D-2).

Snell & Wilcox introduced three Kudos IQ black burst generators. The composite digital D2BB model has six analog black and burst outputs with 0° SC/H phase and four composite digital outputs. The ABB is analog and has ten analog composite black outputs, ±10° SC/H phase accuracy, and PAL or NTSC formats. The D1BPG offers 10-bit digital component pattern data; genlock, slave lock, and free run capability; auto 525/625 select from genlock; and six separate outputs (double width). Output may be horizontally and vertically phased to any of the input references and has full EDH information.

The Kudos A/D and D/A converter range features conversion between 4:2:2 and YPbPr and GBR. The compact 1-RU device can incorporate two channels of A/D or D/A and features high-performance 10-bit conversion between serial/parallel digital and analog component, serial and parallel digital interfaces, YPbPr and GBR interfaces, and 525/625 operation.

Finally, the Kudos IQ three-channel ADC from Snell & Wilcox provides conversion to 10-bit 4:2:2 from analog component inputs. The sampling rate is obtained from separate loopthrough sync input or from syncs on Y or G. A 13.5-MHz luminance sampling rate is standard, but 18-MHz operation for 16:9 applications is available as an option. The Kudos IQ three-channel DAC D/A converter converts to analog component from 10-bit 4:2:2 inputs. It provides a full broadcast-quality conversion and is useful for interfacing analog equipment with a modern SDI environment.

Thomson Broadcast Systems introduced four digital production mixers. The 9250 (1 M/E) is particularly aimed at production in a small studio or small outside broadcast vehicle. It has 24 inputs, 18 of which can be accessed directly from the control panel. The 9300 (2 M/E) has a wide range of options available, varying the power to suit user requirements. Depending on the options selected, it can have 1.5 M/E with 1 DSK, 2 M/E, or 2 M/E with 3 DSKs. In standard form there are 12 inputs, which can be expanded to 24 or 36. The 9500EX (2.5 M/E) can have 42 inputs (video or key), of which 32 are standard and the additional 10 an option. The standard mixer has 2 DSKs, and may be fitted with 2 additional DSKs. The 9600 (2.5 M/E) is designed for studios or OB vehicles working on large productions with a very large number of sources (cameras, VTRs, etc.). It has the same number of inputs as the 9500EX, with direct access to 32 inputs instead of 24. In standard form the 9600 has two DSKs and two additional DSKs may be fitted. The control panel provides very powerful and secure operation during production.

Videotek, Inc., introduced the VSG-201D/VSG-202D SMPTE 259-C (601) sync generators for use in 525/60 and 625/50 television systems. Both generators can free run at either 525/60 or 625/50 as selected on the front panel and will genlock to any NTSC or PAL composite video signal. They have a high stability TCXO internal oscillator and the genlock range is infinite. The sync generators output two serial digital black signals, two serial digital color bar signals (100% or 75% saturation), and four analog black burst signals. The serial digital test signals have the proper EDH information embedded. Both generators also output analog stereo tones. The VSG-202D includes two pairs of AES/EBU tones (on BNC connectors and XLR connectors) and embedded audio in the digital black and color bar signals. The tones are adjustable in amplitude and frequency, and the embedded tones may be placed in any set of four in the 16 channels available in the 259-C signal.

The DPA-100 component serial digital proc amp from Videotek accepts a serial digital SMPTE 259-C (601) input and allows the user control of total gain, luma gain, chroma gain, hue shift, pedestal (black level), and Y/C delay. As an added feature, the DPA-100 has a broadcast legalization function, which clips any color difference signals that exceed the broadcast legal gamut limits in either NTSC or PAL encoding. The system follows chromanance as related to luminance and is influenced by a user selection of gamut limits. The DPA-100 also recalculates and inserts proper EDH to follow any changes made to the signal.

Software

QuickTime version 2.5 from Apple Computer, Inc., addresses specific requirements of content creators for broadcast, music, film, and the Internet. It includes an enhanced music architecture, multiprocessor support, support for 3-D objects, a graphic importer component, support for close-caption capture APIs, an enhanced primary data handler, asynchronous JPEG and raw codecs on PowerMac, and a new clock component.

Apple Computer developed version 1.5 of its QuickDraw 3 cross-platform 3-D graphics toolkit. The application program interface is available for Mac

OS, Windows 95, and Windows NT, and is designed to provide real-time, interactive rendering for simple 3-D models. It offers trimesh geometries; support for plug-in renderers; 3-D picking, enabling any application to add 3-D painting capabilities; new Internet-related tools for browsing 3-D spaces; support for multiple processors under Mac OS; ability to run under Microsoft Windows; and new user interface enhancements.

Chyron Corp. has introduced software version 14.0 for the CMX Omni line of editing products. The new software adds lookahead auto-assembly, which allows the CMX Omni system to scan forward through the EDL while recording. Also included is an improved digital disk recorder (DDR) interface, which is capable of handling Tektronix Profile, Sierra Design Quick Frame, Accom, and Scitex DDRs with extended communication protocol. The caching feature can be used to automatically transfer effects and images to DDRs for layering, B-Rolls, or special motion effects.

Liberty Paint 64 is a 64-bit digital paint and rotoscoping program for film effects and digitally painted mattes. Operating in 64-bit color space, it includes real-time video support with the new SGI Indigo2 IMPACT workstation and enhanced connectivity with Chyron's iNFiNiT! family and IMAGESTOR! real-time still-store management system.

Pixar Animation Studios developed RenderMan Artist Tools. The suite of tools includes Pixar's RenderMan Toolkit for digital special effects; ATOR, an Alias-to-RenderMan plug-in for the Alias PowerAnimator version 7.0; Combiner, a compositing application for combining images; Alfred, an application that manages remote batch rendering; Pixar Looks, which includes surface material descriptions for RenderMan 3-D objects, and Pixar Classic Textures, digital photographic texture collections.

Tiffen Manufacturing Corp. introduced Crystal Image Software, which makes it possible to digitally re-create the precise characteristics of Tiffen glass filters. Used in conjunction with the Kodak Cineon digital film system, the filters allow cinematographers to preview effects prior to actual shooting. Among the effects are standard colors, warming, cooling, coral, and custom sets. The software also enables users to preview combinations of filters with different actors and various locations. The software will give users access to the Tiffen filter library through their computers and allow them to apply the filter effects to any film and video images at any resolution.

Standards Converters

The GF9105 component digital transcoder from Gennum Corp. (Fig. SC-1) is a flexible DSP engine capable of performing a variety of format conversions. Its flexible architecture allows the user to perform a wide range of DSP functions that require a general 3 x 3 multiplier structure and/or high performance 1:2 interpolation and 2:1 decimation filters. Device configuration is selected by writing device configuration words through an asynchronous parallel interface. The device accepts either multiplexed or nonmultiplexed input data and may produce either multiplexed or nonmultiplexed output data. External H, V, and F inputs allow for the insertion of TRS into multiplexed output data streams. All interpolation and decimation filtering required for ITU-R 601-compliant 4:2:2:4 <-> 4:4:4:4 sample rate conversions has been integrated into the GF9105, and all input and output offset adjustments required for transparent conversions between the YUV and RGB color spaces have been included.

The DEC-8601 NTSC/PAL decoder and DES-6801 decoder/synchronizer/TBC from Leitch, Inc., is capable of converting conventional composite analog video material into signals needed by the rapidly evolving digital world. These items are available as circuit cards for the standard 6800 or 7000 series of digital frames and as dedicated 1/3-RU standalone products with front panel displays.

Leitch's USM-6800 universal encoder-DA-D/A converter is a combination of a four-output NTSC/PAL encoder and a four-output serial DA. It is capable of removing jitter from the 4:2:2 serial signal before encoding and converting to analog. This monitor can also be configured to provide RGB, YUV, or YC outputs. Other features include vertical blanking pass/blank, setup on/off, burst on/off, chroma on/off, and on/off control of a built-in color bar generator.

Figure SC-1. GF9105 component digital transcoder from Gennum Corp.

Figure SC-2. NHK's motion-compensated standards converter.

NHK has developed a motion-compensated standards converter (Fig. SC-2) to improve the quality of film-to-video motion picture transfer. Motion compensation reduces the judder to make the motion as smooth as that of video signals recorded by 60 field/sec video cameras. Using this technique, it is possible to conduct film-to-video transfer by adding a new image filter adapted for film-to-video signals, an automatic detector with the 2-3 pull-down conversion timing, a selector to select the fields used in motion vector estimation and image interpolation with the appropriate timing, and a controller to determine the appropriate interpolation ratio.

Snell & Wilcox produced a number of standards converters in 1996. The Alchemist Ph.C all-digital 10-bit motion-compensated standards con-

verter incorporates phase correlation (Ph.C) motion compensation and delivers sharp, smooth output pictures that are free from such artifacts as judder, blurring, smearing, and breakup. It offers conversion between all of the world broadcast standards, and all functions and processing controls are fully adjustable to ensure maximum quality.

The Kudos CVR45D 4-field, 4-line aperture standards converter with digital output offers full broadcast-quality 8-bit 4:2:2 processing, as well as a range of input and output options. The compact device provides rugged portability, high reliability, and extremely low power consumption, together with high-quality conversion. The Kudos CVR41D is also a 4-field, 4-line aperture standards converter with digital output, NTSC, NTSC4.43, SECAM, or PAL TV standards to either PAL or NTSC standards. The Kudos CVR22D 2-field 4-line aperture standards converter with digital output delivers sharp, stable output pictures from a wide variety of input standards and formats.

The Transphix computer-to-broadcast converter accepts any computer-generated input of up to 2500 lines (120 MHz) and converts it to 525 or 625-line component digital, YPbPr, or composite. Transphix auto-detects incoming computer-generated signals and delivers full control over size, shape, and aspect ratio and includes full anti-aliasing filters.

Snell & Wilcox's ARC100 widescreen display processor is a flexible broadcast-quality aspect ratio converter with serial digital inputs and outputs. It will convert aspect ratios in either direction and can go between any desired ratios. Full control over all parameters of the selected picture window is provided, both from the front panel and via the remote control facilities. The ARC100 is designed to fit into post-production, telecine, and continuity/transmission suites.

Finally, the ARC150 aspect ratio converter from Snell & Wilcox is an all-digital, 10-bit device that will convert 4:3 images to 16:9 or vice versa. The output aspect ratio from the ARC150 is fixed, making it useful for on-line use in a production environment.

The 7830 motion-compensated standards converter from Thomson Broadcast Systems uses improved algorithms for motion compensation, together with sophisticated composite input/output interfaces and digital comb filtering. The unit is very compact, at 4 RU and 19 in.

Still Stores

Chyron Corp. introduced the IMAGESTOR!, a real-time still-store management system based on 4:4:4:4 system architecture for high-quality image storage for the broadcast, post-production, and corporate/industrial markets. The system is configured as a single- or dual-channel system with component or ITU-R 601 digital inputs and outputs; each output channel includes a full linear keyer. Chyron's extended effects frame buffers allow a single-channel IMAGESTOR! system to perform transitions between still frames with dissolves, wipes, reveals, and other programmable effects. Effects can be embedded into a playlist for automated transitions between stills. A library of up to 2,000 stills may be stored on-line.

NHK introduced a new animated weather image file system into its News Center. The system automatically records animated and still images produced by more than one image generator, and outputs those images according to the script control with the touch of a button. The system maintains a dual structure throughout the recording, editing, and output processes to ensure high reliability. The system consists of an image file unit, a server that controls weather images and program transmission, and a group of terminals for editing and transmitting operation. The animated image file unit is a digital image and sound recorder equipped with 16-Mbit DRAMs. The semiconductor recording media allows instantaneous reproduction of necessary materials because of its high-speed random access capability. The absence of a mechanical section ensures excellent stability and reliability. The I/O section permits simultaneous input and output multichannel processing, which enables recording, transmitting, and previewing images from more than one image generator at the same time. The memory capacity is 6.4 Gbytes, which permits recording animated images for 10 min in the noncompression mode. The system is currently used in the JPEG mode (1:3 compression), and it can record animated images for 30 min.

Support Equipment

The BodyCam from Advanced Camera Systems (Fig. SU-1) takes the weight of the camera out of the hands or off the shoulder of the operator. The camera, carried by a dual suspension system, consisting of an arm supported and pivoting behind the left shoulder, is isolated from unwanted movement; gyro-like stability is possible. Motion can be added to the camera that simulates action, a predator point of view, or other effects. The balance assembly supports the camera, a viewfinding monitor, and one or two batteries. This assembly has two separate electrical circuits. When using a video camera, the second circuit can be used as a backup in case a problem arises with the first. When using a film camera, one circuit is for the film camera, and the other circuit is for everything else. Batteries are brick-style and last 2 to 3 hr.

Anthro Corp.'s Anthro RackCart Workstation (Fig. SU-2) was designed to support rack-mountable equipment combined with a workstation. The workstation is available in two sizes (60 in. and 72 in.) and comes with large 4-in. soft rubber, twin wheel castors. The frame is 16-gauge steel with a baked-on power coat finish. Shelves are 1 in. thick industrial grade particle board with high-pressure, scratch-resistant laminate. Additional accessories include shelves, drawers, back and side panels, and face plates.

Chapman/Leonard Studio Equipment Co. developed a number of new pieces of support equipment. The Pedolly Pedestal (Fig. SU-3) has the capabilities of both a traditional pedestal and a camera dolly. It has a low camera mount height of 15 5/8 in., and the maximum standard mount height is 55 in. It has a variety of tires for the different terrains encountered during filming.

Chapman/Leonard's CS Base (Fig. SU-4) is a versatile crane base capable of carrying a Chapman remote or manned crane arm. The maximum payload for the CS Base is 3400 lb. The base has quick-pin transmissions, permitting crab or conventional steer-

Figure SU-1. BodyCam from Advanced Camera Systems.

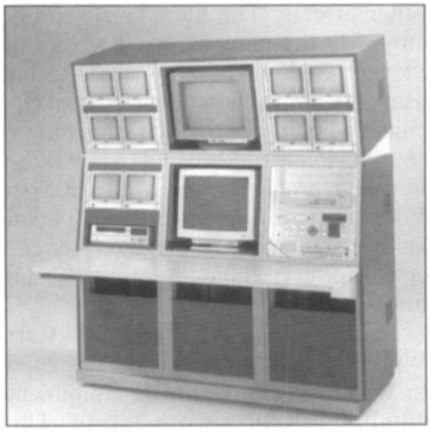

Figure SU-2. Anthro RackCart workstation from Anthro Corp.

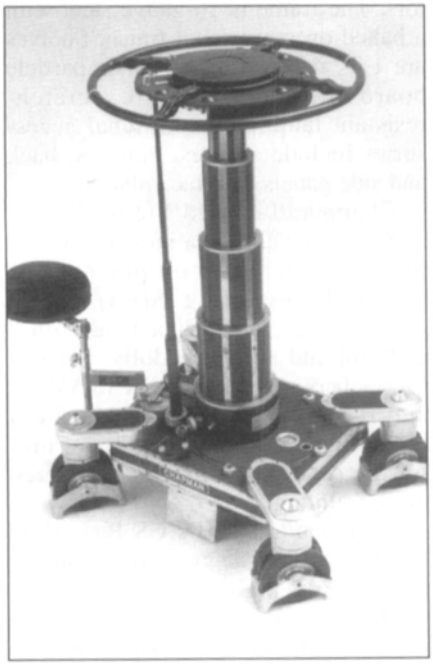

Figure SU-3. Pedolly Pedestal from Chapman/Leonard Studio Equipment Co.

ing. A variety of tires are available, including balloon tires that allow the base to move with ease through all types of terrain. Corrective steering along with crabbing capabilities enable the crane to be maneuvered smoothly into places most other chassis cannot go. The built-in, bogie-track wheels allow the unit to work on a track without changing tires. The CS Base also comes equipped with a removable center post, a tool box for storage, and adjustable and removable track wheels.

The Super PeeWee III (Fig. SU-5) includes a universal stop valve and universal head with the XOX leveling system. The universal stop valve creates smooth feathering stops at any chosen position. This system allows smooth, repeating stops without sacrificing the speed of the arm throughout its vertical travel. The universal head provides vertical travel of up to 40 in. while obtaining additional reach, height, and lower lens height without removing the camera. The drop-down accessory attachment enables the system to achieve lower lens heights while mounted on the universal head.

The Lenny Mini remote camera arm from Chapman/Leonard (Fig. SU-6) is compact, making it useful for fitting through small areas such as car windows and doorways. The arm possesses two leveling rods built within the 6 in. x 8 1/2 in. total outside measurements. It is made entirely of 2-ft aluminum sections, each weighing 38 lb and capable of spanning 19 ft for film and 23 ft for video.

Cinema Products Corp. announced its Master Series Elite Steadicam (Fig. SU-7). Among its features are a monitor with a brighter, higher contrast image; a patented gimbal system design, permitting the operator to hold the hand grip closer to the unit's center of gravity for more precise camera control; a completely redesigned stabilizer arm that permits the operator to adjust support for cameras of various weights while the unit is in use; a redesigned, narrower sled composed of composite materials, providing a lightweight but extremely strong structure; quick-release lock rings on the post that allows rapid adjustment without tools; and a 5-Ah NiCd battery pack and a 12/24-V switcher option with twice the capacity of previous units and greater than 90% operating efficiency.

George Paddock, Inc., introduced the PRO Gyro System, which was designed specifically for situations that require extra stabilization such as shooting in high wind, using a vehicle mount, or in situations where greater inertia around the pan and tilt axes is needed. This additional inertia provided by the gyros allows a greater freedom of shot choice, making it possible to use lens lengths of up to 400 mm.

Hover-Cam Ltd. developed a camera-carrying, scaled-down helicopter that can capture images in positions that are physically unreachable by such conventional camera carriers as cranes or full-size helicopters. The minature (5 ft long) helicopter can fly above and around participants in the scene and can operate inside structures, around bridges or just a few cm above any land or water surface. The camera operator is in constant radio link with the pilot and works alongside a creative director who can "fly" with the camera, using a live video link microwaved from the helicopter to its control vehicle. The system can operate with video, 16mm, or 35mm cameras.

The Radcam camera car from Innovision Optics (Fig. SU-8) captures high-speed, low-angle action. It allows the camera to be positioned in the front, rear, left, or right side of the vehicle. The lens can be as low as 1 in. off the ground or as high as 15 in. One person acts as the driver, and using a radio controller, adjusts the speed and steering of the Radcam car. The camera operator wears a video headset that displays the live image seen by the camera. Using a second radio controller, this operator adjusts the pan and tilt of the camera as the miniature car travels. The camera's image can also be displayed live on a full-size monitor.

Innovision's Shuttle (Fig. SU-9) offers remote-controlled travel along a curved or straight single track. It features accurate joystick controllers that provide variable speeds of up to 20 in./sec. The track comes in both straight and curved segments for a broad range of configurations, including full circles 6 ft and 8 ft in diameter and straight lines up to 20 ft long. The Mini-Mover motion-control system transports objects backwards and for-

Figure SU-4. Chapman/Leonard's CS Base.

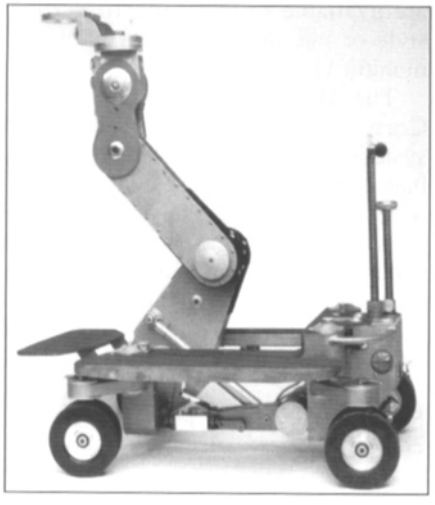

Figure SU-5. Super PeeWee III from Chapman/Leonard.

Figure SU-6. Lenny Mini remote camera arm from Chapman/Leonard.

wards, side-to-side, up-and-down, and in rotation. The camera can also be moved inside, around, or through larger objects for unusual and creative points of view. Dual joysticks provide smooth and accurate movement via the "Brain Controller." Complex actions lasting up to 10 min are stored in the Brain Controller for precise repetition. Speed and ramp time are fully adjustable.

The Microdolly camera dolly and track system from Microdolly Hollywood (Fig. SU-10) weighs less than 10 lb but will easily support cameras weighing up to 35 lb. Machined from anodized, structural-grade aircraft aluminum, the entire system folds to 30 in. in length. The Microdolly comes with its own custom-made soft case for easy transport.

The Type 3631 Litewate stand from Mole-Richardson Co. is a lightweight 3-riser compact stand for light kits. Its folded length is 30 in. and fully extends to 109 in.

The Mountain Box from Mountain Box Systems (Fig. SU-11) is constructed of ultra-lightweight materials and measures 8 in. x 12 in. x 20 in., standard for an apple box. Flush mount locks are built into all sides, allowing the boxes to be quickly attached to each other while through-tubes on four sides accept speed rail pipe that can be pushed into and through the boxes. The user can build nearly any size structure within minutes. Production equipment of almost any kind, including cameras, lights, and grip equipment, can be mounted instantly. Applications for the Mountain Box include quick location set-ups, commercial stage production, and live performances.

The Mountain safety bed and safety hanger from Mountain Box Systems uses a lightweight core covered in fiberglass. Structural options include pipe receivers on the undercarriage that transform the bed into a ground-supported platform or quick set-up stage. Channels or tracks run under the bed, allowing instant installation of lights and production equipment.

Photoflex, Inc., introduced its Dome Accessory Kit, which includes a set of louvers, a stripmask, and a circlemask. The louvers, a set of corrugated plastic slats, are positioned against the face of the softbox to narrow the angle of

Figure SU-7. Master Series Elite Steadicam from Cinema Products Corp.

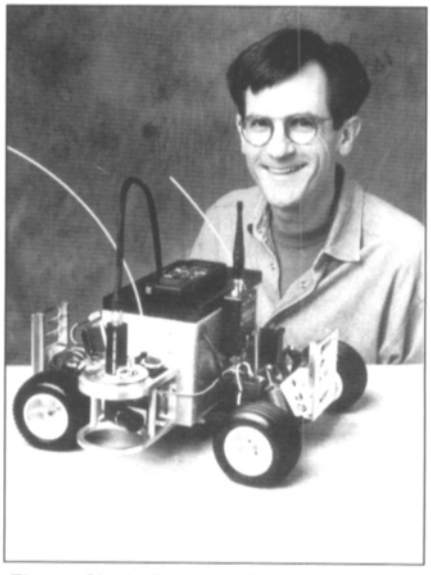

Figure SU-8. Radcam Camera Car from Innovision Optics.

Figure SU-9. Innovision's Shuttle and Shuttle Track, shown with a film camera.

Figure SU-10. Microdolly camera dolly and track system from Microdolly Hollywood.

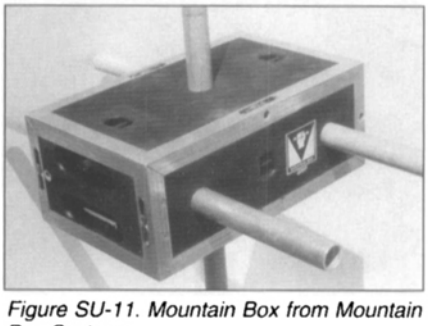

Figure SU-11. Mountain Box from Mountain Box Systems.

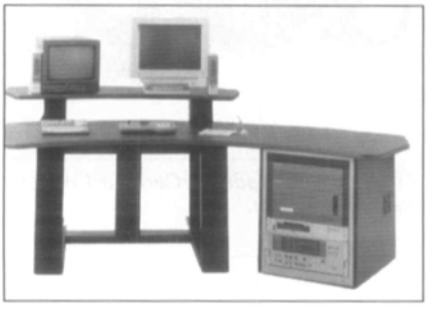

Figure SU-12. Digital Desk from Winsted Corp.

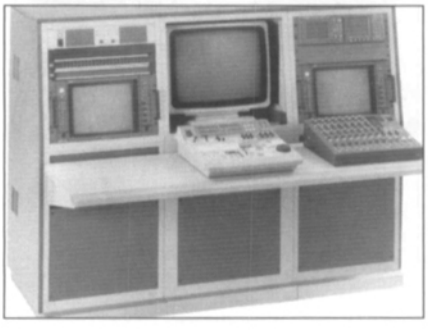

Figure SU-13. Winsted's System/85 for 21-in. consoles.

light. The slats cause the light to travel in straight lines, eliminating the presence of "stray" or "scattered" light. The stripmask is a layer of fabric with a column-shaped cutout that attaches with Velcro to the face of the softbox; it is silver-laminated on the inside, black on the outside, and produces a narrow, direct highlight that won't spill on face or background. The circlemask, a layer of fabric with a circle cut-out, produces a graceful, round reflection on the subject, and is ideal for portraiture where a circular catchlight in the eye is desired.

The Air-Shocked Litestand from Photoflex provides an added safety measure for valuable lighting equipment. Its simple gravitational system senses the weight of equipment and uses the air pressure in the tube to cushion its decent. As the stand is adjusted, equipment is gently raised or lowered, preventing sudden jolts and costly apparatus from plunging to the ground. The Litestand also features a two-pin anchoring system that evenly secures the stand's brass stud mount and inhibits unwanted shifting.

Photoflex's Aluminum Litepanel Frame is an all-metal frame that is highly heat-resistant and will not melt or warp under high-temperature conditions. Extruded aluminum tubing prevents the frame from twisting and keeps the fabric taut. Fabrics are held securely by wide elastic bands that fit around each corner of the frame. Because the fabric does not completely adhere to the frame, air is allowed to flow around it and the frame remains sturdy even outdoors in windy weather.

SpaceCam Systems, Inc., introduced a gyro-stabilized platform for 65-15 and 65-5 film formats, especially suited for large-format, wide-angle cinemaography. The SpaceCam's power-gimbal joint and backlash-free pan-and-tilt drives allow it to be operated in an open-front "Bubble Wave" dome, which permits filming with 180° angle-of-view lenses at helicopter or camera car speeds of up to 100 mi/hr.

The Winsted Corp. announced the Digital Desk (Fig. SU-12) for desktop editing and production, designed especially to accommodate the Panasonic nonlinear A/V workstation. The desk's 94-in. work surface provides ample space for keyboard, jog pad, and other materials. A 48-in. riser holds monitors and hard disk boxes and is adjustable from 6 in. to 10 in. A 24 1/2-in. rack cabinet is included to accommodate Panasonic Postbox rack-mount electronics. The desk is designed to curve gently around the user, placing equipment within easy reach.

Winsted also introduced the 22-in. System/85 module (Fig. SU-13) to accommodate the 21-in. CRT monitors often used as in nonlinear editing suites as a computer menu monitor or the main preview monitor. The module is a part of a variety of Winsted consoles including five-bay, four-bay, and three-bay systems. The rack bays are available in the standard vertical style or one that slopes for improved monitor viewing.

The Model K8121 from Winsted Corp. is a complete three-bay rack system incorporating a center monitor bay that holds two large 21-in. monitors on 22 in. wide shelves. The complete system offers this extra-wide center section along with 11 RU of 14 in. to 19 in.-high equipment space, an 18 in. deep shelf and top modules that slope forward for proper viewing.

Switchers and Routing Systems

The CrossPoint Series matrix switchers from Extron Electronics offer RGBS, video, and audio signal routing with a true 200-MHz (-3 dB) bandwidth. The switchers are capable of switching RGBS analog, composite video, and S-Video, as well as two-channel audio (balanced or unbalanced) signals simultaneously or independently of each other. Because each channel (RGB) is independent, they can also simultaneously switch video and S-Video signals.

The Extron System 4LD*ex* is a universal projector-controllable switcher with a built-in line doubler (scan doubler). The 300-MHz bandwidth device is a four-input, composite video (NTSC/PAL), S-VHS, and RGBS/HV switcher capable of bidirectional "talk and listen" control of all large-screen CRT-based projectors. In addition, it has a built-in line doubler capable of converting standard video, S-VHS, or 15.75-kHz RGB to line-doubled video.

The Matrix 50 Series switcher from Extron Electronics has a modular design that incorporates universal I/O slots for composite video, S-Video, component video, and balanced or unbalanced two-channel audio. Other features of the Matrix 50 include an 80-MHz (-3-dB) bandwidth and vertical interval video switching. The video signals are first genlocked from an external sync source, and then sent to the Matrix 50 to switch video signals during the vertical interval.

The SPT-1000 serial protocol translator from Leitch, Inc., allows Leitch's routers to be controlled by other manufacturers' control systems and, conversely, allows Leitch's control systems to control the routing switchers of others. This compact device provides two ports: a serial control port to talk to other manufacturers' equipment, and a pair of XY ports (coax and XLR) to talk to Leitch switchers and control elements. The SPT-1000 can be mounted to the side of a rack or left in line along a length of cable.

Leitch's LCP-ABA and RCP-ABA alphanumeric breakaway control panels offer easy-to-read alphanumeric status displays with the flexibility of multilevel breakaway control. Each panel displays the currently selected destination and sources connected to that destination on a series of four alphanumeric LED displays. Available as remote or local, the panels' software has been designed to support three distinct operational modes: single bus, four-level breakaway; XY, three-level breakaway; and four-destination AFV.

The GPI-20, 40, and X^{plus} programmable GPI contact closure interfaces from Leitch are programmed using the Windows-based panel mapper utility, which is included with the units. The GPI-32p offers 32 contact closure inputs and 32 contact closure outputs; the GPI-64 offers 64 inputs and outputs. Inputs can be configured to trigger crosspoint selections, launch router salvos, or initiate the broadcast of user-definable command strings on the control bus. They can also be configured for joystick override operation for camera-control applications. The outputs can be used to tally router crosspoints or to trigger external events such as VTR rolls.

The NV3064 router from NVision, Inc., is available in synchronous or asynchronous AES processing formats as well as digital time code. The 32 x 32 matrix can be readily expanded to 64 x 64. The NV3064 offers redundant power supplies and can reside under a wide range of existing control systems.

NVision's NV1308SA router is an 82 synchronous AES routing module that can be expanded to 16 x 8. This new switch allows clean audio transitions and eliminates the need for muting circuits to overcome normal switching errors. The NV1308SA, in conjunction with the NV1055 four-channel mix-minus module, provides TV broadcasters with the ability to include AES audio within an all-digital master control system.

Telecine

Eastman Kodak introduced the Kodak Cinematographer's Tool Kit and the Kodak Telecine Tool Kit. Components of these kits include the Kodak Telecine Exposure Calibration (TEC) films, the Kodak Gray Card Plus, Kodak Cinematographer's EV Software, Kodak Cinematographer's EV Scale, and Kodak Telecine Analysis Films (TAF). TEC film is a three-step telecine calibration film that allows the transfer facility to evaluate film exposures and provide transfer points much like printer points from the film lab. The Gray Card is a camera card comprised of a large 18% gray area flanked by black and white patches. The EV software is a DOS-based PC program that indicates how shadows and highlights will be recorded on a given film and rendered on television or on a theater screen; the EV scale is a handheld slide rule that serves a similar purpose. TAF is an objective and comprehensive tool for engineers and colorists to set up and center the controls on the telecine.

Film & Video Systems, Inc., introduced the Orion video dailies telecine. The Orion uses a CCD line array scanner to create broadcast-quality pictures. Color control is software-calibrated, allowing either correction in exposure increments or optionally in conventional telecine manner using gamma and lift. The time-code generator is part of the data logging software so that sync can easily be set by clicking a button on the data monitor. The operator interface uses mouse "point and click" technology, driven by a trackball on the console. Full-resolution frame stores with split-screen facility, when assisted by the auto button, allow very accurate matching from shot to shot, which makes a computer assessment of color balance. Orion is switchable between NTSC and PAL.

Philips BTS announced Spirit DataCine, a multirole film scanner. The advanced imaging head (AIH) CCD-based design, developed by Kodak in association with Philips BTS, ensures high throughput rates of artifact-free, optical-quality, low-noise images and offers a choice of output formats. Users will be able to transfer images with significantly improved speed and resolution. Transfer is at approximately 6 to 7 frames/sec, with data output using a single HIPPI interface. Because all signal processing is digital, no routine adjustments are required. In addition, shading correction is fully automatic.

The TKG system from Rank Cintel Ltd. connects directly to the telecine transferring the camera original negative for video dailies or off-line editing. It measures density levels in red, green, and blue, and the results can be presented to the cinematographer as exposure stops over or under the optimum, as well as the color balance. Using TKG does not affect the telecine operation, and the colorist is free to produce color-corrected dailies as normal. Calculating the exposure level requires the press of a single button.

Test and Measurement Equipment

Astrodesign, Inc., announced its HD-694/HD-695 HDTV digital serial/parallel converters. The HD-694 (Fig. TME-1) converts serial digital signals to S-004A, while the HD-695 (Fig. TME-2) converts S-004A to S-002A.

The Model 307 Video Caliper from Colorado Video superimposes two vertical cursors onto the video display, and the user can adjust the position of these cursors using front panel controls. The right control sets the distance between the cursors by moving the right cursor only; the left control moves both cursors across the screen

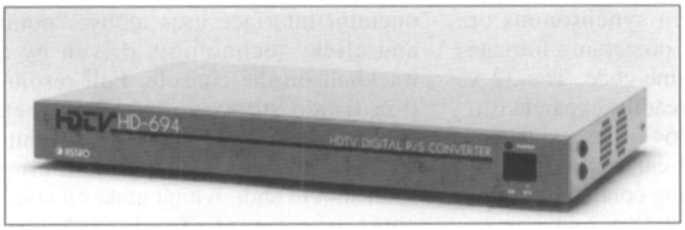

Figure TME-1. HD-694 HDTV digital serial-parallel converter from Astrodesign, Inc.

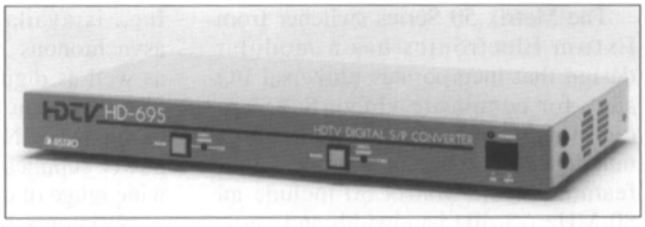

Figure TME-2. Astrodesign's HD-695 digital serial-parallel converter.

while maintaining the distance between them. This arrangement allows dimensional comparison of objects across the image without disturbing the distance between the cursors, which is indicated by a four-digit display. Three scale adjustment controls calibrate the meter reading for a given distance between the cursors. A switch allows the user to select between the three control settings so that calibrations can be made and then selected as necessary for three different optical setups.

Fluke Corp. introduced the 54000 series of video and TV signal generators, which includes the Fluke 54100 video signal generator and the Fluke 54200 TV signal generator (Fig. TME-3), which provides audio test signals and an RF output. The series features highly accurate, digitally synthesized video and audio signals that are fully compliant with the recommendations of the FCC, EBU, ITU, EIA, and ITU. In total, more than 500 test patterns are available in both 4:3 and 16:9 aspect ratios, including general patterns for calibrating geometry, synchronization, focusing, convergence, bandwidth, interference, amplitude response, and clipping. Other patterns allow checking of additional requirements, such as the A/D conversion, color reproduction or cut-off setting. Extensive data capabilities cater for testing all teletext, PDC, VPS, and closed-caption systems. In addition to these features, the Fluke 54200 also offers a stable RF output and supports group delay precorrection. The RF output signal allows voltages of up to 100 mV (-7 dB) with a maximum attenuation of 80 dB.

New from Gennum Corp. was the GS9004C serial digital cable equalizer (Fig. TME-4), developed for SMPTE/EBU-scrambled NRZI serial digital video signals. This device features DC restoration to pass the pathological test signals and fully automatic equalization in order to meet the SMPTE 259M Serial Interface Standard. The outputs typically deliver 800 mV (p-p) equalized signals into 50-Ω loads (to VTT). These signals can be used to feed cable driver circuits for serial distribution amplifier applications. This device also incorporates an analog signal strength indicator (SSI), which provides a 0.5 to 0-V output relative to VCC, indicating the amount of equalization being applied to the signal. The GS9004C features an output eye monitor (OEM) that allows verification of signal integrity after equalization, prior to reslicing. Operating with a single ±5-V supply, the unit typically draws 52 mA of current.

The SAR-II signal and status monitoring system from IMMAD Broadcast Services can monitor video presence on up to two video inputs as well as high/low or absent audio on four channels and power supply and main standby status.

Leader Electronics Corp. announced the LT-440D digital signal generator (Fig. TME-5). Its outputs are S-001A and S-004A; the signals S-005A and S-006A are multiplexed. The LT-440D also provides a genlock function. Leader's LV-5150D waveform monitor (Fig. TME-6) can display waveforms as well as other modes of vectors, audio, etc. The LT-5910 SDI analyzer from Leader Electronics Corp. (Fig. TME-7) examines transmitting errors in the SDI system. It is serial digital composite and conforms to SMPTE 259M.

The WSM 720 from Magni Systems, Inc., is a video signal test system for multichannel, multisite monitoring. A specially designed transmitter set provides numeric values for key parameters that include diff phase, diff gain, APL, SNR, and more. Measurement screens, waveforms, and vectors can be retrieved via a PC/modem interface for viewing or can be archived to a file. The "Logbook" software enables

Figure TME-3. Fluke 54200 TV signal generator from Fluke Corp.

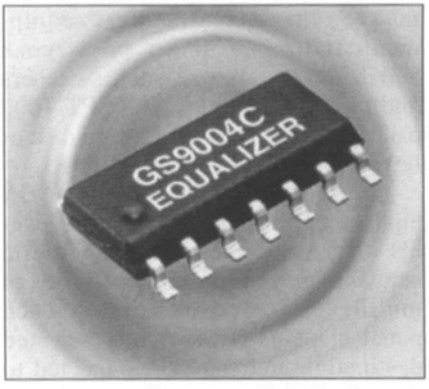

Figure TME-4. GS9004C serial digital cable equalizer from Gennum Corp.

Figure TME-5. LT440D digital signal generator from Leader Electronics Corp.

Figure TME-6. Leader's LV 5150D digital waveform monitor.

access to multiple sites, multiple channels, or events for comprehensive proof of performance and video quality control. Applications for the device include cable head end, manufacturing and testing, broadcast transmission, and post-production.

NHK has developed a device (Fig. TME-8) capable of measuring the modulation transfer function (MTF) of displays in NTSC, PAL, EDTV, and HDTV formats. It is much quicker than conventional devices, measuring MTF in only 10 min. A linear imaging sensor is used for its optical sensing function. Horizontal MTF is measured through the display of sine waves of up to 40 MHz generated by the signal generator. To measure vertical MTF, the sensor is rotated 90° in the vertical plane, and a scan line is displayed to measure impulse response. Fourier transformation of this response gives vertical MTF. A personal computer controls the device and processes the signals. MTF curves are displayed on the monitor, and the data can be recorded on a disk.

The DVG MPEG-2 measurement generator from Rohde & Schwarz is a universal generator for digital TV signals in line with the MPEG-2 standard and is able to generate an interruption-free infinite MPEG-2 transport stream. It continuously updates the time information contained in the signal and provides various selectable MPEG-2 transport streams consisting of combined video, audio, and data sequences. The DVG repeats these sequences continuously and embeds them completely into a continuous transport stream in line with the MPEG-2 standard. The digital data streams generated by the DVG can be used as test signals for a variety of equipment employed on digital TV transmission links from the studio to the domestic receiver. The DVG can be remote-controlled via an RS-232 interface and is therefore useful for development, production, quality management, and servicing of equipment processing the MPEG-2-coded signals.

Rohde & Schwarz's DVDM MPEG-2 measurement decoder is a universal analyzer and measurement decoder for digital TV signals in line with the MPEG-2 standard, and it provides on-line monitoring of MPEG-2 transport streams. It also offers simultaneous decoding of the transport stream and output of the video and audio signals in the known analog and digital formats. The DVDM can be remote-controlled via an RS-232 interface and is used as a measuring instrument for a wide variety of equipment used on digital TV transmission links from the studio to the domestic receiver. Applications for the DVDM is the development, production, quality management, and servicing of equipment and system components supplying MPEG-2-coded signals; use as a reference decoder in the development of MPEG-2 decoders; and signal distribution and transmission where the DVDM monitors the syntax of transport streams and is used as a professional decoder for monitoring the audio and video signals. Moreover, it is capable of distributing an MPEG-2-coded TV program in the form of CCVS signals.

The SFQ TV signal generator from Rohde & Schwarz can generate all satellite transmission signals. With its versatile transmission parameter variation and settable error simulation for I/Q modulation, SFQ can be used in the development and production of DVB receivers for cable and satellite. SFQ requires an MPEG-2 transport stream as an input signal and provides output signals with standardized error control that are QAM or QPSK-modulated and rated for a frequency range of up to 3.3 GHz. SFQ allows the parameters I/Q phase, I/Q imbalance, and I/Q residual carrier to be varied just as the data rate and the roll-off filtering of the I/Q coder.

Shibasoku Co., Ltd., debuted the TG-15A6 HDTV digital signal generator (Fig. TME-9). It provides three lines of S-001A, S-002A, and S-004A output as well as more than 30 test signals such as color bar, multiburst, stair step, and others.

Snell & Wilcox developed the Kudos TPG20 test pattern generator, a standard format and hardware-independent programmable test pattern image generator. It can be instantly configured to supply ultra-precise test images with no drift or approximation in all current standards and formats as well as current and future standards and formats such as 16:9 and PALplus. The TPG20's programmability means that the user can define custom patterns/images to aid in-depth analysis of new technology. There are more than 500 resident signals in the unit.

The Kudos TPG21 programmable test pattern generator from Snell & Wilcox is a fully programmable test pattern generator with nonvolatile memory for customized patterns, designed to be used in conjunction with Kudos Pattern Master software. The Kudos TPG21 is a fully programmable test generator that delivers the same features and functionality as the Kudos TPG20, with the additional capability of downloading line, field, and frame-based patterns as well as reference pictures to a nonvolatile memory via the Kudos Pattern Master software. This eliminates the need to download patterns repeatedly from an external source and enables the user to customize the TPG21 generator in the most appropriate way for their application.

Also from Snell & Wilcox was the Kudos TPG20/TPG21 Pattern Master software, a software package that creates test patterns for Kudos TPG series test pattern generators. Complete frames can be compiled from individually created lines and the full-screen pattern can then be displayed. Pattern Master also enables the user to edit and analyze existing patterns. Pattern Master software is included with the TPG21 test generator. It may also be purchased as option for the Kudos TPG20.

The BitAlyzer DVA184 digital video analyzer from SyntheSys Research, Inc., integrates recognized state-of-the-art analysis for testing SDI signals as well as digital format compatibility, test pattern generation, jitter insertion, 200-frame error logging, and multiformat capability. Features such as a high-bandwidth digital storage oscilloscope, video waveform monitor, a sophisticated multiformat test pattern generator, video logic analyzer communications, a bit error rate and EDH tester, a jitter spectrum analyzer, and digital video format analyzer are all integrated. The DVA184 can generate still test images, log error events, and log complete errored frames. It is capable of inserting jitter, displaying the jitter histogram, and isolating the jitter frequency components by looking at the fast Fourier transform (FFT).

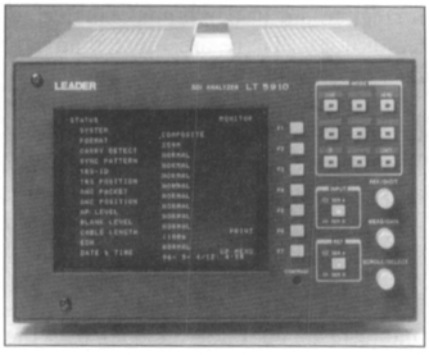

Figure TME-7. LT 5910 SDI analyzer from Leader.

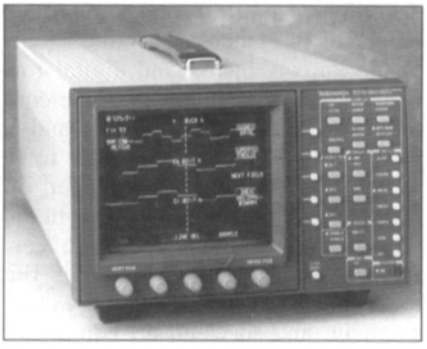

Figure TME-10. WFM601M waveform monitor from Tektronix.

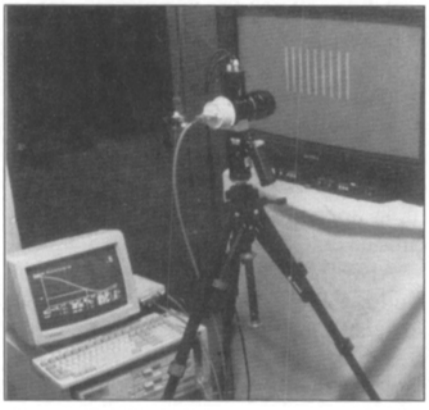

Figure TME-8. MTF measurement device from NHK.

Figure TME-11. The 2715 cable TV spectrum analyzer from Tektronix.

Figure TME-9. TG-15A6 digital test signal generator from Shibasoku Co., Ltd.

Tektronix, Inc., introduced the TG2000 signal generator platform, which is targeted to the broadening television market. With up to eight individual analog and digital generator slots, the platform can generate multiple signals and formats independently and simultaneously. A variety of composite and component test signal libraries are provided, and users can use the platform's programmable, Windows-based software to create new test signals and formats. The platform offers highly accurate test signals, making it well-suited to serve as a facility reference generator. The TG2000 also provides stressing functions in both the analog and digital domain, as well as moving patterns for evaluating data compression systems. A programmable system clock offers the flexibility to generate test signals for a wide range of video line and field rates.

The WFM601M serial component measurement set from Tektronix (Fig. TME-10) addresses operational monitoring and technical test applications, as well as installation and maintenance requirements. It evaluates serial digital component signals from source to destination, accepts a serial component video signal data stream, analyzes the data stream for conformity to accepted standards, and indicates any data errors that may have occurred during signal transmission. The WFM601M incorporates a data word listing similar to the logic analyzer that allows analysis of signals to determine conformance to standards, field/line/word cursors that provide an intuitive way to access data values, and a numeric jitter readout in addition to previous models' eye pattern jitter measurement.

Tektronix's 2715 cable TV spectrum analyzer (Fig. TME-11) now contains digital channel RF measurements. These new measurements include digital channel averaged power, which verifies transmitted signal level by measuring the averaged power across the bandwidth of the digitally modulated carrier; desired-to-undesired signal power ratio, which provides information about transmission path quality by comparing modulated signal power to intermodulation distortion and noise distortion power in the channel; digital channel triple beat and second order distortions (CTB/CSO), which measure the level of distortions relative to the averaged power of the digitally modulated signal; and adjacent channel leakage (ACL), which verifies spectral integrity of digital modulators by comparing signal leakage into adjacent channels to the test channel's averaged power. In addition, a companion PC Windows software package simplifies 2715 channel table setup, creation of downloadable measurement programs, and data collection. The software package also provides a variety of new capabilities, including display transfers, limits checking, and alarms.

Time Code Generators

ESE introduced the ES-185A global positioning satellite (GPS) system master clock/time code generator (Fig. TCG-1), which has an eight-channel receiver and ESE TC90 (time and date) and ESE TC89 time code outputs. The receiver is capable of tracking up to eight satellites simutaneously. Standard time code outputs include SMPTE/EBU, ASCII, IRIG-B, ESE TC90, and ESE TC89. Standard features include a five-hour battery backup, 1-pps TTL output, automatic daylight savings time correction, time zone offset, antenna, and a rugged rack-mount enclosure.

Also from ESE was the ES-160A (Fig. TCG-2), which features a smaller enclosure measuring 1 3/4 in., allowing less accumulated rack space. In addition, the ES-160A features SMPTE/EBU time code, as well as ESE TC89, ESE TC90, RS232C/ASCII time code, and a 1-pps signal. The temperature-compensated, volt-

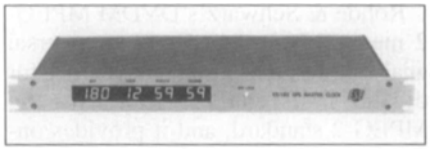

Figure TCG-1. ES185A GPS system master clock/time code generator from ESE.

SMPTE

Society of Motion Picture and Television Engineers

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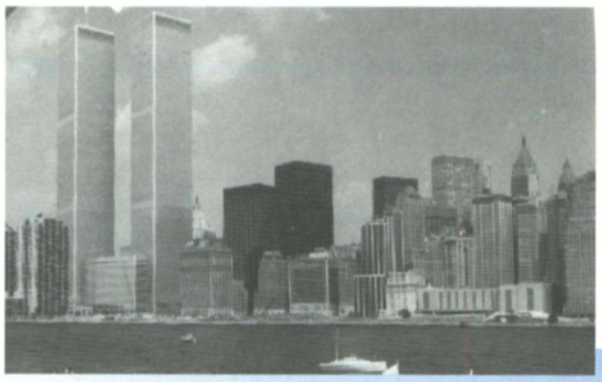

31st SMPTE Advanced Motion Imaging Conference

The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders

February 6-8, 1997

Crowne Plaza Manhattan, New York, N.Y.

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- Nonlinear Editing: Technical and Operational Issues
- Digital Distribution
- Storage Technologies Using Compression
- Advanced Television

Two Day-Long Seminars

- Shooting on Film, Editing Nonlinear, Completing on Film and Video: What Procedures are Available for the Filmmaker?
- A Technical Introduction to Digital Video by Charles Poynton

FINAL ANNOUNCEMENT

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Sponsored by the Society of Motion Picture and Television Engineers, the winter conference is the industry's leading forum for disseminating technical information and debating the latest trends associated with television and the allied arts and sciences. Program Chairs Darcy Antonellis, CBS, and Mark Schubin, consultant, have put together a comprehensive technical program with four sessions, including nearly 30 papers presentations.

Social Events

Full-conference delegates to the SMPTE conference will be treated to the Get-Together Luncheon at the Crowne Plaza, and a special SMPTE Evening Reception at the Sony Theater in Lincoln Center. The reception is sponsored by Sony Electronics. An IMAX showing of the film *L5* will be presented in 3-D. Both the Luncheon and Evening Reception are being held on Thursday, Feb. 6, and are included in the price of full-conference registration.

Partners Program

A two-day Partners Program featuring a potpourri of sights, including both uptown and downtown Manhattan, will be available for those accompanying attendees to the SMPTE Conference. Empire Force Events, Inc., will navigate partners around New York City on a comfortable European motor coach for an upscale orientation tour of the Big Apple. Among the destinations included in the Partners intinerary is lunch at the American Festival Cafe in Rockefeller Plaza on Thursday. The restaurant features floor-to-ceiling windows overlooking the most famous ice-skating rink in the world. On Friday, an exclusive and exciting full Continental Breakfast awaits you at Macy's in Herald Square, site of the largest Macy's in the world. Guests will arrive prior to Macy's opening at 9:45 a.m., and will be escorted to the Ottomanelli Cellar Grill, one of the oldest in New York City. While dining at breakfast, you'll be treated to an exclusive fashion show featuring great American designers. Sign up for the Partners Program using the registration form included in this brochure.

A Welcome from SMPTE's President

I would like to personally welcome you to the 31st SMPTE Advanced Motion Imaging Conference. This year's technical program will focus on the many changes affecting the television and computer imaging industries. With the theme The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders, the sessions and papers will address the technologies that are changing the face of the industries we serve.

The technical program is structured to appeal to engineers and technologists from the television, telecommunications, and computer imaging communities. As an added value to your full-conference registration, you will have your choice of two separate and very distinct day-long seminars on Saturday.

Shooting on Film, Editing Nonlinear, Completing on Film and Video: What Procedures are Available for the Filmmaker?, is being presented by Linda Young, Don Donigi, Domenic Rom, and Tim Spitzer, of Du Art Film and Video Labs. These seasoned professionals will walk you through the video dailies and film and video post-production process, which includes a demonstration by Steve Hamilton, of Spin Cycle Post. Steve will cover the various issues associated with preparing audio in a nonlinear digital environment.

A Technical Introduction to Digital Video. This workshop and course is an updated presentation of Charles Poynton's program, which was so popular at last year's winter conference in Seattle. It is based on Mr. Poyton's book, also entitled *A Technical Introduction to Digital Video*. By using computers and communications systems, it is easy to acquire, process, transmit, and display photographic-quality still color pictures, but the goals of smooth motion and accurate color reproduction remain somewhat elusive. Therefore, the technologies of digital video that are necessary to achieve these important goals have remained inaccessible to computer professionals. Charles will cover the basic principles, raster images in computing, filtering and sampling, image digitization, and a host of other key disciplines associated with digital video. Delegates to this program will receive a complimentary copy of the book.

Please note that all programming is being held at the Crowne Plaza, with the exception of Charles Poynton's seminar, which is being held one block away, at the Marriott Marquis Hotel. Although, no registration facilities will be available at the Marriott, you can register for this, and all conference activities, at the Crowne Plaza. The seminars alone promise to be well worth the admission price of the conference.

The popular Get-Together Luncheon is being held on Thursday, February 6. Later that evening the SMPTE Evening Reception, sponsored by Sony Electronics, will be held at the Sony Theater in Lincoln Center and will include an IMAX showing of the motion picture *L5* in 3-D. A two-day Partners Program is also available for those accompanying delegates to the conference.

There is an abundance of attractions in New York, all of which provide the charm and excitement that make the Big Apple so unique. The Society's strong technical program is your ideal opportunity to examine the latest advances and share them with today's most respected industry leaders. There is an abundance of attractions in New York, all of which provide the charm and excitement that make the Big Apple so unique. We are so pleased to be back here again. So mark your calendars for February 6-8, 1997, and plan to attend the 31st SMPTE Advanced Motion Imaging Conference.

I look forward to welcoming you to New York.

David L. George
President

31st SMPTE Advanced Motion Imaging Conference

The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders

Two Day-Long Seminars to Follow Conference

Linda Young

Shooting on Film, Editing Nonlinear, Completing on Film and Video: What Procedures are Available for the Filmmaker?

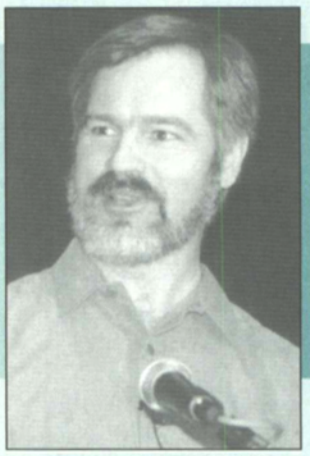
Saturday, February 8, 1997 (9:30 a.m. to 5:30 p.m.)

This seminar will cover the important procedures the filmmaker has to follow when shooting on film, making video dailies only, editing nonlinear, and completing on film or video. Depending on the filmmaker's budget, the seminar will examine the value of making limited film dailies when completing on film. Linda Young, Don Donigi, Domenic Rom, and Tim Spitzer, of Du Art Film and Video, will walk you through the video dailies and film and video post-production process.

Steve Hamilton, of Spin Cycle Post, will cover the planning, preparation, syncing, and editing of audio in a nonlinear digital environment. To help the cinematographer understand how to evaluate video dailies, a film and video projection demonstration will compare film and video dailies made from different Eastman color negative camera films in both 35mm and 16mm, shot at different exposures. The demonstration will be followed by a panel discussion.

Special Rates

By special arrangement, AICP, AIVF, DGA, IA, IFP, ITS, ITVA and Women in Film receive SMPTE member rates on registration for the Shooting on Film Seminar only.



Charles Poynton

A Technical Introduction to Digital Video

Presented by Charles Poynton

Saturday, February 8, 1997, 9:30 a.m. to 5:30 p.m.

Marriott Marquis Hotel, Astor Ballroom, 7th Floor (one block from Crowne Plaza).

In a repeat performance of his seminar, first presented to a sold-out audience in Seattle last February and based on his best-selling book, *A Technical Introduction to Digital Video*, Charles Poynton will demonstrate how computers and communication systems have now reached the stage where it is possible to display near-photographic, quality color images; but accurate color, easier to achieve with video equipment, remains a challenge for general-purpose computers. A copy of Mr. Poyton's book is included in the price of the seminar.

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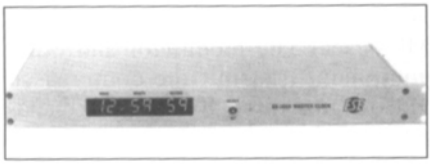


Figure TCG-2. ES160A from ESE

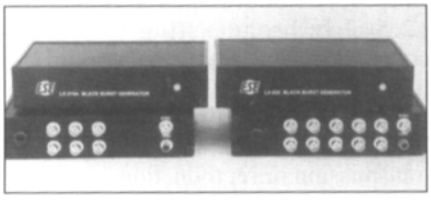


Figure TCG-3. ESE's LX-219A and LX-220 black-burst generators.

Figure TS-1. A menu display of integrated services TV (ISTV), developed by NHK.

age-controlled crystal provides an accuracy of 1 sec/month. Battery backup and a calendar that automatically compensates for daylight savings time are also included.

ESE announced two new black-burst generators. The LX-219A and LY-220 (Fig. TCG-3) feature enhanced RS-170A black-burst circuitry and extremely precise stability. Both generators are useful for pre-blacking tapes and/or for general synchronization purposes. Options include 1-kHz tone output, composite sync output, rack mount, and UL-approved power supply.

Time Code Readers

ESE introduced the LX-5112 12-in. analog clock (Fig. TCR-1), designed to operate as a time code reader, a standalone clock, or an impulse clock. The LX-5112 is capable of automatically setting itself to the correct time as received via any one of three different time code inputs (SMPTE/EBU, ASCII, or ESE). Alternate modes of operation on the LX-5112 allow the clock to synchronize with an alternating 12 or 24-V impulse signal or to act as a standalone clock. Sweep or step silent modes and time zone offset are user-set via rear-mounted dip switches. Options for a lighted dial (with brightness control) and rack mounting are also available.

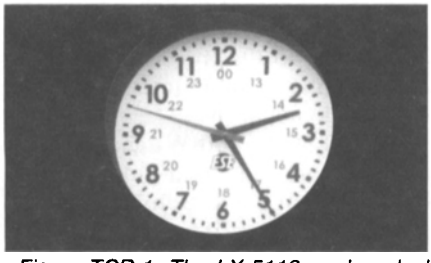


Figure TCR-1. The LX-5112 analog clock from ESE.

Transmission Systems and Equipment

Hitachi Denshi America Ltd. announced a digital triax transmission system for its SK-2600 digital studio camera series that enables the cameras to be fully digital from the camera head to the output of the camera control unit. At the CU-2000 camera control unit the digital component signals are digitally transcoded into serial digital outputs in D-1 or D-2/D-3 formats. Simultaneous analog outputs are provided with RGB and encoded video for maximum flexibility. As an option, the two viewfinder returns and the teleprompter can accommodate inputs in serial digital in D-1 or D-2/D-3 formats for ease of use in an all-digital studio. For protection against possible data errors that may affect the accuracy of digital component transmission, digital error handling has been provided in accordance with SMPTE RP-165.

Also from Hitachi was a new digital microwave link that offers high-quality and highly reliable real-time, digital microwave transmission of audio and video signals. The transmission system combines a 16/32 QAM modulator/demodulator with an RF head and an MPEG-2 codec. It also incorporates powerful error correction and automatic waveform equalizing. HDTV signals can be accommodated by the transmitter and receiver sections as well. The audio mode is selectable between compressed and noncompressed signals, and a multiplexed signal is adaptable to the transport stream. The system's transmitter operates in NTSC at 15 Mbits/sec on three to four channels, and in HDTV at 45 or 60 Mbits/sec on one channel.

Hitachi introduced a new high-performance triax transmission system for its Z-2000 digital camera series. It is an RGB FM transmission system that provides broadcast-quality outputs for pristine chroma keys and includes a half-rack CCU, which can use the RC-Z2 and RC-Z21 remote control units.

Multidyne, Inc., introduced the FTX-100 (FM) series and the FTX-200 (AM) series of video, data, and audio fiber-optic systems. The video SNR is up to 70 dB and the bandwidth is 10-MHz. The differential gain and phase are less than 1% and 1°, respectively. Both series support up to 32 duplex data channels for RS-232C, RS-422, and complementary metal oxide semiconductor (CMOS) at up to 38.4 kbits. Also supported is remote sensing of laser power, video presence, and data parity over the optical fiber through a dedicated data channel.

The FTX-195/FRX-195 fiber-optic stereo audio and digital AES/EBU transmission system from Multidyne offers specifications that exceed RS-250C short-haul and broadcast requirements. The optical budget exceeds 30 dB with a 1550-nm laser optics. The 20-bit stereo digital audio delivers an SNR of more than 90 dB. The receive unit has front panel controls for left and right-channel audio gain. The system supports digital audio transmission for the AES/EBU, IEC 958, S/PDIF, and EIAJ CP-340 formats. The FTX-195 system is

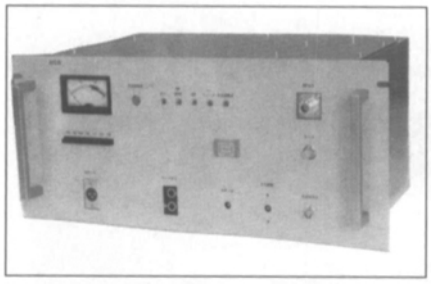


Figure TS-2. NHK's AM transmitter using digital phase shifting.

Figure TS-3. Hi-Vision communication satellite transmission system from NHK.

optionally available with up to two auxiliary data channels for RS-232C, RSX22, or CMOS. The system can also support up to two 10-Hz to 5-kHz auxiliary audio channels.

The NHK Science and Technical Research Laboratories has been studying integrated services digital broadcasting (ISDB) for future broadcasting systems. The receiver of the system, called integrated services TV (ISTV), shown in Fig. TS-1, can receive and display not only ISDB but also existing broadcasting programs. The simulation system of ISTV consists of eight personal computers connected to each other through a LAN, TV/HDTV resources, a Windows composer/switcher, a home video server, an HDTV display, and a remote control unit. The menu display is an initial turn-on page display. The latest TV news, weather information, TV program table, and TV newspapers (a new multimedia information service in ISDB), are stored in the home video server and available any time viewers desire.

NHK Science and Technical Research Laboratories has also been examining band segmented transmission (BST)-OFDM for digital terrestrial broadcasting transmission. Modulation of carriers and signal multiplexing can be configured in every OFDM segment of 100-kHz width, thus allowing expandability of ISDB

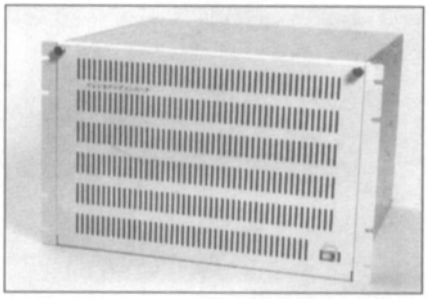


Figure TS-4. The communication satellite broadcasting system from Nippon Television Network Corp.

services as well as the ability to accommodate fixed portable and mobile reception within a TV channel.

NHK developed a new AM transmitter using digital phase shifting (Fig. TS-2). The transmitter consists of a 12-bit A/D converter; a ROM; six drivers, including a phase shifter; and two selectors and six switched RF power amplifiers with weighted output power and a power combiner. A 12-bit digital sound signal is separated through a ROM into six 2-bit groups. In response to the value of a 2-bit digital signal, each driver selects two phase-shift carriers from nine different phase-shift carriers that are generated by a clock having a frequency of 16x sampling frequency fed from the RF carrier section. Then it provides the two phase-shift carriers as its output. With the output phase-shift carriers, each driver differentially switches the switched power amplifier. Outputs of the six switched power amplifiers with digitally pulse width-modulated waveforms are combined by a power combiner, and then the combined signal is filtered through a band-pass filter, thereby obtaining AM waves. This transmitter shows high overall efficiency of 58% at an output of 100 W and 67% at 300 W, an SNR of 69 dB, and a total harmonic distortion of about 0.9%.

A digital transmission system for Hi-Vision (HDTV) program materials (Fig. TS-3) has also been announced by NHK. The system consists of an HDTV codec based on the MPEG-2 algorithm, a trellis-coded 8-PSK modulator, and other equipment. This system, used with a communications satellite, makes it possible to transmit Hi-Vision program materials from field broadcasting points. The codec compresses HDTV images of 1.2 Gbits/sec to approximately 45 Mbits/sec. The modulator and other equipment transmit the compressed video signal through a 27-MHz bandwidth, which corresponds to the bandwidth of one transponder of a satellite.

The Nippon Television Network Corp. (NTV) developed a system for 12.5-GHz broadcasting through a communication satellite, using 525-line scanning (Fig. TS-4). The picture is compressed and coded to 10 Mbits/sec and suffers no damage upon transmission or reproduction.

The Spectrum System from Odetics Broadcast is designed to provide total automation of multichannel spot insertion and program on-air presentation. The system offers centralized spot archiving using a single TCS90 automated video library, random-access spot playback from digital disk recorder cache, program playback from a TCS45 or TCS90 automated video library, low-cost client-channel manager for additional spot insertion channels, and scalability up to 24 on-air channels. Spectrum will increase the life span for on-air presentation equipment and improve the on-air look and reliability by using a digital disk cache and a centralized spot tape archive.

RE Technology introduced a distance-independent remote control feature for its RE 4500 video codec. By echoing the commands intelligently from the video codec, the action range of the control is increased to worldwide coverage. Also, with the introduction of a pointer adjustment buffer option, the codec is now completely optimized for transmission over SONET and mixed DS-3/SONET networks. The option is designed to compensate for the disturbing effects that pointer adjustments have on transmitted video signals. These effects can be seen as frame-jitter and as transients in the color subcarrier phase. This new option ensures that frame-jitter is virtually eliminated and that the rate of change of the color subcarrier phase is minimized so that problems such as color blanking or momentary color changes do not occur.

The NL5010 (100 W) and NL5020 (200 W) solid-state transmitters developed by Rohde & Schwarz are of modular design. The modules are identical, except that they are rated for different output powers. Broadband,

Figure TS-5. Cobra fiber-optic triaxial interface from Telecast Fiber Systems.

linear transistor amplifiers, and an exciter with built-in linearity precorrection ensure high transmission quality. Additional units such as satellite receivers and GPS frequency standards can easily be integrated. All relevant operating parameters are indicated on the display of the transmitter control unit, which is integrated into the exciter. All settings such as on/off, output frequency, output power, and linearity precorrection are menu-guided, use hardkeys and softkeys, and are microprocessor-controlled. A remote control interface provides floating status messages. For compliance with the spectral mask specified by ETS 300 401 for the radiated signal, a bandpass filter can be integrated in the transmitter rack for suppressing out-of-band intermodulation products. The DAB transmitters are suitable both for ambient-air cooling and for forced-air cooling; their excellent power efficiency minimizes operating costs.

Telecast Fiber Systems, Inc., introduced Cobra (Fig. TS-5), a fiber-optic camera snake system designed to extend or replace triaxial cable in remote teleproduction. The Cobra interconnects Sony and Ikegami triax-equipped cameras to their base stations using lightweight fiber-optic cable. Up to three to five times the range of conventional unrepeatered triax systems is possible, and the producer is able to locate cameras up to 50,000 ft away from their base stations. All camera signals, communications, and control functions are supported and component program video transmission permits the use of chroma keying.

Video Cameras

The Z-2000A digital, 2/3-in. camera from Hitachi Denshi America, Ltd., has a data transfer system for quick transfer of set-up information between cameras; it also includes an optional remote-controlled filter wheel. Battery functions have been enhanced with a programmable battery warning signal and a viewfinder display of the remaining battery operation time available. The Z-2000A uses a single LSI that digitally processes the RGB video with 13-bit minimum, 18-bit maximum accuracy. It features state-of-the-art specifications, such as 850 TV lines of resolution, 63-dB SNR, and F8 standard sensitivity. The camera is equipped with a six-vector color corrector and a linear matrix that works simultaneously for the ultimate in color reproduction. The Z-2000A has a flesh-tone detail control, which softens skin tone areas without softening the overall detail in the picture. Multicore and triax configurations for studio and field use are both available.

Hitachi's DK-H2 camera is designed for high-definition industrial applications, such as microscopy or as a graphic-stand camera. It is a three-CCD color camera that provides 1125 scanning lines and a horizontal resolution of 1000 TV lines. It provides various outputs, including YPbPr, RGB, binary/ternary sync, and HD/VD. It also features a lightweight camera head and CCU.

Ikegami Electronics announced its DVCPRO digital camera/recorder series (Fig. VC-1), which consists of the HL-V77 520,000-pixel FIT CCD x 3; the HL-V73 400,000-pixel IT CCD x 3; and the 16:9/4:3-switchable HL-V77W 520,000-pixel FIT CCD x 3. The camera head uses Ikegami's proprietary digital processing integrated circuits (ICs), which achieve a substantial reduction in power consumption (25 W, including the VCR). The camera features a variety of DTL functions, such as diagonal DTL, skin DTL, soft DTL, and variable 8-step DTL boost frequency. In addition to five preset shutter modes, the camera comes with a continuously variable shutter speed. It also includes Super-V to enhance vertical resolution. The VCR section employs digital component 1/4-in. DVCPRO format and

Figure VC-1. DVCPRO digital camera/recorder from Ikegami Electronics.

Figure VC-2. Ikegami's HK-388/388P ultra-wideband studio/field digital CCD camera system.

high-fidelity audio recording. It can record up to 63 min of footage with an M-cassette.

Ikegami also introduced the HK/388 field/studio and HK-388P portable companion all-digital camera systems (Fig. VC-2), which use the company's proprietary digital processing application-specific integrated circuits (ASICs). Image sensors are 2/3-in., 520,000-pixel FIT CCDs. In the switchable configuration, 16:9/4:3 aspect ratio, 640,000-pixel CCD imaging sensors are used. Digitally generated functions such as skin DTL, slim DTL, diagonal DTL, and viewfinder DTL allow creative and artistic capabilities for various production applications. The HK-388/388P offers a 10-MHz ultra-wideband component triax transmission system that permits a maximum transmission distance of 2000 m. The cameras come standard with D-1 serial component from the base station in addition to analog output. D-1 digital output is also available as an option.

The HL-59 from Ikegami Electronics (Fig. VC-3) is a 10-bit digital processing camera with reduced power consumption and improved functionality and performance. The camera features

Figure VC-3. HL-59 digital processing camera from Ikegami.

Figure VC-6. Betacam SX camera from Sony Corp. of America (left) with the rest of the Betacam SX ENG system.

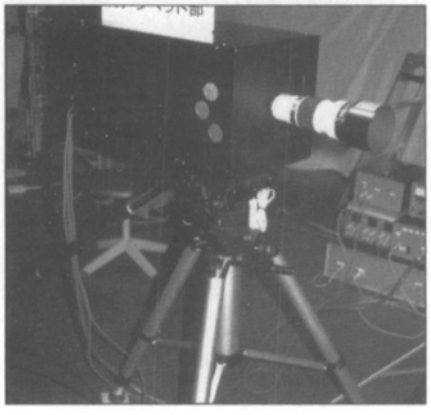


Figure VC-4. The 4K x 2K pixel progressive color scan camera system from NHK.

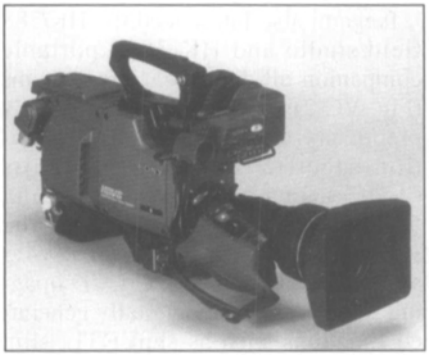


Figure VC-5. NHK's compact HDTV camera.

digital processing ASICs and higher-performance CCDs. The camera uses three 2/3-in., 520,000-pixel FIT CCD imaging devices. With a newly developed CCD drive scheme, the HL-59 permits optional aspect ratio switching between 16:9 and 4:3. In the 4:3 mode, the camera achieves an SNR of 62 dB or more, and a horizontal resolution of over 850 TV lines. With digital processing ICs, processing after knee is all digital. Digitally generated functions such as skin DTL, slim DTL, diagonal DTL, DTL boost frequency, and black stretch allow creative and artistic expression for various productions applications. The HL-59 can be docked to a variety of 1/2-in. VCRs. Triax operation can be achieved, and a variety of control systems are available including digital remote control, digital remote set-up, maintenance control (with memory card), and an operating control panel.

NHK has developed a 4K x 2K pixel progressive scan color camera system (Fig. VC-4) that provides high-quality large images and achieves new video effects such as electrical zooming for processing in HDTV and NTSC program production. Using four 2-million-pixel charge modulation devices (CMDs) and a four-sensor pick-up method, the system has an image capturing rate of 60 frames/sec and a limiting resolution of 1500 TV lines. In the four-sensor pick-up method, two of the sensors are used for green, one is for red, and one is for blue. The spatial half-pixel pitch offset imaging method in the diagonal direction has been applied to the two green sensors to improve horizontal and vertical resolution. By using interpolation technology, the number of pixels in the green channel has been increased to 3840 horizontally and 2070 vertically. There are half as many sample points for the red and blue signals as there are for the green.

A compact HDTV camera (Fig. VC-5) that is capable of outputting both HDTV and NTSC signals simultaneously is new from NHK. It uses 2/3-in., 2-million-pixel CCDs and can be operated in the same way as NTSC cameras. The 2/3-inch CCD produces the high-quality pictures comparable to those of a 1-in. CCD camera. The camera covers all ranges of production from OB van shooting and studio use to handheld operation. Lenses from a conventional camera can be used, widening the selection of lenses.

Sony Corp. of America announced the Betacam SX digital ENG camera (Fig. VC-6). The material shot with the camera is transferred to the server of a nonlinear editing system at high speed using 4:2:2 MPEG compression. This process preserves magnetic tape because the tape runs at half the speed of Betacam SP, and as a result, the life of the video head is extended.

Sony also introduced new HDC-700 (studio) and HDC-750 (handheld) cameras. They are 2/3-in., 2-million-pixel CCD cameras that can be used in NTSC, EDTV, and HDTV formats.

The Microcam split head compact camera from Thomson Broadcast Systems is a very compact and ergonomic camera for ENG or EFP applications. The configuration has the CCD block used remotely to provide a small and very maneuverable camera; the block can be remounted on the camera body for conventional use.

Video Camera Accessories

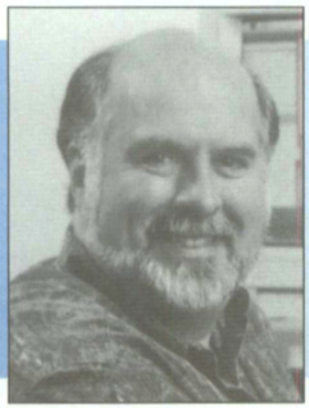
Hitachi Denshi America, Ltd., developed a CCD for its SK-2600W digital studio camera and SK-2600PW portable companion camera that enables easy switchability between 4:3 and 16:9 aspect ratios. The new high-density chip has 640,000 pixels and provides significantly higher resolution in both the 4:3 and 16:9 modes of operation. Both the SK-2600W and the SK-2600PW use a single, digital LSI that provides RGB signal processing with 13-bit minimum, 18-bit maximum accuracy.

Innovision Optics introduced the

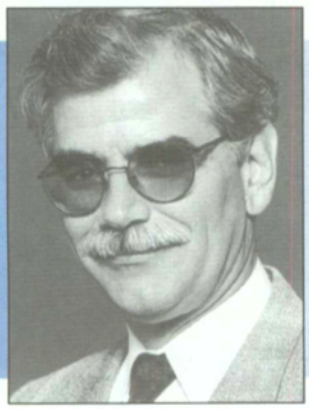
31st SMPTE Advanced Motion Imaging Conference

Sessions

SMPTE's technical program is divided into four sessions, with an emphasis on the transition to digital technology and nonlinear systems, including video servers, graphics devices, and storage systems associated with the latest broadcast technology. The program will feature discussions on various compression techniques and their potential uses. Conversion from analog-to-digital distribution and its effect on the marketability of ATV will be analyzed. The latest in nonlinear editing techniques and systems will also be discussed, with an emphasis placed on key factors such as database management.



Bob Turner



Robert Kisor

THURSDAY MORNING

Nonlinear Editing: Technical and Operational Issues: Chaired by Bob Turner, Turner Post-Production

- DV: The Format of the Future? Adam Silver, Adaptec, Inc., Milpitas, Calif.
- Microsoft ActiveMovie: A New Media Architecture, Andy Maltz and Amit Chatterjee, Microsoft Corp., Redmond, Wash.
- Worlds Collide—The Integration of Black Box Effects Technology into Nonlinear Editing Systems, Pete Challinger, Scitex Digital Video, Inc., Redwood City, Calif.
- NLE System Design Using Mathematically Lossless Motion—JPEG, Janet Matey and Alain Legault, Matrox Electronic Systems Ltd., Dorval, Que., Canada
- The Promise of Complete Digital Integration in the Video Production Process, and the Current Failure of Personal Computer Based Systems in Meeting this Goal, Steve Hartford and Mark Randall, Play, Inc., Rancho Cordova, Calif.
- Crossing the Line: Bridging Traditional and Digital Post Production Processes, Michael E. Phillips, Avid Technology, Inc.
- Bridging the Digital Islands: OMF Interchange in Post Production Today, Franklin A. David, Avid Technology, Inc.

THURSDAY AFTERNOON

Digital Distribution: Chair, Robert Kisor, Paramount Pictures

- Issues to be Considered—The Implementation of a Digital Distribution System by the Commercial Broadcast Networks, Brent Stranathan, CBS, New York, N.Y.
- Increasing Aggregate Performance and Access Time of Large Video Format Files and High Performance Connection to Large Distributed Storage Capacity Through Fibre Channel, Bent Stoevhase and Kumar Malavalli, Brocade Communications Systems, Inc., Santa Clara, Calif.
- Networking Nonlinear Editing Systems—Workgroup Challenges and Solutions, Paul Yarmolich, Scitex Digital Video, Inc., Redwood City, Calif.
- MPEG2 Practical Choices in Implementing a Compression Standard, Bruce Penney, Tektronix, Beaverton, Oreg.
- A Visual Compositing Syntax for Ancillary Data Broadcasting, Craig Birkmaier, PCUBE Labs, Inc., Gainsville, Fla.
- Fibre Channel Gigabit-Speed Digital Distribution for Studio and Broadcast Facility Networks, Terry Anderson, Anchor Communications, Inc.
- High Speed Internet Access Using Cable Modems with Telephone Return, Jonathan Fellows, General Instruments, San Diego, Calif.

SMPTE

Society of Motion Picture and Television Engineers

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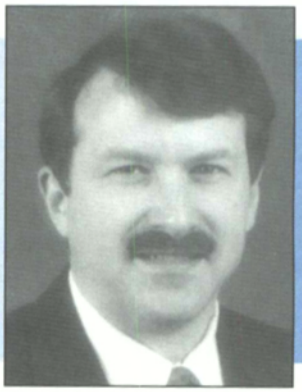
Technical Papers

The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders, will feature papers on the technologies that are changing the face of the television and computer imaging industries. Here is a sampling of sessions and papers scheduled for presentation at the conference. *Note: Papers are subject to change.*



Robert Seidel

FRIDAY MORNING

Storage Technologies Using Compression: Chair, Robert Seidel, CBS, Inc.

- A Portable Field Editing System for Electronic News Gathering (ENG), C. Golson, K. Yamamura, T. Kondo, and M. McGrath, Sony Electronics.
- Mysteries of Video Disk Arrays, C. F. McConathy, Irvine, Calif.
- Wide Area Network Storage Solutions for Digital Media Production, Claire Jordan Grant, Pacific Bell Electronic Commerce, San Francisco, Calif.
- Multichannel Video Management—Integrating Video Tape, Video Server, and Compression, Michael Guess, Odetics Broadcast, Anaheim, Calif.
- Digital Video Servers for the Television Industry—Potential Applications/Features to Look For, Bob Blackburn, Video Server Development, Austin, Tex.
- Advances in Server Technology, Christopher D. Bennett, Hewlett-Packard Co., Santa Clara, Calif.
- Practical Applications of Server Technology, Mark LeValley, KDFW/KDFI-TV, Dallas, Tex.

Charles Pantuso

FRIDAY AFTERNOON

Advanced Television: Chair, Charles Pantuso, HDVision, Inc.

- 525-Line Progressive Scan Digital Broadcasting System via Satellite, J. Urano, H. Sakaguchi, and S. Tamura, Nippon Television Network Corp., Tokyo, Japan
- A Report on the Technology Test of Advanced Video in Support Services - MPEG2, Richard A. Mizer, NUKO Information Systems, San Jose, Calif.
- Digital HDTV: Why Bits are Not Just Bits, Charles A. Poynton, Poynton Vector, Toronto, Ont., Canada
- HDTV Compression and the March to Marketplace Reality, Laurence J. Thorpe, Business and Professional Group, Sony Electronics, San Jose, Calif.
- Cost vs. Quality in ATV Receivers, Gary Demos, DemoGraFX, Santa Monica, Calif.

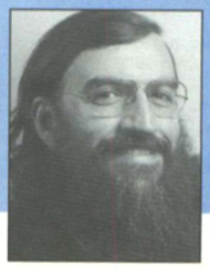
Ed Hobson
Conference
Vice President

"I am pleased that our annual Winter Conference will be returning to New York this year.

Our program and social activities have been planned to provide an educational and stimulating event.

I look forward to seeing you in New York this February.

Thanks, Ed



Program Chairs
Darcy Antonellis
Mark Schubin

31st SMPTE Advanced Motion Imaging Conference

The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders

February 6 - 8, 1997

Hotel Rates *(Circle your choice)*

Single Occupancy	$139.00
Double Occupancy	$154.00
One Bay/One Bedroom	$399.00
Two Bay/One Bedroom	$499.00
Two Bay/Two Bedrooms	$699.00

Crowne Plaza Club Level rooms are available at an additional $30.00 per person, per night.

Note: *All rates do not include applicable taxes Reservations must be received by 1/13/97.*

All rooms require a guarantee in the amount of one night's room and tax prior to January 13, 1997.

Housing Reservation Form

Name _____

Sharing with _____

Company _____

Address _____

City _____ State _____

Country _____ Postal Code _____

Tel _____ Fax _____

Arrival Date/Time _____ Departure Date _____

☐ Smoking ☐ Non-Smoking

Note any special requirements _____

_____

Payment Method ☐ MC ☐ Visa ☐ AmEx

Account # _____ Expiration Date _____

Name on card (please print) _____

Signature _____

Cancellations must be received prior to 6 pm on the day of arrival. After 6 pm, 1 night's room and tax will be charged.

Send your reservation form and payment to:
Crowne Plaza Manhattan 1605 Broadway New York, NY 10019
Tel: 212-977-4000 Fax: 212-333-7393

Pre-Registration Discount $100.00

Deadline: January 10, 1997
Save time and money ($100.00). Avoid waiting in line to complete forms. Pre-register for the SMPTE Conference now. Your completed registration form and payment must be postmarked by January 10, 1997, to qualify for the $100.00 discount.

On-Site Registration Hours

Delegates arriving in New York prior to the official start of the conference can pick up credentials at SMPTE Registration on the 4th floor of the hotel on Wednesday, February 5, between 3:00 p.m. and 6:00 p.m. Otherwise, the registration hours are shown here:
Wednesday, Feb. 5....3:00 p.m. - 6:00 p.m.
Thursday, Feb. 6 .....7:30 a.m. - 5:00 p.m.
Friday, Feb. 7 .....8:00 a.m. - 5:00 p.m.
Saturday, Feb. 8 .....8:00 a.m. - 12:00 noon

Author Registration

Authors participating in the SMPTE Conference receive a complimentary registration. The fee for the Shooting on Film Seminar is $100. Charles Poynton's seminar is $135.00.

Housing Reservations

The Crowne Plaza Manhattan is the official SMPTE Headquarters hotel. All reservations must be made directly with the Crowne Plaza. Reservations received after January 13, 1997, will be assigned on a space-available basis. A reservation form is included in this brochure. Please complete the registration form and return to the hotel via fax or mail prior to January 13, 1997. All rooms require a guarantee in the amount of one night's room and tax.

Travel Discounts to New York

Cal Simmons Travel Management Co. and American Airlines is offering an exclusive SMPTE discount for travel to the SMPTE Conference. By calling the official travel agency for SMPTE, you'll be eligible for specially discounted airfares and other benefits such as complimentary $100,000 flight insurance, frequent flyer numbers recorded for mileage credit, and advance seat selection and boarding passes for expedited airline check-in. To make reservations, call Cal Simmons Travel at 1-800-783-5830, or (202) 775-5810, or American Airlines at (800) 433-1790. Refer to American Airlines Star File number S9224.

Cal Simmons Travel

Proceedings on CD-ROM

Paid delegates with full-conference registration receive a complimentary copy of the Technical Proceedings on a cross-format CD-ROM.

Additional Information

Please take a few minutes now to complete the registration form provided and return with your payment to SMPTE, 595 W. Hartsdale Ave. White Plains, NY 10607; call (914) 761-1100; Fax: (914) 761-3115; or register on-line at http://www.smpte.org

About SMPTE

Celebrating our 81st year, SMPTE is an international, award-winning technical society devoted to advancing the theory and application of film, television, video, computer imaging, telecommunications, and the related arts and sciences. The SMPTE currently serves nearly 10,000 members in 85 countries. Members of the Society are engineers, technical directors, cameramen, editors, technicians, and consultants; specialists in film processing, production, post-production; practitioners in computer imaging, marketing, and sales; and manufacturers representatives.

Membership Application

Office Use Only

I wish to join SMPTE as a new (check one)

☐ Active Member: $80.00 ☐ Student Member: $25.00

Personal Information

First Name Middle Last

Street Address

City State Zip/Country

Date of Birth

Please send the *SMPTE Journal* to my ☐ Home ☐ Office

Please send annual invoice to my ☐ Home ☐ Office

During the months of _____ to _____ send the *Journal* to this address:

Student Members

Note: Students must transfer to Active Membership upon graduation. Maximum number of years as student, is 6.

Name of School Date of Anticipated Graduation

Name of Faculty Advisor Faculty Advisor Tel. No

Professional Information

Company Name

Title

Street Address

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City State Zip/Country

Office Phone Office Fax

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☐ Visa ☐ MC ☐ Amex ☐ Check (payable to SMPTE)

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SMPTE Job Classification

Please check one category in each column that best describes what you do.

Job Function

01 ☐ Management
02 ☐ Engineering/ Technical
03 ☐ Production
04 ☐ Post-Production
05 ☐ Consultant
06 ☐ Sales/Marketing
07 ☐ Educator
08 ☐ Other (specify)

_____

Business Category

09 ☐ TV Station/Network
10 ☐ Non-broadcast TV (cable, industrial, etc.)
11 ☐ Production Facility
12 ☐ Post-Production Facility
13 ☐ Manufacturer, Dealer, Distributor, Rental House
14 ☐ Educational Institution, Gov't, Research Facility
15 ☐ Satellites, Telecommunications
16 ☐ Computers, Multimedia
17 ☐ Other (specify) _____

I hereby make application for SMPTE membership and agree to be governed by the Society's Constitution and Bylaws.

Signature_____ Date_____

If recruited by a SMPTE Member, please provide recruiter's name:

Recruiter's Name _____

Membership #_____

Return with payment to:

SMPTE Membership Dept.
595 West Hartsdale Ave.,
White Plains, NY 10607
Tel: (914) 761-1100 • Fax (914) 761-3115
htt://www.smpte.org

Note: $20.00 of dues is allocated for your subscription to the SMPTE Journal and is non-deductible.

SMPTE Registration Form

Please mark registration and tickets desired.

	Before Extended to 1/10/97		After 1/10/97	
Member: Conference & Seminar *(Luncheon & Reception Incl.)*	$385	☐	$485	☐
Member: Conference Only *(Luncheon & Reception Incl.)*	250	☐	350	☐
Nonmember: Conference & Seminar *(Luncheon & Reception Incl.)*	485	☐	585	☐
Nonmember: Conference Only *(Luncheon & Reception Incl.)*	330	☐	430	☐
Student Member: (Conference, Seminar) *(Luncheon & Reception Incl.)*	60	☐	70	☐
Student Nonmember: (Conference, Seminar) *(Luncheon & Reception Incl.)*	80	☐	90	☐
Student Member: (Seminar Only)	25	☐	35	☐
Student Nonmember: (Seminar Only)	35	☐	45	☐
Life Member/Life Fellow (Conference & Seminar)	50	☐	50	☐
Seminars Only				
1. Shooting on Film				
Member	$100	☐	$125	☐
Nonmember	125	☐	150	☐
Members of AIVF, IFP, I.A., DGA, ITVA, ITS, AICP and Women in Film receive SMPTE member rates on Shooting on Film seminar registration only. Please specify your organization _____				
2. A Technical Introduction to Digital Video by Charles Poynton				
Member *(Book Incl.)*	$135	☐	$155	☐
Nonmember *(Book Incl.)*	160	☐	175	☐
Social Events				
Partner's Program	$125	☐	$150	☐
Get-Together Luncheon	50	☐	60	☐
AUTHORS: Two days Papers Program Complimentary:				
Shooting on Film Seminar	$100	☐	$100	☐
A Technical Introduction to Digital Video	135	☐	135	☐
TOTAL AMOUNT DUE	$ _____		$ _____	

Please mark which seminar you plan to attend: 1 ☐ 2 ☐

- Cancellations must be made in writing. A $50 administrative fee will be incurred.
- No refunds or cancellations postmarked after January 20, 1997.
- **Registration credentials will be available for pickup on site.**

Name _____

Company _____

Address _____

City _____ State _____

Country _____ Zip/Postal Code _____

Tel _____ Fax _____

Partner's Name (if registering) _____

SMPTE member? ☐ Yes ☐ No Membership Number _____

Crowne Plaza Manhattan
New York, N.Y.

February 6-8, 1997

Payment Method

☐ Check enclosed (payable to SMPTE)

☐ MC ☐ Visa ☐ AmEx

_____
Account #

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Expiration Date

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Name on card (please print)

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Signature

Mail or fax your form and payment to:

SMPTE
595 West Hartsdale Avenue
White Plains, NY 10607-1824
Tel: (914) 761-1100
Fax: (914) 761-3115

Register on-line:
http://www.smpte.org

31st SMPTE Advanced Motion Imaging Conference

The Age of Compression: Nonlinear Editing, Digital Broadcasting, and Other Wonders

SAVE

Save $100!
Register before January 10, 1997

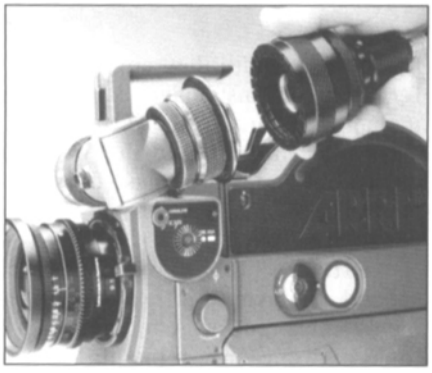

Figure VCA-1. The CCD Eyepiece from Innovision Optics.

CCD Eyepiece (Fig. VCA-1), a full-color video assist that snaps onto the viewfinder port of a wide range of 16 and 35mm motion cameras. Attaching readily to any Arri 435 or 535, Aaton 35, or such 16mm cameras as the SR 3 or Aaton 16, this compact, flexible tool provides a color NTSC (or optional PAL) signal with a resolution of 480 lines. A variety of adapters are available to accommodate older cameras, as well. The 12-V system runs on ordinary AC or 12-V DC power supply.

Video File Servers

Hitachi Denshi America, Ltd., introduced a video file server that uses Hitachi custom software for the complete handling of all commercial insertions. The server enables direct transmission of programs and commercial insertions so that filing, previewing, and editing can be performed simultaneously during on-air operation. It uses the MPEG-2 video compression scheme and a RAID-5 disk array for recording. The server can record from 5 to 30 hours, depending on options selected.

The Dynamo Déjà Vu from Viewgraphics, Inc., is a digital video broadcast time delay and NVOD system comprised of a computer server, on-line storage, digital video broadcast (MPEG-2) interfaces, and application software. Déjà Vu is used for recording, storage, and playback of multiple program streams to any number of time zones and scheduled air times. It is built for a digital MPEG-2 system and eliminates the need for analog recording of individual channels before delivery to satellite transmission systems or settop decoders. Digital capabilities allow for multiple types of industry-standard MPEG-2 interfaces.

Video Laboratory Equipment

Colorado Video, Inc., introduced the Model 619 video cross-hair and line generator, which superimposes cross hairs or lines onto real-time video signals. The user can adjust the position of these lines by means of high-precision multiple turn controls. The loopthrough input with two connectors allows connection of both a video source and a destination to the input. Power input requirements are 12 to 24 V DC at about 75 mA. An AC adapter is included.

The Thorough Control System (TCS) from Gamma & Density Co. establishes standards of communication with the telecine colorist in the film-to-tape transfer process. The system centers around the Gamma=1c cinematographer's control chart, a combination of the gray and color fields. It connects the brightness of the scene with scientifically calculated IRE unit equivalents printed on each corresponsing gray field. The chart creates a proper connection between the brightness of the scene and the luminance of the video monitor. There is also a second gray scale in 1/2 F-stop increments called the exposure/latitude index, which can be used to determine the combined latitude of the film-to-tape process being used.

The Pulsar 5300 conveyor degausser from RTI/Lipsner-Smith provides fast and complete erasure of virtually any metal particle or oxide videocassette format while operating continuously on 117-V AC power. The Pulsar erases up to 500 cassettes/hr and has a hopper option that permits unattended operation.

Video Recorders

NHK and Matsushita Electric Industrial Co., Ltd., have developed a 1/2-in. HDTV VTR (Fig. VR-1) that records 10-bit, 4:2:2 HDTV signals

Figure VR-1. 1/2-in. HDTV VTR from NHK and Matsushita Electric Industrial Co.

based on SMPTE 240M and SMPTE 274M and uses 5.4:1 compression. The VTR is composed of a high-definition processor that encodes and decodes the HDTV signals as well as a D-5 VTR. The HDTV signals are input/output through a 1.5 Gbit/sec serial digital interface based on SMPTE 292M. The compression method uses intra-field fixed-length DCI for field-by-field editing. Editing/trick play functions are the same as those of the D-5 VTR. Four-channel audio signals quantized at 20 bits with a sampling frequency of 48 kHz are recorded without compression. This VTR can record, play back, and edit signals at a field frequency of either 60 Hz or 59.94 Hz, and it has a recording time of 2 hr.

Sonosax USA, Inc., introduced the Stelladat II time code DAT recorder, which has four mic/line inputs, all with mic preamplifiers, input gain control, low-pass filters, pan pots, and output level controls. These four inputs can be mixed into the two primary DAT tracks through the front panel master gain controls. The Stelladat II has a true four-input mixer. Other features include two AES/EBU XLR connector pairs for four-track output, optical connectors for S/PDIF digital signals and XLR and Lemo time code in-and-out connectors. An LCD screen allows a much greater range of information to be displayed; in particular, signal levels can be controlled to a very high degree due to the high-resolution image.