NAB '90 begins a new decade
If you've been putting off doing stereo field remotes for fear of risking a fragile, expensive stereo mic, Shure's new VP88 is what you've been waiting for.

The VP88 is an advanced single point stereo condenser mic that not only recreates the sonic environment with extraordinary audio fidelity, but meets Shure's legendary standards for ruggedness and reliability.

The VP88 is built to withstand the punishment of field remotes. And, it comes at a price you'll find surprisingly affordable.

TRUE MS STEREO.

The VP88 features a forward facing Mid capsule, perpendicular Side capsule and built-in stereo matrix to assure a wide, natural, uncolored response for stereo imaging. Yet, it's perfectly mono compatible.

To enable you to control the degree of stereo spread and ambience pick-up, the VP88 has three switch-selectable stereo modes or direct mid and side output. And it's designed to provide the wide dynamic range and low noise you need for remote broadcasts.

THE FEATURES YOU NEED.

The VP88 can be powered by a self-contained battery or phantom power so you can go where the action takes you. It includes switchable low-frequency rolloff for reduced ambient noise and a built-in "pop" screen.

In addition to camera mounting, the VP88 can be used on a stand, fishpole, or boom. And the mic comes with a wide range of standard and optional accessories to accommodate your most challenging stereo miking requirements.

So whether you're just beginning to look at stereo miking, or you want to take your stereo to the next level — consider the advantages of the Shure VP88. It's making stereo miking an affordable proposition.

For the name of your nearest dealer and our free brochure, call or write Shure, 222 Hartrey Avenue, Evanston, IL 60202-3696. 1-800-257-4873. The Sound of the Professionals®... Worldwide. SHURE®

Circle (1) on Reply Card

Shure's New VP88 Stereo Microphone Offers A New Level Of Reliability And Affordability.
The most important audio control equipment works from here to here.

Keeping sound clean and accurate can make or break your audio projects. SONEX from illbruck ensures that you're getting the sound you want. Our complete line of acoustical materials gives you total control—in the studio, the control room, or wherever sound quality is critical. There's a reason SONEX continues to lead—nothing works better. Put the leader to work for you; call today for all our performance specs and application guides—800-662-0032.

**SONEX**
The only acoustical foam with the illbruck anechoic-wedge—over 400% more surface area than flat materials. Controls reverb, reflections, and resonances beautifully. The proven performer.

**SONEX 1**
The same unbeatable performance of SONEX but in materials that meet all Class 1 regulations. For demanding applications where heat or fire are factors. Safe for you but deadly for sound.

**SONEX CEILINGS**
Suspended ceiling treatments that deliver new levels of acoustical performance. Unique, contemporary designs. Available in a variety of styles and colors.

**BARRIERS & COMPOSITES**
When the problem requires more than absorption, illbruck barriers deliver. Single layer vinyls to multi-level laminates. Lead performance without lead price or problems.

illbruck
Sonex Acoustical Division
5155 River Road N.E.
Minneapolis, MN 55421
1-800-662-0032
In MN: 612-521-3555

Circle (3) on Reply Card
www.americanradiohistory.com
NAB CONVENTION REPLAY:
The NAB convention is the "main event" for the broadcast and post-production industries. The show replay will cover the primary points of interest for our readers. The NAB '90 coverage will include the following reports:

FEATURES:

26 Perspective on the Convention
By Brad Dick, editor
Southern hospitality did not make up for the maze of confusion called the exhibit hall.

32 NAB Engineering Conference Report
By Brad Dick, editor
Practical technology was the key to this year's sessions.

48 The Pick Hits of NAB '90
By Rick Lehtinen, TV technical editor, and Skip Prazzi, radio technical editor
BE's judges pick the peachiest products in Atlanta.

68 Show of Shows
Coordinated by Carl Bentz, special projects editor
Hundreds of new products are introduced at each NAB convention. Our "Show of Shows" report provides a complete, detailed listing of new products exhibited at the convention, organized by product categories.

ON THE COVER
The 1990 NAB convention broke from tradition and moved to Atlanta. Record attendance and sales combined with political wranglings set the stage for broadcasting's new decade. The cover portrays the new-technology products introduced in Atlanta. A complete wrapup of the sessions and new products is contained in this issue. (Cover photo courtesy of Tektronix.)
One of Our CCD Cameras Should Be One of Yours

Presenting the Hitachi SK-F Series...
A Line-up of Five High Performance Broadcast CCD Cameras.

Use the SK-F700/710 for studio & field production work. A choice of RGB Triax, Composite Triax or Multicore gives you total system flexibility.

The SK-F3 is our top-of-the-line EFP portable with 400,000 pixel FIT CCD's.

The SK-F2 is our Broadcast ENG camera featuring 1/3 CCD's with 700 lines of resolution.

The SK-F1 is our ENG/EFP model that makes FIT technology affordable.

Hitachi Denshi America, Ltd
150 Crossways Park Drive, Woodbury, New York 11797  Tel: (516) 921-7200
Montreux sponsors International Symposium

The 17th International Television Symposium and Exhibition will be held June 13-18 in Montreux, Switzerland.

The exhibition will be open daily from 10 a.m. to 6 p.m., Friday, June 14 through Tuesday, June 18.

The symposium committee composed of international personalities in the production, broadcasting and cable industries will focus on innovations in various fields. The program committee will comprise experts in these fields from around the world and will develop a program geared to the interest of managers, creative producers and technical experts.

Workshops covering specialized subjects of interest were conducted for limited audiences at last year's symposium; this year, workshops will be extended to a full program.

Sunday morning, the highlight session on production and facilities houses will be presented.

Noise-free radio is on the air

The Federal Communications Commission has authorized WQYK-AM, Seffner, FL, to conduct on the air tests of the narrowband FM system known as noise-free radio. WQYK-AM 1,010kHz, 50kW-D, 5kW-N, DA-2 is licensed to Infinity Broadcasting.

This past April, the necessary modifications and adjustments were completed on the 50kW and 5kW transmitters and the first noise-free radio broadcasts were started.

Noise-free radio is a method of compressing the normal 200kHz-wide FM broadcast signal to a bandwidth of only 2kHz so it can be transmitted on the standard AM broadcast band. Then, expanding the narrowband 2kHz signal to a wideband 200kHz signal in the receiver, which can be used to reproduce the high-fidelity-noise-free sound of FM.

Interest group to support private TV

Five private TV stations — Francis TFI, Italy's Fininvest, Luxembourg's CLT, Britain's ITV and Germany's Sat-1 — have formed a European business interest association to influence government broadcasting policy. It will be headed by Italian TV magnate Silvio Berlusconi.

The prospect of establishing an all-encompassing representative board for commercial broadcasting in Europe has been hampered by the absence of Robert Maxwell and Rupert Murdoch. Although Murdoch is a shareholder in TFI, ITV and MTV, relations between him and Fininvest chief Berlusconi are known to be strained.
Selecting an ENG/EFP lens for your 3/4" CCD camera is a creative decision. It should be lightweight, responsive and zoom smooth as silk at any speed. Its design should utilize Extra-low Dispersion Glass to minimize chromatic aberration. It should include an anti-reflection coating for improved spectrum transmission ratio. And it should have an advanced design that improves corner resolution and produces a high, flat MTF curve. In short, it should be a Nikon.

But selecting an ENG/EFP lens is also a business decision. And on that score we provide something almost as compelling as Nikon quality – our unique Express Loaner Service. Simply register the Warranty, then in the unlikely event your lens needs service we’ll get you a loaner lens overnight. All your investment in equipment and crews is more secure than ever before.

A service like this is remarkable in itself. But not quite as remarkable as our lenses.

As with all Nikon products, our new ENG/EFP lenses have all our renowned quality, tradition and technology built right in. Our growing line is also fully accessorized, including adapters that allow the use of your entire arsenal of Nikkor 35mm SLR camera lenses for special effects.

To find out more, call or write for our complete brochure: Nikon Electronic Imaging, Dept. D1, 101 Cleveland Avenue, Bayshore, NY 11706, (516) 222-0200 Ext. 324. Or call 1-800-NIKON-US (645-6687) for the dealer nearest you.

Nikon
ELECTRONIC IMAGING
© 1990 Nikon Inc
Passing the buck

"The perfect bureaucrat is the man who manages to make no decisions and escapes all responsibility."

Justin Brooks Atkinson

That quote pretty well describes the operation of the FCC and FAA. During recent NAB meetings, it became obvious that broadcast licenses are being held hostage while these two agencies pass the buck between themselves to avoid taking responsibility for granting licenses. Broadcast license applications now are being delayed, sometimes for as long as a year.

Processing license applications is supposed to be controlled by the FCC. The FAA's role is limited primarily to tower considerations. Unfortunately, the FAA has taken it upon itself recently to expand its authority in bureaucratic fashion. At the same time, the FCC has acquiesced to this territorial battle and let the FAA have its way. The result is that many broadcast licenses are sitting on a desk in Washington awaiting a decision.

When an application is submitted to the FCC, the broadcaster has the right to expect an analysis of any potential for interference and a prompt response from the commission. Yet, the FCC is willing to sit on its hands and the FAA is doing the same. It's the broadcaster that's left without a license.

In the past year, the FAA appears to have expanded its role and assumed jurisdiction over some spectrum issues. The turf battle between the FCC and FAA is resulting in a standstill on broadcast applications.

During the FCC Q & A session at the NAB convention in Atlanta, serious questions were raised about the FCC and FAA's handling of broadcast applications. One attendee related his difficulty in getting answers from either agency. When he called the FCC for help he was told, "Don't ask us; talk to the FAA." Calling the FAA resulted in no action. The broadcaster's license was held for almost a year, with no accountability from either agency.

Come on, people, quit passing the buck.

The squabble between the FCC and FAA represents the "don't blame me, it's not my fault" attitude common to Washington politics. The FCC should be trying to help broadcasters operate according to the rules and serve the public. The FAA needs to work with the FCC instead of against everything that produces RF.

Roy Stewart, FCC Mass Media Bureau chief, said that his staff was meeting with the FAA to "work toward a solution." Big deal. While these two groups talk, broadcasters wait. Talks have been going on for more than six months without any apparent movement toward resolving the problems.

Part of the problem is that all broadcasters facing these stonewalling tactics think they're the only ones being affected. This is not the case.

The situation is unacceptable. It's time broadcasters and NAB turned up the heat on the FCC and FAA. It's too easy for bureaucrats to pass the buck; it's always a case of "someone else's fault" or "meetings are now taking place."

Come on, FCC and FAA, stop talking and start acting. You're paid to solve problems, not create them. If you can't resolve the issues, get someone who can. If the entire FCC commission needs to step in and butt heads, then so be it. Broadcasters deserve better treatment. Just because the two combative agencies refuse to resolve their differences is no reason to hold broadcasters hostage.

Brad Dick, editor
An interview with
"Orbie,"
the Orban Dalmatian.

HOME: San Francisco, California

PROFESSION: Orban Products spokes-dog.
(Eat your heart out Spuds!)

AGE: 35 (that’s 5 in human years).

QUOTE: "Orban has a passion for quality that is
exceptional among companies today."

PROFILE: Reliable, versatile and technically
outstanding (like Orban products).

ON ORBAN: "Orban maintains the highest
technical standards and delivers the most
thoughtfully engineered audio processors on
the market. Reliable products, purpose-built
and backed by great customer service.
That's dogged perfection!"

FAVORITE PRODUCTS: "Compressor/
Limiters, De-Essers, Stereo Synthesizers,
Parametric Equalizers, Spatial Enhancers,
Programmable Processors and of course,
the OPTIMOD. The entire line is
unsurpassed in quality."

FAVORITE SONG: "You Ain't
Nothing but a Sound Dog."

LISTEN TO THE DIFFERENCE.
Compressor/Limiters, De-Essers, Stereo Synthesizers, Parametric
Equalizers, Transmission Processors

orban
a division of AKG Acoustics, Inc.
1525 Alvarado Street
San Leandro, CA 94577 USA
Tel: (1)415/351-3500
FAX: (1)415/351-0500

Circle (5) on Reply Card
www.americanradiohistory.com
Moves made to improve AM

By Harry C. Martin

In April, the commission amended its rules to encourage interference reduction between AM stations and revised its methods for calculating skywave and groundwave field strength in the AM band. To encourage interference reduction between AM stations, the FCC also has done the following:

1. Eliminated the policy of grandfathering existing authorizations. When an AM station has been deleted, the commission, as a matter of policy, has preserved or grandfathered the facility for one year to permit parties to file applications for replacement of the deleted facility. However, this policy has led to continued objectionable interference between AM stations. The commission has discontinued this grandfathering policy to promote compliance with current AM assignment standards.

2. Agreed to accept certain contingent applications. If two or more licensees submit contingent applications to carry out an interference-reduction arrangement, a participating applicant seeking a power increase or other major modification will not be subject to competing applications from a third party with respect to the opportunities created by the contingent arrangements. The commission thinks this change will encourage licensees to negotiate interference-reduction arrangements because they can be assured of the benefits derived from their efforts.

3. Agreed to determine whether a "service area" or minimum level of service has been maintained following a reduction in AM facilities. The commission's case-by-case determinations will depend on the number of AM and FM services remaining in the area losing service, the amount of AM interference that would be eliminated, the areas and populations that will gain service as a result of the proposal and the availability of other services within these areas.

Calculating interference

The commission also has revised its rules to improve the methods for calculating skywave and groundwave field strength in the AM band. Although the replacement of the existing AM broadcast skywave propagation curves with an improved skywave propagation model alone will not improve the quality of AM service, it will enable the commission and the engineering community to more accurately determine the interstation relationship between AM facilities. In addition, the commission has replaced its current AM broadcast band groundwave propagation curves by a computer-generated mathematical calculation of predicted groundwave field strengths at all distances.

The FCC is proposing that AM stations causing the most interference in the existing band be given priority rights to assignments in the expanded 1.605kHz–1.705kHz band, which will become available after the conclusion of the AM rulemakings. The commission thinks this proposal would give broadcasters the ability and incentive to improve AM service.

In order to encourage the migration of existing stations to the 1.605kHz–1.705kHz band, the proposal would make the additional spectrum available to new applicants initially. When the transition has been completed, however, new applicants could apply for unused capacity in the expanded band under the same rules and regulations governing other applicants for new AM stations.

To further spur AM improvement, the commission is proposing the following:

- Issuing tax certificates to AM stations who agree to reduce interference to co-channel or adjacent-channel stations.
- Relaxation of its multiple ownership rules to permit ownership of AM stations with overlapping 5mW/m daytime contours if the licensee agrees to adjust the operation of either station to reduce co-channel or adjacent-channel interference to other AM broadcasters.
- The reimplementation of the AM-FM nonduplication rule.
- Adoption of AM technical standards, which include changes to the AM classification system, changes to protection criteria and nighttime enhancement for daytimers.

New filing fees

On May 21 of this year, the commission increased the amount of all existing fees by 12.6% and imposed new fees on other regulatory services or filing requirements. The procedures for collecting fees also were changed.

Fees now must be paid with FM-TV booster, ownership reports, petitions for new or changed FM or TV channel allocations, as well as requests for special temporary authorizations, rule waivers, call sign changes and extensions or reinstatements of construction permits.

The procedures require all applications with fees to be filed at the Mellon Bank in Pittsburgh. To facilitate sorting at the bank, the FCC has created Form 155 that must accompany all filings with fees. On this form, applicants are required to use specific codes identifying the nature of the filing and the amount of the fee. The application will be returned if Form 155 is not included or completed correctly. The FCC has established several different post office boxes in Pittsburgh where applications are to be sent depending on their nature.

Broadcasters or cable operators who are planning to file feeable applications with deadlines must ensure they are completed and ready for filing a few days in advance of the deadline so they will reach Pittsburgh in time. Same-day delivery services to Pittsburgh are available from Washington, but they require customers to deliver their forms and checks early in the business day to meet the deadline.

To know where to file and how, it is crucial to determine whether a filing fee is required and what the proper procedures are for filing. The FCC’s fee hotline number is 202-632-FEES.

A schedule of new fees applicable in the broadcast services was included in the February 1990 “FCC Update” column.
Performance.

Are you ready to shift up to digital power? Nobody supports you like GVG.
Clarifying EBS tone modulation levels

By Tim McCartney

Broadcasters who are confused by the EBS test-signal modulation requirements are not alone. The problem begins with the FCC rule and can extend to the FCC field inspectors.

This past February, an article in this column called “Review your local EBS tests” made reference to the FCC’s 40% modulation requirement for EBS test transmissions. Quoting directly from the commission’s rules, however, was a mistake. The FCC requirement is incomplete.

Readers see problem

Several TV station chief engineers called the confusion of EBS test requirements to our attention. They said although each of the two EBS generator tones must be set to individually achieve a minimum of 40% modulation, it is incorrect to imply that the modulation of both tones also would be 40%. Although Section 73.906(c) of the rules calls for each tone to modulate the transmitter at 40%, it fails to specify the minimum required modulation percentage when both tones are used.

Hamnett & Edison study

A 1989 study resulted from a conversation between Dane E. Erickson, consulting engineer for Hamnett & Edison, San Francisco, and Frank Lucia of the FCC Management Planning and Program Evaluation office. According to the correspondence, Lucia apparently agreed that requiring 40% modulation for each tone amounts to an implied requirement to meet simultaneously the 40% modulation level for each tone. Erickson pointed out that because the 853Hz and 960Hz tones are not related harmonically, they add algebraically, and a combined modulation of at least 80% should result. Erickson noted that the two tones are in phase approximately every 10ms during the 20-25 second EBS tone duration. This should produce at least 2,000 occurrences in which the two tones are in phase and a peak modulation of 80% results, regardless of the initial phase relationship between the two tones. See Figure 1.

Erickson concluded that, because of the large number of peaks in the 20-25 second tone period, the peak flasher of a monitor should indicate at least 80% modulation when an EBS test is transmitted. For the peak flasher circuit to activate, its variable adjustment control, usually located on the monitor front panel, must be moved to 80% modulation instead of the normal 100% setting.

The effect of audio processing

The study assumed an unprocessed environment. Erickson pointed out that a “processed” single EBS tone may be able to achieve 40% modulation. However, both tones in combination will modulate the transmitter substantially less than 80%, due to non-linear effects of downstream audio-processing equipment. Such an outcome may not be acceptable; bypassing audio-processing equipment for EBS test transmissions is preferred. Most EBS equipment provides this “loop-through” wiring capability. However, it may be more difficult to configure a stereo TV station in this manner.

Confusion

Broadcasters have been confused by the way the FCC rule is written, so it may be unsafe to assume that FCC inspectors would understand the requirement. Such was the case during an FCC visit in which the inspector observed a transmitted EBS test on the studio audio monitor. At this station, the feeding of EBS tones through audio-processing equipment restricted modulation to about 65%, in spite of 100% modulation on the audio console.

The inspector’s intent was to observe actual modulation during an EBS test transmission while watching the monitor. Upon seeing the 65% modulation level, he indicated that although he could not remember the exact EBS modulation requirement, the station had modulated sufficiently.

In spite of the confusion, the best evidence is that 80% modulation of the 2-tone EBS test transmission is required of all TV, AM and FM broadcast stations. We can look forward to an eventual FCC clarification of the matter.

Figure 1. Hamnett & Edison graph showing the two tones in phase approximately every 10ms, resulting in a peak modulation of 80%.
Who’s Setting The Pace For FM Transmitter Technology?

When it comes to technological developments in FM transmitters, the record is very clear.

Broadcast Electronics:
First to introduce a Proportional VSWR Foldback System.
First to introduce “PWM Automatic Power Control” with “Soft Start”.
First to offer a built-in synchronous AM test port.
First to design a single tube high power 30KW FM Transmitter.
First to introduce a single tube 10KW FM Transmitter with a 4CX7500A tube.
First to introduce a single tube 35KW FM Transmitter with a 4CX3500A tube.
First to introduce a Microprocessor Video Diagnostic System.
First to offer built-in, PC based, transmitter remote control.
First to offer a standard synchronous FM booster option.
And, Broadcast Electronics again sets the world standard for FM Exciters with the new FX 50 which stands alone in audio performance with 93 dB SIN and 0.03% THD and IMD.

State of the Art Leadership
Stereo technology, only B.E. designs AM, FM and TV stereo generators.
Broadcast Electronics is the only major FM transmitter manufacturer who designs and builds its own solid state intermediate power amplifier (IPA).
All products are backed by B.E.’s 24 hour parts and service and a strict quality assurance program.
The result of this commitment to state-of-the-art innovation is a complete line of RF products, designed to provide you with years of reliable service. Certainly it’s clear who is setting the standards for FM transmitter technology!

Patented Innovations
Broadcast Electronics has the largest and most skilled engineering staff dedicated to the radio broadcast equipment industry. Significant FM transmitter design patents awarded to B.E.:
- Internal Second Harmonic Suppressor, patented 1982.

Circle (7) on Reply Card

www.americanradiohistory.com
RF and the earth connection

By John Battison, P.E.

This is the era of Earth awareness, so this month, it seems appropriate to talk about the "Earth connection." Our European engineering cousins refer to the essential stabilizing connection to ground as earth; North Americans call it ground. Regardless of the name, it is vitally important to radio engineers.

With greater attention being paid to audio quality and hi-fi, it is probable that most engineers think of grounding in connection with audio hum and how to avoid ground loops and crosstalk. We will deal with the audio side later in this series, but for now we will explore the more important side of grounding: RF. Audio, after all, is merely something that messes up a nice clean carrier.

RF grounding
Consider the RF aspect of grounding. All electrical circuits are essentially 2-pole or 2-conductor systems. The familiar dipole or vertical antenna forms one connection; the other connection is the ground system.

The antenna system is connected to the output of the transmitter. The heavy copper strap from the ground system to the ATU and the transmitter form one connection. The coaxial transmission line has a shielded inner conductor and a metallic outer conductor that also is grounded. It connects from the transmitter output connector to the ATU or phaser. These metallic connections, which form the return line to the transmitter, are important.

Most radio engineers are familiar with the problems that arise when conductors actively carrying RF have poor connections, such as RF carrying connections from an ATU to antenna, from transmitter to ATU and similar circuits. Moisture and dirt enter, corrosion of metal oxide forms, and we have a perfect metal (semiconductor) rectifier.

The rectifier acts as a random frequency generator or mixer, similar to a mixer stage in a receiver. Depending on local conditions, unwanted spurious radiations can occur. Sometimes these fall on critical local services, and other times they fall on more distant, but equally critical, services. Whatever the effect, they are illegal and not tolerated by the commission. In higher-power stations, spurious radiation has interfered with aircraft communications services, which has led to violation notices.

Guy-wire radiation
Deteriorated connections external to the transmitting antenna system can begin to cross-rectify and radiate on spurious frequencies. An often-overlooked potential source for such unwanted radiation is the connection to the ground anchor at the bottom of guy wires. Remember, the guys are in close proximity to your radiators. Their lengths should not bear a harmonic relationship to the operating frequency and should be broken up by suitably placed insulators. If these insulators are installed properly, a broken insulator will not result in a guy wire parting, but it will lead to a longer length of guy wire extremely close to your radiator.

When an insulator breaks, it makes two lengths of guy wire into a more or less continuous longer wire. The strain on the guy cable probably will be great enough to allow minimal sag in the guy, and the pull on the wire produces a sort of connection between the two pieces.

An often-overlooked potential source for such unwanted radiation is the connection to the ground anchor at the bottom of guy wires.

This longer piece of wire, however, is imperfect and discontinuous. It has a potential semiconductor rectifier in the middle, at the point where the two loops of guy wire are joined. Proper insulator installation means that when an insulator fails, the two cable ends that passed through the insulator's holes, kept apart by the presence of the insulating material, now loop together to prevent the tower from falling. At this point of guy wire connection, dirt, rain and air pollution will form a perfect semiconductor rectifier where you don't want it — in the middle of a long length of more or less vertical wire.

The power source (antenna) is extremely close. A strong field is induced in the guy, so close that it is in the induction field. Cross-rectification occurs, and you have a perfect source for the elusive interfering spurious signal.

The same thing can occur where the ground anchor and guy wire bottom end come together. A potential random RF generator can form, and the lower guy wire becomes a radiator. The problem is that these random generators do not always operate when you are seeking them. Gently shaking a guy or tower often will start (or stop) radiation.

Discharge resistors
Some antenna installations employ high ohmic resistances across guy insulators to handle guy wire charging. My former station, KAVE-TV in New Mexico, had a 300-foot hilltop tower. On a normal day with a light wind, the insulated guys charged. You could hear, and at night sometimes see, sparks jump across the insulators.

Discharge resistors placed across the insulators would have stopped this occurrence. The antenna was to carry KAVE-AM as well, but this never was implemented. If we had carried AM, the spark discharges surely would have modulated the signal and necessitated such treatment. As it was, I never knew of any such problem on television.

This may seem a far cry from grounding, but it is not. In the science of radio broadcasting, everything ties into the "good old Earth." Its volume is so great that it makes a perfect reference point. Although local conditions vary in terms of resistance or conductivity, it acts as a stabilizing reference for our signals. It would be interesting to take a 1/4-wave vertical broadcast antenna into space on a rocket and make some measurements under true free space conditions to see what happens to the image antenna and how it would operate without an Earth.

Next month, we'll examine RF in the studio and audio circuits.
Let's compare automated audio test equipment capabilities:

<table>
<thead>
<tr>
<th>FUNCTIONS/ MODES AVAILABLE</th>
<th>AUDIO PRECISION SYSTEM ONE</th>
<th>H-P 8903B</th>
<th>S-T 3000B</th>
<th>TEK AA5001/SG5010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wideband amplitude</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Selective amplitude</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Dual input/output</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Simultaneous 2-channel ampl. meas.</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Real time ratio/crosstalk meas.</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>THD + N</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>SMPTE IMD</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>CCIF IMD</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Transient IMD</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Wow &amp; flutter</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Phase measurement</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Frequency measurement</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Squarewave</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Sine burst</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Pink/white/USASI noise</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

PRICES (U.S. DOMESTIC)

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer-interfaceable instrument</td>
<td>$7350-$10350&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Software package included</td>
<td>$600-$3000&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Typical controller</td>
<td>none available</td>
</tr>
<tr>
<td>$5000&lt;sup&gt;3&lt;/sup&gt;</td>
<td>none available</td>
</tr>
<tr>
<td>$1000-$3400&lt;sup&gt;4&lt;/sup&gt;</td>
<td>none available</td>
</tr>
</tbody>
</table>

<sup>1</sup> DSP spectrum analyzer/waveform capture option also available starting at $3500.

<sup>2</sup> Personal computer, interface card included in instrument price.

<sup>3</sup> H-P Model 330/MMA IEEE-488 compatible.

<sup>4</sup> Personal computer plus IEEE-488 interface card.


For a much more complete comparison of these and other audio test systems, call or write Audio Precision.

System One

Audio precision

P.O. Box 2209, Beaverton, OR 97075
503/627-0832  1-800/231-7350
FAX: 503/641-8906, TELEX: 283957 AUDIO UR

Circle (8) on Reply Card
Future directions of society debated

By Bob Van Buhler

The SBE board of directors met March 30 to consider several topics, with much of the discussion spent on the upcoming and subsequent SBE national conventions. President Brad Dick, vice president Richard Farquhar, secretary Paul Lentz and treasurer William Harris were present. Directors who attended the meetings were William Hineman, Dane Erickson, Steve Brown, Phil Aaland, Edward Roos, Paul Montoya, Charles Kelly, Tom Weems and Robert Goza. Directors Jeff Baker and Joseph Manning were absent.

The board discussed the upcoming SBE national convention and its future locations. An array of options for growth is under consideration, including coastal locations and areas with heavy concentrations of broadcast engineers.

An outside consultant was commissioned to examine the way SBE operates at the national level and to provide recommendations for improving procedures and practices. In the executive session, the confidential report was presented to the board as a committee of the whole. The report was adopted by a vote of the board, and the implementation of its recommendations was approved by a substantial margin of 10–2 on a roll call vote. (The official voting record is shown in Table 1.)

Membership directory

All SBE members should have received their membership directory. Credit for its publication goes mainly to board members Tom Weems, Dane Erickson and Phil Aaland, who urged its timely release and initiated the process. The original cost was estimated at $18,000, considered by many directors to be a quid pro quo for the members in exchange for the last dues increase. Final cost was $16,553, including publication, assembly and mailing. This was offset by advertising sales of $7,753. With a little more work and time, additional advertising income could be realized. The project was coordinated by Lentz, who is credited with raising almost half of the directory’s expenses in advertising income.

The membership was polled previously on renting the membership list to generate income for the society, and reaction was favorable. The board voted on renting the list, with the motion carried by 11 to 1.

SBE officials’ voting record

<table>
<thead>
<tr>
<th>Issue</th>
<th>To accept and implement the report of Steve Ingram, certified association executive, regarding professional management for the SBE.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Votes for professional management:</td>
<td>Brad Dick, Richard Farquhar, Paul Lentz, William Harris, Steve Brown, Dane Erickson, Robert Goza, William Hineman, Edward Roos and Tom Weems.</td>
</tr>
<tr>
<td>Absent:</td>
<td>Jeff Baker, Charles Kelly, Joseph Manning.</td>
</tr>
<tr>
<td>Abstentions:</td>
<td>None.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue</th>
<th>To permit rental of the SBE membership mailing list.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Votes for mailing list:</td>
<td>Brad Dick, Richard Farquhar, Paul Lentz, William Harris, Steve Brown, Dane Erickson, Robert Goza, William Hineman, Edward Roos Paul Montoya and Tom Weems.</td>
</tr>
<tr>
<td>Absent:</td>
<td>Jeff Baker, Charles Kelly, Joseph Manning.</td>
</tr>
<tr>
<td>Abstentions:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Table 1. The official voting record. Recent actions are shown in accordance with the policy established by the current SBE president to publish officers and board voting records. The record is made public so members can hold their elected officials accountable for their actions.

Computer update

The society recently named Gerry Dalton manager of information services. He will coordinate computer services and software for the national SBE office. Recent changes include adoption of "Money Counts" accounting software. Helen Pfeifer, SBE executive secretary, reported that the program has simplified her work greatly. In addition, it provides an immediate savings of several thousand dollars from reducing outside accounting costs. Net savings from the new program in the first year will exceed $3,000. The program also allows her to provide a more thorough presentation of the SBE financial position for review by the directors.

The same accounting system was adopted for the national convention. A report generated on the system was distributed to the directors at the board meeting. According to Dick, the system’s installation was a huge task but a necessary management tool. Board member Bob Goza installed the software for both accounts.

SBE officers attend international meetings

Broadcasters from 36 countries were invited by NAB to meet at the Atlanta convention. Fifty representatives assembled to discuss common technical, policy and regulatory issues for NTSC uses. At NAB’s invitation, Farquhar represented SBE. The society will attend the international meeting again next year.

The SBE also hosted a meeting with the engineering organization’s Western hemisphere counterparts from Canada and Mexico. Sergio Rojano Sabah, president of the Mexican engineering association (AMITRA), Sergio Beristain, editor of its official publication, AMITRA, and representatives from Canada, Wayne A. Stacey, Stacey, Lawson Associates and Stephen L. Edwards, Rogers Broadcasting Limited, met with Dick and Farquhar.

Agreement on a variety of telecommunications issues soon developed. The groups decided to further cooperative efforts on certification information, member services, education and training, industry regulation, exchange of member information and correspondence.
Otari's new MX-50. Built around the premise that you can have everything you ever wanted in a two-track tape machine, and still stay within your budget. For example:

**The Transport**
- DC quartz PLL capstan motor with front panel selection of operating speeds (from either a 15/7.5 or 7.5/3.75 ips speed pair).
- Capstan speed variable by ±7% from the front panel, and by ±50% from SMPTE time-code external controllers via an Otari-standard 37-pin connector.
- Optional remote control.

**The Electronics**
- Lighted VU meters with peak-reading LED indicators.
- Transformerless active balanced inputs with XLR-type connectors.
- Optional Voice Editing Module (VEM) for twice normal play speed with normal pitch.

For more information, call your nearest Otari professional audio dealer, or Otari Corporation at (415) 346-5900.
Measuring reactance and suscceptance

By Gerry Kaufhold II

Last month we used a Smith chart and overlay to design an impedance-matching network that also could function as a low-pass filter. The Smith chart sheet was set up to measure series impedances. We laid out the normalized load impedance of $1.44 + j0.3$ and the normalized complex conjugate of the source impedance of $1.0 + j0.1$ on the underlying Smith chart sheet.

We have defined the matching network to be a low-pass filter, which calls for a series inductance and a shunt capacitor. The inductor is a series component, so it will exhibit an inductive reactance. The capacitor is a shunt component and will exhibit a capacitive susceptance. The problem is how to move a point from the load impedance back to the source impedance by adding capacitive susceptance and inductive reactance components.

**Determining the capacitive susceptance**

The curves and scales of the Smith chart

Kaufhold is a market development engineer for SGS-Thomson Microelectronics, Phoenix.

Overlay are used to determine the amount of capacitive susceptance that must be added to the load impedance to transform it to the desired source impedance.

Starting at the load impedance, trace along the overlay going clockwise (down), following the curvature of the overlay constant resistance circles. The traced line crosses the horizontal resistance component line on the overlay.

Note that the crossing point is approximately 0.68. Divide this value by two to get 0.34. The resistance point 0.34 marked on the overlay will be the center point for the constant susceptance curve. See Figure 1, step A.

Place the pivot point of the compass at 0.34, as measured on the overlay scales. Place the pencil point of the compass on the load impedance point. Trace a bold line rotating the compass downward in a clockwise direction. Trace about one-quarter of a circle. This bold line represents a change in capacitive susceptance value measured downward from the load impedance point.

**Determining the inductive reactance**

Series inductive reactance is measured using the curves and scales of the underlying Smith chart. The source impedance is 1.0. (See right above prime center on the 1.0 resistance component curve.) Plot the inductive reactance change by tracing counterclockwise down along the 1.0 constant resistance curve. See Figure 1, step B. Work precisely.

This inductive reactance change intersects the capacitive susceptance change at R = 1.0, XR = −j0.5, as read from the scale of the underlying Smith chart. See Figure 1, step C.

**Obtaining the susceptance/reactance values**

Two curves have been drawn that intersect each other. The first curve (capacitive susceptance component) follows the curves and markings of the Smith chart overlay, and the second curve (inductive reactance component) follows the curves and markings of the underlying Smith chart sheet. To obtain the value of the capacitive susceptance that must be added to the load impedance, count the number of divisions that were traced on the susceptance curve. See Figure 1, step D. Counting begins with divisions starting at 0.14, through 0.0 and up to 0.48. The total susceptance change of this curve is 0.62.

Recall that capacitive susceptance measured in the downward direction on the Smith chart overlay is positive, because the overlay is rotated 180° compared to the underlying Smith chart sheet.

To obtain the value of series inductive reactance to be added, count divisions up from this intersection point to +j0.1. See Figure 1, step E. The total inductive reactance change is +j0.6.

To solve the problem in its normalized form, begin with load impedance of 1.44 +j0.3, add +j0.62 mhos of shunt capacitive susceptance, then add +j0.62 mhos of inductive reactance. This should result in the source impedance of 1.0 +j0.1.

Next month, we will convert the normalized values to obtain values that can be realized with off-the-shelf components.
HE SAID, “You can write almost anything you want about this machine and put my name under it.” SO WE DID.

Dan McCoy was the first production director in radio to use the DSE 7000, and he saw it revolutionize the way production is done at WZOU-FM, one of the top stations in Boston. A spot that used to take an hour to produce now takes 20 minutes. Without tape. Without razors. Without a single dB of generation loss. Even agency dubs now go right to the DSE for levels, sound enhancement and tags: then onto carts. Creativity has exploded, too. With the DSE’s instant UNDO feature, the fear of trying new things is gone. You simply try another take, assemble a different edit, or test a new effect. If you don’t like the results, UNDO it instantly. No wonder WZOU has designed their production facility around the DSE.

And no wonder Dan McCoy calls this machine “the most impressive thing that’s ever happened to radio.” His words, not ours.

DSE 7000 • THE NEW SPEED OF SOUND
Reviewing video basics

By Mark Everett

An effective troubleshooter relies on three skills in particular. The first skill is a knowledge of basic electronics. Circuit theory is the foundation for identifying problems and repairing equipment correctly. Another skill is an understanding of the various systems that comprise a piece of equipment. Each system performs a function or group of functions for the device. You have to understand how the systems work and how they work together.

A competent troubleshooter also knows how to use test equipment. You must know what device to use and how to interpret the displayed information.

The next series of columns in "Troubleshooting" will examine the basics of video maintenance. We'll review some of the basic terms, waveforms and test equipment used in a modern studio. If you're an experienced troubleshooter, you already may know many of these terms and techniques. However, review can be helpful.

If you're new to the business of video, this review series will allow you to improve quickly your video knowledge. In today's market, the more skills you have, the more valuable you are to the company.

Basic terms

Let's begin by defining some basic terms. They will be used in the following discussions, so be sure you understand what they mean.

Black: Sometimes called color black or blackburst. It's a composite color video signal containing composite sync, reference burst and a black video signal, usually at a level of 7.5IRE (0.05V) above blanking level.

Blanking: Also called composite blanking, it is related to composite sync. The signal has horizontal and vertical components and is at its negative level whenever video is to be blanked or turned off. The video must be blanked when the scanning beam returns from the right side of a monitor (as you face it) to the left side. This prevents the retrace line from being dis-

played on the screen.

Burst flag: This is a short duration pulse related to horizontal drive, usually nine cycles of burst long. The pulse cuts a hole in the composite video signal and allows the insertion of reference subcarrier into that hole. The burst flag pulse occurs 3μs after the end of horizontal sync.

Color field identification pulse (CFID): This pulse is used to identify field 1 of 4 in a composite color video system and is employed with any full bandwidth editing system.

Equalizing pulses: These pulses are found in the vertical interval. They were used to help transmitters get ready for and recover from the electrically difficult process of sending vertical sync, the most energy-consuming part of the transmitted signal. The equalizing pulses form the distinctive "hammer head" seen in the pulse cross mode.

Gen-lock: A process of sync generator locking, usually performed by introduction of a composite video signal from a master source to the subject sync generator. The generator to be locked has circuits to isolate vertical drive, horizontal drive and subcarrier. The process locks the subject sync generator to the master subcarrier, horizontal and vertical drives, resulting in sync generators running at the same frequency and phase.

Horizontal sync: This signal is derived by dividing the subcarrier by 227.5 and doing some pulse shaping. Monitors and cameras use the signal to determine the start of each horizontal line.

SC/phase: SC/H phase becomes a worry when using systems that produce pictures that might be recorded on direct, full-bandwidth video recorders. SC/H phase is the adjusting of subcarrier to horizontal phase. It must be accomplished for every sync generator in the chain of picture generation in the system. The proper SC/H phase is accomplished when the subcarrier sine wave is at a zero crossing and going toward positive at the same moment that the leading, or negative going, edge of horizontal sync at line 10 field 1 is at its halfway point.

Subcarrier: This is the basic signal of all NTSC sync signals. It is a continuous sine wave, usually generated and distributed at 2V in amplitude and having a frequency of 3.579545. All other synchronizing signals are directly divided down from subcarrier.

Sync: Properly called composite sync, this signal is derived from a composite or combination of horizontal and vertical syncs, along with equalizing pulses. It is one of the more popular signals used in video systems today and usually is accompanied by subcarrier.

Vertical sync: Also known as field sync. This timing signal is derived by dividing horizontal sync time by 262.5; it produces a frequency of 59.94 or approximately 60Hz. This is the vertical reset signal used by monitors and capstan servos in VTRs.

Figure 1. Basic video signal. Waveform monitors can display this signal in several ways. Each is useful in troubleshooting and aligning video systems.
The Standard By Which All S-VHS Should Be Measured

PROFESSIONAL S is more than a trade name — it’s a tough JVC standard that only the most sophisticated S-VHS products can meet. PROFESSIONAL S products must have VITC time code capability, balanced audio and superior picture quality through multiple generations. All JVC 11 Series products meet the PROFESSIONAL S standard. For further information call 1-800-JVC-5825 or write JVC PROFESSIONAL PRODUCTS COMPANY, 41 Slater Drive, Elmwood Park, NJ 07407.
Management
for engineers

Finances and today’s engineer

By Brad Dick, editor

We examined the different types of financial records kept in a broadcast station in last month’s column. Those records represent the financial picture of a station’s daily operations. They also provide historical records of a station’s performance that form the basis for developing budgets, and are the key to a station’s financial success.

Why have a budget?

What is a budget? Many consider budgets as a financial straitjacket, but they provide guidance for allocating a station’s resources. A good definition for budget might be a written expression, in statistical and financial terms, of an organization’s goals.

A station budget represents the intents and objectives of station management. A well-developed budget also provides the necessary vehicle to monitor the implementation of the plans, allowing managers to track how well departments adhere to the overall station goals.

Allocating money to a particular department, however, is not enough to ensure success. If the station wants to increase its visibility within a community, allowing the promotions department to spend money on new carpet and office furnishings probably is not a wise use of resources. Although additional resources were allocated to the correct department, they were managed improperly. The budget can help in this case, because it provides feedback on department activities as they relate to achieving the station’s overall plans.

At many stations, an individual’s performance is based on financial performance. One component of performance is adherence to a budget, or staying within expenses. With sales, however, exceeding budget is a desired feat.

Advantages of budgeting

Budgets usually are viewed with disdain. No one likes preparing them; even worse is having to live within a budget after it’s developed. This is especially true if you had little say in its formulation. However, budgets have four primary advantages:

1. Budgets help direct a station’s capital to the most profitable centers within a company. Because engineering is not seen as a profit center in some stations, resources are difficult to obtain. We’ll learn some techniques to help remedy this situation in a future column.

Allocating a station’s resources to the most profitable areas is effective management. If the news department is producing more revenue than the morning drive-time DJ, then it’s important to support the news department. Reallocating resources to other areas, especially if it impacts negatively upon the news department, could be unwise. A financial manager can make the proper choice only with a budget and careful analysis of income vs. expenses.

2. Budgets provide a disciplined approach to problem solving. Suppose a time/revenue analysis of the news department example shows that 70% of the news department’s income comes from the morning show. Knowing this fact might allow the manager to target expenses for control during other times of the day or week. Providing a 3-person news staff on weekends or evenings may be an inefficient use of money; it’s only through budgetary analysis techniques that such information comes to light. We’ll learn how to analyze the effectiveness of some of your projects later.

3. Budgets provide a benchmark for measuring performance. Measuring performance is crucial to personal and business success, and budgets are the key. Setting a goal of $1 million in sales may be foolish if last year’s billings were $100,000. If a salesperson’s goal is set at $100,000 and he/she consistently bills $200,000, however, the performance objective needs an adjustment. Budgets allow accurate goals to be set.

4. Budgets send a clear signal to the entire staff that the company knows the importance of making a profit and controlling costs. When coupled with appropriate rewards, budgets encourage department heads to maximize performance and minimize expenses.

Disadvantages of budgeting

Budgets are not an exact science. Developing and using them requires much common sense and judgment, which can be a problem for stations. The process of allocating station resources tends to create competition between departments. When a limited amount of funds is available, everyone prepares to battle for that last dollar. This competition must be monitored carefully by the manager.

Because budgeting is imprecise, it takes time to do an effective job. Therefore, the first time a budget is developed, problems are certain to follow. The next year the budget is assembled, the previous financial history is available to help make decisions. Allow for fine-tuning time.

Managers should not let a budget restrict a station’s operation, because opportunities will arise that should be seized. Don’t continue committing funds to an area where they aren’t needed. Likewise, don’t be afraid to reallocate funds if opportunities or problems develop.

In one case, with three months left in the fiscal year, the station manager refused to reallocate money from the programming department’s budget to the engineering department’s budget. A format change halfway through the year had required a 50% increase in remote broadcasts. The increased out-of-studio operation depleted technical funds. Faced with no resources, the director of engineering asked for additional money and was refused. At that point, equipment was not repaired when it failed. By the time the crisis ended, four of the 12 tape machines were out of service. The programming department was forced to pay overtime to staff members as they worked after hours on the remaining machines. This is a real-life example of what can happen when budgets are cast in concrete and management refuses to apply common sense.

Next month, we’ll consider the five different types of budgets: operating budget, cash budget, capital budget, balance sheet budget and master budget.
NEW FROM ARRAKIS SYSTEMS
10,000 SERIES

For features, performance, price and reliability,
NOBODY BUILDS CONSOLES LIKE ARRAKIS.

Call (303) 224-2248

Circle (13) on Reply Card
NAB Convention replay

Broadcasters searching for good news found it on the exhibit floor, with more "real" products and increased sales than ever before.

More than 50,000 NAB convention attendees converged on Atlanta on March 31, looking for answers to the important issues facing the broadcast industry. Where is HDTV going? Can anything be done to save AM? Will relief in the form of "if carry/must pay" or other cable regulations be forthcoming?

Although the questions were obvious, finding the answers was much more difficult. Broadcasters didn't find many sympathetic ears in Congress or with the commission. Two of the most talked about TV issues, "if carry/must pay" and cable regulation, were widely discussed, with hints that the industry better not count on support for either position.

Broadcasters searching for good news found it on the exhibit floor. For the first time in several years, the products shown at the exhibit, for the most part, were real (not vaporware) and available for purchase. Judging from the smiles of the exhibitors, many of those products will soon be winging their way to stations. Sales at this year's show were reported to be better than any year in recent history. That's good news for all of us.

This month's coverage looks in detail at the legal and engineering concerns facing the industry. The engineering sessions also will be covered. The BE annual "Pick hits" highlights the 20 most exciting TV and radio products our experts spotted at the show. Our coverage of the 1990 NAB extravaganza concludes with a complete listing of new products shown at the convention.

It is not possible to see and attend to everything at the NAB convention— it's just too big. Now is your chance to read about what you might have missed in Atlanta. And, if you missed the show because you were home tending to business, that's even more reason to follow the action in BE.

- "Perspective on the Convention" ............... page 26
- "NAB Engineering Conference Report" ........... 32
- "Pick Hits of NAB '90" ............... 48
- "Show of Shows" .................. 68

Brad Dick,
editor
If you're looking to image in field pro
we suggest you lose a
When we set out to produce the best image acquisition tool for field production, we knew the competition would be heavy. Which is exactly why the Sony BVW-400 comes out on top.

No other imaging device puts such extraordinary performance into such a compact, lightweight camcorder.

The BVW-400 Betacam SP camcorder is engineered with Sony’s most advanced CCD sensor technology—the Hald Accumulated Diode (HAD) 768 FIT chip. So you can shoot video with 700 lines of resolution. With virtually no vertical smear.

At the same time, the BVW-400 weighs only 15 lbs. It’s just 15 inches long. And its low profile offers an unobstructed peripheral view.

There’s also an optional adapter for simultaneous Betacam SP recording on an external VTR.

All this performance in such an easy-to-handle package will give you a degree of creative flexibility that you’ve never had before.

Of course, when you consider Sony is the originator of one-piece technology, a camcorder this good should come as no surprise.

For more information about the BVW-400, call 1-800-635-SONY.

After all, while a camcorder should be designed to weigh as little as possible, its performance should never be taken lightly.
Perspective on the convention

By Brad Dick, editor

Southern hospitality did not make up for the maze of confusion called the exhibit hall.

Atlanta became home to 50,000 broadcasters and 5,000 Dead Heads (fans of the rock group Grateful Dead) as the industry gathered for the yearly NAB convention. It wasn’t hard to tell the two groups apart. It was like traveling back 25 years ago to the mid-60s; for two days, the hippies were everywhere.

The Dead Heads were in Atlanta to attend the Grateful Dead concerts, held for two nights in the nearby Omni. It was reassuring to board the shuttle bus and see police equipped with flak jackets and armed with shotguns standing nearby. The high point was a drug bust, which took place next to my bus on the second day. Wow — weapons, drugs and police helicopters hovering above — just like on television.

Excluding the arrival of the Dead Heads, southern hospitality was the one advantage to holding the event in Atlanta. In the many years of conventions that I’ve covered, I’ve never been to a city where the local residents were more hospitable. You expect to be treated rudely in Las Vegas and New York, but not in Atlanta. When you tipped, they acted as if they appreciated it. From hotel doormen to restaurant waitresses, every local person I encountered was pleasant and friendly. I’m going to miss that part of the show next year.

Attendees, for the most part, seemed pleased with just about everything except the exhibit hall. To say the Georgia World Congress Center was confusing is an understatement. Because the NAB convention requires so much room, exhibits were divided into seven different areas spread among three different floors and two outside areas. The walk between the two primary halls must have been at least a block, only if you knew about the shortcut. Some of us didn’t discover the shortcut until the last day.

No matter where you were, the meeting room or the exhibit hall you wanted was either on a different floor or in a different hall, or both. The layout was so confusing that even a scout with a compass and map couldn’t find the way around the exhibit hall.

What’s new?

“What’s new?” is the first question asked at every convention. Although many new concepts were on display, much of the hardware represented improvements on ideas and products used today. (For a complete listing of the new products shown at NAB, see “Show of Shows,” which begins on page 68.)

From a buyer’s standpoint, seeing second-generation or improvements on existing technology reinforces the idea that the products are real and destined to be around for a while.

Trusted technology

Broadcasters caught between rapidly changing technology and back-breaking debt are hesitant to purchase equipment that may be obsolete in a short time. Those with whom I spoke emphasized three things when making purchases: cost-benefit, reliability and non-obsolescence. Broadcasters were looking for (and buying) trusted technology.

Purchases are no longer being made simply for the sake of technology. Engineers look for products that make financial sense. Today, that means looking for items that will perform in tomorrow’s undefined technological arena. Will today’s $100,000 camera be adequate when the station begins passing a network HDTV signal? Will the switcher need replacement in 1993 when the FCC selects an HDTV standard? There are no easy answers to these kinds of questions.

Broadcasters face the competition

The main issue for TV broadcasters centered on competing technologies. Cable is breathing down our necks, DBS signals are falling from the sky (literally), and HDTV looms on the horizon. If those factors are not enough to give managers headaches, don’t forget that telco also wants a piece of the action.

In the session “Advanced Television: Tuning into the Future,” one of a TV broadcaster’s worst dreams was voiced by Aubie Grant, University of Texas. His research into the organization and software factors related to HDTV indicates that broadcasters won’t be the first to use the technology. Grant said, “Indeed, there is a race on, that cable has the lead in the race because the software they’re currently using requires less replacement equipment. If HBO wanted to tomorrow, they could start transmitting a (HDTV) signal and leave broadcasters way behind.” Gulp!

The costs of HDTV

The cost of providing HDTV service has scared many broadcasters. With figures as high as $40 million being mentioned, many broadcasters are wary about implementing HDTV. Cable may have the advantage here, too. In response to an audience question, the panel said that reports show it may be possible for cable systems to pass the new signals with minimal expense. Head-end changes, perhaps some line amplifier improvements and
Sometimes you get further ahead by not re-inventing the wheel. For proof, take a look at our high-efficiency UM Series UHF transmitters. Their evolutionary MSDC klystrons can cut your power costs in half. Without compromising 24-hour-a-day, 365-day-per-year reliability.

MSDC klystrons build on proven familiar technology to give you advantages no other high-efficiency power amplifier can offer. They don’t need crowbar protection. They don’t compel your technical staff to undergo lengthy and expensive retraining. They won’t restrict you to a single source, either—MSDC klystrons are available from Philips, EEV and Varian.

Harris UM Series transmitters lead the industry in serviceability as well. Exciters and IPAs are easily accessible from the front of the transmitter. Cooling system filter replacement and most other routine maintenance operations can be performed without taking the transmitter off the air or reducing power.

Bold thinking and common sense solutions: You’ll find ample evidence of both in our new 60, 120, 180, and 240 kW UM Series UHF transmitters. That’s why so many UHF stations are choosing Harris as their manufacturer. If you’d like to cut power costs without giving up dependability, call (217) 222-8200, Extension 3408 for more information on Harris UM Series UHF transmitters. (Outside the continental US, phone (217) 222-8290 or telefax (217) 224-2764.)

© 1990 Harris Corporation

Circle (12) on Reply Card
www.americanradiohistory.com
new decoders, might be all that’s needed. If so, the conversion costs for cable would be far less than for broadcasters.

In addition to the equipment costs, there may be other penalties for broadcasting an HDTV signal. According to Stewart, one hidden cost of potential HDTV service may be reduced service areas. In response to a question about the possibility of reduced service areas if a simulcast system were adopted, he said, “You can’t have the best of both worlds. If you want a simulcast system, if you want to make it available to all broadcasters, or as many as possible, the capability of having HDTV, then you have to make some cuts and compromises. As a result, yes, if we did shorten the co-channel separation requirements, it might result in the shrinkage of service area.”

Despite the costs, broadcasters will eventually have to adopt the technology. Speaking before the engineering luncheon, Peter McCloskey, president of the Electronics Industries Association, and Al Sikes, FCC chairman, echoed the need for broadcasters to incorporate HDTV technology and to begin planning now. McCloskey said, “The danger for broadcasters is that a failure to plan and adjust to these events may result in a steepened erosion of viewing audience to other media. In short, broadcasters must embrace HDTV or risk the AM-ization of the local TV broadcaster.”

Stewart said that the FCC had decided to look at simulcast HDTV systems rather than an augmentation HDTV system. He said this would be a more efficient use of spectrum.

It was a disappointment to some that the FCC will not establish an EDTV standard before HDTV is examined. Although the commission will entertain EDTV experiments, the focus will be on simulcast, said Stewart. No EDTV system will be selected until the simulcast system has been selected. Whether an HDTV system will prove acceptable depends, according to the panelists, on technology and costs. Implementing an HDTV system could be so cost-prohibitive that the consumer or broadcaster or both would benefit from implementing an EDTV system first. While broadcast systems should be happy with the FCC’s decision to emphasize a simulcast system, if HDTV could not be effectively implemented with the available spectrum, then EDTV could be a safety net.

**HDTV schedule**

The commission has announced an HDTV test schedule that involves several phases. Tests will begin this fall. Eight systems are being considered for the testing, which will continue through 1991. The testing will take at least one year. In addition to the laboratory tests, field tests also must be completed, which are crucial to simulating actual conditions. It’s here that the possible effects from NTSC-NTSC, EDTV-NTSC, EDTV-HDTV interference will become most critical.

All tests are scheduled to be completed by Sept. 30, 1992. After the tests are completed, the advisory committee can select either a single proponent or a combination of features. In that case, the best features of more than one system might be combined and offered as the most desirable system. The final decision is to be announced in the spring of 1993. Stewart said that the amount of lead time was on the side of broadcasters. Stations should think about what steps need to be taken to implement a system.

That is going to be difficult for broadcasters, because the exact HDTV parameters are not known. It’s not certain what equipment can be bought today that will be useful with an undecided HDTV system.

Several potential improvements to the current NTSC system were showed on the exhibit floor. Improvements to the current NTSC system could be introduced to the market before the FCC’s setting of a standard, but that becomes less likely as we move toward spring 1993.

The panel maintained that enhanced TV proponents are “not out of the game.” Consumer acceptance and cost are crucial to the ultimate decision. The concept of simulcast is that HDTV can be done in 6MHz, however, it still needs to be proved that all (HDTV) information can be squeezed into 6MHz.

**FCC Q&A**

The FCC Q&A session generated heated responses and denials on several fronts. Mass Media Bureau chief Roy Stewart opened the session and reviewed his concerns about proposed rule changes and areas he saw as important. He discussed many of his department’s responsibilities, showing an overall improvement in his department’s responsiveness. However, his department was not viewed with great favor by the FAA.

One issue dealt with the FAA’s holding broadcast licenses hostage. Stewart said he “found that there was a serious problem between the FCC and the FAA in terms of FAA clearances, not just for obstruction basis, but electromagnetic interference grounds.” He said that several meetings were taking place and that he was devoted to resolving the problems. He pledged to continue working toward some resolution with the FAA.

That didn’t seem to satisfy the audience. One questioner said his application had been held up for almost a year because of FAA action. He said that he received little help from the FCC and that he was told to call the FAA. The FAA was unresponsive, and apparently the FCC did little to help. This point of view echoed others interviewed at the convention.

Stewart supported the FAA’s position, saying, “They are responsible for air safety in this country. Although we’re the licensing authority for broadcast, they have a separate responsibility, which is equally important. I’m not sure that we (the FCC) can tell the FAA that they have 30 days (to approve an application).”

He said that if he ever told the FAA they had 30 days to approve an application, the FAA would simply reject the application immediately.

The FAA is currently working on an airspace model. Once the model (which will tell broadcasters whether an interference problem may exist) is completed, the process should be smoother. Engineers were

---

**Traffic was excellent on Saturday, according to exhibitors. Overall attendance was down, but exhibitors said sales were good.**

**HDTV: Simulcast in, augmentation out?**

Many questions were raised about the commission’s recent actions on HDTV. The schedule and decision not to study an enhanced TV system created some controversy.
If Your Only Excuse For Not Buying An ITC Cart Machine Has Been Money, You Just Ran Out Of Excuses.

Introducing the Series 1 cart machine from ITC. As the world's leading cart machine manufacturer, we understand how to make a superior cart machine. And the new Series 1 cart machine is superior.

Equally as important, we realize each station has a different need and a different budget. That's why we designed the new Series 1 with all the features you need at a realistic price.

Pound the buttons. Flip the switches, jam a cart in and yank it out a few hundred thousand times. We've built the new Series 1 to take anything you can dish out, 24 hours a day, 365 days a year. So before you mortgage your program director or settle for something of less value than ITC, check out the new Series 1 today.

You won't need an excuse to buy one.

For more information contact:

ALLIED BROADCAST EQUIPMENT 1-800-622-0022
AUDIO BROADCAST GROUP INC 1-800-999-9281
BROADCAST SERVICES COMPANY 1-800-525-1037
BROADCAST SUPPLY WEST 1-800-426-8434

IN CANADA CONTACT
MARUNO ELECTRONICS LTD
416-255-9108

International Tapetronics Corporation...The World Leader in Cartridge Machines

www.americanradiohistory.com
warned that after the airspace model is adopted, it will be a go/no-go situation. If the model says the proposed installation will create interference, the license application will be rejected. Stewart and Bill Hassinger, FCC assistant bureau chief for engineering, said that meetings with the FAA were continuing and that little can be done outside of these discussions.

Spectrum cops

Stewart warned engineers that the current commission was interested in enforcing the rules. The question arose when an engineer asked why the FCC was not enforcing what he believed were obvious rule violations. Stewart’s response was that all complaints must be documented with reliable proof and documentation. Telephone calls to the commission about potential violations are not enough. Written complaints are the proper avenue for voicing a concern, he said.

There seems to be considerable controversy about FM modulation levels. Challenging the Mass Media Bureau and Field Operations Bureau to get their acts together, consulting engineer Dane Erickson said there was confusion on exactly how to measure FM peak modulation. He indicated that an FM modulation monitor manufacturer and the Field Operations Bureau were using different methods to measure peak modulation. The result is that engineers don’t know which method is correct. Erickson urged cooperation between the Mass Media Bureau, the Field Operations Bureau and equipment manufacturers so that FM station engineers know what method is acceptable.

Hassinger said discussions were taking place between the Field Operations Bureau and the FCC office of engineering to define the correct measurement procedure. He admitted the problem existed, but offered no short-term solution. Atlanta field office inspector Angelo Ditty, said his office was still enforcing modulation levels with a wideband discriminator and oscilloscope.

When it comes to rule compliance, engineers were encouraged to protect themselves with written records. Ditty said that engineers are responsible for ensuring that their stations operate correctly. “Be sure the station’s personnel are complying with your instructions,” he said. “Written records are important in justifying your efforts to keep the station operating legally.”

Speaking for other field engineers, he said, “It takes a lot of work on my part (to issue fines). Believe me, that money we collect goes to the treasury. The FCC doesn’t see it. So if you make my life easier, you’ll make my life a lot happier.”

Engineers should pay close attention to this warning. Based on the panel’s comments, stations had better take notice that the spectrum cops are out.

Next year

By the time NAB meets in Las Vegas next year, many of the concerns raised in Atlanta will be better defined. We’ll know how the industry greeted the FCC’s recent proposal to rejuvenate the AM band. Perhaps the band will be headed toward recovery.

For TV broadcasters, the year will be spent wondering about HDTV and cable. By next April, almost one year of HDTV testing will have taken place. Although the final decision will still be more than a year away, expect several proponents to have dropped by the wayside. By then, the now-fuzzy HDTV picture should become much clearer.

Until we meet again, engineers should remember: Don’t look now, but that sound behind you is new technology — and it’s gaining.

---

The engineers who know RF best already know us very well.

If you’re looking for superior rigid coaxial transmission line and RF components, your transmitter or tower might be a good place to start. Take a look around — you’ll probably find the bright blue Myat logo. TV and radio RF engineers at Harris, Acrodyne, QEI, Micro Communications, and Broadcast Electronics all routinely specify our products. And so do the antenna experts at Jampro and the engineers for the Navy’s top airborne radar system.

All of these manufacturers demand long life and superior efficiency. They expect the highest quality materials, the toughest construction techniques, plus the most effective expansion compensation designs. And, like you, they have budgets and schedules to meet. All of them demand Myat, because they know Myat delivers.

Next time you need rigid transmission line or RF components, call your favorite RF equipment distributor or phone us direct at (201) 767-5380. For quality, durability, value and service, Myat is the name to know.

MYAT, INC. • 380 CHESTNUT ST. • P.O. BOX 425 • NORWOOD, NJ 07648
TELEPHONE: (201) 767-5380 • FAX: (201) 767-4147
"There was an extraordinary improvement in reception, particularly with rabbit ear antennas, when we switched to the Alan Dick Circularly Polarized antenna."

"WHAT LDL DELIVERED, MONEY CAN'T BUY."

"I was very impressed with the way they engineered the Lambda antenna as well as with the depth of their qualified engineering expertise."

"The Lambda replaces a Batwing without increasing tower load. This is a key point since modification to provide for additional loads can cost more than the entire antenna project."

"After our Lambda antenna went on the air, NBC purchased a Lambda for their owned and operated station, WRC-TV in Washington, DC."

"LDL GAVE US A COMPLETE PACKAGE WITH OUR LAMBDA ANTENNA. THEY PROVIDED A TURNKEY SYSTEM AND DID IT WELL."

Need we say more about CP antennas?

Floyd Kinard, Director of Engineering, says it all when he talks about their Lambda project at WLBT-TV, Channel 3, the NBC affiliate in Jackson, Mississippi. All we'd like to add is that the Alan Dick Lambda CP Antenna is designed to replace your super turnstile without increasing wind load.

LDL COMMUNICATIONS, INC.
A MEMBER OF THE LeBLANC COMMUNICATIONS GROUP

14440 Cherry Lane Court, Laurel, MD 20707
Telephone: (301) 498-2200, Fax: (301) 498-7952.
This year, the attendees at the 1990 NAB Engineering Conference were treated to sessions filled with practical information. This has not always been the case. The papers dealt more with the bottom line in broadcast technology and how to obtain positive results. This was good news, because when you pay $1,000 to attend a convention, you need to see a return on your investment.

Plenty of new technology was discussed at the conference. In most cases, it represented ideas and products that are or would be available soon. From a working engineer's perspective, that's what we want to hear. Technology that's 10 years down the road is great to know about, but right now stations are trying to make it through their next newscast.

**TV engineering sessions:**

The major theme for TV engineers could have been *HDTV: Myth or monster?* Broadcast engineers and managers don't understand how the technology will affect their stations. The predicted high costs are making the risk extremely great. Before any station ventures into the HDTV arena, a lot of questions need to be answered. Fortunately, the FCC and the industry appear to be developing some of those needed answers.

**HDTV cost update**

The cost to implement HDTV continues to preoccupy broadcasters. It's one thing to realize the technology is coming; it's quite another to attach actual costs to implementation.

Last year, Robert Ross, KYW-TV, Philadelphia PA, sent broadcasters running for cover with his cost estimates to implement HDTV. This year, he provided an update on those sky-high figures. Fortunately, the costs have tempered a bit. Although little additional information has become available, one thing hasn't changed: bandwidth = cost. This means that HDTV is going to cost money — in many cases, a lot of money.

In January 1989, there were 17 proposed systems from 14 vendors. By September, the number had dropped to nine systems from seven vendors. Ross claimed that the only current format available for HDTV is the 1125/60 system. Production equipment is available. Unfortunately, "if the FCC picks a transmission system that uses other than 1125/60, it will create a double-conversion system," he said.

Ross thinks that when the FCC chooses a transmission standard the commission will, by default, also be choosing a production standard. The cost estimates in his report are based on the scenario where the transmission and production standards are the same.

**Logistical concerns**

Several general issues concern ATV. Here are some important matters that the broadcast and production engineer need to keep in mind when considering how much it might cost to convert to an advanced TV standard.

Something as small as adding ATV-capable monitors should be considered. The cost of an ATV set will be approximately $3,000. How many sets would your station need to provide? Although not every monitor needs to be ATV-compatible, advanced TV systems will require a new monitor at every location that needs to view the wide-aspect ratio. Ross noted that his station had more than 75 color television. Converting each of them to ATV represents a hidden, but significant, cost.

Today, the only in-plant cabling system for implementing full HDTV is separate cables for red, blue and green signals. This means HDTV will triple the number of wideband DAs, will require three routing levels and will require three times the number of input and output connections for each input and output termination. Don't forget to add the equipment to handle up to four channels of audio.

Ross reviewed why he thought that the typical ATV broadcast studio would need several types of format converters. Library material would have to be converted to the production format. Satellite and microwave signals would require similar treatment. Even the ENG operations would require converters. Figure 1 shows some of the locations and the number of converters that might be needed in a station.

Control-room monitoring also requires careful consideration. The new wide-aspect monitors will not fit in a standard 19-inch rack. For producers and directors to see the new wide-aspect screens in the proper size, 30- to 40-inch-wide racks will be required. The wider racks also will require larger control rooms. Once you've planned for this additional equipment, don't forget to add extra power and air-conditioning capability.

**What's the cost?**

Ross divided the expense of converting to HDTV into cost categories, based on the various component systems. They are grouped into five categories, which represent a major increase in the implementation cost.

Group 1 represents today's NTSC signal. A Group 2 extended-definition-type signal would pass through the core of today's broadcast equipment. Some modification would be required to tape equipment, cameras and the transmitter exciter.

The Group 3 HDTV signal will pass through the broadcast equipment, but...
1:45 Wednesday, having fun.
Your client cracks you up.
One hour into the session he
laughs, takes another bite of apple,
says... "this looks better than
the piece we did last week.
What's changed?"

Capture the power

You could tell him the only change
is your new Abekas A82 composite
digital switcher—its speed, digital
keyers, status monitor, digital
framestores, modular design—
and lots more.

But you don't.

Abekas
Leading in Digital Innovation
Selecting the most comprehensive video production system has never been easier. The Panasonic® Professional Video Production System is designed for total systems operation in the field, studio, editing suite and for virtually any playback operation.

The SVHS recording format is at the heart of Panasonic's comprehensive video production system. It provides a new level of high performance and cost efficiency across the spectrum of video recording and playback. One look at the numbers tells it all. Five generations of signal integrity, 400 lines of resolution and two-hour operation on a single cassette.

It is Panasonic performance you'll benefit from in the field. Panasonic's compact SVHS camcorders feature component signal technology and the efficiency of half inch cassettes. Including both dockable and fully integrated one-piece units. And only Panasonic has SVHS camcorders available with three, two and single CCD image sensors. So you can specify the configuration that best satisfies your requirements. Panasonic lets you decide what's best for you.

Panasonic also captures all the details in the studio. With CCD cameras that feature component outputs to take full advantage of the SVHS recording format. And to make sure all the action you're recording looks its absolute best, Panasonic monitors allow you to easily analyze any video signal from any video source. A safeguard you'll appreciate during postproduction and final playback.

You can complement the performance of SVHS with the sophistication of Panasonic's MII recording format. The MII format delivers the operational characteristics you need for demanding broadcast
and postproduction applications. Like a luminance bandwidth of 4.5 MHz, a K factor of 2% and a signal-to-noise ratio in excess of 50 dB, it provides images that equal one-inch VTRs with signal integrity that exceeds five generations of recording.

The integration of SVHS and MII video production components adds a new dimension to video system specialization. Because you can select the Panasonic components you need for the highest degree of performance and flexibility for specific system applications.

Panasonic SVHS and MII editing components provide a host of sophisticated features designed for virtually any application. From programmable 128-event A/B roll systems with time-base correction to highly accurate insert and assembly systems. In addition, Panasonic speaks the industry's language with RS-422 VCR control interface components and video signal transcoders for inter-format editing.

And for highly efficient playback operation, there's Panasonic's line of professional SVHS, MII and VHS VCRs, monitors and projection systems.

Make Panasonic your choice. After all, Panasonic has video production down to a system.

For more information and your local dealer, call your nearest regional office:
Eastern Zone: (201) 348-7620 • Central Zone: (708) 981-4826
Southern Zone:
Dallas Region: (817) 685-1117 • Atlanta Region: (404) 925-6841
Western Zone:
Seattle Region: (206) 285-8883 • Los Angeles Region: (714) 373-7275
Panasonic® makes it easier than ever to carry away the performance of SVHS. By offering you the smallest, lightest and most versatile SVHS dockable VCR available. The Panasonic AG-7450. It delivers field recording with no strings attached.

Now you can combine the high performance of Panasonic’s 300CLE, 200CLE and F70 CCD Cameras with the AG-7450. To create a one-piece SVHS camcorder system designed for one-person operation. Because everything you need for high performance field recording sits right on your shoulder. Which means greater mobility and flexibility when shooting. The AG-7450 can also be used as a stand-alone field recorder with an optional 14-pin VCR adaptor.

And even though the AG-7450 weighs in at a mere 75 pounds, it delivers heavy weight performance. Because it provides you with all the exceptional recording and playback characteristics you demand. Like the economy of two-hour recording on a single cassette, Y/C signal separation with over 400 lines of resolution and a signal-to-noise ratio in
With No Strings Attached.

excess of 47 dB. So there's no need to "bump" your original footage for post production.

In addition, the AG-7450 provides street smart features. Like an antirolling system to compensate for gyro error on the video head. Four channel audio (two hi-fi and two linear) with independent level controls. And an optional vertical interval/longitudinal time code (VITC/LTC) generator/reader that docks directly to the back of the unit.

So if you're looking for a lightweight dockable VCR that performs like a heavyweight, take a good look at the AG-7450. You won't have to look any further. It's Panasonic field recording. With no strings attached.

Panasonic
Professional/Industrial Video

For more information and your local dealer, call your nearest regional office.
Eastern Zone: (201) 349-7320
Central Zone: (708) 981-4826
Southern Zone:
Dallas Region: (817) 665-1117
Atlanta Region: (404) 925-6841
Western Zone:
Seattle Region: (206) 285-8883
Los Angeles Region: (714) 373-7275

Circle (18) on Reply Card
www.americanradiohistory.com
Continued from page 32

Origionation is in HDTV. It would require no modification to the core plant or transmi-tter.

Group 4 represents an HDTV production signal that can be converted to fit into a modified transmitter. Group 5 represents an HDTV production signal that requires complete plant replacement to carry the production format. It also requires a second RF system for augmentation or simulcast.

Simulcast wins first round

Several advisory groups have been operating since 1989. Don Jansky, Jansky/Barnat Telecommunications, said that a consensus among the groups would be to eliminate augmentation as a transmission method and to support simulcasting. Each approach involves vastly different technical issues.

An augmentation transmission system requires that an additional frequency be used to transmit the needed information to generate the advanced images. This signal would be added to the standard broadcast NTSC signal in the receiver to produce the enhanced picture. The NTSC signal would be VHF or UHF, and the augmentation channel would be transmitted only in the UHF band.

A simulcast system requires that two complete signals be transmitted from each station. Each signal contains a complete image. A normal NTSC signal is transmitted on the station’s current VHF or UHF carrier. A second signal containing an HDTV program compressed within 6MHz would be transmitted on a second UHF carrier. The viewer’s receiver, NTSC or advanced image, would select the appropriate signal to accept and process.

If taboo channels were disregarded, enough UHF spectrum is available to service 600 TV stations with a second frequency. The taboo channels were originally based on the capabilities of receivers designed in the 1950s. Because modern receivers are much better, it may be possible to ignore those 1950s assumptions. Work is under way to analyze those factors and to prepare for the needed additional channels. The FCC is scheduled to select a standard in the spring of 1993. This would allow commercial equipment to become available in the spring of 1995.

The assumption of using all of the taboo channels was based on a planning model. Only the results of actual tests will determine the levels of interference. Another problem with the transmission is the actual installation of the transmission equipment. Jansky said that only 28% of existing stations could use the same tower for two antennas and that 60% would have to build a second tower on the same location or build a new transmission plant.

Ghost busting

Many people believe that NTSC can be improved in the near term while the issues surrounding HDTV are resolved. Ghost canceling is one of the areas receiving attention.

Ghosts have been a problem, especially for urban viewers, since the first TV signal was broadcast. The problem is analogous to multipath in FM signals. The difference is that the receiver is stationary.

One key was being able to reliably detect the ghost. It’s possible to do so if the detecting circuits look for distortion on the time axis instead of on the frequency axis. The circuit removes the ghost signal by first calculating the difference or error between the output of a transversal filter and a reference signal level. The filter’s tap coefficient is then adjusted to minimize the error. A special reference signal is inserted in the vertical blanking period and used by the receiver to adjust the canceling circuits.

Get-to-work graphics

As usual, the NAB’s graphics and animation session was packed, but the information provided to the estimated 400 attendees was different from last year. This year, it was a “how-to” session. The speakers addressed various aspects of electronic graphics with an eye toward making pictures work in today’s broadcast environment, instead of hoping to dazzle the audience with the sheer act of making pictures by computer. There were some impressive video presentations, but generally it was a get-down-to-work session.

According to Steve Davis, WPRH-TV, Providence, RI, the engineer must be aware of the creative objectives of the artist, and impart considerable technical and operational information without bullying. Continued on page 42

Figure 2. Standards converters will become a fact of life in tomorrow’s ATV studios. Shown here is an example of where converters might be needed in a typical broadcast station.
3:45 Thursday, way ahead.
He’s a tough client but you were ready. And right now you can hear him saying,
“Fast... this is going fast.”

You could tell him about the speed of your new Abekas A72 CG—How it sizes characters instantly, does italics, drop shadows, outlines—instantly.
All with no waiting to render.

But you don’t.

A72 Digital Character Generator

Abekas
A Carton Company
Leading in Digital Innovation
Not long ago, these facts would have been fiction. Then Sony introduced D-2 composite video.

D-2 takes the amazing possibilities of digital technology and makes them a practical reality.

In fact, revolutionary is the only way to describe it. D-2’s digital world is a place where performance is consistently extraordinary.

Where every tape copy is as good as the original. Where audio is as important as video. And where machines operate without the need for constant adjustments.

In the digital world, a D-2 VTR does its job just about perfectly. So you can too.

And it’s all a matter of fact.

D-2’s picture quality is exceptional from the start, and it stays that way consistently. Here’s why:

D-2 effectively eliminates dropouts.

To everyone with their video it’s time to

D-2’s unique error correction and concealment system means you’ll never have to worry about dropouts.

D-2’s digital transparency is another clear advantage.

And copies of D-2 tapes aren’t dubs.
They're "clones." Digital replications indistinguishable from the original.

As for audio, D-2 VTR's have broadcast sound quality previously unheard of.

Four independently editable channels of CD quality digital sound. In stereo that never needs a phase adjustment.

Fact is, no other composite VTR performs as well as D-2. In both video and audio. You might think such a high performance machine would be hard to work with. But in fact, D-2 is quite easy to use.

For example, D-2 shows you pictures-in-shuttle faster.

In-shuttle faster and in color. So you can work more quickly and efficiently. And one person can comfortably operate up to eight D-2 VTRs. Which makes it a lot easier to do a lot more.

Given all this intelligence, you'll have to agree. Sony D-2 sets a new standard in recording technology. After all, you can't argue with the facts.

D-2 lets one person easily operate up to eight VTRs.

For more information call (800) 635-SONY.

SONY
or turning off the members of the design team.

This artist/engineer interface is necessary for several reasons. Tape is popular for images storage, but it can be difficult to use. For instance, VTRs must be loaded and cued, and someone must change the reels. Freezes on tape can break up unless the finest equipment is used. Also, a machine may not come up in exactly the same horizontal position each time, a feature of the 4-field color system that is guaranteed to drive artists crazy. Still-stores can introduce artifacts in the picture in the A/D, Y/C separation and D/A stages. Digital effects devices can be double-trouble, because they are subject to the same artifacts as still-stores, plus interpolation artifacts and aliasing.

Artists can avoid problems by not making designs with fine lines and abrupt color transitions. Designers and engineers may occasionally bump heads on this point, but engineers can help by trying to educate the artists so that they can learn to design consistently within the technical limitations of the broadcast system. Every proposed design should be tested to make sure it will pass without degradation through all elements of the station's signal and transmission system.

Networking graphics systems
The economics of broadcasting is changing. According to David Scannell of Quantel, the industry must think of change as well as expansion when specifying electronic art systems. For instance, centralized graphics departments were once cost-effective because they allowed all users to go to a common location where the expensive equipment resided. Distributed graphics processing may have been appealing, but the hardware was too costly. Unfortunately, with the equipment concentrated in one place, it was easy for a hot news story to push an artistic program out of the way.

Networking can help overcome this. Designers can work on modestly priced terminals in their own work groups, and draw on more powerful central resources when appropriate.

The NBC networking system also has a digital picture layer. NBC uses a paint system to provide textures or patterns for the 3-D systems, a D1 DVT for production and image archival, and an M1 analog recorder for storing production copies of the animations. A digital disk recorder serves as a storage and preview device and as a conversion system between the LAN-linked systems and the video equipment. Communications between the analog recorder and the D1 devices is accomplished by D1-to-component analog converters.

B.J. Goldsmith's paper centered on development concepts for a new type of technical director's workstation. This station would be able to access all production functions of the station: router crosspoints, VTRs, still-stores, character generators and other support equipment. The system would use a PC-like interface with windowing and multftions, and would permit simultaneous access to the system components.

To facilitate real-time handling of the large amount of data required, a LAN would be used. The LAN would function with two to four machines controlled through one LAN node. Such a distributed-type processing system allows control of many machines and other equipment.

Radio sessions:

Michael Rau, NAB senior vice president for Science and Technology, began the session with a thorough review of the exciting digital broadcast technology. Daniel Pommier, French Telecommunications Authority CCETT, and a leading player in the Eureka Project No. 147 on DAB, discussed the coded orthogonal frequency division multiplex (COFDM) approach to digital broadcasting. His presentation, titled "A Hybrid Satellite/Terrestrial Approach for Digital Audio Broadcasting with Mobile Receivers," outlined the system's ability to encode 12 to 16 CD-quality stereo digital signals into approximately a 6MHz channel. The signals are robust and suitable for terrestrial or satellite transmission to fixed and mobile receivers.

The astounding power efficiency of the format also was noted, showing that a 50W terrestrial transmitter is all that is required to cover a major metropolitan area. On-channel boosters are easily accommodated because the system is totally immune to overlap problems associated with conventional transmission. In fact, the common RF time-domain problems, including multipath, are eliminated with COFDM.

The system employs a data-compression technique that reduces digital audio samples in each audio channel from 16 bits to 3 bits. The process, called sub-band coding, adds both error-correction and concealment. A channel-coding system then multiplexes the dozen or more data-reduced stereo signals into a single data stream, further adding a large amount (more than 500ms) of time-domain redundancy as a spread-spectrum-like frequency division.

The transmission is accomplished using 4PSK modulation on 512 carriers of 15kHz bandwidth each, with significant overlap between carriers. Consecutive symbols of the data stream never appear in consecutive order in time or on adjacent carriers. In case of symbol corruption, a coding link tells the receiver where to find redundant
2:21 Monday, challenged.
Your client wants a unique digital effect. It's a clever idea but it has to be perfect.
“There,” she says. “You got it… that’s what I want.”

You could tell her your Abekas A53-D captures the most advanced digital effects—page turns, warps, true 3-D perspective, drop shadow with one channel—all with ease.

But you don’t.

Abekas
Leading in Digital Innovation

For details: (415) 369-5111 Atlanta (404) 451-0637 Chicago (708) 699-9400
Dallas (214) 385-1544 Los Angeles (818) 955-6446 New York (516) 829-0820 San Francisco (415) 369-6791

Circle (21) on Reply Card
www.americanradiohistory.com
symbols in time and in frequency. This provides a method of data transmission so robust as to be considered error-free, yet still highly power- and spectrum-efficient. Pommier outlined some of the various applications where the COFDM technology might be useful, including terrestrial, satellite and hybrid systems.

One aspect of the technique is the ability to combine satellite and terrestrial signals. A small terrestrial station receives the signal from the satellite in an open area and then retransmits it at the same frequency toward a shadowed area.

New satellite equipment

Kent Malinowski of Scientific Atlanta described the company’s plans to release a second-generation digital audio satellite distribution system. After establishing through a show of hands in the audience that the company’s current digital satellite system, DAT 32, is well-known, he described the new system as an update to it, in his paper, “The Future of Satellite-Delivered Audio.”

The new format is called spectrum-efficient digital audio terminal (SEDAT). Unlike its predecessor, it will be a single-channel-per-carrier (SCPC) system. The design incorporates a data-compression algorithm that reduces 16-bit samples to 4-bit values for transmission. This conserves transponder bandwidth and allows for a greater number of channels. This spectral conservation, in turn, allows the use of the multiple carriers required for SCPC operation, thus providing an additional flexibility and efficiency in satellite program distribution.

The system contrasts to earlier digital audio satellite systems, such as Scientific Atlanta’s DAT 32, in which multiple audio channels were multiplexed and then modulated as a composite datastream onto a single wideband carrier. As long as a master uplink was used to feed all channels to all receive locations, this arrangement was acceptable. However, this prevented the use of multiple uplink sites operating at one time. The SEDAT format will provide such flexibility and retain digital transmission quality and reliability.

Backhaul with VSAT

Also on the subject of digital satellite interconnection, Paul Donahue, Gannett Radio, discussed the use of very small aperture terminals (VSATs) for backhauling.

He described the use of an audio-processing technology APT X-100 system to encode a 4-bit/sample/channel digital stereo on a Comstream VSAT datalink from the Los Angeles County Zoo to KIIS-FM, Los Angeles. Such technology offers several advantages (when weather isn’t a problem). The systems are small, lightweight and easy to set up. It was suggested that radio stations could develop cooperative arrangements much like TV stations. The use of Ku-band equipment would allow stations to uplink feeds, trade stories and cover fast-breaking stories when other techniques might not be available.

Radio backhaul

Remote backhaul also was the application discussed by Tony Masiello, CBS Radio Division. He proposed using 7kHz audio on ISDN and Switched 56 services, two new telco features becoming available in many areas. Masiello provided a thorough overview of the progress of digital audio transmission algorithms in the time domain, from the data-intensive 16-bit linear PCM through the highly efficient adaptive-predictive delta modulation.

The more interesting part of his talk was the demonstration using one codec and Switched 56 service. He transmitted from the meeting room in the Georgia World Congress Center to the offices of Corporate Computer Systems (CCS), Holmdel, NJ, which makes the codec. First, an audio signal was fed from CCS and auditioned in the hall. Then, Masiello’s live mic was fed into the circuit and looped back from New Jersey to the hall’s PA system. He conducted the remainder of his talk through the Switched 56 path.

According to Masiello, CBS is using these systems in a number of backhaul applications and plans to increase its implementation as access to these switched data networks become more available. Engineers should check with their phone company before purchasing any equipment.

CD player maintenance

The last paper was presented by Laura Tyson, Denon America. She provided a well-illustrated presentation on CD player maintenance. She recommended cleaning the optical pickup once a month in broadcast applications, and performing a full servo adjustment on each player every six months.

Using slides of circuit board test points and trim pots, Tyson showed what adjustments should be made. With slides of oscilloscope displays, she demonstrated proper and improper patterns for each of those parameters. Although her company’s player was used in these slides, she stressed that the information was applicable to all CD players.

One close-up of a CD player’s optical pickup and other parts presented graphic evidence of the hazards of smoke and dirt in the control room, showing accumulations of grime throughout. In explaining how the floating optical pickup maintains tracking and focus on the CD by the adjustment of tiny magnetic coils, she noted that the extra weight added to the pick-up assembly by excessive dust and dirt may actually wear out these coils more quickly. She described how to test for play in the pickup assembly, saying that each type of pickup has its own feel, which must be learned by touching it.

Not all discs are created equal, and Tyson described various torture test discs she uses to present challenges to a CD player. These include warped discs (forcing the optical pickup to stay in focus over a range of continuously changing focal lengths), eccentric or off-center discs (requiring main and April 2, under the chairmanship of E. Glyon Walden of Group W, and covered the gamut of AM problems. However, the session did little to add to the general improvement of AM broadcasting apart from the interesting developments in antenna design.

The program started with words of wisdom from Roy Stewart, chief of the FCC’s Mass Media Bureau. Stewart was accompanied by Bill Hassinger, assistant bureau chief for engineering, to bolster his technical expertise. Stewart is a lawyer, and are most of those in charge at the FCC. Stewart’s remarks were short and dealt with the surprise AM freeze that was announced at the beginning of the convention. He noted some exceptions to the freeze and said AM service would be addressed within a month and new standards established as soon as possible. His comments noted that the cure will not be of the piece-meal approach. He claimed that AM would be made as good as FM.

No one responded to his request for information on how to cure AM utility company interference. Problems were mentioned, but no new lines of help were revealed. The consensus was that power companies continue to be uncooperative.

The question of outmoded clear-channel stations came up, but it was unsatisfactorily answered. Stewart said that NRS-1 compliance will be rigorously enforced at the end of May.

AM systems-engineering

The 1990 NAB engineering sessions included a morning devoted to the all-in AM broadcasting system. The session was held Monday, April 2, under the chairmanship of E. Glyon Walden of Group W, and covered the gamut of AM problems. However, the session did little to add to the general improvement of AM broadcasting apart from the interesting developments in antenna design.

The program started with words of wisdom from Roy Stewart, chief of the FCC’s Mass Media Bureau. Stewart was accompanied by Bill Hassinger, assistant bureau chief for engineering, to bolster his technical expertise. Stewart is a lawyer, and are most of those in charge at the FCC. Stewart’s remarks were short and dealt with the surprise AM freeze that was announced at the beginning of the convention. He noted some exceptions to the freeze and said AM service would be addressed within a month and new standards established as soon as possible. His comments noted that the cure will not be of the piece-meal approach. He claimed that AM would be made as good as FM.

No one responded to his request for information on how to cure AM utility company interference. Problems were mentioned, but no new lines of help were revealed. The consensus was that power companies continue to be uncooperative.

The question of outmoded clear-channel stations came up, but it was unsatisfactorily answered. Stewart said that NRS-1 compliance will be rigorously enforced at the end of May.
This brand new, and very affordable ACE™ 10 editor gives you an intuitive keyboard that's lightning to learn and use. It lets you concentrate on pictures, instead of numbers! And to let you move even faster, you can control most switcher functions right from the shuttle knob.

Want more speed? Things like A/V splits, cassette eject, and tag are just a keystroke away. And so you can choose the way you work best, ACE 10 features four user files—one keystroke and you're editing the way you like to edit.

The truth is, you just can't find an editor that will let you do the news faster.

Call 1-800-25AMPEX for a full-sized poster that any editor can love, and for more information about what the ACE 10 can do for your news editing.
AM interference

John Kean of Moffet, Larson and Johnson had a paper titled "An Analysis of Potential Interference Between AM Stations Separated by Two or Three Channels." Glynn Walden, Group W Broadcasting, was co-author.

Kean opened his discussion by warning that mere compliance with NRSC-2 does not necessarily mean that all possible interference is avoided. Section 73.77 of the rules covers interfering signal overlap. Co-channel protection values are adequately protected, but second and third channels are not clearly covered, as far as protection is concerned.

He gave as an example the third adjacent 25mV/m and 25mV/m situation where a station 30kHz removed, places 25mV/m over the transmitter site of another station. This kind of interference often looks like intermodulation problems to a receiver. A new scale of protection ratios is probably required.

Measurements of coverage and interference using a spectrum analyzer were shown to correlate the theories he expressed. He pointed out that spectrum analyzers could provide misleading results and said that their design and specifications require close study. Kean indicated a need to give greater consideration to second- and third-adjacent channel interference because of contour overlap.

A comment from the floor by a contract engineer who is responsible for the transmitters mentioned earlier confirmed Kean's comments. He said that the antenna system and its associated feed and combiner system are critical to NRSC compliance.

AM receiver performance

Almon Clegg reviewed the procedures used to design receivers to meet the NRSC specification. He traced the development of the receiver from cat's-whiskers through tuned-regenerative feedback to superheterodyne. Today, semiconductors, varactors and ICs are the keys to modern receiver design.

He surveyed 13 receiver experts of whom 11 responded, including one from a Japanese company. Because the survey is so comprehensive, summarizing it to fit the available space would lessen its value. However, a few extracts are worth noting. To the question, Will NRSC radios sound better? nine survey respondents said yes and two said no. To the question, How much will the addition of NRSC increase the cost of the receiver? five respondents said $5 more, four said less than $4, and two said less than $2. Are there any technical considerations that are being overlooked? Five respondents said no, six said yes. Which is better, old radio designs or today's radios? Of the respondents, seven said old, four said new. Which technology has had greater engineering investment over the last 10 years? Ten responded FM, and one responded AM. It is interesting that we've asked these questions before and the answers haven't changed.
COMARK'S 240 kW FIELD PROVEN KLYSTRODE® EQUIPPED TRANSMITTER

The Clear Winner!
Now In Service
At WDRB-TV Channel 41
Blade Communications, Louisville, KY

Comark financing or leasing available to qualified buyers.

Comark has the only proven track record in advanced technology transmitter performance.

For further information on Comark’s complete line of water or air cooled Klystrode equipped transmitters call or write:

COMARK COMMUNICATIONS, INC. 1990
A Thomson-CSF Company
Route 309 & Advance Lane, Colmar, PA 18915
(215) 822-0777 • FAX: (215) 822-9129 • TELEX: 846075

Klystrode® is a registered trademark of Vertol Associates, Inc.

Circle (22) on Reply Card
www.americanradiohistory.com
For the fifth year running, BE’s “Pick hits” judges scampered about the convention floor disguised as convention shoppers. Well, not actually disguised. Our experts did what they normally do, which was to seek the best new products for their respective facilities, and to keep their notes for us to share. In a short meeting at the end of the convention, we asked them to develop a list of the products they liked best: 10 for radio and 10 for television. They talked, they argued, they voted. We present here the best products they found.

TV Pick hits

- Abekas: A82 composite digital switcher

The Abekas A82 composite digital (D2) switcher uses a timeline display and a trackball to preview effects step by step. The device control interface drives up to four digital effects channels and a digital disk recorder from the switcher front. Video from these devices can be integrated into switcher effects.

Each mix effects system accepts up to 32 inputs and has two digital keyers. Seven inputs are internally delegable, with LEDs for identifying sources. A single control panel can control up to four mix effects systems. Six full classes plus 18 control panels may be integrated onto an Abekas network so operators can assign resources as needed. With optional analog input and output modules, the switcher functions in analog and digital production environments.

- Steadicam: EFP system

The Steadicam EFP system may free ENG camerapersons from the tyranny of the tripod, bringing steadicam moves into the price range of local news and production entities. The EFP system retains the features of its bigger predecessor, while trimming its profile to match the lighter designs of today’s camcorders. Features include the standard J-7 zoom lens control and VTR run/stop switch, wireless control interface plug-in (WRC-4 wireless controller is optional), the “lazy bubble” for horizon finding and a quick release system in case the operator ends up in a dangerous situation. Viewfinding is on a transreflective LCD monitor, treated with a proprietary coating to make it viewable in bright sunlight. The unit transports in custom-molded ATB-approved hard cases.

- Digital Processing Systems: DPS-265 universal synchronizer

Digital Processing Systems’ DPS-265 universal synchronizer is a TBC and frame sync. The 8-bit processor features a built-in pattern generator that produces color bars, NTC-7 and black. It has a freeze mode that uses an adaptive comb filter circuit to maintain quality, and it also functions as a VITS inserter. The on-board proc-amp section offers control over video, chroma and setup level, as well as hue and system H and V phase. Input video is switchable over three inputs, one of which is loopthrough, and each of which is capable of automatically sensing whether the signal supplied is direct color or heterodyne video for processing.

- Ergo Industries: EIP-7500T rack-mount kit

Ergo Industries rack-mount accessories allow you to pull decks out of the front of an equipment rack, tilt them forward and gain access to the mechanisms, without craning, tiptoeing, lifting or disconnecting cables. They are particularly useful in high-maintenance situations where you must change the belts and heads or clean... Continued on page 52
PEOPLE WHO KNOW ROUTING SWITCHERS, CALL US FIRST.

FIRST - 20 MHz solid state video switching system (NASA), 1963
FIRST - 360 x 800 20 MHz switching system —worlds largest (JPL), 1964
FIRST - 30 MHz bandwidth switching system (USAF), 1965
FIRST - 30 MHz equalizers for up to 200 feet of coaxial cable, 1967
FIRST - 90 MHz video matrix (Satellite Tracking Center), 1969
FIRST - 42 MHz bandwidth switching system (USAF), 1969
FIRST - Use of laser-trimmed hybrid video circuits, 1978
FIRST - Switching of high res computer generated graphics, 1980
FIRST - 120 MHz switching system, 1987
FIRST - 135 MHz switching system, 1987
FIRST - 150 MHz video DA's, 1988
FIRST - 40 MHz 2 RU WA router, 1989

It only makes sense. When you want the most advanced routing and distribution systems, you come to the people who’ve set the standards. The people of DYNAIR.

Just consider what the list above means for you. Because while it details our technical milestones, there’s another message coming through. One of experience. And reliability. Proven reliability. Like the DYNAIR switcher at NASA’s Jet Propulsion Laboratory. It’s been in continuous use since its installation—26 years ago.

26 years. Isn’t that the kind of dependability you need when your job counts on it?

For reliable system routing and coax/fiber connectivity. For needs ranging from CCTV to high resolution graphics. For performance that’s designed in, not tweaked in, dial 800-854-2831. We’ll send you information on our full line of routing switchers and distribution systems. And you’ll see why for 32 years, people have called DYNAIR. First.

DYNAIR
Call us first. 800-854-2831

Circle (25) on Reply Card
www.americanradiohistory.com
History doesn’t happen twice.

You can’t plan it. But you’ve got to be ready. Because when it happens, it happens.

That’s why virtually every major television facility on earth relies on products from Tektronix to help bring home the news.

Whether you’re broadcasting live feeds from a hometown sports event or sending signals via satellite from Berlin or Beijing to thousands of stations around the world, you can count on Tek to help deliver the clearest picture of current events.

Globally or locally.

Whether format you work in, no one offers better tools than Tek for measuring and maintaining your video signal quality. More confidence, at the moment of truth.

For over 40 years, Tektronix technology has kept a step ahead —to keep you on the air. Our high-performance waveform monitors and vectorscopes, sync and test signal generators and fully integrated video measure-

ment sets cover the entire gamut of test and measurement capabilities. They’re accurate, easy to operate and give you results quickly and consistently.

Even in the evolving world of high-definition television, Tek is out in front with wide-bandwidth instruments to test and evaluate HDTV equipment.

It’s just another measure of proof that Tektronix television products continue to meet the broadcast industry’s needs better than anyone, day after day, year after year. Whether it’s the first big break in the Iron Curtain or the last lap at the Indy 500, we’ll see to it that your picture looks its best; because nobody’s watching closer than Tek.

Nobody’s watching closer.
Continued from page 48

the machine frequently.

The cost-efficient rackslides are fabricat-
ed out of aluminum and steel, using fully
encapsulated bearings with no visible roll-
ing surfaces. The tilt-mount rack kits are
part of a larger series of human form-
factor-engineered products, including cab-
ble retractors that complement the tilting
rackslides by preventing cable jams, strains
and pinched wiring.

• J-Lab: BPDA series
  battery-operated D/As
  J-Lab’s pocket-sized BPDA1 battery-
powered video D/A measures 1.3”x
2.8”x5.” The unit serves as a hum-bucker
  of a cable reel and powered by standard
ENGtype NICAD batteries. The terminal
end is a rack-mount chassis with modules
according to the configuration desired. Cir-
cuit length is determined by how many
lengths of cable you plug in between the
receive and transmit assemblies. Suggest-
ed applications include remote trucks and
satellite vehicles.

• Panasonic: LQ-4000 rewritable
  optical disk recorder
  Using magneto-optical media that can
write/rewrite more than a million times,
the Panasonic LQ-4000 rewritable optical
disk recorder can process 20 minutes of
motion video or 36,000 stills, in high-
resolution (>450 lines) mode, on a 12-inch
disk cassette. In normal mode, the unit
can play for 30 minutes or store 54,000 stills.

• National Photonics: Sidewinder ENG
  video system fiber-optic snake
  National Photonics Sidewinder fiber-
optic snake uses rugged, militarized mul-
ticonductor fiber-optic cables to connect
up to three cameras with video, stereo au-
dio, video return, tally, talent earphone
and intercom, over path lengths up to
25,000 feet. Despite its strength, 1,000 feet
of the tactical fiber weighs less than 20
pounds.

  The field end of the system is an ana-
log/optical interface mounted on the side

and a distribution amplifier for a minimum
of 12 hours, longer with different battery
options or a power supply. The unit has
a loopthrough input, five 75Ω outputs,
+20dB of gain adjustment, and can equal-
ize 1,000 feet of cable. Frequency response
is flat to above 5MHz.

  A companion BPDA-2 audio D/A has
four balanced outputs, and uses two 9V
batteries for up to 48 hours of operation.
It has +10dB gain control, and harmonic
distortion is less than 0.02% dc to 30kHz.

• Sony: BVP-270 3-chip studio camera
  The Sony BVP-270 is a cost-effective,
high-performance 3-chip CCD studio cam-
era. A 768 IT (interline transfer) CCD and
HAD (hole accumulated diode) technolo-
gy greatly attenuate vertical smear. A to-
tal of 380,000 effective picture elements
assure high horizontal luminance resolu-
tion (700 lines). The CCD imager is
equipped with a 1/100- to 1/500-second
electronic shutter.

  The unit accepts and outputs compo-
site video, S-video, analog RGB video and
dub formats. Signal-to-noise is 47dB.
Regardless of recording mode, the unit will
output in all formats simultaneously. Au-
dio frequency response is 20Hz-20kHz,
with >70dB dynamic range. An RS-232C
interface and remote I/O port allow ex-
ternal control of the device (RS-422A in-
terface optional).

• Sony: DVR-2 portable
  composite digital VTR
  The Sony DVR-2 portable composite digi-
tal video (D-2) VTR achieves 6MHz re-
sponse and 54dB S/N for video, and has
four 20Hz-20kHz, 90dB dynamic range
PCM audio channels. The VTR accepts RS-
170A video or can take a signal directly
from the 26-pin camera cable. The DVR-
2 accepts M- or S-sized cassettes, giving
a maximum record time of 94 minutes. An

LCD front panel displays tape timer, time-
code and UB numbers, audio bar graph,
“good-no good” video levels indicator, tape
time remaining, plus SCH or battery ca-
capacity. A 2-line sub-display menu guides
servo setup and provides diagnostics. Mic
power switches provide power output for
condenser mics.

The camera’s matrix is tuned to match
the colorimetry of Plumbicon cameras.
Many of the features resemble the tube-
based BVP-380. The CCU master setup
and operator panels are similar, with some
options, such as the color viewfinder, com-
mon to both lines. A memory system
stores eight camera setups, 64 scene files
How do you judge a standards converter—on paper or on performance? For professional broadcast engineers there can only be one answer.

That’s why at Snell & Wilcox we’re not just interested in technical specifications, but in practical ones as well.

Our range of standard converters—the only complete range in the world—is designed and built by broadcast professionals. We understand what it’s like to be in your shoes. And it shows in every aspect of performance.

**Superior picture quality**—Seeing is believing. Our 4-field, four-line aperture converters, incorporating Advanced Motion Processing, provide sharper pictures than you’d ever have thought possible—even from the poorest input signals.

**Versatility**—Our standards converters also serve as time base correctors, synchronizers, color correctors, enhancers and powerful noise reducers.

**Upgradeability**—A concept introduced by Snell & Wilcox. When your needs grow, Snell & Wilcox converters grow with you. Snell & Wilcox converters up to 5 years old can now be upgraded to full broadcast specification at any time.

**Handling**—Low power consumption, portability and ergonomic design make our machines the most user-friendly on the market.

There is of course one major performance specification without which all the rest are useless.

**Reliability**—When you’re a Snell & Wilcox user you can put your feet up and relax. It’s very likely that you won’t have any problems at all. But in the unlikely event you ever do—call us up and speak directly to the engineers who designed and built your machine.

What other manufacturer can offer that reassurance?

But naturally we don’t expect you to be convinced just by promises on paper. The only real way is to judge for yourself.

That’s what all the world’s major broadcasters have already done. As a result they use more Snell & Wilcox standards converters than any other make.

Once you try Snell & Wilcox you won’t be satisfied with anything less. Call us to arrange a demonstration. You’ll be converted.

![Snell & Wilcox Image]

Snell & Wilcox Inc., 2454 Embarcadero Way, Palo Alto, CA, 94303 USA Tel: (415) 856-2930 Fax: (415) 857-1434 Telex: 910-3731782
Snell & Wilcox Ltd., 37 Jubilee Road, Waterlooville, Hampshire PO7 7RE, United Kingdom Tel: 0705 268827 Fax: 0705 241252 Telex: 940 12583 SWECG

Circle (27) on Reply Card

www.americanradiohistory.com
Tektronix: VM700A option 40 audio measurement set
Option 40, an add-on to the Tektronix VM700A audio measurement system, allows the device to interface with automated test tone generators. It monitors for the start of the test sequence (an FSK burst), then records out-of-parameter measurements in memory, including date/time stamped audio measurement results in the VM700A's auto-mode video measurements display. The device also provides real-time display of audio parameters, including a dual-channel FFT spectral display of frequencies from 10Hz to 20kHz, and stereo audio-monitoring functions, including bar graphs calibrated in several different scales. An audio analyzer mode displays, in real time, the frequency, level and THD+N for each channel, as well as the level and phase difference.

Using removable magnetic "Bernoulli" disks, this half-rack-sized, cart machine-like digital recorder puts 10 minutes of 15kHz stereo (or 20 minutes of mono) on a disk with 16-bit resolution, twice that for 10kHz audio at 12 bits, 16 bit, 20kHz audio also is available. Users can place an unlimited number of cuts on a disk. Each cut's name and running time is shown on a front-panel fluorescent display. The system supports editing and cut-sequencing, with instantaneous start-up of any cued cut. Automation system interface is via an EIA-232 port. The system accommodates SMPTE time-code. An internal hard disk, if fitted, provides a maximum of one hour of audio. A SCSI port accesses external hard drives.

Broadcast Devices: UNI-200 universal remote interface
The UNI-200 universal remote interface is an inexpensive remote-control interface problem solver. The 2.5"x3.5" circuit board can serve as a buffer between virtually any remoting electronic device and its control point. It also may be used to establish remote control and status indication on hardware that is not normally remoting. The unit accommodates pas-

Continued on page 58
Test Drive a TETRA

You won’t believe the new P165 TETRA from CEL Electronics.
This is not your parents standards converter.
The TETRA is fully bi-directional so you can get to or from NTSC, or PAL, or SECAM and back again faster than anything else in its class. TETRA also has the power of full bandwidth in 8-bit 4:2:2 and seats more standard features than converters twice the price.
In the open studio TETRA is smooth as glass with four-field, four-to-eight line adaptive motion interpolation. Even a test pattern generator is included for those tough-to-handle output curves.
We build the TETRA for the engineer, but we didn’t forget the budget. You won’t be able to tell its only $28,995.00.
You’ll love what we do for you, TETRA.

The new P165 TETRA

CEL ELECTRONICS INC,
US OFFICE: TEL: 800-325-CEL1

CEL Electronics, Inc. • 4550 W. 109th Street, Suite 140, Overland Park, Kansas 66211 • Tel: 800-325-2351 Fax: 913-345-2771

www.americanradiohistory.com
INTRODUCING THE HL-53 BROADCAST QUALITY CHIP CAMERA

If you're in the market for a broadcast quality chip camera that combines outstanding performance with outstanding price, consider Ikegami's HL-53.

Engineered for the value-conscious buyer, the HL-53 features three 2/3" IT (Interline Transfer) chips, each delivering 400,000 pixels. This insures superior image quality even in the Hi-Gain position with a dramatic reduction in fixed pattern noise, reduced smear, enhanced resolution at 700 TVL, and a high S/N ratio of 62dB.

Weighing only 6.8lbs with viewfinder, the HL-53 features a six speed electronic shutter to assure high resolution under...
Various shooting conditions, a newly developed optical low-pass filter for reduction of noise, high sensitivity (+24dB) and much more.

The HL-53 viewfinder provides complete set-up data, an incredibly clear picture, and can add or delete a safe title area box, cross hairs and audio bar graph.

Adding to the value of this exceptional camera is the ease in which it can be used with a Betacam SP® or MII® VCR without an adaptor.

The HL-53 is one more addition to Ikegami's outstanding UNICAM® family of cameras and is compatible with all HL-95 accessories, providing maximum operational flexibility and versatility in the ENG/EFP or studio configuration.

Accessory compatibility is just one more reason to stay with Ikegami, where quality combines with economy. The finest value in broadcast chip cameras is the HL-53. When a better value comes along, it will also be an Ikegami.

For further information, contact your regional sales office of the Ikegami Dealer near you.

Ikegami

Ikegami Electronics (USA), Inc.
37 Brook Avenue, Maywood, NJ 07607
East Coast: (201)368-9171  West Coast: (213)534-0050
Southeast: (305)735-2203  Southwest: (214)869-2363
Midwest: (708)834-9774  Hawaii: (808)946-5955

Betacam SP® is a registered trademark of Sony. MII® is a registered trademark of Panasonic.
Continued from page 54

sive momentary switches with illuminated tally lamps by providing open collector status outputs for lamps or LEDs. Triggering of these outputs can be internal or external to the board, with steady or variable flash-rate illumination available. External control comes via optically isolated inputs. The board allows use of the same power supply for control of different units, with a high degree of isolation.

• Computer Concepts: digital commercial system
  This PC-based digital audio storage/retrieval system is designed for radio spots. It holds 340 minutes of mono audio (170 minutes stereo) on a 766Mb hard disk, expandable up to 68 hours, using user-selectable data-compression routines. The system supports audio and EOM editing, and includes a trackball interface. All hardware is off-the-shelf except for the audio interface board, which with Delta-Sigma D/A conversion and DSP, allows up to three stereo record/playback operations to take place simultaneously. Sampling rates of 16kHz and 32kHz are standard, with 44.1kHz and 48kHz available. The system can interface with satellite systems for full weekend walkaway capability, and can be integrated with the company’s traffic system software.

• Consultronics: PC-3000 stereo audio analyzer
  From a Canadian telecommunications test equipment maker comes this microprocessor-based stereo audio analyzer. The PC-3000’s size and construction make it appropriate for field work. It features a built-in low-distortion synthesized function generator with automatic multirange sweeping. The receiver section measures and stores data on level, noise, frequency, phase difference, distortion, stereo crosstalk and level difference, IM, overload recovery, level tracking, quantization noise, group delay and gain variation over time. The analyzer also plots and

## CAMERA REMOTE CONTROL THE SENSIBLE WAY

Telemetrics – for over 20 years the innovators of camera control systems.

Control Pan-Tilt-Trolley-Zoom-Focus with

• Simple Joystick Panel
• Presetable Shot Panel
• Touch Screen Panel
• Computer RS-232/422 thru

• Multicore Cable
• Twisted Pair
• Telephone Modem

Telemetrics
7 Valley St. Hawthorne, N.J. 07506
For Information Call (201) 423-0347

Circle (31) on Reply Card
SPACE SAVING TAPE STORAGE CABINETS

DOUBLE YOUR TAPE STORAGE capacity with exclusive Pull-Out Cabinets that save space, provide fast reference and immediate access. IDEAL for odd-shaped areas, alcoves, unused aisles. Pull out easily on low profile tracks. Modular or custom units to fit any space requirements. DURABLE ALL-STEEL construction accommodates heaviest loads.

WINSTED ALSO OFFERS Side-by-Side and By-Pass movable storage systems to maximize your tape storage capacity. Installations in many network and major station facilities. WHATEVER YOUR NEEDS, Winsted offers the most complete line of tape storage systems in the industry.

FREE! full color catalog. Write or call today toll-free.

800-447-2257
FAX: 612-944-1546

THE WINSTED CORPORATION, 10901 Hampshire Avenue So, Minneapolis, MN 55438 • 612-944-8556

Preferred by Professionals Worldwide
stores frequency and phase response in mono and stereo. It also can store setups and test runs. Exchanging its removable ROM pack enables other programs. The PC-3000 has a large superbright EL graphic display, built-in speaker and RS-232C and graphic printer ports.

- CRL Systems: audio signature processor
  CRL System's microprocessor-based audio signature audio processor includes a wideband and a 4-band processing section, with user-adjustable crossover points. It combines analog audio circuitry with digital control, providing storage and recall of four user-defined settings or four factory presets. Digital control also allows control of the device from a PC's RS-232 port, either locally or via modem. Software included with each unit allows control of all system parameters from the computer, with graphic display of values. Unlike most digitally controlled devices, the processor uses a separate, continuously variable rotary pot for each control, providing an analog feel. Recall of stored settings is accomplished by manually adjusting each control until an LED next to it lights up.

- Gentner Electronics: Lazer FM generator and 3-band limiter
  The Lazer digital FM stereo generator and 3-band limiter offer digital audio circuitry, plus storage and recall of eight configurations. Digital operation also reduces susceptibility to noise and RFI, and stereo generator parameters may be adjusted and stored digitally. Peaks are analyzed in level and duration.

All functions, including built-in test signals, are accessed from front-panel soft keys, with menus on an LCD window, and levels on multifunction LED bar graphs. An RS-232 port allows PC remote control. Analog composite baseband output is provided on a BNC connector, with 24-bit digital composite output and digital SCA input provided for future applications. Analog-to-digital conversion is accomplished by a separate outboard optical encoder, feeding the Lazer's optical input.

- Gentner Electronics: PeopleLink broadcast telephone system
  The PeopleLink broadcast telephone system can handle up to 40 telephone lines. A microprocessor mainframe connects as many as six control surfaces (each with simultaneous, independent control). up to four 10-line interfaces, audio interfaces (for audio and control connections with recorders and consoles) and up to six digital hybrids. Single-line frequency ex-
The World's Most Advanced Stereo Broadcast Consoles

The SL 5000 M Series is an open architecture console system comprising a wide range of standard audio and control cassettes in a variety of mainframe sizes. It can be configured to exactly match your current and future requirements. The use of standard cassettes eliminates the service and maintenance problems often associated with systems of this sophistication.

A unique sectional grid distributes audio and control busses throughout the mainframe, interlocking master and local facilities in virtually any combination you desire. This makes a wide range of applications possible - live radio, continuity, outside broadcast, film and video post production.

The SL 5000 M Series retains the full benefit of computer-assisted operation and centralised assignment, where appropriate. Dynamic fader automation, optional motorised faders, and SSL's Instant Reset™ and Total Recall™ computer systems provide maximum control of these advanced functions.

At last the specialised requirements of broadcast audio production can be served by a new level of operational efficiency and creative flexibility.

SL 5000 M Series mainframes are available in 3 depths and from 8 to 128 channels wide, allowing consoles of almost any size and capacity.

The SL 5000 M Series is used by:

- ABC TV, USA
- Bayerische Rundfunk, FRG
- BBC Radio, UK
- BBC TV, UK
- Radio Bremen, FRG
- Fox TV, USA
- ITN, UK
- NRK, Norway
- Nippon Hosso, Japan
- Paris Omnisport, France
- RTE, Eire
- SRG, Switzerland
- TBS, Japan
- TVS, UK
- Videotime, Milan
- YTV, UK

Solid State Logic

SL 5000 M SERIES

Begbroke, Oxford, England OX5 1RU (0865) 842300
London (071) 706 4948 • Paris (1) 34 60 46 66 • Milan (2) 612 17 20 • New York (212) 315 1111 • Los Angeles (213) 463 4444
• Toronto (416) 363 0101 • Tokyo (03) 5474 1144
U.S. Toll Free Number 800 343 0101

www.americansradiohistory.com
Camera cable information from the company that knows best...Mohawk!

Mohawk offers superior broadcast camera cable and a free, newly expanded camera cable and connectors information kit!

If the job demands flawless broadcast transmission, order the best cable—Mohawk. Count on Mohawk’s quick response to assembly orders and repairs to save you precious time.

Our expanded product line features:
- Ultra-flex VTR cable assemblies for Hitachi, Ikegami, Panasonic, Sony and others
- Slimline studio camera cables
- Waterproof, high strength, three-piece connector design
- Customized lengths

Mohawk’s entire team of engineers, technicians, and sales and service professionals are committed to providing product and service excellence. Our strict performance standards exceed even industry requirements.

Get your information from the reliable source! Mohawk’s new edition of the TV camera cable and connectors information kit is available free. Just call or write Mohawk today!

MOHAWK
Wire and Cable Corporation
9 Mohawk Drive • Leominster, MA 01453 • (508) 537-9961
Toll free: 1-800-422-9961 • In MA: 1-800-642-9961

Circle (115) on Reply Card

---

AMPLIFIERS AND CONTROL PREAMPLIFIERS DEDICATED TO THE BROADCAST AND VIDEO PRODUCTION INDUSTRIES

Bryston approaches the broadcast and video production industry requirements for high quality, musically accurate, and reliable power amplifiers and control preamplifiers with the same integrity and commitment to excellence that has earned Bryston its leading position in the Canadian power amplifier industry for the past 15 years.

Whether your requirements are for 50 watts, 800 watts, or anything in between, Bryston amplifiers can satisfy your every power need. Standard features include such things as dual power supplies, completely independent stereo channels, balanced XLR connectors, clipping indicators, gain controls, rack mounting, and bridgeable switching.

FULL TWENTY YEAR WARRANTY

When a highly versatile and reliable control preamplifier is needed, then the Bryston BP-L, BP-4 or BP-5 provides all the flexibility required by the professional broadcast and video production industries.

Bryston BP-5 preamplifier

Bryston 28-LP power amplifier. Other models include Bryston 38, 48 and 63 with output range from 50 to 805 watts.

Features include such things as balanced XLR connector, cartridge load adjustment, high overload threshold, 1 space rack mount and fully discrete gain blocks. For further information contact:

Bryston
Bryston Marketing Ltd.
Tel: (416) 746-0300 Fax: (416) 746-0308
BrystonCanada Ltd. Tel: 1-800-673-7899

---

Harris "chimney design" air-handling system is included. The entire line is stereo-ready. Modulation capability is 130% on positive peaks and 100% on continuous sine wave.

Radio Design Labs: NRSC stick-ons

This set of three small potted circuit boards is designed for NRSC-1 compliance. The NRSC-PR provides NRSC-1 preemphasis. The NRSC-PL defines the 10kHz stopband filtering. The NRSC-DM contains the deemphasis circuit required for NRSC monitoring, and also includes a fine-tunable 10kHz notch-filter. Stereo or mono configurations of the stick-on modules are available.

---

tenders also can be incorporated. The features of each control surface can be individually programmed by a PC-based configuration program. PeopleLink can use central office or PBX lines. Up to four “hold” audio sources can be independently assigned to any call. Among the control features are call screening, conferencing, routing, recording and protection routines, as well as a “next call” function and an automatic “contest” call counter/auto-answer system.

- Harris: GATES series AM transmitter

The old name returns in this line of fully solid-state AM transmitters, with 1kW, 2.5kW and 5kW models, priced below the company’s other AM products. The modulator and PA sections use second-generation MOSFETs. Transmitter features include high-speed automatic VSWR protection, plus constant output power and modulation levels despite power-line fluctuations. A discrete logic controller provides simple operation and front-panel status indication, storing six independently adjustable power levels and overload history. Battery backup data storage makes the transmitters capable of immediate return-to-air after power restoration. The
INTRODUCING
The PVS Series 2 Production Video Switcher

Utah Scientific customers have been asking us to build a production switcher for a long time. We agreed to do that, but only when we were able to offer significant improvements over existing designs. That time has come. We proudly announce the PVS Series 2 Production Video Switcher: built for speed; built for performance; and built for reliability... Utah Scientific reliability.

Here are some of the features that make the PVS Series 2 the Production Switcher for the 1990s:

• A revolutionary design approach combining the best in on-air, live switching techniques with an efficient and dependable graphic display/response control system.
• Unmatched feature set—competitively priced.
• Free software upgrades for the first year.
• Guaranteed delivery commitments.
• 3-Year warranty.
• 24-Hour customer service hotline.

Plus, the PVS Series 2 offers: 24 inputs; two multi-level mix/effects allowing up to eight video levels; level-specific "hot keys" for instant effects; standard analog keyers and edgers; program and preset busses with two independent downstream keyers; and dual auxiliary/DVE busses.

Find out more today. Call your Utah Scientific sales representative. Let us show you the production video switcher that really is built for speed.
The NRSC-PR is designed for insertion between the air chain's compressor and limiter. It can be powered with single-ended 24Vdc-36Vdc, which it converts to bipolar 15Vdc for its internal use. Those bipolar supply rails also are brought out to screw terminals on the NRSC-PR for use by the NRSC-FL, which is placed between the limiter and transmitter.

- **Will-Burt: hurry-up telescoping mast**
  This 25 foot, manually telescoping mast weighs 20 pounds. It consists of six nested 0.065-inch-walled aluminum tubes with quick-lock/release aluminum collars, and is designed for use with lightweight ENG/RPU transmitting antennas or meteorological instruments. Its drive-on baseplate allows the use of a remote vehicle for counterweighting, providing survival in wind speeds in excess of 50mph with a 2-square-foot topload. Deflection is less than two feet in 35mph winds under similar loading. An optional 2-level guy kit can be used for mounting away from a vehicle. Optional brackets allow permanent vehicular mounting. The mast collapses to a 6-foot length. The baseplate may be unlocked and removed from the mast during transit.

---

**The rules**

1. They must be new products, not shown at a previous NAB. In cases where it is difficult to distinguish a "new product" from a modified old product, a new product is one with a new model number or designation.

2. They must have some positive impact on the everyday work of the user. The judges searched for equipment that would be used on a regular basis at a station. The equipment should provide a new solution to a common problem.

3. They must offer a substantial improvement in current technology. Although the equipment does not need to include unique circuit architecture, it should include some new ideas on applying current technology.

4. The product's price must be within reach of the intended users. The judges sought products marketed to a wide spectrum of broadcasters.

5. The products must be available for purchase. Equipment must be displayed on the convention floor, be in production or nearly so, and have delivery dates within the year. Products demonstrated in private showings don't qualify.

---

**The judges**

We selected several well-known and respected industry experts to act as our panel of “Pick hits” judges. They were asked to pay particular close attention to their assigned area of radio or television. The judges did not disclose their participation in Pick hits during the convention, and are revealed here for the first time:

**For television:**

**Richard Farquhar**
Chief engineer
SOS Productions
Columbus, OH

**Gary Krohe**
Chief engineer
KMC-38
Overland Park, KS

**Karl Renwanz**
Vice president, engineering and operations
WHDHTV
Boston, MA

**Doyle Thompson**
Vice president, engineering
The Weather Channel
Atlanta, GA

**Chuck Deen**
Chief engineer
KPNX TV
Phoenix, AZ

**Leon Anglin**
Vice president, engineering
WUSA-TV
Washington, DC

**For radio:**

**John Battison**
Battison and Associates
Louisville, OH

**Andy Laird**
Vice president, engineering, radio group
Heritage Media
Los Angeles, CA

**Marvin Born**
Director of engineering
WBNkes FM/AM/TV
Columbus, OH

**Charles Morris**
Corporate director of engineering
KIRO
Seattle, WA

**Richard Rudman**
Engineering manager
KFVB
Los Angeles, CA
A POWERFUL FORCE IS SURFACING IN COMPONENT GENERATORS

Take full advantage of component television's many capabilities with the powerful new component generator, Model 425 from Leader. First, though, we should explain what the 425 is doing in the jaws of this primitive, half-ton killing machine. The generator develops a number of test signals tailored to gauge distortion and relative timing in component systems. Among these is a new timing signal we call the "shark fin." It exposes relative timing errors over a 2 MHz bandwidth rather than at a single frequency.

The 425 generates both component and composite test signals. These include a number of test signals dedicated to component analysis (available in GBR, Y/R-Y/B-Y, and Y/Time-Compressed Chroma) as well as the more familiar test signals applied to the composite feeds.

You can order the 425 in either Betacam or MII format. No matter what end of the business you’re in—from ENG to post-production—if you’re going to swim with the sharks, do it with the help of a cutting-edge component generator, the new Model 425 from Leader.

For our full-line catalog, in NY call 516 231-6900. Or call toll free:

1 800 645-5104

Leader Instruments Corporation, 380 Oser Avenue, Hauppauge, New York 11788
Regional Offices: Chicago, Dallas, Los Angeles, Boston, Atlanta. In Canada call Omnitronix Ltd., 416 828-6221.

Circle (37) on Reply Card for product information.
Circle (38) on Reply Card for product demonstration.
www.americanradiohistory.com
You know about our recording systems—from players to editors to the sophisticated M.A.R.C. automated cassette system. You know about our unmatched standards for price/performance with component analog VTRs at 3/4" prices.

But we want you to know we're more than that. We are the source of the world's first digital processing cameras, as well as some of the most cost-effective analog cameras ever made.

And, we've got just about everything in between: auto-setup monitors, cables, adapters, switches, editors, etc.

When you're looking for value, performance and innovation, think systems. Panasonic Broadcast Systems.

Panasonic Broadcast Systems Company, One Panasonic Way, Secaucus, NJ 07094 (201) 348-7671
The following pages provide brief notes about new products exhibited at NAB '90. The overview was prepared from data collected as our staff visited each manufacturer's stand. Because of the many exhibitors, a good deal of last minute booth shuffling and space sharing was the norm, and because some exhibitors did not have material available, a few noteworthy items may not appear in this list. We regret any such omissions.

The products in this list are grouped by four general categories, per the following directory. Page numbers (given parenthetically after group designators) indicate the page where that category starts. Reader service numbers are included for convenience in getting information about the products.

**Group A - Audio Products**

A2 (71): Processing systems (dynamics, delay, effects, noise reduction), telephone-related equipment.
A3 (76): Recording systems (all analog formats), ancillaries.
A4 (76): Sources, monitors (wired, wireless mics, intercoms, headphones, speakers, phone, CD).
A5 (80): Digital recording, MIDI.

**Group R - RF Products**

R1 (84): Broadcast transmitters, antennas; transmission line; remote control, telemetry; towers, tower ancillaries.
R2 (85): Terrestrial microwave (aural, video; ENG, STL, ITFS, MDS, electronics, antennas.
R3 (92): Power amplifier cavieties, devices.
R4 (92): Receivers, demods, modulation monitors.
R5 (92): Exciters; generators (SCA, MTS stereo, SAP, PRO, FM, AM).
R6 (94): Satellite antennas, electronics.

**Group S - Support Products**

S1 (96): Automation; computer hardware, software; timers, clocks; data transmission systems.
S2 (100): Cable, wire, fiber-optic products, connectors, patch panels, patch cables.
S3 (104): Bags, cases, racks, studio furnishings; acoustic treatments.
S4 (106): Recording media, degaussers; tape, film maintenance products.

**Audio Products**

**A1: Mixers**

- Console automation

**AMEK Consoles/TAC**
- *Mozart*: 40, 56, 80-input frames; “all-input” system replaces in-line, split monitoring concepts; 32 mix buses, 12 stereo aux returns, 16 aux send paths; on-board grouping computer extends signal control.
- *TAC AFV Bullet*: compact 10/4/2 format console; audio-follow; complements Sony BVE900 editor; stereo modules, VU metering, electronically balanced; ESAM I, II serial interface.

Circle (536)

**Arrakis Systems**
- *15000 series*: mainframes for 8, 18, 28-channel; VCA system, de-controlled switching; three stereo output, two telco mix-minus buses; pre-fader patch points; digital timer, stereo splits.

Circle (554)

**Graham-Patten Systems**
- *D/ESAM 800*: digital edit suite mixer; ESAM li protocol talks with any editor using ESAM protocol; Motorola DSP-56000 device; 32-input, 4-output analog or digital.

Circle (806)

**Klark Teknik**
- *DDA DCM232 console*: with Alpha Audio BOSS/2 automated audio editor; permits control of many transport synchronizers and direct connections on serial interfaces.

Circle (879)

**Logitek**
- *TR2 stereo*: 12-mixer, 36-input, rack-mount; four metered outputs with DAs; independent monitor drivers with cue; machine control, detachable meter bridge.

Circle (906)
BELDEN BRINGS THE LIGHT OF INNOVATION TO BROADCAST CABLE

Just as no performer can stay on top without innovation, no company can retain its reputation for performance without product innovation. The standards we've set with our broadcast cables are a reflection of our commitment to product innovation – something that continues today with Brilliance®.

Named for the sound and picture brilliance obtainable through product innovation and improved signal integrity, Brilliance products range from exciting audio/video cable assemblies to the four new cable products below:

**Soft, flexible Microphone Cables.**
The debut of Belden's four-conductor microphone cable sets an industry standard. Featuring matte finish jackets in a wide range of colors, these new cables are designed to increase cable flexibility while enhancing performance.

**High-Flex and CL 2 Rated Precision Video Cables.**
To solve the problems of rack installations and CCTV systems, Belden has developed a new 75 ohm precision video cable. High-Flex combines Belden® 8281 electrical performance with improved flexibility and longer flex life.

**Audio Snake Cables.**
Belden now offers a line of multi-pair snake cables. Featuring individually jacketed and shielded pairs, Belden snake cable provides maximum protection against signal loss. Features include loose tube construction and a non-reflecting black matte finish.

**Audio and Video Composite Cables.**
For systems combining audio and video, Belden has specifically designed cables for ENG and camera applications. They combine off-the-shelf availability with specialty design center technology and fiber/copper composition.

Call your local Belden distributor for our Broadcast Catalog, or contact us directly:
Belden Wire and Cable
P.O. Box 1980
Richmond, IN 47375
1-800-BELDEN-4
(in Indiana, call 317-983-5200)

There is no equal.
Improve the Means to the End

Introducing Our New Extended Benefits Package:
Model MCE325 Programmable User Station

Think of it...

a versatile intercom user station with a wide range of operational and packaging formats.

Physical benefits include a five-way modular packaging technique for permanent or portable applications. While headset operation comes standard, adding our MCS325 Speaker and a plug-in microphone supports an open-listening setting.

Operator benefits sport user-friendly software and hardware-based programming; the MCE325 can be operationally and functionally configured to suit individual requirements.

As for the small print: the MCE325 works in conference-line or dedicated-line environments, with 2-channel split talk/listen or 4-channel combo talk/listen, in 2-wire or 4-wire line mode, or a combination of both. Also featured are two channels of IFB, two program inputs, and call signaling. Modular packaging includes: rack mount or portable headset station, rack mount or portable speaker station, or console mount headset station.

Please call or write for details.

The First Name in Intercommunications
Professional Intercommunications
Professional Audio Products
1938 - 1989
Engineering
Emmy Award

RTS SYSTEMS
A Telex Communications Company
1100 West Chestnut Street
Burbank, California 91506
Phone 818-566-6700
Fax 818-843-7953
LPB
• Citation II C2-16: 10-channel on-air, production; 3 inputs/channel, lock-out switching; two stereo outputs; user-configured 4-position aux selectors; programmable cue, mute.
Circle (999)

Neve
• Orion series 32: 32 channel broadcast unit; 32 inputs accept 320 sources; universal input modules accept stereo line and mic sources; ReMem disk-based recall memory.
• Neve 66 range: for broadcast TV; integral µP control, reset recall switch status, input gain; fader settings, mix-minus; 4-band EQ.
• Model VPR: post-production console.
Circle (971)

Ottar Console Products Group
• DiskMix 3: VCA P/Q moving fader automation; touch-sensitive controls; unlimited group ing of 128 console channels; 68000 series coprocessor; frame-accurate fader, mute data; on-line facilities.
• TC-100 transfer console: for transfer, dubbing in film, video production; multiple card tracks with independent; separate power supply; 9-18 inputs per rack; 4 bus output; solo functions; fader bypass.
• Series 34 consoles: 24, 36-input; DISK MIX 3 moving fader options; 4-band EQ, high-resolution monitoring; dual signal paths; 10 aux sends.
Circle (964)

Ramark Research
• Xl series: stereo mixers with 4, 6-, 8-, 12-channel frames; single, dual outputs with separate stereo mix (mono); rotary or linear faders operate VCA circuitry; 2 inputs per channel except last, which is 3-input.
• Optofade: output to VCA based on change of light intensity as mylar band moves through an infrared beam; optional unit for XL series mixers.
Circle (1435)

ROH/Anchor Audio
• ROHPAC 1; programmable audio control system; for PA automation.
Circle (1057)

Sennheiser Electric
• WH-1 wireless mixer; 5-channel portable mixer; internal, external, de power; four wireless receivers; one channel for wired source; EQ control: LED bargraph; output by wire or integral transmitter; limiter.
Circle (1084)

Sony Communications/Pro Audio
• MXP-2900 mixer, 8-, 16-, 24, 30-channel frames; four inputs of stereo, mono inputs; video editor interface; depth of fade, editor crossfade group control.
• MXP-210, MXP-290 mixers: 210 where video editor interface is not expected; 290 for use with editing equipment; internal preview switch; master faders for channels one, two; both units 5-channel.
Circle (1104)

Soundcraft/USA
• Model 8000: front-of-house mixer; special monitor/output section for live TV, remote production; 16, 24-, 32, 40-channel.
• USA 24 II, 24-channel parallel interface for audio-follow; with 200 BVE mixer integrated with a video editor.
• Model 200 Delta: 8-, 16-, 24-, 32-input frames, 8-channel rackmount; 8 aux sends, with individual group modules, separate master; 20-segment bar graph meter.
Circle (1110)

Soundtracs
• PC MIDI series: intelligent console for keyboard workshops.
• SPA mixer: PA sound reinforcement; 24-, 32-, 40-, 48-input configurations.
• FMB broadcast console: on-air, radio production mixer; input modules offer mic, RIAA phono, telco inputs on mono, stereo balanced lines.
• IL 3632 Tracmix automation: production mixer with fader automation; 36-, 48-channel frames.
Circle (1264)

Studer ReVox
• A-779: compact professional mixer.
Circle (1127)

TASCAM
• M-950/24 ST console: eight group buses, in-line distributed monitor; four assignable effects return; 4-band EQ/channel; linear faders, mute LED; pan, dual effects sends per input; FLIP feature doubles inputs.
Circle (1146)

Wheatstone Broadcast Group
• A-32EX radio console: expandable with MP-32 talkback module; ECM-32 6-station intercom, SC-20 studio monitor, mute, multilink selection, machine control modules.
• A-50 radio console: machine control, programmable channel logic, program, audition, telco outputs; control room, studio monitors; headphone, cue power amps.
• TS-500 talent station: for announce booth; talk studio, mic channel switch; touch button, talk-to-control room: separate; speaker, headphone controls; digital clock, timer; I/O ports for prompt-to-talent.
Circle (1248)

Yamaha
• PM1200 mixer: 16, 24-, 32-input frames with four groups, stereo mix; 3-band EQ, sweepable mid-band, high-pass filter; switched phantom power; 40, +10dB channel gain adjustment.
Circle (1259)

A2: Processors
• Compressor, limiter, EQ
• Delays, effects, noise reduction
• Telephone equipment

Allied Broadcast Equipment
• Gentner Telelink 2000: digital telco-broadcast interface; automatic record on-air, off-air calls for playback; full-level conferencing of several callers; permits frequency extended broadcasts.
• Gentner PeopleLink: modulator telephone system with digital processing for broadcast, audio conferencing on existing telco lines; 40-caller participation; automatic selection of next caller on-air.
Circle (527)

AMEK Consoles/TAC
• Medic EQ: dual-path, 4-band EQ; high, low-pass filters per path; combines to single 8-band EQ system.
Circle (536)

DPS-265
A Universal Way To Stay In Synch.
Our UNIVERSAL 4 FIELD SYNCHRONIZER includes a TBC with automatic mode switching. There's a digital adaptive comb filter for broadcast-quality freeze. And you choose from 4-field/2-frame or independent field freeze modes. A special 5 field animation feature. And a built in test generator.
So now you can have a universal synchronizer at down to earth prices. Like an early $5,495.
Ampex D2.
A better business machine . . .
from the ground up!
Yes, it's true that our new VPR-200 and VPR-250 D2 video recorders are designed and built specifically for broadcast operations. It's also true that they offer the broadcaster superior signal quality. But a much more important consideration is that these machines make business sense. Here's how.

You probably amortize your recorders over 5 or 7 years, but the "200" and "250" are built to be around a lot longer than that—you're not going to find any "bent metal" here! Precision-milled castings and pre-aligned guide assemblies not only give you dependable long life, but also low maintenance costs. Replaceable heads and easy access components reduce downtime.

We've given your operators some help, too. For example, these are the only D2 machines designed specifically for broadcast applications that make it easy to change program length. With program compression, your operators merely enter the program length required and the machine does the rest. You get no bounce, no blur video, and recovery of all four audio channels! And because all machine selections are clearly displayed and easily changed without cumbersome menus, operator training time and operator errors are significantly reduced.

Then there's virtually instant lock-up and 60 × shuttle speed to save you time and money, plus air lubricated tape guides, and... but you get the idea.

You may not have thought of video recorders as "business machines" before, but we think your first VPR-200 or 250 will change your mind. Call 1-800-25AMPEX for more information.
Apex Systems Ltd  
• #651 Expressor: compressor, limiter; voice, music, single track modes; enhances detail attenuated in wideband systems; SPR restores bass clarity, punch without increased midrange.
• Model 150 remote: audio control with VCA technology; two independent channels, 15dB gain control; display LED indicators show attenuation levels in 4dB steps. 

Audio Development
• REBUS modules: compressor, limiter, oscillator, pre-amps, equalizers, LED meters, mic/line amps, mixer/DA's, pan controller, VCA, noise reduction, balance, noise gate, expander, digital sampler. 

Audio Processing Technology/SSL
• Enhanced api-X 100: encoders-decoders; AUTO-SYNC synchronizes operation of decoder on satellite, radio transmissions. 

Broadcasters General Store
• BigMod 2900 processor: 3-card package makes standard Optimod 8100 perform as a multiband, digitally controlled processor; suggested for CD, R-DAT material; by California Digital Audio Systems.
• VIGILANTE limiter: multiband unit from Cutting Edge Technologies; usable with most of processing chains; high-frequency limiting without loss of mid-band material with special clipper/filter circuit.
• SMO-900 optimizer: intelligent enhancement process expands perceived dynamic width of the stereo signal; by Hit Design. 

CEI Electronics
• F190 audio delay: 16-bit linear A/D, D/A conversion, -90dB dynamic range at 20Hz-20kHz; 100% delay tracking; used with standards converters where video has been delayed in processing. 

Circuit Research Labs
• Audio Signature: programmable 4-channel EQ and audio compressor system.
• IPP-100R: remote control for the IPP-100 microphone processor.
• MBL-100 series: 7.5kHz model processor for news-talk AM radio stations. 

Comrex
• THX extender hybrid: telco to broadcast audio management; 1-line bandwidth extender; two cart starts; send limiter; bandwidth filter; tone source, balance indicator, 2XP/2XR encoder, decoder; updated frequency extender; 50Hz-5kHz audio on two dial lines; portable encoder smaller than original model; variable telco EQ; optional auto level adjuster.
• Multiline Frequency Extender: 1-, 2-, 3-line; 1-button auto dial, setup; auto EQ; 6-band noise reduction; audio processing; optional satellite differential delay; 1-line to 3kHz; 2-line to 5kHz; 3-line to 8kHz.

dbx Pro Products/div AKG Acoustics
• 1403 Type II: noise reduction with dual-channel encode, decode electronics; inputs, outputs at standard professional line levels; 
• ½-rack package is 1RU high. 

Dolby Labs
• AC-2 audio coding: spectrum-adaptive transformation; DP51 encoder, DP502 decoder at 128kb/s; frequency-domain processing in narrow bands masks noise. 

Eventide
• HS532 sampler: H3000 Ultra-Harmonizer option; 16-bit, 41.1kHz sampling stores 11.8 sec stereo, 23.7 sec mono; expanded memory for 3 minutes of mono, manual, audio level or MIDI triggering.
• BD1000 video delay: video counterpart to BD980 stereo audio delay; includes DUMP button for obscenity deletion; RAM options for 1-20sec delay range; addressable control to specify events by frames.

Gentner Electronics
• FM LAZER: digital FM limiter, stereo generator; front-panel displays of left, right, composite, 3-band limiting; LCD status, menu control system.
• PRIZM processor: 4-band stereo system; front-panel LED displays of left, right channel activity and of expansion and compression in each band; LCD menu of status.
• Digital Hybrid II: auto null; maximum separation between caller, send audio, cue, record features.
• SP85, SP85E: hybrids improve audio quality for on-air, call recording, audio conferencing; adjust caller control to reduce caller level when announcer talks; record start, stop switch.
• PeopleLink telephone: multiline, modular system; works with any telco system and for studio or conference arrangement; call screening, recording, conferencing; run caller contests more easily. 

GML
• Model 8906: compressor, limiter. 

Inovonics
• Model 222: NRSC AM-SW processor. 

Kahn Communications
• POWERBlok processor: maximizes coverage for all-talk, all-news AM; FCC compliant filtering. 

Klark Teknik
• DSN90 dual compressor: 2-channel, combines compression, expansion, limiting; stereo in-out switch; LED gain reduction meter; envelope auto-manual switch. 
• DSN4 quad processor: 4-channel compressor; limiter; 1RU package; complete function control per channel; may operate as two stereo pairs; LED meters gain reduction. 
• DN276 stereo delay: 2-input, stereo 16-phase output; 20Hz-20kHz; 0.1-3sec delay in 20sec increments; 16-bit linear design.
• DSN10 dual noise gate: stereo, 2-channel mono; gate range 0 to -90dB; filter, gate, trigger, masking controls; envelope with duck, fixed, MIDS switches; adjustable delay; distortion is 0.05%, SN/N-104dBm.
• DPR-504 noise gate: 4-channel; link in pairs for stereo; eliminates noise from tape, uncontrolled room reverber; enables gated reverb effects; auto voice fader; adjustable threshold +20dBv to -50dBv.
• DN514 quad auto gate: auto attack settings, hold time scaled to release value; sync feature interlocks four gate release times. 

Lexicom
• Model 300 effects: digital reverb, pitch shift, effects; menu-driven; 50-event time code trigger; Dynamic MIDI; DAT interface; keypad, softknob, dedicated key control. 

McCurdy Radio Industries
• TIF teilo interfaces: TIF-800 8-hybrid package for 3RU rack space; TIF-951 interface with DTMF decoder in 1RU cabinet for McCurdy intercoms. 

Orban/div AKG Acoustics
• Model 4000A: transmission limiter; controls peak modulation on microwave links, telco lines; causes no dulling of signal with limiting or pre-emphasis.
• Model 764A EQ: multichannel parametric EQ; to 99 channels; one or two EQ boards; digital control of analog circuitry; grouping; MIDI, RS-232-422; Query status of preset.
• Model 259RX: harmonic, spectral restoration, Open Sound single-ended noise reduction revitalizes heavily processed audio. 

Solid State Logic
• Logic FX processors: G383 dual mic amp, EQ; G384 stereo compressor; functions of G-series consoles as stand-alone products. 

Swintek Enterprises
• MARK 2000/RI: remote telephone link.
• MARK QDC-HFI, 50A-HFi: high-fidelity pocket-sized receiver, transmitter. 

Symetrix
• SK-206 dynamics processor; recording, broadcast, concert applications; compressor, limiter, expander, gate, duck, slave modes; LED GR display; balanced, unbalanced output, stereo operation link. 

TeC Electronics
• TC 1290, TC 1380: stereo, multitap delays; 20Hz-20kHz with 0.5dB variation; minimum phase shift; enter delay values in meters, feet; MIDI option. 

Telos Systems
• Direct interface: module directly connects Telos 100 hybrid to telco lines without PBX or key systems.
• Telos LINK: intercom-to-dialup telco interface; AGC, digital auto null hybrids on telco and com paths; pitch shifter reduces feedback; call signal generation. 

Titus Technological Laboratories
• TLW-2 The Last Word 2: auto stereo synthesizer, corrector; avoids loss of channel, loss of signal and inverted polarity; use for stereo production for TV. 

Circle (559)
Circle (733)
Circle (757)
Circle (622)
Circle (810)
Circle (603)
Circle (848)
Circle (652)
Circle (694)
Circle (687)
Circle (798)
Circle (519)
Circle (870)
Circle (848)
Circle (652)
Circle (684)
Circle (519)
Circle (687)
Circle (888)
Circle (932)
Circle (951)
Circle (901)
Circle (1100)
Circle (1130)
Circle (1134)
Circle (1135)
Circle (1147)
Circle (1179)
Circle (1182)
You're burning the midnight oil... Final edit's due at 8 a.m. Be glad you have Prodigy—the switcher with more brainpower in a smaller package.

**Forget about old two mix/effect systems.**

A reliable video switching and special effects system follows the industry standard—multi-level effects with look-ahead preview—then raises it with features no one else has, even on their most expensive systems. Prodigy offers stereo audio-follow-video, editor interface, effects memory and a programmable downstream keyer. Independent inner/outer border softness control is standard. An RGB chroma keyer is also available.

**Have it your way.**

Modify Prodigy to suit your style and create memorable performances. Program up to 99 events into Prodigy's 68000 microcomputer and preview the results instantly. Ten programmable sequences link 80 on-line memory registers, and ten learned operator transitions track your actions over time. With Videotek's exclusive Times Six Plus black burst generator, system timing is virtually automatic.

**Prodigy is multi-talented.**

Equally at home in the post-production facility, newsroom or studio—Prodigy rack-mounts in minutes and its software talks to a wide range of popular editing controllers.

Get your hands on a Prodigy and let the performance begin! For details or your nearest Prodigy dealer, call Videotek today.
**A3: Recorders**
- Non-digital recording
- Editing, synchronizing
- Ancillary equipment

**Accurate Sound Corporation**
- 6300 series: instrumentation recorders; FM, direct, PCM, voice modules; 8-channel may use one channel for voice; 20-hour or optional 160-hour record.
- MCS-500, 1053: cassette recorders, loggers; 3/4", 3-channel; 4:3:1 channel; dual Philips cassette transport; time code read, write; 16-hour record; $1064 duplicator.

**Apollo Lightning/Audio Visual**
- PA-2060: portable cassette recorder with public address feature.

**Audio Services Corporation**
- Sound Assist: tape counter utility package for analog recorders.

**Fidelipac**
- CTR 80: audio tape recorder-playing; mono, stereo, stereo Maxtrax versions; 3-tone cue, fast forward, 4-digit real-time timer; dynamic noise reduction; LED bargraph on recorders; Dolby H/S Pro.

**Fostex**
- G-16 16-track: multitrack recorder, optional integrated synchronizer as plug-in card; G-16 functions as master or slave transport; supports MIDI, RS-422/232, remote control panel; 10 cue points.

**International Tapetronics/ITC**
- Series 1 cart deck: NAB cart machine; available as playback or record-play; dc-servo capstan motor; new beam-and-cam design; opto-sensor sees carts with marking to trigger external user-selected functions.

**Otari**
- MTR-15 analog ATR: 1/4", ½" mono, stereo, 2-track and 2-track w/center track code; four tape formulation memories; 4-point locator, repeat mode, multiple search facilities.
- DP-4050 E series: in-cassette duplicator; three versions are 1-master/2-slave, 3-slave or buffer unit to expand the number of slave drives; open-reel master transport remains available.

**Studer ReVox**
- Model A 807: 2/2-TC 2-channel recorder; SMPTE center-track time code feature.

**TASCAM**
- BR-20T mastering deck: ¼" 2-track with center time code; servo-control accuracy of transport motion under SMPTE external control; gapless, seamless punch in/out edits; dissimilar reel size compensation.
- BR-20H handheld: ¼" 2-track recorder; independent channel recording; shuttle control with EDT, QuickCue; NAB, IEC EQ, 250/320 operating level adjustments from front panel; dissimilar reel compensation.

**A4: Ancillary audio**
- Wired, wireless mics
- CD, phono products
- Headphones, headphones
- Intercoms, speakers

**AKG Acoustics**
- K 290: switched headphones; mute activated when set is removed from the operator's head; sealed circumaural design; parabolic placement of two transducers in each muff; cuts leakage into open mics.
- K 280 parabolic headphone: reproduces left-right perspective of concert hall with parabolic reflector, dual driver design; 75Ω impedance, 51 mW power capacity; low distortion; open-air design.
- Micronics series: C401, 402 for acoustic string instruments; C408 for percussion instruments; C409 for wind instruments; C410 headmic for vocalists; each has characteristics appropriate for source.
- C 523 Stage/studio mic: condenser; lighter weight; capsule diaphragm than conventional dynamic mics, improved transient response; designed for musical instruments or vocals; not phantom-powered.
- C 1005S: multiple pattern mic; 9Vdc, phantom-powered; pattern adjusts from cardioid to hypercardioid with FCC 1000 polar pattern converter; 200Ω unit with sensitivity of 6mV/pa and 137dBspl at 0.5% THD.

**Allied Broadcast Equipment**
- Numark CD6020: dual CD transport; 18-bit A/D conversion, 8x oversampling; separate or simultaneous operation with mixing.

**Alpha Video & Electronics/AVEC**
- NC-102: telephone IFB system.
- SW-206 IFB selector: six XLR inputs with adjustable level control; includes cellular phone, home audio, teleconferencing; mic repeatable; switch for voice override; isolated outputs at mic and line levels.

**AMS/Calrec**
- S7220: remotely controlled stereo mic; unit adjustable between X-Y, M-S stereo from end-fire to vertical operation; 20Hz-20kHz response; 24kHz processing.

**ATI Audio Technologies**
- SMAD-200, SD2000; stereo 1x4 modular DAs, with input telemetry of L, R, sum signals; dipswitch selects stereo, sum, difference, L-only 1x8, R-only 1x8; single, full-slot stereo capability for DA-10000 series.

**Audio Developments**
- AD 150: dual mic amp, EQ; 1RU panel; XLR input; 48Vdc phantom, 12Vdc Tonador/AB power; phase switch; high-pass filter, overload indicator; transformer balanced output 24dBm at 600Ω; gain switchable.

**Audio Services Corporation**
- FSC power supply: universal unit for 12T, 48V phantom-powered mics.

**Audio-Technica US**
- AT 877 shotgun mic: 60Hz-1kHz with 350Ω output; -41.5dBm sensitivity; 12-48Vdc phantom, A2A power; highly directional pattern, linear off-axis response.
- Series 600; studiophones, oval earcup cavity for minimum standing waves, more natural sound; AT609 40mm driver, 20Hz-20kHz; AT611 44mm driver, 20Hz-20kHz; AT616 closed back, 20Hz-22kHz.
- PRO 22 mic: close vocal, instrument mic; unidirectional pattern, 3-position output impedance switch; shielded cable for unbalanced h12Z operation; 70Hz-15kHz; -59dBm to 40dBm sensitivity.
- AT 825 field mic: for X-Y stereo recording; 30Hz-20kHz to 130dBspl, 1% THD maximum; switched low-cut filter; phantom, A2A power; full mono compatibility.
- Boundary microphones: AT 841A, Omni-Plate omnidirectional; AT 851A Micro Uni-Plate cardioid; AT 871R phantom-powered Uniplate unit with sensitivity increased by 10dB; 30Hz-20kHz responses.

**Audiotronics**
- 1900 IFB enhancements: expansion to 16, 24, or more outputs; any number of IFB controls; confidence module for continuous feeds; talkback for 2-way setup; field upgrades.

**Barco Industries**
- EMT 981 CD player: front loading system for mini, normal CDs; universal cabinet for 19” rack mounting or desktop unit; line and digital outputs; 16-bit with 4x oversampling; integrates into automation system.

**Benchmark Media Systems**
- System-1000 enhancements: 1201 input buffer/lexer; 1202 matrixed output module; 1203 gain control modules.

**Beyer dynamics**
- DT 770 headphone: professional monitoring headphone; 30Ω impedance for better match to mixing, reproduction equipment.
- DT 158/159 headset microphones; single, dual-muff; boom-mount mic dynamic ribbon or condenser mic.
- MC 742 stereo condenser: studio mic for stereo, M-S, X-Y recording; double diaphragm capsules arranged vertically; upper rotates 360° relative to lower capsule for desired mode.
- A-V pack: M58, MCE6, MCE5 or MCE10 microphone for lavaliers; hand-held interview, shotgun requirements in single attache case.
- Model 32 audio station: music library listening station; dual 220 stereo head-phones; developed by Current Designs.
- TGA series: high-output mics; neodymium rare earth magnet; transient response to 140dBspl, 1/8", 140Vacrolon diaphragm; -280, -580 H0staphan diaphragm.
Vega Pro Plus Wireless, the Performance Standard

Vega Pro Plus systems featuring the new R-42A receiver, have become the accepted standard for the most demanding applications from broadcast and film production to concerts and major live events. Offering true-diversity operation, unparalleled RF selectivity, and resistance to overload, no other wireless system performs as well in severe RF environments. Usually, 25 or more systems may be used in one location. Pro Plus systems also feature third generation Dynex® III audio processing for the highest obtainable signal-to-noise ratio, lowest distortion, unequaled transient response and the widest dynamic range. When it comes to dependability, Vega is second to none. Major live events almost always use Vega systems because of their rock-solid reliability and exceptional performance. In other words, if you’ve got only one shot at it, you better have a complement of Vega Pro Plus systems.

The handheld transmitters are available with the new Electro-Voice concert vocal capsule, the N/D857, the popular N/D757A and a variety of Shure microphone elements. The bodypack transmitter offers flexible microphone biasing and interface, making it compatible with just about any lavalier microphone.

Nobody does wireless better than Vega. The Vega Pro Plus series, clearly the world’s best wireless system.

For additional information, literature and technical assistance, please call James Stoffo at 1-800-877-1771.
Here are just a few of the over 1,500 individuals and facilities worldwide who use the ADAP Digital Audio Recorder and Editor to make their jobs faster and easier in the production of music, effects, and dialog:

**Access Network**
- ADAC Radio
- Alberta Studios
- ADR Television
- Aspect Audio

**Bavaria Film**
- BSC
- Blue Nile Recording

**BR-TV**
- Canadian Broadcasting
- Canal-Plus Television

**CBS Television**
- Centre Georges Pompidou Museum
- Commercial Pictures
- Conway Studios

**Copro Film**
- CUE Systems
- David Bowie
- David Gilmour

**Dierks Brothers**
- Digigram
- Dream Edit
- EAG-Video

**Elson TV**
- Euronews Television Production
- Focused Audio

**FR3-TV**
- Hank Smith Productions
- Harbor Music

**Hermandaz Mexicana Nacional**
- Hot Line Studios
- Iggy Pop

**Integration Technologies**
- Labeo-Films/Mester
- Levon & Many Studios

**Lorimar Studios**
- MS Radio
- Midi Station

**Meridian Audio**
- Milburn Sound
- Motley Crue

**National Children's Theatre**
- National Radio Network
- Nexus Productions

**OnBeat Studio**
- Qunroco Studios
- Paramount Studios

**Pilot Studios**
- Public Access Television
- Renowned Sound

**SAO Theater**
- Sonic Perfection
- Soundex

**Spitfire Audio**
- Star Trak Studios
- Structured Dynamics Research

**Tech Arts**
- The Music Suite
- The Works Productions

**Todd AO Dunn & Dunn**
- TruSound Films
- Twentieth Century Fox

**University of Arizona**
- Video 22
- Westdeutscher Radio

**World Trade**
- ZDF Television
- Zapteveil Films

And here are just a few of the more recognizable projects they have completed using the ADAP system:

**Born on the 4th of July**
- Glory

**Honey I Shrunk the Kids**
- The Fabulous Baker Boys
- Steel Magnolias

**Colors**
- Friday the 13th, Part 8
- Die Hard

**And God Made Woman**
- Camille Claudel

**The Life and Times of Maro Polo**
- A World Without Jolly
- George's Los Nueve
- War of the Worlds
- The Cowboy Show
- ABC Move of the Week
- Tatortings
- Falcon Crest
- The Simpsons

Any questions? Want to know more? Good. Call or write us for more information, a brochure, and the name of the authorized ADAP dealer nearest you.
COMPACT, POWERFUL, FLEXIBLE...

...AND TOUGH

Designed and built to withstand daily operation into the next century, the ergonomically designed AMS VCS offers more facilities and flexibility than any other console, within a compact, yet reassuringly conventional work surface.

Complete console set ups can be stored and recalled instantaneously in live situations or for later transmission. Featuring a unique offline set-up editing package, complete with high definition graphics, precious studio preparation time can be significantly reduced.

Faders are freely assignable to channels so that a single person can centrally operate the entire console. For occasions when more than one operator is required, two separate Assign panels accessing all console parameters are simultaneously available.

Fourteen day memory storage is automatic in the event of mains power failure and a sophisticated automatic maintenance program pinpoints faults to a single card.

Time tested in Europe and the United States, much copied but never equalled, this concept in consoles is the result of over 20 years of console design for broadcasters and leads the way for the future.

The AMS Virtual Console System
The most technologically advanced stereo console available.

For information and literature contact...

AMS Industries plc
Billington Road, Burnley BB11 5ES, UK
Tel: (0252) 57011 Fax: (0252) 39542

AMS Industries Inc
1180 Holm Road, Suite C, Petaluma, CA 94954, USA
Tel: (707) 762 4840 Fax: (707) 762 4811
Systems Wireless Ltd
- Clear-Com intercom: Matrix Plus digital 50-50 central matrix, point-to-point and conference line intercom.
- Vega systems: R-42A true diversity wireless receiver; QX-6A wireless intercom; Q-Plus wireless intercom headset; T-477 transmitter; R-463 true diversity receiver, in UHF channels.
- Lectrosonics wireless: CR-185 compact receiver and M-185 bodypack or H-185 plug-on transmitters.

Circle (1138)

Tannoy North America
- Audio monitors: AVM-DMT shielded, high resolution A/V reference monitor; PBM-4/5-8 playback monitors; NM-8 (DMT) reference monitor; differential material technology with aluminum diaphragm in polyamide suspension.

Circle (1142)

Television Engineering
- IFB-19 controller: communicate with staff in the field; selects eight IFB sources, four interrupt sources; three isolated outputs; telco line capture, hold; line level control.

Circle (1183)

Telex Communications/Pro A-V
- BP-1, BP-2: 1-2-channel belt-pack intercom units for AUDIOCOM series; match balanced, unbalanced system with selector switch; light-signalizing; male/female XLRs.
- PC-25 case: for FMR-25/25TD wireless equipment; 10 AA cells give 10-15 hour operation; "rubber duck" antenna option.
- RADIOCOM: wireless intercom on 150-216MHz; BTR-200 base station, 4-channel receive, one transmit; TK-200 belt-pack with one receive, one transmit channel.

Circle (1165)

Vega/Electro-Voice
- SP-30 wireless: SR-33 miniature receiver, ST-37 transmitter; mounts on camera; Dynex II processing; GaAs FET amp, 10-pole IF filter in receiver.
- R-42A receiver: true-diversity companion to Pro Plus microphones; 4-pole resonator for selectivity; GaAs FET RF amplifier; Dynex III preemphasis, de-emphasis processor.
- T-89 hand-held wireless: E-VN/DYM/N0875 dynamic element with Vega Pro Plus transmitter; concert applications with cardioid pattern, extended response, low handling noise; dipole antenna.
- "Pro Plus" wireless system with R-662 receiver and T-677 transmitter; Dynex III processor for 35dB increased S/N ratio; 535-820MHz operation; 150mW RF output.
- QPlus wireless intercom: QX-6A base station communicates with six QTR-2 walk-around units; full duplex; local sidetone for QTR-to-QTR operation.

Circle (1217)

Ward-Beck Systems
- MT884/M7885: communications terminals for WBS MicroCOM II; enhanced software extends capability of the intercom system.

Circle (1293)

Wheatstone Broadcast Group
- Intercom: station communication system.

Circle (1248)

Whirlwind
- MICROPOWER phantom supply: portable power unit delivers 12-18Vdc from two 9V batteries; operates 50 hours to 4mA load.
- Link balancer: isolates, splits, balances line level signals; XLR, 1/4" TRS jacks for input; male XLR output; transformer isolated 2nd output.

Circle (1250)

Wolf Craft
- Integrator series 1000: field interruptible feedback IFB; various inputs, transformer balancing, amplification, distribution through four transformer protected outputs; ac/dc; from Critical Communications.

Circle (1257)

Yamaha
- MS50S: powered 2-way speaker; 8-inch low-frequency, bullet-type high-frequency; Yamaha Active Servo Technology; two main, one guide input.
- P2350, P2700: 2-channel, P-series high-power audio amplifiers; P2350 for 250W per channel to 4Ω or 175W to each 8Ω channel; P2700 provides 500W, 350W respectively to the two impedances.

Circle (1259)

A5: Digital, MIDI
- Recorders, workstations
- Editing, interfacing

AKAI Professional
- DD-1000 studio recorder: direct-to-optical disk unit with editor; rewritable optical disk drive, 24 GB limit; 44.1kHz, 16-bit; disk read/write at 44.1kHz, 48kHz; 25 minutes per disk side; an external drive doubles time to 50 minutes.

Circle (519)

AKG Acoustics
- DSE-7000 enhancements: "undo" control avoids destructive actions, including erroneous selection of "undo"; auto backtimin; 3-point edits; extensive sound library management of effects, tags, music beds; full digital mixing.

Circle (520)

Allied Broadcast Equipment
- AKG DSE-7000: digital workstation; 16-bit architecture; controls simulate standard tape recorder; EGA monitor display.
- Alpha Audio DR-2: hard disk recorder; 44.1kHz 16-bit stereo for 30-minute capability; optional 720MB for disk 60 minute, one hour input.
- DSC interface: digital integrated storage control; senses signal from satellite feed and initiates specified event, then reorients satellite source; instant access for more than 500 spots; replaces cart machines.
- PL-2 Pilote-Lok: phase-linear filter by Semic Engineering; guards 19kHz pilot to eliminate blends to mono caused in heavy clipping of composite signals.

Circle (527)

Alpha Audio
- DR-2, DR-2 Remote: digital hard disk recorder with "tape recorder" controls; 60 minutes of 16-bit stereo at 44.1kHz, 48kHz sampling; emulation for various editing controllers; chase functions.

Circle (529)

AMEK Consoles/TAC
- TAC MICE: Multiple Interface Control Element; mute switching with MIDI.

Circle (536)
In The Category Of "Innovative Broadcast Facilities," These Are The Nominees.

If there actually were such a category, they would all be winners.

Why? Because they've purchased a Sony Multi-Cassette System.

In fact, Sony has installed over 40 Multi-Cassette Systems nationwide in the past eighteen months alone. A winning solution to a very real challenge confronting broadcast facilities.

It's a vision worthy of recognition. And one which Sony supports with their commitment to technical and service leadership.

For more information, contact your Sony Broadcast Sales Engineer. Or call 800-635-SONY.

Sony Communications Products Company, 1300 Queen Anne Road, Tarrytown, New Jersey 07091. Sony is a registered trademark of Sony. ©1990 Sony Corporation of America.

SONY
BROADCAST PRODUCTS
Bricel & Kjier Instruments/Pro Audio
• R-DAT archiver set: two type 4006 microphones, stereo mount, nosecones, battery charger; Panasonic SV-255 portable R-DAT; in FAA carry-on luggage case. Circle (623)

BTS
• BAC-3000 audio encoder: dual codec; takes two AES/EBU signals to four mono, two dual mono or two stereo signals; bidirectional; 20-bit 128× oversampled; 44.1kHz, 48kHz sampling, with 32kHz in decode. Circle (628)

Digidesign
• Sound Tools for Mac: features for Macintosh; MIDI, digital audio synchronization to SMPTE code; CD mastering; live performance functions; DAT backup; integrated sequencing.
• Soundtrack: Atari digital recorder, editor; 2-track CD-quality with 56001 DSP processor; 44.1kHz samples for 30 minutes stereo on 300MB byte drive; full edit capability. Circle (1496)

Digital Audio Research
• WORDER: auto dialogue synchronizer.
• SoundStation II: enhanced multichannel digital audio recorder, editor; optical disk for 2-hour rewriteable storage as removable 650MB byte; 5¼” magneto-optical cartridge; multiformat possible. Circle (724)

Digital Audio Technologies SA
• Stellavox Stellad: portable R-DAT recorder: 4-head design for editing; time code option in software; serial, parallel, infrared remote control; 44.1kHz, 48kHz, 32kHz sampling; chase synchronizer option. Circle (1438)

Dolby Labs
• DP501, DP502: digital encode, decode; 2-channel, 128kb/s per channel; encodes digital audio prior to storage, transmission. Circle (736)

Fairlight Electric Sound & Picture
• XDR upgrade package: digital processing with Waveform Supervisor: Rev 8 software has dynamic voice allocation, CAPS hit point display, Sysex recording, MIDI time code, Cue List, Dynamic Router. Circle (770)

Goatham Audio
• PRODAT: upgrade package turns consumer R-DAT machine into a professional, rackmount unit.
• BW 102/50: Harmonia Mundii Acoustica sampling frequency synthesizer; A/V synchronization with sampling frequency conversions; for SD/FF-2, PRODIGI, JVC, AES/EBU, F1, SDP/D formats.
• IMA BA-102: modular digital broadcast system; source-to-telco on lines in processing in digital domain.
• Ferrograph 5500: digital disk recorder; software has central library networking.
• SPOT 90: recordable CD; PQ codes for fast, accurate cues; any CD player performs as digital cart machine; PQ provides direct digital transfer without generation loss. Circle (805)

JVC
• DS-L90U controller: digital processor for recording; limiting, compression, noise gate, level control, parametric EQ; FLP, IR filters; RS-232C serial port control. Circle (886)

Klark Teknik
• DN775 preview delay: for stereo mastering preview purposes; 2×2 matrix; 0.55ms delay over 20Hz-25kHz response range; 16sec delay increments; 16-bit linear processing; 90dBm dynamic range. Circle (879)

Lexicon
• MIDI Remote Control: V 3.0 talks to 16 machines; controls LXP-1, LXP-5 with storage of 64 setups; two slider pages; user- defined Sysex strings; hardware changes.
• OPUS automation: full control of knobs, switches, absolute, trim updates; auto-takeover, auto-release; 90-track reel format has corresponding automation track. Circle (898)

Neve
• Mitsubishi digital ATRs: X-880 32-track recorder; X-86 2-track, 20-bit recorder. Circle (971)

New England Digital
• Auto conform: Mac software; reads CMX data from 3.5” floppy; auto-locate control find program material on source reels, automatically enter and exit record at indicated times; creates audio EDL sequence.
• PostPro SD: 16-track Direct-to-Disk; eight outputs from Synclavier form 24-track random access system; 30 minutes recording per track with 44.1kHz sampling; graphics environment interface.
• EditView: Mac software; audio cues scroll on monitor as audio plays; operator selects a block to change, fade-in, fade-out, durations, timing with volume envelope modification. Circle (972)

nVision
• NV2000 multiplexer: high-performance digital multiplexer, supports multichannel audio for HDTV. A-1, D-2, type C; 20-bit encoding; 2/4-channel upgrades to eight with analog or digital reference. Circle (1464)

Optical Disc
• ODC 610A laserdisc: CLV videodisc expands time to full hour; permits interactive operation, seamless search, random access to frames typical of CAV format discs.
• 617 CX encoder, decoder: improved analog recording with 14dB noise reduction; CX compression in encoding, expansion in decoding. Circle (869)

Radio Systems
• RS-2000: audiocart system; flutter compensation, phase correction, front-panel azimuth adjustment; available in mono, stereo; ½” track size; R/P, play-only models with 3-tone, fast-forward, splice-finder. Circle (1014)
The broad Philips line of Plumbicon® tubes includes broadcast, ENG and EFP types, low-power and high-definition types. With lots of options. And they’re available overnight.

Philips broadcast experience in camera tubes also covers UHF transmission. With UHF klystrons, Philips is a global leader in terms of market share and innovation. Immediate U.S. availability, strong technical field support, and energy-saving MSDC design are yours from Philips.

Philips Components for TV imaging and transmission. With guaranteed supply continuity. And worldwide availability.

Philips Components
Discrete Products Division
2001 W. Blue Heron Blvd.
P.O. Box 10330
Riviera Beach, FL 33404

Ramset Audio/Panasonic  
- SV-3700 Pro-DAT: digital recorder; front-panel shuttle wheel to 0.5×15x speed; 4-stage, 1-bit Delta-Sigma A/D converters; quad 18-bit D/A for reduced zero-crossing distortion; push-button fade-in, fade-out.
- SV-3900 Pro-DAT: full remote control on serial interface; Esbus, P-2 protocols; use with many editing, automation systems; key board entry of ID, PNO, shuttle wheel.
- SV-255 portable: R-DAT recorder; 128cB EINS/N, 87dB dynamic range; dual channel mono mode, MASH A/D converters; 64× oversampled; 18cB/octave filters enhance phase, frequency response.  
Circle (1044)

Solid State Logic  
- SoundScreen editor: enhanced software; audio- for-video editor with hard disk, optical disc storage; assembled digital sound tracks with music, dialogue, effects from tablet, wireless stylus.  
Circle (1100)

Solidyne  
- Audicon ADX-900 editor: PC-based recorder, editor; 60cMB disk stores 2½ hours stereo; on-screen VU indicators; expand, compress features; effects with stretch, compress, freeze, pitch change.  
Circle (1448)

Sony Communications/Pro Audio  
- VSP-4800 sound processor: control 4-channel PCM audio from DVR; snapshot storage of EQ, dynamics, delays per channel; interface to BEV-9001 editor controls audio fold; presets; optional 32×16 router.
- PCM-7010, 7030, 7050 DAT: R-DAT recorders with time code; 2-hour capacity of 16-bit stereo per cassette; RM-D7300 DAT edit controller; 90dB dynamic range, 20Hz-20kHz; 64× oversampling.  
Circle (1104)

Soundmaster International  
- Soundmaster upgrades: Professional Librarian, Sound Supervisor, Spotmarker, Cueprinter functions to digital editing system; result of joint development with Leonardo Software.  
Circle (1111)

Studer EdiTech  
- Dyaxis 2-2: digital production system; 4 mono or 2 stereo channels; full DSP, EQ, pan, metering, level control, VPK3 emulation; full system sync with SMPTE, MIDI; random-access record, playback.  
Circle (1126)

Synmex  
- DP-R100 enhancements: Macintosh control accesses 40 channels of recording in blocks of eight; real-time level control, EQ, compression, limiting, gating; dynamic recall all parameters.  
Circle (1134)

TASCAM  
- DA-310-DAT: stereo ATR; Delta-Sigma modulation in A/D, 64× oversampled; 18-bit with 8× oversampled D/A converters for 94dB S/N, 32kHz, 44.1kHz, 48kHz sampling.  
Circle (1146)

360 Systems  
- Digitcart: digital cart system; 16-bit sampled audio, instant cues; 203b/sec spots per removable media disk; zero start time; emulates standard cart machine control.  
Circle (1172)

Turtle Beach Systems  
- 56K digital system: 2-track editing with IBM AT or 58386 PCs; 56cPc 16-bit card with Motorola 68000 fixed signal processor; 56K interface to AES, EBU, SPDIF, A/D converter, SoundState 2 edit software.  
Circle (1489)

WaveFrame Corporation  
- CyberFrame Editor: digital editorial automation for post-production in film, video; tools for NDR, dialogue, effects, music editing; auto assembly by time code or EDL data; 80386 PC 20MHz processor.  
Circle (1258)

Yamaha  
- DMR-1540 track; 20-bit recorder; 24-bit digital mixer, time code locator, auto mix in one package; DRU8 digital record units bring single machine to full 24-track system.
- DOLLS audio delay: 3-input, output 2, mode operation; maximum delay per output to 1.3 sec; each channel has 3-band digital parametric EQ, variable Q at mid-band, 18-bit A/D converter, 110dB dynamic range, 19-bit resolution with THD to 0.018% from “digital floating” concept; 48kHz, 44.1kHz sampling.
- FMCI2 interface: direct-digital audio link between JVC VTRs and Yamaha DMP7 digital mixing processor; 8-input capacity using AES/EBU format.  
Circle (1259)

RF Products  

RI: Transmission  
- Antennas, masts, towers  
- Transmission line  
- Remote control, telemetry

Acrodyne Industries  
- TRU/25K transmitter: 25kW UHF transmitter; solid-state control; hardwired Thomson THS-602 in combined amplification; system efficiency approximately 54%; linearity permits decreased preemphasis.  
Circle (509)

Allen Osborne Associates  
- Hi-tech product: R2 telescopic portable mast; several series include universal, cable, winch types; various configurations with guys, vehicular mounts.
- Magnetic safety switch: signals van driver that telescopic mast is not fully retracted.
- Compressor control: RMC 1 remote control for NLC compressors, RMC 2 for NLC units; handles RF or other antenna; raise, lower, hold functions.
- Air compressors: C-3E-003 1.3 CFM, C-3E-004 0.85 CFM units; operate from 12Vdc automotive battery power source; limit switches; slo-blo fused; output pressure regulated to 18 psi and 21 psi.  
Circle (526)

Andrew Corporation  
- VL VHF TRASAR: antenna for channel 7-13; reduced windloading and weight of previous slotted arrays; full radome enclosure; elevation gain to 12; appropriate azimuth pattern, optimum beamfill per application.
- ALPine series: models to 20kW; higher power feed systems of Andrew Helixx cable; full environmental protection; profile for low windloading; CP options, LPTV models.
- RADIAX CATVR coax: riser-rated, fire-resistant slotted cable per NEC code; for installation in buildings without use of plenum spaces; specifically for controlling spaces; 1/2" to 1" diameters; functions as an antenna.
- TRASAR improvements: null-free elevation patterns for improved reception in areas near transmitting antennas; with EP or CP to eliminate ghosting, weak signals, dead spots at receiver with rabbit ear antennas.
- XCL semi-flexible coax: cable for LF, MF, HF frequencies to 30MHz and powers to 500kW; 38ft, flanged segments of 7", 8", 9" diameters; solar reflective paint avoids sunshields; permits short radius “S” bends.
- CATVR HELIXX coax; NEC riser-rated, fire-resistant cable; 9/8-19" foil, 9/8-24" air types; superflexible foam in 7", 8", some elliptical waveguide also available.  
Circle (543)

BEXT  
- LPTV, broadcast transmitters: 5W, 25W drivers; 100W, 1kW amplifiers; dual baseband inputs; automatic switching; hum rejection; group tetrode rectifier,  
- NS series amplifiers: cavities with integral circulator, RF load; modular; full feature capability; VSWR, voltage, current overload protection; ferroresonant primary transformers for voltage stability.  
Circle (597)

Cablewave Systems/RF Systems  
- FM antenna: for broadcast; non-directional characteristics for high power.
- Semiflex: transmission line in 5", 6" diameters; with appropriate connectors.
- APD-70, -72 dehydrators: automatic pressure surization dehydrators; 0.7 and 0.538°C; FM ratings; pressure swing drying system.  
Circle (631)

Catei Telecommunications  
- CTM 20 modulator: CATV modulator for NTSC as well as CCIR B/G, 1, D/K standards; digital color control panel; generator, diagnostics; emergency audio alert switching for emergency override.  
Circle (644)

Comad Communications/SIRA s.r.l.  
- SIRA UT2-509: UHF panel TV receiving antennas: H and V polarization; narrow beam, high gain, low side lobe to aid in rejection of interference.  
Circle (671)

Comark Communications/Thomson  
- Air-cooled systems: UHF TV transmitters to 70kW, based on Varian/Elmac Klystron or Elmac IOT devices; avoids costs of water pumps, plumbing, heat exchangers.
- Advanced SK series: UHF transmitters; PA uses EEF inductive output tubes (IOT), similar to Elmac Klystronds; power levels to 70kW per tube; water or air cooled; duplex or common amplification.  
Circle (674)

Continental Electronics/Varian  
- FM transmitters: model 813A 500W, model 814E FM broadcast transmitter; both units are all of solid-state design.  
Circle (684)
The new dimension in lighting. Reporter 125D, 270D, 100H, 250H, 300H, 650H; Production 575D, 1200D.

Sachtler's new product line brings innovation in lighting. Built with worldwide known Sachtler quality.

The Sachtler Reporter 270D is lighter and handier due to a synthetic housing material and a compact design.

The reflector, with its new geometry and its varying surfaces, surrounds the 270-watt HMI bulb much closer. For the first time a light output of 5800 lux at spot setting (16.4 feet/5 m) is available.

With a focusing range of 1:6 and excellent light distribution, the 270D is unsurpassed by any "Open Face" fixture. Precisely guided by three rails, the socket carriage will focus reliably even after years of use.

Hand-held or on a stand, AC or battery powered, the new Sachtler Reporter 270D provides flicker-free daylight quality in news gathering and studio environments.

Crouse-Kimsey Company
- Stanz mast: 15' portable mast; operates with a reversible hand drum of 600W capacity minimum; adjustable, fold-away legs, swivel feet, integral leveler screws.
Circle (1470)

Delta Electronics
- TCT-7W: super high-voltage toroidal current transformers.
Circle (715)

Dielectric Communications
- DCPC FM antenna: panel design for broadband high power operation; ≤12MHz bandwidth with 1.10:1 VSWR; power panel of 20W; dual feed configuration.
Circle (721)

Electronic Research
- SMA-104 surveillance system: uses SAM workstation, interfaces, sensors to monitor operation of antenna, combiner system; with alarm report on 12-station multiple input antenna system.
Circle (755)

Energy-Onix
- SST-30, 500, -1000: solid-state FM exciter, amplifiers; 30W, 500W, 1kW power ratings; broadband, programmable.
- AM low power: 2.5W-10kW transmitters; solid-state control; plate modulation; low-cost PA, modulator tubes; NRSC option.
Circle (761)

Flash Technology
- SC-100: tower lighting system controller.
- FTB-301: medium-intensity light.
- FTB-205: high-intensity obstruction light.
Circle (780)

Hallikainen & Friends
- DRC-200 remote: transmitter control system; standard CRT terminal or computer as terminal, programmable via spreadsheet for logging; alarms, auto control; communications link made through telco, subcarrier, UHF radio.
Circle (614)

Harris Broadcast Division
- Platinum Sentry PC option: remote control for Platinum series VHF solid-state transmitters; displays all screens available on panel of transmitter; tracks real time data in memory; provides alarm cue access.
- Platinum HT 1LS: 1kW VHF transmitter; power ratings of 1kW, 2kW, 5kW, 10kW; field replaceable, broadband design FET PA modules; distributed cooling; distributed control; dual carrier sound available.
- UM series transmitters: UHF TV systems with MSDC depressed collector klystrons; devices available from EEE, Phillips, Varian; 120W, 180kW, 240kW models.
- Westar series products: UHF TV antennas in waveguide or coaxial construction for top or side mounting; dc-grounded dipole with each slot controls degree of vertical polarization; omni, cardioid, trilobe and peanut patterns.
- DX-100 MK transmitter: 100kW solid-state, AM transmitter; 86% efficiency achieved through digital modulation process; 140% peak positive capability, 100% CW modulation; common modules for modulator, PA.
- Gates AM series: medium-wave transmitters; solid-state design; 1kW, 2.5kW, 5kW ratings; MOSFET modulator, PA stages; auto VSWR protection; constant output power modulation with input power fluctuations.
Circle (815)

Hughey & Phillips
- KG225 Type W strobe: medium-intensity strobe, obstruction light; for retrofit to existing red beacon systems without rewiring the tower lighting system; acrylic lens, cast aluminum base.
Circle (832)

IBSS Canada
- CTE VI 5000: solid-state FM transmitter; efficiency ≥52% overall; 5kW from redundant 250W PA modules; 80dB harmonic suppression; switching power supply; LED status panel; from CTE, Italy.
Circle (1441)

ITS/Information Transmission
- ITS-230A: 1kW UHF TV transmitter; new design for low cost; with receiver forms ITS-232A translator; 9017 tetrode as PA; remote control, telemetry interface.
- ITS-1230 transmitter: UHF TV transmission system; 1kW rating from solid-state design; redundancy for reliability; integral switching power supplies in each amplifier tray.
Circle (860)

Jampio Antennas
- JBPF-FM antenna: twisted-Z antenna design for FM broadcast; 1½ Elements create 73-lb windload; omnidirectional characteristics; multistation system; 10MHz carrier separation without compromising performance.
Circle (863)

Jaymen Broadcast
- JBS solid-state transmitters: 2W exciter; amplifiers rated 100W, 2kW, 10kW, 55kW; UHF or VHF operation; redundant modular PA design; 120V/230V international frequency assignments.
Circle (1437)

LDD Communications/Larcan
- Larcan 30kW: solid-state VHF transmitter; incorporates multiple 1.5kW modules, combined through printed-circuit wiring to achieve desired output power.
- Lambda CP: TV transmitting antenna; circularly polarized in lowband VHF spectrum.
- Spearhead antenna: FM master antenna serves 10 full-power, Class C FM stations.
Circle (890)

Lindsay Specialty Products
- TZU Omni antenna: omni-directional, rated 1kW with bat-wing construction; fixed aluminum elements are field replaceable.
- ZigZag pattern: adjustable pattern transmitting antenna; stacked arrays alter patterns for specific terrain and population requirements; array rated to 10kW.
- Power dividers, combiners: division from 10kW for low signal loss to an array of antennas; combiner permits three UHF channels with various power levels.
Circle (1444)

M&R Data Services
- RF Manager: PC-based enhancement for TTS-7900 transmitter controller; various versions include direct interface to 7900 systems and three levels of stand-alone remote control systems.
Circle (915)

Micro Communications
- Articulated Flex Waveguide: WR975 to WR2300 types for 470-1050MHz frequency range; VSWR < 1.05:1 over specific channel; handles 280kW to 900kW peak; flexible permissible in E or H plane axis.
- Calometer: usable with any water load; digital thermometer with analog bowformer; iron constant in ferrite core sensor; calculates input-output water temperature differential; readout to 0.1°C.
- UHF/LPTV combiner: for four UHF channels with minimum 2-channel spacing; interdigital filter for 1.056s insertion loss and <1.5:1 VSWR; >25dB isolation; covers 470-800MHz.
- Wideband impedance tuner: for super power systems; non-contacting short-circuit design for one full wavelength linear expansion; phase shifter with 1.05 VSWR, 0.1dB insertion loss, 50Ω isolation.
Circle (940)

Midwest Communications
- Townsend TX series: CST computer supervised transmitters for UHF TV; 30kW, 60kW, 120kW, 240kW visual ratings; EEU wideband klystrons, ITS-20 exciter; 2-level fault protection for PAs; low-voltage pulsed system.
Circle (946)

MYAT
- Transmission line: 9½ diameter line and associated components; Teflon crosspins; designed to avoid line burnout caused by environmentally caused motion of the line.
Circle (811)

Nautel
- AMPFET series: NDI, NDI2, ND50 solid-state AM transmitters; NRSC-2 compliant; 1kW and 25kW upgradable to 50kW; distortion ≤0.5%, response ±0.25dB, 80% efficient; on-air serviceability.
Circle (954)

NCA Microelectronics
- R-2000: transmitter monitor and remote control; uses DTMF Touch-Tone signaling, synthesized voice report; CRT, keypad; 32-input analog, digital; alarms reported to four phone numbers.
Circle (955)

Potomac Instruments
- Type 1900: directional antenna monitor.
Circle (1015)

QEI
- BTT500: exciter/transmitter in 10½ of 19 rack; FET PA produces 10W to 600W; full remote control; replaces of IPA in older FM transmitters.
Circle (1028)

Rohde & Schwarz
- NI-115, NT-213A: mobile solid-state FM band II, TV band III transmitters, rated 100W; for terrestrial service; containerized with 24 batteries, charger, monitoring equipment; for areas without ac power.
Circle (1056)

Scala Electronics
- U.S. distributor: Kathrein panel and co-linear antenna products.
- OR-2300 Orion rotator: turns antennas; 2,800 in/lbs starting, 2,000 in/lbs rotating torque; 55-120sec per revolution; 6-wire control; accurate within 4° of true position.
Circle (1074)
Gentlemen, synchronize your clocks.

The new Leitch CSD-5300 keeps clocks milliseconds accurate across the city, across the country. Automatically.

If time synchronization is one of the keys to your business, look into the new Leitch Master Clock System Driver - the CSD-5300.*

Under this one control, a multitude of clocks, digital or impulse, will move in astounding unison. These clocks can be in the same location or thousands of miles apart in different time zones. The new Leitch CSD-5300 also interfaces with video terminals and computers. What's more, you get time setting accuracy within one millisecond. Using the telephone, the Leitch CSD-5300 calls a number connected with the ultimate reference for time in the land and adjusts itself when necessary.

Clock driving technology just Leitched ahead.

Leitch Video International Inc., 10 Dyax Rd., Don Mills, Ont., Canada M3B 1V5 - Tel: (800) 387-0233 Fax: (416) 445-0595 Telex: 06 986 241
Leitch Video of America, Inc., 825K Greenbrier Circle, Chesapeake VA 23320 - Tel: (804) 424-7920 or (800) 231-9673 Fax: (804) 424-0639

*Generates SMPTE, EBU Time Code.

Circle (56) on Reply Card
Shively Labs
- Antenna configurations: serving special situation applications.
- Band-pass combiners: balanced system with protective circuitry integrated.
  Circle (1087)

Siemens Components
- UHF/VHF final: 5kW/10kW, 20kW units; RS-1034L, RS-1034SK tetrodes; TV transmitter PAs, any standard; minor modifications.
  Circle (1090)

Singer Products
- RF Dynamics F-series: FM transmitters F-501kW, F-550kW, F-710 10kW, F-712 12kW; A-710 AM transmitter, 10kW.
  Circle (1094)

Stainless/GG Communications
- G-48 tower design: improved construction efficiency of microwave, AM, FM, and TV towers through design change; meets RS-222 standard; knockdown construction for future modifications feasibility.
  Circle (1116)

Television Equipment Associates
- Model 200 transmitter: mini video transmitter; special-purpose use for roving camera or security camera applications.
  Circle (1164)

TTC/Television Technology
- FMS-4000, FMS-8000: solid-state FM transmitters; 1kW, 4kW, 8kW output levels; no tuning required; modular "fail-on" design for improved reliability; model X exciter with 0.01% distortion.

Circle (1192)

Utility Tower Company
- Type 520, 84" face tower; design capable of heights to 1,500 feet.
  Circle (1208)

TVT
- Vista 1891-90 enhancement: uses MSDC klystrons to produce 60-240kW visual output in UHF channel service.
  Circle (1214)

Will-Burt/TMD
- Hurry Up mast: pneumatic, telescoping mast; 5-section nested T6 aluminum tubing extends to 25'; free-standing unit in vehicle mounting stand with "drive-on" plate; uses vehicle weight to keep mast upright.
- Easy-Link positioner: ENG, microwave antenna pan/tilt mount; 12Vdc runs stepper motors; preset stow position; remote control; multispeed rotation, elevation.
  Circle (1252)

R2: Microwave
- Antennas, electronics
- ENG, ITFS, MDS, STL

Andrew Corporation
- HMD microwave series: HMD24HO/V0, HMD32HO/V0 models; 16dB, 17dB gain respectively with 1,25.5 VSWR; wideband versions available; HO horizontal, V0 vertical polarizations; radome enclosure; 30" 50W for Felix, EW20 WG.
  Circle (543)

AVCOM of VA
- MVT-3000A transmitter: for surveillance use on authorized microwave bands; portable transmitter for mono, color NTSC video; 12Vdc power.
- PSR-3000A receiver: companion to MVT-3000A transmitter; integral B/W monitor; signal strength meter; battery powered; second output for additional monitor, VCR.
  Circle (577)

BEXT
- LC, SD STL systems: composite format; 80dB noise ratios; channel change on front panel without tuning; bandwidth adjustable; 12Vdc operation; SD series for subcarriers to 20kHz.
  Circle (597)

Broadcast Microwave Service/BMS
- BMF-2GP: transmitters operating in 2GHz, 2.5GHz bands; 30-channel, frequency-agile.
  Circle (612)

Combant Technologies
- Wireless cable antennas: MMD, ITFS models from 12dB to 27dB; dipole corner feed gives sharp illumination of reflector; dipole sealed for moisture resistance, longer life.
- Proband system: wireless cable unit has scrambling, addressable descrambling for baseband signals; when a subscriber descrambler is disabled, an A/B switch allows direct off-air reception.
- Block downconverters: one for midband, superband or dual-band; one for dual-band where MDS, ITFS, MMD, OFS channels are received on different antennas.
  Circle (673)

COMWAVE/Communication Microwave
- SBM-18: multichannel transmitter for up to eight 1W composite television signals.
- SBR-11: response transmitter; for voice, data communications; output rated to 1W.
  Circle (688)

Conifer
- PA-1033 pre-amp: low-noise using GaAs FET devices; for 2.1-2.7GHz MDS, MDD, ITFS services; MOV lightning, surge protection.
- QL-1015: 31-channel wireless cable downconverter for marginal reception areas; internal GaAs FET pre-amp; noise figure <2dB with 35dB conversion gain.
  Circle (690)

Digital Microwave
- DMC 18V: digital video microwave for STL, ICR system; operates in 18GHz range; audio, video performance unaffected by signal levels; spectrum conservation; secure signals; forward error correction.
  Circle (728)

EMCEE
- TFS 100MC: internally multiplexed wireless cable transmitter; audio, video inputs for 12 channels; output at 2.5-2.9GHz bands with 1W/channel.
  Circle (758)

Ikegami Electronics (USA)
- PTR tracking microwave: for mounting on H-53, -55, -55A, -95 cameras; auto-tracking permits freedom in camera maneuverability during live relay production; use with bidirectional transmitter, receiver units.
  Circle (838)
The World's Most Successful Television Family.

You've seen it for yourself. Many of the world's favorite television programs have been produced, edited, or broadcast on Ampex tape. From our industry standard 1961 master broadcast video-tape to our state-of-the-art 319 D-2 and Betacam SP metal-particle videocassettes, you get the same high quality consistently, tape after tape, carton after carton. Because every tape is manufactured to the same exacting specifications by the same experienced technicians in the same ultraclean plant. No wonder more demanding professionals demand more Ampex tape. It's a television success story... all around the world.

Ampex
The Professional Choice

Ampex Recording Media Corporation
401 Broadway, Redwood City, CA 94063, (415) 367-3809

Circle (68) on Reply Card
Leaving the Users of MII, Betacam SP and D2 Tape Speechless.

There’s no one better at eliminating unwanted information than Garner. So we won’t bore you with a lot of impressive talk about our Eliminator 4000. All we’ll say is that it’s so effective at erasing low-end audio noise, it’s the one degaussers approved for use by the major television networks and production facilities. And it’s the one bulk eraser that guarantees 75 db erasure of completely saturated 1500 oersted metal particle tape in 12 seconds or less.

If you’d like to know more about everything the Eliminator 4000 can do for you, give us a call. We’ve got a lot to say.

garner industries

4200 N. 48th Street / Lincoln, NE 68504 / Toll-free 1-800-228-0275 / FAX (402) 464-6960

Circle (59) on Reply Card
Video Timing Analyzer TIF

SC/H phase?
Yes, and lots more!
itter,
...

Digital measurement of all timing parameters

Call or write for full details

D-8000 München 80
Postfach 80 14 69
Telex 523 703 (rs d)
Telefax (0 89) 41 23-21 64
Tel. internat. +(49 89) 41 23-0

ROHDE & SCHWARZ

An independent concern, founded in 1933.
5000 employees, represented in 80 countries.
Design and turn-key installation
of systems with software and servicing.
Calibration, training and documentation.
for ENG antenna pedestal, site peripherals.
- TS-900 TouchStar: 1-, 2-site master controller ENG; Macintosh SE-based graphic interface needs no keyboard; auto pan locks direction of greatest signal.
- TS-95OS, 95OSL controllers: slave or local/ slave ENG site controllers; drives four steerable antennas and receivers or remote cameras; works with NavTrack helicopter tracking; Con-Troll-It operating system.

Circle (1449)

R3: RF amplifiers
- Cavities, devices

EFV
- JOT1360: UHF inductive output device for UHF TV to 60kW visual service; figure of merit 130%; electromagnetically focused electron beam with density bunching by rugged grid driven with RF cavity.
- KSC360, KSC371: high-power klystrons rated 40kW-70kW; multistage depressed collector for 75% and 80% figure of merit; beam current reduction; air, water cooling.

Circle (749)

Philips Components
- PDC/9 klystron: 5-stage depressed collector, 1.3 figure of merit; ABC design, 12GHz bandwidth, operations to 960MHz; improved linearity for less precompression.
- YK1267 klystron: ABC visual PA device for UHF output; 70kW over 470-860MHz band; 65% efficiency, modulation circuit dependent; air-cooled device; companion YK1221 klystron for aural service.

Circle (1008)

Thomson Tubes Electroniques
- TH 357 tetrode: 350kW for long, medium-wave service, 300kW at short-wave.
- TH 353 tetrode: for UHF TV service; 35kW separate, 25kW multiplexed visual/aural operation; Pyroblock grids, Hypervaractor cooling.
- TH 343 tube, cavity: 25kW in FM broadcast use; coaxial metal-enameled tetrode; 17dB gain operates to 120MHz; TH 3820G circuit uses device in ground-grid mode without neutralization.
- TH 553 tetrode: 600kW device for LW, MW.

Circle (1189)

Varian Microwave Division
- 2KDX60/A/LF 60kW klystron: air-cooled device for 60kW, 120kW, 240kW UHF transmitters; link systems; 6-, 15-, 24-channel tuning from 58-6425GHz.

Circle (1211)

R4: Reception
- Demods, receivers
- Modulation monitors

Belmar Electronics
- Modulation minder: new approach to monitoring of L-R or loudness content and stereo composite viewed on two displays; per pre/83 FCC rules; FM, TV versions.

Circle (592)

Boontoon Electronics
- Model 8220: modulation meter for 0.01-1.3GHz range; to 50kHz FM deviation, 99% AM, 0-500 rad, -7dB to 19dB level; modulation displayed as ratio or level; IEEE-488 interface; rms, peak.

Circle (606)

Delco Electronics
- RDS automatic radio: Radio Data System receivers; switches between stations carrying same program; shows traffic announcements on dot-matrix display.

Circle (1454)

Delta Electronics
- Antenna amplifiers: avoids loading of an antenna from a coaxial cable.
- Peak hold feature: option for Delta SM-1 splatter monitor system.
- Metering panel: auxiliary metering facility for AM/FM modulation monitor.

Circle (715)

Modulation Sciences
- ModMinder demo: IBM-compatible 5¼" disk contains interactive program to explain ModMinder operation; simulates remote monitor software, Histogram display.

Circle (977)

Motorola C-Quam/AM Stereo
- SR-66 receiver: Sangean America personal portable AM/FM twin stereo receiver.

Circle (954)

Phillips Consumer Electronics
- FR50, FR60, FR70: AM/FM receivers comply to NRSC standards; tunes 520-1710kHz; improved voice, music quality.

Circle (1265)

QSI Systems
- 2000 stereo TV demod: 154-channel access; for broadcast, CATV; last channel memory per band: proc-amp for CDD V/C separation offers full adjustment; RS-232 control.

Circle (1029)

Radio Design Labs
- NRSC/DM: connects between modulation monitor, audio system to de-emphasize audio; tunable 10kHz notch filter removes whistle from monitors.

Circle (1039)

Videotek
- DM/1415 demodulator: stereo audio with dual buffered outputs of composite baseband video, 137-channel access of UHF, VHF, CATV signals; tactile membrane front panel keyboard with memory.

Circle (1232)

R5: Exciters, generators
- Radio, TV, stereo

CCA Electronics

Circle (647)

Inovonics
- Model 706: FM/FMX stereo generator, production models.

Circle (848)

ITS/Information Transmission
- ITS-206: exciter-modulator retrofit; 3W visual, 3W aural to drive UHF TV transmitters; ready for stereo, SAF, PRO channels.

Circle (860)

QEI
- 695SYNC: synchronized FM exciter; ties multiple auxiliary 695 exciters to one master exciter; sync provided through SCA channel or CAT-LINK auxiliary channel.

Circle (1028)
Time delay.

The SV-255 portable Pro-DAT: It's *A Time Machine*. What goes in comes out, whether it's one minute or one year later!

To do this the SV-255 brings you the best pre-amps and A-D's in the DAT world. Our low noise pre-amps, with optimum headroom and "gapless" trim range, match the widest variety of sources and levels for the best possible sounding recordings.

MASH A-D converters significantly lower noise and distortion compared to conventional A-D systems, especially at low levels and high dynamic ranges only DAT lets you use. And the 64-times oversampling rate allows the use of gentle 18dB per octave filters for notably enhanced phase and frequency response.

This kind of engineering integrity has made Panasonic portable professional DAT's today's best selling DAT machines.

Come into your Panasonic Pro-Audio Dealer today and judge the superior sonic qualities for yourself.

For your nearest dealer, call 714-373-7278, or write: Panasonic DAT, 6550 Katella Avenue, Cypress, CA 90630.
For enhanced performance use: Panasonic DAT tape.
Radio Design Labs
- **NRSC-PR, NRSC-FIL:** "NRSC Stick-On" modules; PR device introduces pre-emphasis between compressor, limiter; FIL controls "stop-band" emission between limiter, transmitter input.
  
  *Circle (1039)*

**R6: Satellite**
- **Antennas, electronics**
- **SNV systems**

Advent Communications
- **AVC270X range:** satellite communication up/downconverters; for Lynx SNG vehicles, Manitis flyaway systems.
- **LYNX SNG vehicle:** uplink on lightweight van; redundant phase-combined, RF, video, audio test, monitoring, playback, communications equipment; A/C, generator.
- **AVM2700 video monitor; 70MHz intermediate frequency input.**
- **Manitis 1900 Fly-Away SNG phase-combined system:** packs in IATA transit cases as checkable baggage, fits in station wagon; range of HPA, exciter, down/upconverter options; meets INTELSAT, FCC, AUSSAT, EUTELSAT specs.
  
  *Circle (515)*

Andrew Corp.
- **4-port, 6-port upgrade:** for dual reflector antennas in C- or Ku-band use; permits C- or Ku-band only as C/Ku-band receive and Ku-band transmit; extends antenna usage without additional system purchases.
- **ASC 2000 ESA monitors, controls:** earth station antenna repositioning; multi-user to five terminals or PC consoles; context-sensitive help; 16 receivers, two antennas, support equipment.
- **1.8m Fly-Away:** 8-segment FlashPack antenna; ships in six containers as "check-in" baggage; for C-, X-, Ku-, C/Ku-band CP and LP operation; matched feed system for each band; aluminum construction.
- **TriFold RT/TT antennas:** 3.7m, 4.5m mobile antennas; rapid, repeatable deployment; meets FCC, EUTELSAT, INTELSAT regulations; sets up within 30 minutes; optional motorization kit; 4.5m for C/Ku-band, 3.7m for Ku-band.
  
  *Circle (548)*

Antenna Technology
- **Simulsat series:** multibeam antennas; view 70° arc simultaneously (69°-W-139°W in three models).
- **Parabolic antennas:** 8m to 32m diameters; new, used available.
  
  *Circle (547)*

BAF Communication
- **459-D, 459-C:** satellite news vehicles with 6- and 4-camera production capability; D, 32°, C, 28°.
  
  *Circle (583)*

Comtech Antenna
- **2.4m antenna:** Ku-band transmit, receive; 2.4m diameter; available with or without EC-4 µ-based controller.
  
  *Circle (868)*

Hallikainen & Friends
- **SAT201:** steers satellite dish on 3 axes; multipoint control of multiple antennas, receivers via telco, subcarriers; preprogram for antenna position, receiver tuning.
  
  *Circle (814)*

ICA/Miralite
- **3.7m antenna:** low side-band performance for 2° spacing; 41.8dB gain with G/T of 18.7; hybrid mode feet; high aperture efficiency of 65% at C/Ku-band operation.
  
  *Circle (584)*

I SS Engineering
- **Series III modulator:** frequency-agile from channel 2 through CATV channel WW; audio subcarrier phase-locks to crystal for intercarrier stability; RS-232 remote; MPX stereo, standard audio; to solfets without IF change.
- **GL1000A demods:** frequency-agile unit; programmable memory with lock in channel recall, lock on frequency from multiple antennas; options for 4.5Hz audio on video, separate A/V IF, T channels.
- **GL5020A receiver:** IRD satellite system with proof-of-performance test results; serial remote control communications program; ready for VideoCipher II Plus scrambler.
  
  *Circle (858)*

Keltec Florida
- **K4050CJ amplifier:** HPA rated 65W 5.9-6.4GHz C-band, 70W 7-8.4GHz Ku-band, 48W 14-15.5GHz Ku-band; N output connector; environmentally shielded; remote control.
  
  *Circle (1457)*

Microdyne
- **CSD-BDR-1 receiver:** receives RS-250B, C and NTC-7, L, S, C, Ku-band; compatible with NTSC, PAL, current scrambling systems; programmable inputs for combinations of frequency, polarity from multiple antennas.
- **CSD CM 1 headend modulator:** for CATV, SMATV, MMDS; operates with any of 36 different channels selected by front-panel thumbwheel switches; adjustable modulation and carrier levels.
- **CSDSR 1 receiver:** CATV, SMATV; C, Ku-band with vertical, horizontal polarization; clamped, unclamped scrambled video; two tunable audio channels.
  
  *Circle (541)*

Radiation Systems Inc./RSI
- **Model 5000:** enhancements to earth station control software.
  
  *Circle (1037)*

Scientific Atlanta
- **8060 antenna:** 6m cassegrain antenna for C/Ku-band in international or domestic applications; use as T/R or receive only unit; 7330 receiver: four L-band inputs for C, Ku-band reception; RS-250C spec unit offers six IF filters for bandwidths of different transponders; full- or half-transponder formats; H/V polarizations.
- **7670 controller:** PC-based earth station control with monitoring; Version 3.0 software has enhanced graphics editing, mouse operation, 16 additional device drivers; permits on-site or remote control.
  
  *Circle (1079)*

Siemens Components
- **HP TWT devices:** products supporting 6GHz, 13GHz and 30GHz uplink systems.
  
  *Circle (1090)*

Standard Communications
- **Agile Omni Broadcast receiver:** RS-250B receiver for TRVO; PLL RF center, audio subcarrier tuning; panel indicator shows satellite format, channel number, antenna
SATELLITE RECEPTION. CABLE NETWORK.
RADIO FM AND BROADCASTING.

THOMSON-LGT
LABORATOIRE GÉNÉRAL DES TÉLÉCOMMUNICATIONS
1, rue de l’Hautil - Z.I. des Boutrics
78700 CONFLANS STE-HONORINE - FRANCE
Tél.: (33-1) 34.90.31.00 - Fax: (33-1) 34.90.30.00 - Téléx: 696833 F
Support Products

**S1: Automation**
- Hardware, software
- Business, program
- Newsroom, equipment
- Clocks, timers
- Data transmission

**ADx Systems**
- ADx10: "smart machine" controller; operates on time code.

**Aerobureau Corporation**
- Flying newsroom service: Ku-band in-flight communications for global event coverage; Electra L188C aircraft interconnects to ground-based van, aircraft, satellite links.

**Alamar Electronics**
- MC-2055: 3rd generation automation links traffic, switching, playback transports via LAN and IBM/compatible PCs; options, net delay, record, playback; general-purpose machine control.

**American Lightwave Systems**
- LC series: Lightwave Compact fiber-optic transmission systems; single, multimode fibers; for NTSC, PAL, SECAM; 57dB/S/N with audio meets RS-250B over 15.5-mile links; two audio subcarrier capability.

**Ampex Corporation**
- ACR-255 Auto Resolve: conflict resolution feature; automation cart system makes break tape if multiple cuts from one cart are too closely spaced or short duration events are too short;Precise feature.

**Associated Press Broadcast Services**
- AP NewsDesk: newsroom management software for IBM/compatible PCs; connects to news wire, operates in background to save material, updates category indices, leaves computer "free" for other work.

**Avid Technology**
- MediaLog software: review, catalog, organize source footage; creates electronic bins that are compatible with Media Composer; can be used as stand-alone system; Macintosh-based system.

**BASYS**
- Connolly BASmaster: broadcast automation; automatic operation of all equipment for program transmission; may include PSS-200 program scheduling system.
- PET: portable editing terminal, interfaces with BASYS newsroom computers; software for IBM/compatible laptop; use as a field extension of the newsroom system.

**Circle (1177)**

**Wegener Communications**
- ProSwitch Channel Inserter: for cross-channel promotions cable systems; Network Communications, Control for local commercial insertion in national cable networks.

**Circle (1246)**

**CLEANER & SHARPER VIDEO RESOLUTION**

- Optimize the signal to your video monitor with Canare high performance cables and connectors.
- Ideal for computer graphics, video projectors, component (RGB) broadcast and digital VTR's.
- Component coax cable: super flexible, 75 Ohm (<2.2 nanosecond differential delay time). Matched with 75 Ohm BNC connectors (<1.1 VSWR to 2 GHz).
- Available in bulk or pre-assembled fan-to-fan tails.

**CANARE**

CABLES & CONNECTORS
511 5th St., Unit G, San Fernando, CA 91340
Phone: (818) 365-2446 FAX: (818) 365-0479

**Circle (65) on Reply Card**

Now, matching frames is a piece of cake.

The Ensemble Designs TC400
Four Channel TBC Controller with Memory.
Fingertip control of Video & Chroma levels, Setup, Hue, and Timing. Serial interface provides scene-by-scene storage of TBC settings in the EDL.

**Circle (66) on Reply Card**
Western Radio and Television Engineers—There’s something special in store for you in Santa Barbara July 14-17.

Don’t miss the 43rd Annual Western Regional Broadcast Convention of the California Broadcasters Association. For the first time—Engineering Sessions tailored for you.

Western Engineers—be sure to attend these sessions at the Western Regional Broadcast Convention, July 14-17

✓ Audio Processing
✓ Testing and Implementation of HDTV, including an IDTV demonstration
✓ FCC rules, applications, upgrades from FCC personnel
✓ The Future of EBS
✓ Digital Audio via Satellite and Cable

Featuring: Michael Rau, Science and Technology Vice President, NAB

Single day registration available at special rates. Spouses welcome in the superb oceanfront setting of Santa Barbara’s Red Lion Inn. For more information call Vic Biondi at CBA, (916) 444-2237.

Exhibit space available at attractive rates. Call (408) 395-1161.

Professional Time Code

P-1 Portable Generator/Reader

F-21 SMPT/E Time Code Generator/Reader/Character Inserter

Call your local dealer or contact us at (714) 852-8404

Fast Forward Video

June 1990 Broadcast Engineering 97
board, software; record, playback commercials, jingles, liners; integrate to Broadcast Traffic System or operate as stand-alone.
circle (680)

Computer Engineering Associates
* CEA Newsroom: modular assignment desk, production, business, file, security, on-air procedures; for Data General MV computer; IBM-compatible PCs as terminals.
circle (681)

Concept Productions
* CAPS I, CAPS II updates: computer-assisted programming for radio; enhanced with hard disk recorder; R-DAT decks; interface to traffic, billing systems.
circle (689)

Datacount
* The RateCard software: generates grid rate cards based on avail.
circle (708)

Decision
* Broadcast System III: broadcast computer applications on IBM/PS/3 System/6000; UNIX with LAN, wide area networks, multi-user.
circle (713)

Dynatech NewsStar
* PC Laptop PCLT system: software for electronic newssheet; runs on Toshiba portable, Compaq LTE PCs; requires NewsStar software release V4.31.
* Newsstar Tutorial: software for PC/AT, hard disk and color monitor; instruction for NewsStar basics.
circle (742)

EEG Enterprises
* Data network: high-speed, 9.6 kbaud data service uses one VBI line; forward error correction: EN 512 data inserter, TES 11 data bridge; DD 430 video decoder.
circle (748)

Electronic Research
* SAM workstation: lab, industrial workstation; computer with 101-key AT-style keyboard, 40-column thermal printer, 3.5" disk drive; 10.5" plasma display supports MCA, CGA,EGA,VGA graphics.
circle (755)

Gefen Systems
* SoundTouch Music System: touch-screen, keyboard control automatically executes defined playlists, random access of 120 online CDs; trigger for DAT, CARTID, advertisements; prints logs.
circle (796)

Grass Valley Group
* E series codecs: permits full motion video, data, video on single circuit; optional four T1, R5-232c data channels on one DS3 circuit; integrates to fiber optics networks.
circle (807)

GTE Spacecom
* News Express Voice: improved communications; rugged for mobile operation; voice terminal access public switched telco network over three GTE satellites.
circle (811)

IGM Communications
* IGM/MC controller: PC-based radio automation; 12-channel switcher, RS-232 protocol; full automation, live assist, satellite, access 99 trays from multitrack sources; FSK logging, synchronizes to external clock.
circle (837)

Image Video
* EDAAS: full station automation for TV, radio facility; high-speed Ethernet; Windows-based operating system.
circle (841)

Jefferson Pilot Data/JDS
* SalesLine: for DEC systems; network sales information to all state departments.
* DCM NewsData: newsroom computer by Data Center Management; DCM provides sales and system support, installation.
circle (865)

Leightronix
* TCD/RT controller: event control by time of day, day of week, for playback, satellite recording, character generators; 16 GPI outputs as well as direct control; for 64 VTRs, 10 switches or matrix router.
* Mini TR controller: event control with 5 input A/V switcher; four VTR control outputs; 6-event; automated playback, recording, channel blackout; permits title video page control.
circle (1447)

Leitch Video
* UDT5700: up/down counter for Leitch Master Clock; 2-channel for production, control applications, independent operation; five GPI inputs, RS-232/422 port.
circle (895)

Louth Systems
* NEWSTRAK software: three modules include NEWS for on-air news presentation control via 16 video sources; TRAK to prepare scripts, lists of on-air play; ARC to archive news with multi-user database.
circle (1479)

M/A-COM MAC
* FiberLink systems: 830nm, 1,300nm, 1,550nm fiber-optic systems; LED or laser sources in single, multimode; permits four NTSC, PAL video channels per fiber, each with four audio subcarriers; RS-220C spec.
circle (916)

Matco Mfg & Test
* MA-301 playback system: single-channel VTR playback for VHS industrial decks with serial control; use parallel control through MA-107, -108 interfaces; 7-day programming of 700 events; programmed records.
circle (927)

McCurdy Radio Industries
* EDAAS automation: extensible distributed architecture automation system from Clark & Associates Ltd.
* DBUS automation: dedicated computer automation by Clark & Associates Ltd; CU-188 controls 11 interface cards for equipment operation; each system provides 11 inputs to EDAAS system.
circle (932)

Media Computing
* PROJec PC-based programmable, remote control for equipment used with T.E.N. newsroom automation.
circle (935)

MicroNet
* Microwave, satellite service: audio, data, video transmission; private digital, route diversity, disaster recover, videoconferencing services; local area network bridging.
circle (1453)

Moseley Associates
* MRC1620 SCADA: supervisory control, data acquisition system; remote, control terminals, IBM PC, TaskMaster 20 software; extended I/O option to 32 status channels, subsets; alarm log.
* DigiMAC multiplexer: synthesized digital program multiplexing: program channels centered on 1 kHz step sizes between 1 kHz-200 kHz; interchannel spacing 100 MHz minimum; to six full duplex programs.
* 9600 SCA data system: FM SCA generator, receiver complements; error-free I-way communications to 30 miles with single SCA channel; 9600 b/s rate; compatible at 57 kHz with 57 kHz RDS-MBS paging systems.
circle (953)

Motorola Communications Sector
* PMR 2000: personal message receiver, voice, numeric or alphanumeric display, paging: hardwired capability; 1.984 character memory, 32-character display of 16 memory stores.
* SYNTOR X 9000 mobile: 2-way radio; 11-character alphanumeric display supports operating, mode programming; VHF, UHF, trunked, 800 MHz Privacy Plus, SMARTNET systems, with SURENET voice message protection option.
* HT6000 2-way radio: µP-controlled portable; “personality” storage of frequencies, squelch codes, other operating data.
* SABER Handie-Talkies: 136-174 MHz, 403-512 MHz portable FM radios; 12, 72 synthesized channels; data for transmit, receive frequencies stored in EEPROM.
* Spectra mobile radios: conventional FM VHF, UHF 2-way; optional SURENET encryption with mode select switch; handheld control head/mic with unit ID, Call Alert decode, alphanumeric display.
circle (1468)

Neshit Systems
* VTL videotape library: software manages data regarding videotape library; for AT, PS/2 compatible with 3.1 DOS minimum.
circle (1469)

Neutrik USA
* Inforomatic System: digital recording, announcing system; security, public address, telecommunications, broadcast applications; battery-backed memory stores maximum of 35 minutes of announcements.
circle (570)

NewsMaker Systems
* NewsMaker Newsroom: hardware, software for 33,80286 PC workstations with VGA color; Ethernet to dual 80386 file servers each with 300 MByte redundant disk drives; line printer; AP wire service input.
circle (1490)
Who makes the best ENG wireless microphone system?

The best mini-receiver . . .
The CR185 offers a six-pole helical resonator front-end, followed by narrow-band crystal IF filtering at 21.4 MHz. This provides unmatched selectivity and sensitivity, and minimizes drop-outs and interference. A balanced, XLR output interfaces with any professional camcorder.

The best belt-pack transmitter . . .
The M185 is a highly refined belt-pack transmitter. It matches any input requirement and provides "phantom power" for almost any lavalier microphone via a standard 5-pin jack. The belt-clip is constructed of machined aluminum and steel parts, spring-tensioned for a secure fit on any belt or fabric. Audio level LEDs are provided on the control panel for accurate level adjustment.

The best "plug-on" transmitter . . .
The H185 introduces new flexibility to your ENG operations. It makes any hand-held or shotgun mic with an XLR connector wireless. The microphone body becomes part of the antenna circuit, forming a very efficient RF radiator. The audio input level is indicated by two LEDs next to the microphone coupler. These LEDs are clearly visible with the microphone attached for accurate level adjustment.

The best construction . . .
All external parts are constructed of machined aluminum for ruggedness and durability. Shock-mounted crystals are used in the IF filtering and oscillators for reliable operation. The transmitters and receiver are built for the real world of hard knocks.

The best factory support . . .
Whether it's frequency coordination or follow-up service, Lectrosonics will come through. Our commitment to the needs of broadcasters is second to none. Call us with questions, and you will get answers that make sense.

Call us toll-free to locate your nearest dealer:
1-800-821-1121

LECTROSONICS, INC.
P.O. Box 15900 • Rio Rancho, NM • 87174
581 Laser Rd. NE • Rio Rancho, NM • 87124
(505) 892-4501 • (800) 821-1121

www.americanradiohistory.com
Odetics Broadcast
- **TCS2000 enhanced**: control by RISC, UNIX-based Sun SPARC workstation; multitasking; current systems upgradable.
- **SCS800 sequence**: cartridge system; cart loading management; CRT display indicates sequence, transport for loading; Multi-cut software plays multiple segments per cartridge; 65,000 cart database.
- **BTS interface**: operates TCS2000 library cart machine with BTS BTA2300 automation control system.

Circle (984)

Promusic
- **Music Library V.3.0**: software for IBM, compatibles or Mac Plus, SE, II with 1MB byte RAM, 20MB byte hard disk; database search for music cuts by word, category, synonym, catalog number.

Circle (1026)

Radio Computing Services
- **Radiologic system**: hardware, software; answers caller questions on music, traffic, theater schedules, etc.; 10 different features on 4, 8, 12, or 16 telco lines; 80386 PC, OS/2, custom DSP audio processing.
- **AirCheck**: hardware, software identifies, logs broadcast of prespecified program materials on commercials on TV, CATV, 80386, custom digital audio processing equipment.
- **Listener**: audio recognition unit; PC-based unit for music, commercial verification.

Circle (1038)

RE Instruments
- **RE 591, RE 331**: RDS system coder for broadcast use and decoder unit.

Circle (1445)

Reach Electronics
- **Pagers**: 10-digit numeric display models, tone-only modules; Monitor pagers for high, low-band, switch-selected tone, voice.
- **DMC dispatch**: POC/DSG-coded "carrousel-vehicle" dispatcher; gives route driver ongoing data on route status; data via RCC.

Circle (1047)

Register Data Systems
- **Traffic Master 5**: multiple-user traffic, billing, accounting package.

Circle (1051)

Rohde & Schwarz
- **DMC data decoders**: decodes VRF, RDS signals; DMC03 RDS test decoder to monitor, evaluate digital information; DMC05 for VRF, RDS measurements and tests.
- **DMC FM coder**: DMC05 modulates 57kHz aux carrier with RDS, traffic signals; DMC09 RDS decoder for VHF transmission without traffic announcements.

Circle (1058)

Sage Alerting Systems
- **SAGE**: transmits emergency information, procedures to industrial receivers; stationery data terminal permits secure communications for broadcast, safety agencies; includes receivers, sirens.

Circle (1407)

SISCOM
- **NewsPro 4.0**: enhanced newsroom software; creation, dissemination of newscasts; for DEC/VAX computers; spell checker, Bitstream type fonts.

Circle (1484)

Software Specialists
- **Radio Trac software**: traffic, contract data, program log, schedule, accounting, sales, management, file security modules; large degree of flexibility in configuration.

Circle (1450)

Solltec
- **Video Robot**: models 288, 576; automated broadcast system; automatic loading of VTRs; AD/ID identifies tapes to feed logging printer; identifies failures.

Circle (1101)

Sono-Mag
- **Model 450-452 Carousel**: audio automation; bidirectional to reduce random-access time; full status indication on control panel; digital tray number panel.
- **MSP-12 programer**: automates broadcast, CATV, background music; 2,000-event, expands to 4,000; supports 12 stereo sources, 39 trays each; multiple network joins; external flags delay recording.

Circle (1102)

Sony Communications/Broadcast
- **SVT-2000 SN9 codec**: digitizes, compresses, upconverts component video, stereo audio to Ku-band; reduced power requirement of SN9 uplink for same C/N ratings.
- **BZC-1100 LMS software**: single-spot per cassette for DVC-80 uses three external VTRs, integrates program and commercials from the same system; CMS cassette management library database feature; Auto-Dub; COMBAX backup.

Circle (1103)

Tapscan
- **MultiRank**: permits extensive research of demographics to determine ranking of stations; DEMO ranker, specify any time period to 18 grid boxes for expansion into full screen ranker display.
- **Director series**: radio management, information system; traffic, logging, billing, ratings, analysis, client budget, schedule planning, copy management, music scheduling, revenue maximization.
- **GridONE**: software projects appropriate rate structure for each of 28 standard dayparts; generate proposals, edit spot lineup, automate schedule distributions.

Circle (1144)

Tel-test
- **SMAC controller**: for serial modular automation control; touchpad selects machine, function; access 64 devices connected to SMAC/CM control modules.

Circle (1168)

Telecom
- **COS 6000**: change-of-status monitor, control; wireless multipoint capability; interrogates maximum of 500 remote units each 10 minutes; monitors 7 functions, 32 inputs, controls 2 outputs.

Circle (1158)

Tennaplex Systems
- **Music Manager automation**: updated to control of 48 multiscan CD players, R-DAT decks; operates from remote locations by computer, modem; prints CRT records, billables.

Circle (1169)

Torpey Controls & Engineering
- **STW-5 production timer**: Up/Down with 0.8" display; -59:59.0:0 to 9:59:59.9 range; load, store, start, stop, reset; lockout controls prevent unintentional function changes.

Circle (1184)

Unique Business Systems
- **RentTrace software**: integrated rental, point-of-sale; inventory, reservations, contract processing, maintenance, invoicing, accounts receivable.

Circle (1198)

Utah Scientific
- **TAS-IC**: time code control of automation; Novell/Ethernet LAN, multichannel control; full facility interface; modular C programing, distribution process.

Circle (1205)

Video Communications
- **Software tools**: relational database; search capabilities; SQL report creation; film package tracks syndicated, feature film usage.

Circle (1223)

Video Design Pro
- **Generic Designer documentation tools**: 2-D drawing libraries; predefined symbols: CableDoc, label printer, PathROUTER.
- **Touch & Cable 2 interfaces**: CableDoc, VidCAD/AudCAD drawings; touch source output, destination input to draw cable, documents jack field, telco block, labels.
- **AudCAD 4.0**: performs multi-pair documentation; includes normals, half-normals, wild normals: telco blocks, trees, auto normal cross connections; jack prefixes; single input, output jacks, blocks.

Circle (1224)

Video Logic
- **Log Producer 22**: automated tape logging for Betacam, U-matic VTRs by RS-422 ports; adapter cable, custom microchip for PC controlled tape motion, search/retrieval.

Circle (1228)

Vortex Communications Ltd
- **Model 480 master clock**: off-air reference; auto-changer over; analog, digital displays, driver options; RS-232/422, EBU/SMPTE time code interface for automation system.

Circle (1237)

Vyyx National Video Network
- **FO distribution**: network for broadcast signals over Williams Telecommunications Group FO system; full-time, occasional.

Circle (1483)

S2: Interconnections
- **Wiring, cable; patch panels, cords**
- **Connectors, fiber optics**

Anixter Brothers
- **Chesto Video 20 CL2**: conforms to NEC specs; passes 70,000 BTU vertical tray flame test; 75Ω, standard outside diameter of 0.325", UL approved.

Circle (545)
Arcor Broadcast Products
  Circle (556)

Belden Wire & Cable
- **SMFTE RGB cable**: meet SMFTE analog, parallel transmission recommendations; 1164A, 1167A 3-coax; 1418A 5-coax types in NEC CM spec; 1406A, 1407A, 1417A high-flexibility types.
- **Flexible RG-59, 8241F high-flex studio, routing**: 95% coverage bare-copper braid shield; 1426A NEC CM spec, solid center conductor for better low-frequency attenuation.
- **Snake cables**: multiple pair cable with CM and UL ratings for NEC spec in-the-wall installation; nine multipair, individually shielded, jacketed; four to 32 pairs; 2A4WG conductors, Z-fold Beldfoil shield.
  Circle (593)

Canare Cable
- **Patch panels**: 201UVJ22W-C 20-position, 241UVJ22W-C 24-position patch panels; 1RU, 2RU sizes, 75Ω impedance; designation strips; use VWP-C4, WE-type video patch plug assemblies.
- **Video connectors**: VWJ2-W, VWJ2-S dual video jacks; normal-through and straight-through; 2-piece clamshell design mounts to a panel from the front; isolated; VWP-C4 video patch, BCP-T 75Ω termination plug.
  Circle (638)

Chester Cable/div Alcatel NA
- **Cable products**: precision video 75Ω meets '87 NEC CL2 spec; audio cable in single, multiple pair; PRJ audio series multiple individually of jacketed pairs.
  Circle (693)

Connectronics
- **Soundwaves PV series**: phono, video patchbay connectors; phono-BNC panel-mount converters; 20, 40 channels, insulated, non-insulated; PVC30, 60, 90 patch cords.
  Circle (691)

IBSS Canada
- **Ghielmetti GKV series**: coaxial crossbar panels use 2-conductor planes; audio, video, data products based on 8×8 matrices; BNC coaxial input, output connectors; patching activation with switching plugs.
- **GKV jack panels**: crossbar, jack distribution for audio; two jack formats permit a variety of configurations for signal routing; requires special patch cords; by Ghielmetti.
  Circle (1441)

Kangaroo Video Products
- **Kangaroo Kips**: cable organizers keep mic, camera, coax cables unsnarled.
  Circle (873)

Kings Electronics
- **KS 6465**: RBGS component jacksfield with patch cords.
  Circle (678)

Naipak Video Sales
- **Cablenet**: Velcro strips for quick installation on coiled cables, handles for better organization; various sizes with logos.
  Circle (961)

National Photronics
- **SIDEWINDER 3180 ENG ENG transceiver**: for video, audio, data in ENG, EFP; portable mounts on heavy-duty FO cable reel; 3-camera operation per fiber with stereo audio, intercom, sync.
  Circle (963)

Nemal Electronics International
- **1750 video coax**: precision coax, similar to RG59/U. 0.75Ω loss per 100 feet at 10MHz, 75Ω impedance.
- **2201A audio cable**: 1 to 32-pair types; 22ga conductors, foil shield, drain wire; 0.135" diameter; crush-resistant; single strip action removes jacket, foil, jacket colors.
- **Multipair audio snake**: 2 to 24-pair construction; each pair of 22ga stranded conductor with drain wire, foil shield; individually numbered.
  Circle (967)

Professional Design Products
- **Power wiring connectors**: distributors for Cam-Lok 204A Posti-Lok distribution panels, Coleman Cable Systems stage, lighting cables.
  Circle (1021)

RF Technology
- **RF-FOC-13 fiber-optic link; 10-mile operation without repeaters**: video, four audio;

---

**Free Catalog of Professional SOUND recording & duplicating SUPPLIES**

**POLYLINE™ EMPTY REELS & BOXES**

**BLANKLOADED CASSETTES**

**BOXES ALBUMS LABELS**

**AGFA AMPEX 3M Scotch TDK maxell tapes**

**POLYLINE Corp.**

1203 Rand Road
Des Plaines, IL 60016

**Call Polyline**

708/298-5300
8:30 am - 5 pm Central Time

Circle (71) on Reply Card

---

**HURRY UP**

**TELESCOPING MAST**

for fast and easy deployment of lightweight antennas

- Manually deployed with quick lock/release collars in one minute or less
- 25' extended height / 6' retracted
- 20 lb top load capacity
- Rigid azimuth locking
- Over 50 mph wind speed capacity
- Free standing
- Universal vehicle mounting stand included
- Portable - 20 lb
- High strength anodized aluminum construction
- Ideal for lightweight antennas

**P.O. Box 900**
Orville, Ohio 44667-0900
Phone 216-932-7015

Circle (72) on Reply Card
Fast.

Very Fast.

On your left, the Porsche 911 Targa Carrera, one of the fastest production cars in the world. It goes from 0-60 in just 6.1 seconds. Fast.

On your right, the revolutionary Schmid SIAT, the world's fastest, most precise audio network testing system. It features technology so advanced, you can check 10 critical parameters of your audio broadcasts, including noise, harmonic distortion, frequency/phase response, channel transposition and more, all at the push of a button.

Even more impressive, you can test any transmission network, from the simplest to the most complex, all from a single location. All in an amazing 5 seconds flat. Very fast!

No more time-consuming manual tests. No more annoying tone tests. No more service interruptions. Instead, faultless audio transmissions that will leave your viewers and listeners coming back for more.

Save time. Save money. All while revving up your audio performance. For more information and a free copy of our SIAT video presentation, call toll-free 1-800-955-9570 or mail the coupon today.

U.S. Sales Office: Holzberg Inc. P.O. Box 323 Sea Bright, NJ 07760
Tel: 201-530-8555 Fax: 201-842-7552

Canadian Sales Office: M.S.C. Electronics Ltd. 147 West Beaver Creek Road
Richmond Hill, Ontario L4B 1G6 Canada Tel: 416-731-9600 Fax: 416-731-5195

Headquarters: Schmid Telecommunication Reiterstrasse 6 CH-8002 Zurich
Switzerland Tel: 011-41 1 206-1111 Fax: 011-41 1 201-2372
8MB/s data rate; IF interface at repeaters.  Circle (1053)

**Switchcraft**
- APP334 audio patch panel: assembled, fully shielded; select type of normals; 48 standard jacks or custom selection; IDC connectors on rear panel; constructed with all-shielded cables.
- QPG series connectors: molded plastic for printed circuit board use; circuit #1 with "make first, break last" configuration; available as latch, fast disconnect and no lock; 3-circuit.  Circle (1131)

**VEAM/Liton Systems**
- **Connectors:** CR8 series quick-disconnect, multipin connectors; 1-150 contacts, to 1,000A; VSC series Socapex compatible 19-pin connectors.
- **Connectors:** CR/GRH series, 5-wire 100A power distribution; CCIS series ep-8, stainless steel for abusive environments; UL approved.
- **B-Block:** sequential power panel; 600A capacity; operator safety features.  Circle (1215)

**Whirlwind**
- **Concert 32/42 systems:** mic splitters in heavy-duty steel stage box or SPA space EIA panel; TRSP-1 transformers provide 2nd output; panel with 24 mic inputs, 8 XLR returns or 32 inputs with 10 returns.  Circle (1250)

**S3: Cases, racks**
- Acoustic materials
- Storage systems
- Studio furnishings

**Advance Products Company**
- **DBL computer table:** 49"x30" work surface on welded frame; height adjusts in 1.5" increments to 26.5"; 4 casters; shell, printer stand, electrical outlet options.  Circle (1499)

**Alpha Audio**
- **Aznoc acoustic foam:** pyramidal-formed material; low-frequency sound absorption characteristics; in several colors.  Circle (529)

**AMCO Engineering**
- **Fragile Frame:** low-cost equipment racks; textured finish, 19" width, 21-78" height; 25-50" depth; uses AMCO accessories.
- **Vertical divider:** new bracket mounting rails for easier mounting of halfrack and unusual width equipment in standard rack configurations; wood-grain side panels.  Circle (535)

**Apollo Lighting/Audio Visual**
- **Cart:** furniture for A/V and computer equipment.  Circle (949)

**Atlas/Sounddier**
- **Equipment enclosures:** cabinets, racks, consoles; front and rear doors, side panels, drawer units; sloping front, corner-fill wedges, other parts for custom-designs.  Circle (1496)

**Audio Broadcast Group**
- **Studio furniture:** for AM, FM, TV facilities.  Circle (565)

**Bretford Manufacturing**
- **Woodsteel utility trucks:** natural, dark oak finishes; QuietGlide casters; slanted, flat steel shelves; outer wood construction.
- **VTRPNA4 cart:** wide-body, 8" pneumatic tires; for TVs to 33" screens; cart stands 44" tall; three shelves.
- **CL5 cabinet:** avoids theft of video, computer equipment; adhesive-backed mounting plate, 5" steel cabinet, theft-proof screws and key.
- **BBU44, BBU48:** wide-body carts; 44", 48" heights; 44 with three shelves; -C48 with two shelves; locking cabinet; 32"x27"D; 4" casters; monitor safety strap.  Circle (610)

**Broadcast Marketing International**
- **Tenba Air Case:** lightweight shipping case for video and audio equipment; exceeds ATA spec; made of corrugated, cross-linked polyethylene rubber foam; high-impact nylon gasket seal.  Circle (1486)

**Calzone Case**
- **S-88, S-812 rack systems:** Studio series; 3/4" design; melamine laminate in light oak, black, high-tech gray, rails tapped 10-32, fitted with 2" designer twin casters.
- **Shipping container mounts:** Lord product line of non-corrosive elastomer construction with controlled stiffness to restrict movement in all directions.
- **Model W-42 workstation:** Studio series rack units for switcher, computer hardware, keyboard equipment; two shelves, 42"x9"x20".  Circle (634)

**Cipper Products**
- **770 super cart:** of telescoping tubing; 300 lb load; 13"x16" load deck; folds to 17.5"x16"; fits under airplane seat or overhead; 14 lbs.  Circle (694)

**Fiberbilt Cases**
- **Model 909 line:** additional sizes of heavy-duty molded high-density polyethylene shipping container; tongue-in-groove gasket seal; available with removable wheels.  Circle (775)

**Gichner Systems Group/Optima**
- **Optima enclosures:** full line of electronic equipment racks, consoles; accessories; standard, custom colors, finishes; EMI/RFI shielding; instrument cases.  Circle (1482)

**Jonathan Manufacturing Corporation**
- **Steel, aluminum rack slides:** mounting slides; ball-bearing support; load range 50-800 pounds, tilt ±45°, ±90° for equipment maintenance and adjustment.  Circle (1487)

**K & H Products**
- **Shoulder case:** lightly padded case for Sony BWV 200, 300 camcorders.
- **Video Vest:** production vest.
- **Equipment bags:** Light Pack, compact, soft-sides case for lighting equipment, accessories; Tech Case over-the-shoulder bag for personal gear, engineering tools.  Circle (869)

**Kalamazoo Technical Furniture**
- **Station furnishings:** technical workbenches; base cabinets with drawers, doors; engineering chairs, stools; work-area lighting.  Circle (871)

**Kangaroo Video Products**
- **KVP DVR-1 recorder packs:** pockets for two BP-A0A batteries, cable, microphones, cassettes including D-1 small, medium sizes; for Sony DVR-1 recorder.  Circle (873)

**Marco Inc.**
- **VC-1241 series consoles:** video equipment rack/consoles; available with 24" counter surface; in 1-, 2-, 3-bay formats or other numbers on order; various rack accessories, corner sections, shelves.  Circle (1476)

**Nalpak Video Sales**
- **Equipment bags, cases:** TPA, TDA Tufftotes production and director's soft bags; 20-6, 20-14 Tuff-Rak rack-mounted cases.  Circle (961)

**O'Conner Engineering Lab**
- **100C-105 case:** foam-lined, molded container for model 100C fluid head.  Circle (963)

**Pacific Recorders & Engineering**
- **PrimeLine cabinets:** modular studio furniture; center, wing sections; sitdown, standup pedestal units, rack turrets, overbridge bays; designed to contain PR&E audio consoles in center section; laminated surfaces.  Circle (986)

**Peerless Sales**
- **Series 1450, 1460, 1470:** monitor mounting brackets, frames for attachment to suspended ceilings, structural ceilings and yoke bracket designs.  Circle (1003)

**Premier Metal Products**
- **Legend Series:** racks, consoles, turrets accessories; instrument cabinets; 22-77" heights; sloped-front consoles, cabinets with 10V±21" panel space.  Circle (1017)

**Rampart Cases**
- **Rugged Line Cases:** shipping containers for auto, van, limited air transport; wood-frame case, turfed gray fiber laminate; steel corner reinforcement, hinges, surface hardware.
- **Trans-all Line:** reusable shipping containers; lightweight, high-impact plastic with tongue-in-groove aluminum valance; steel corner plates; ATA rated; custom configurations, exterior color choices.  Circle (1043)

**Research Technology Int'l/TR1**
- **Modular tape racks:** 30' or 48' wide shelves provide storage for 350, 540 videocassettes, respectively.  Circle (1052)

**Stantron**
- **FastTrack enclosures:** FR series welded cabinets, relay racks; FRK series unassembled racks, cabinets; accessories include fan trays, power distribution, locking doors, mounting angles, hardware.
- **Duplicator rack:** designed for Panasonic AG6840; each holds 16 machines.
- **Rock Slide Kits:** ball-bearing suspension slides for easy access to rack-mounted
How to take control of a broadcast station

MCS-2000 Master Control Switcher

Go ahead, be ambitious. Controlling a broadcast station is no small potatoes, but these advanced products from BTS make it easy by giving you total control of all on-air programming from two workstations.

The MCS-2000 Master Control Switcher together with the BTA-2300 Automation System automate many of the routine operations that are currently handled by staff, which makes both your people and your equipment more efficient and productive. Computerizing your station also drastically reduces programming errors. Since that prevents make-goods, the system quickly pays for itself.

You simply pre-program the BTA-2300 Automation System to air all programs, station and commercial breaks exactly as you want, in real time. The Master Control Switcher accesses material from whatever sources you select: Betacarts, character generators, live feeds or satellite systems, for instance.

The MCS-2000 is user configurable, so you can select (and change) which buttons access which sources. Since it uses the existing outputs from the routing switcher, you don't need a second router. And its on-air bypass feature lets it serve as a simple production switcher if necessary.

The computer system is not only powerful, it's extremely flexible, allowing you to revise the program on a moment's notice. And there's no more reliable automation system available. Both products go through 100% computerized factory testing and have a 5-year warranty.

So take a controlling interest in the station. Find out more about the MCS-2000 Master Control Switcher and the BTA-2300 Automation System. For complete information and technical specifications, call BTS at 1-800-562-1136, ext. 31.

BTS is Broadcast Television Systems, a joint company of Bosch and Philips. P.O. Box 30816, Salt Lake City, UT 84130-0816

Circle (75) on Reply Card
equipment; includes tilt styles; specific models designed for popular VTRs.

Circle (1120)

Star Case
- Case products: expanded lines of dedicated cases; rack-mount types.

Circle (1121)

Stoorel
- Media storage: CD1120 CD setup truck; SCD-64D CD storage system; RS2404i MIL cassette storage system; S859612/10-1 D-2 cassette storage system.

Circle (1124)

Telepak San Diego
- T-METAL: custom cases shielded to meet electromagnetic compatibility problems; protects sensitive data.
- T-CAM Large, Small: soft-side cases for Betacam, small cameras; custom fit design, high-density foam padding, plastic inserts; water-repellent nylon construction.

Circle (1160)

Thermodyne International
- Rack-Pack enhancement: cushioned shock mitigation; expanded heights to 36.875"; improved slide mount casters; custom colors.

Circle (1175)

Winstec
- Instant Assembly: console design for quick setup; ships disassembled but uses positive locking pins for 3-minute assembly.
- Universal rack mounting shelving for 19" racks; secure support for equipment measuring to 17½" x 14", 3½" - 10½" heights; 14ga, 16ga.

Circle (1254)

S4: Recording media
- Audio, video
- Cassette, reel, cart
- Cleaners, degaussers
- Conditioners

Ampex Recording Media
- Hunger caps: snap-on clip for Betacam shipping boxes accommodates 33 boxes per Storage/Rail system rail; adapts to non-Ampex systems; accommodates 28 U-matic cassettes per rail.
- ACC cleaning cassette: for D-2 VTRs; 10 sec pass in forward play mode cleans heads, scanner and guides in routine maintenance; causes minimum head wear.

Circle (539)

Audiotrac
- Type 614 AA-4 cart: premium oxide audio media; extended high-frequency saturation headroom, low-friction binder for reduced running tension; redesigned shell.
- Type 613 AA-3 cart: audio media; high-level 250mW/m recording; redesigned shell.

Circle (571)

DCC Digital
- Micro Video 8: 8mm metal particle media; cassettes for 15, 30, 60, 90, 120 minutes; 1,500e coercivity with 2,300 gauss retentivity.

Circle (720)

Fidelipac
- Audiomax 4000: premium-quality stereo cartridge; bias, phase compatible with AA-4 type carts but for elevated recording levels; improved formulation, housing; 10sec to 10.5 min lengths.

Circle (779)

Garner Industries
- Model 4000: bulk eraser for high-coercivity metal particle media.

Circle (792)

JVC
- ST-PRO S-VHS tape: high-performance, oxide in standard, compact cassette sizes; ST-30PRO, 40PRO, 120PRO, C20PRO; 1,700 gauss residual flux density; improved carbon backcoot, binder, ultra-fine particles.

Circle (868)

3M Magnetic Media
- 41A splicing tape: for audio editing; 1.5mil tearable acetate base film; easy removal.
- Type 186 audio tape: low noise standard output media; uses standard bias reduces machine changeover adjustments.
- S-VHS Master Broadcast: D-2 media in 2-hour, 2.5-hour lengths; 1,500e coercivity; includes AntiStat to eliminate static buildup and reduce scratching.
- DSC-120L, DSC-150L: D-2 media in 2-hour,

Circle (76) on Reply Card

B C A M MAINTENANCE MANAGEMENT SOFTWARE "FOR YOUR PC"

KEEP TRACK OF

* EQUIPMENT REPAIRS
* EQUIPMENT HISTORY
* EQUIPMENT INVENTORY
* WARRANTY STATUS
* PARTS INVENTORY
* PERSONNEL ACTIVITIES
* PROBLEMS & SOLUTIONS

Circle (77) on Reply Card
Adhere to Broadcast Standards.

Every day, all over the world, Delta's full line of products make sure the most important broadcasting standard of all is met—your total satisfaction.

AM Splatter Monitor—Spectrum analyzer performance at a significantly reduced price! An inexpensive means of verifying FCC and NRSC spectral compliance. This frequency-agile instrument tunes from 1700 kHz down to 450 kHz, with 9 or 10 kHz channel spacing. The monitor also measures incidental phase modulation (IPM). Designed to be rack-mounted or operated from a vehicle's 12 volt supply using an optional antenna.

C-QUAM® AM Stereo—The Above Standard Industry Standard is easy to install and maintain with its modular design and construction. Offers standard features other manufacturers charge as options. A sound value, built to last.

Coaxial Transfer Switches—These 1½" and 3½" motorized four port switches are designed to switch between antennas, transmitters, or dummy loads both quickly and efficiently. The switches can also be operated manually and are fully interlocked.

RF Ammeters and Sampling Toroids—Precision toroidal current transformers (TCTs) provide stable antenna monitor sampling while eliminating the problems associated with loops. TCTs also work well in supplying additional modulation monitor or test sample RF outputs. The transformer coupled ammeter (TCA) offers stable base or common point current readings, independent of modulation. The dual and single scale meters also provide remote DC output.

Rotary Variable Inductor—Where long life and high reliability are required, specify the RVI. Designed to provide long life, even under continuous rotation, the RVI is available in either 12 mH or 10 mH versions (maximum inductance). Other values by special order.

RF Receiver/Generator—A rugged, high output (2 watts) generator and correlation detector receiver virtually eliminate false nulls caused by interfering signals. The RG-3A operates from 0.5 to 1.65 MHz, and the expanded range of the RG-4 generates signals from 100 kHz to 30 MHz.

Impedance Bridges—At last, a means of measuring your impedance under full power. Both portable and in-line bridges are available, with a variety of features, for both AM broadcast and HF applications. The in-line Common Point Bridge can be supplied with a TCA RF Ammeter to permit precise current and impedance measurements.

High Power Pulse Reflectometer—Strong interfering fields that would destroy time domain reflectometers are virtually ignored by the PRH-1. This instrument can handle up to 1,000 watts of induced power on an intermittent basis as it locates faults on transmission lines. Provides a visual representation of the transmission or sample line, STL coax, or antenna, using your oscilloscope.

Low Power RF Ammeters—When every milliampere current counts, depend on the accuracy of the TCA Jr. This portable RF ammeter is designed to plug into either a Delta MJ-50 Meter Jack (pictured above), or a standard 1/4-inch jack. Two current ranges are available: 0.2 to 1.0 Ampere, or 0.4 to 2.0 Ampere.

Transmitter Power Controller—Your insurance against over and under-power citations. Continuously monitors transmitter power levels, compensating for AC power line sag by adjusting the transmitter to 100% power.

Digital Controlled Processor—This inexpensive, stereo tri-band processor boasts user-friendly controls and an aggressive sound. More stations can take a step toward AM Stereo, at a price that won't break the budget.

AM Antenna Monitors—These true ratio monitors which deliver a ratio reading without the need to continually reset the reference tower to 1.000. This simple operation reduces errors by non-technical personnel and makes tuning an array easier.
Professional Label Service

- **Visi-Label software**: prints cassette labels; supports laser printers; PLS VHS laser label sheets offer six sets of face, spine labels.
- **Videocassette cases**: "Deluxe" plastic cases for VHS, pushbutton easy-release opening; heavy-gauge plastic sleeves, VHS/Beta sleeve inserts; continuous-form labels on colored stock for VHS.

Circle (1022)

Research Technology INT’L/FTI

- **TapeChek 1212D evaluator**: cleans, evaluates 1” tape at 20x play speed; Micro-Pulse 20-track detection; burnishes to remove loose oxide, dirt; CRT display.
- **TapeChek 400 series**: videotape cleaner, inspection system, rewinders; grades tapes to three levels, determines length with number, locations of defects; VHS format; 2-hour tape checked in two minutes.
- **V90 degasser**: for 5,000e coercivity media; 7,000 gauss for 90dB erasure on conventional oxides; 75dB for metal tape without heat build-up.
- **TapeChek 4150 evaluator**: for 1/2” pancake media; identifies magnetic, physical defects at 100x play speed; Micro-Pulse detection; color CRT graphic display of condition.
- **D-11 dropout counter**: uses any videotape format; analyzes RF signal from recorded tape without erasure; checks media for large catastrophic and less serious dropout conditions.
- **V90 degasser**: high-coercivity bulk eraser accommodates all cassette and reel media to 10/4" reels; 4,000 gauss field, for 200 Betacam, MII cassettes per hour.

Circle (1052)

Sony Magnetic Tape

- **HRPX/HR videotape**: metal particle media; to 400-line resolution, high S/N ratio; low dropout count; stable in editing applications; Hyper Cosmicleite particles for high data density.
- **D-2 large cassette to 208-minute lengths.**
- **HD-1D tape**: high definition tape for HHD-10000 DVT: 1” open reel; 35-48 minute on 10/2”, 63-minute on 11/3” reels.
- **V1-KV tape**: new formulation; reduced friction, headwear, increased durability, S/N; smaller magnetic particles; lengths 18 minutes to 188 minutes.

Circle (1106)

Tape Automation America

- **Interchange evaluator**: data acquisition system reads technical, interchange variables from VCR, calibrates its readings to those of a standard tape; status is displayed over VCR video; for QC system.

Circle (1442)

United Ad Label

- **Status**: Cassette labels: adhesive-backed labels show status of video-, audio-tape at a glance; VHS cassette face and spine label blanks, suitable for use with laser printers.

Circle (1199)

S5: Distribution

- **Routing switchers**
- **Patch panels, cords**
- **Distribution amplifiers**

ADC Telecommunications

- **MCS 3800 video multicast switcher.**
  Circle (511)

Alpha Image

- **a216**: D-1, D-2 digital parallel router.
- **a264S router**: serial digital router for D-1, D-2 signals; 16x16 to 128x128 matrices; simultaneous interfacing with various system controllers.
  Circle (530)

Audio Accessories Inc.

- **Pre-wired audio patching**: front panel contains TRS tip-ring-sleeve jacks; fixed or hinged back plate with KRONET terminal block; bulk, partial, non-normalized versions.
  Circle (564)

Audio Developments

- **AD 081 Flexlink**: 4x1, 1x4 signal distribution modules; mic DA, line DA, line-level and mic-level mixers, electronic balance and monitor modules; rack houses 10 modules in any mixture.
  Circle (566)

Audio Services Corporation

- **CVM system**: monitoring utility; programmable controller selects one of 10 video, audio signals; one controller may operate 18 switching units.
  Circle (1023)

Aritel Electronics

- **DBF 2035 jackfield**: CCIR 601 spec; 8-bit digital signal router with two rows of eight patch plugs; D-25 connectors on back; also as 16-bit version or 9-pin RS-422 version.
- **3200 series modules**: ADA-3231 single-channel audio DA, 1-in/10-out; ADA-3232 dual-channel audio, 1-in/10-out as stereo, dual mono; mix-and-match with video DAs in the same 3RU frame.
  Circle (579)

Barco Industries

- **BVR516x16**: video router; 16x16 matrix for composite, component, reconfigures from local panel, CVS series monitors or standard PCs; 40MHz bandwidth.
  Circle (586)

Bio-Electronics

- **EGA-DA system**: 1-in4-out video distribution drives four EGA monitors; input, isolated outputs on 9-pin sub D connectors.
  Circle (601)

Brabury Porta-Format/BPI

- **CDA-101 DA**: bandwidth, multichannel for RGB or Y/Cu/Cu components to HDTV frequencies; four amplifiers with sync separator, clamp pulse generator; EQ; six modules per 3RU CFT-101 powered card frame.
  Circle (604)

Broadcast Video Systems/BVS

- **BB500/2, BB1200**: 4-layer, 5x1, 12x1 passive switchers; provides stereo audio-follow with time code switching at low cost.
  Circle (620)

BSM Broadcast Systems

- **MR 207**: X-Y matrix control for MODULA routers with memory capabilities.
- **Distribution equipment**: C216P audio patch panel; C310P video patch panel; C312P video clamp, DA in 4x4 design.
  Circle (626)

BTS

- **BCS-300 controller**: distribution control using 3-stage, crosspoint reduction switching; 200x200 matrix system requires only 15,600 crosspoints instead of the normal 40,000; LAN communications via coaxial cable.
- **BV/A/BAA-3000 DA**: permits 20 DA units per 51/2 rack; 1-inx5-out video units, cable EQ for 100’ of Belden 8281, selectable clamp, delay options; 1-inx6-out audio units with 0.005% THD, 20Hz-20KHz response.
  Circle (530)

- **SRC-3000 controllers**: automation controllers TVS/TAS distribution routers; 2000 Switcher configuration edit for user-supplied IBM/compatible PC.
  Circle (564)

- **SRC-2100 controller**: automation switcher control; combines functions of 2000 with real-time control and creation, editing, and execute-timed routing events; performs some multiple channel distribution tasks.
  Circle (566)

Datatek

- **D-2400 enhancement**: PC software automates D-2400 series routers.
  Circle (709)

Datatek

- **DC215 serial router**: supports D-1, D-2 formats with base matrix of 16x16, expandable; may be used as one of eight control levels in integrated system; with 9002 VMC controller partition D-1, D-2 sectors.
  Circle (719)

Dorrough Electronics

- **Model 120-S**: routing chassis interconnects multiple source signals to model 1200 Stereo Signal Test Set.
  Circle (734)

DYNAIR Electronics

- **Dyna MITE enhanced**: full alphanumeric style, destination display to five monochrome characters; control operation from PC, VDT; for NTSC, PAL, SECAM, proposed ATV, HDTV, medium-resolution graphics.
- **Series 3100**: 30MHz utility video, EQ, pulse DAs; 16x mix/match DAs in 1RU, 2RU packages; EQ for 1,000 foot of Belden 8281 coax; plug compatible with GVG 8500 series.
- **1200 FO series**: in 10MHz, 30MHz, 100MHz bandwidths; LED/PIN diode design; for systems to 3km cable lengths (2,000 feet) for 100MHz; coaxial distribution modules with bandwidths to 150MHz and EQ.
- **DYNASTY 100 enhancement**: bandwidth extended to 120MHz; plug-in modules provide mix/match 1/O connections for 10x10 to 50x100 matrices.
  Circle (740)

DYNASTY enhancements: bandwidth increased to 70MHz; 30MHz, 40MHz systems also available; from 10x10 to 1,000x1,000 matrices; plug-and-play expandability.
  Circle (740)
It's 5:53! Where's Charlie, Jim and Jane?

There's nothing to worry about. AutoCam's™ ACP-8000 has control.

Repetitive and boring manual camera control is eliminated. AutoCam's ACP-8000 menu driven touch screen control easily learns and reproduces precisely and consistently all camera shots and floor positions. Now, experienced personnel can accept more challenging and rewarding assignments.

An example of AutoCam's power: After the opening Anchor stories on the 6 o'clock news, cameras 1 and 2 are easily relocated to the Weather desk during a 2 minute video. After Weather, cameras 1 and 3 are quickly repositioned to Sports during a 30 second break...then all 3 cameras return to the Anchor desk to close the show. Preset camera shots, floor positioning and cable management are performed easily and automatically with the HS-110P Pan/Tilt head and the SP-200 servo pedestal with X-Y base.

The proprietary X-Y base guidance system repositions the cameras within an 18 arc-second rotational error. As the cameras are moved from position to position, there is zero cumulative error. Its sophisticated locating and collision avoidance system eliminate the need for rails or studio floor grids. If desired, AutoCam's manual control mode can be initiated at any time.

The AutoTrak™ talent tracking option maintains accurate framing of the Anchor even on tight head and shoulder shots. (An essential operating requirement with key shots.)

AutoCam's newsroom computer option gives the news director quick access to all camera resources. Scripted stories with all camera moves are automatically played via the ACP-8000 newsroom computer story list. Last minute changes are executed quickly and smoothly.

AutoCam can provide you with the most efficient communication link between your director and your on-air product. And, its reliability and sophisticated moves improve your on-air image. Call for a proposal and demonstration...now.
ERGO 90
- **Mini jack unit**: 96-patch points using ADC bantam jacks; prewired with looped normals; Winchester, Elco connector options.
- **RS-422 Datapath**: RS-422 data routing. Circle (764)

FSE
- **DA, switcher**: ES-227 S-VHS compatible video DA; ES-SW90 16x1 audio-follow-video switcher in 1RU. Circle (766)

FOR-A
- **VRS-3000**: video router; 16x16 matrix expands to 64x64, control in any combination for component matrices. Circle (784)

Gennum
- **GX4304 multiplexer**: 4x1 configuration video device.
- **GX2021 crosspoints**: 1x1 switch with tally output; for HDTV applications; 80dB. Circle (877)
- **GY4102 SPD bootle**: switching time 25ns; 300MHz bandwidth.
- **GM8116, GM8105**: prototype modules for 8x1, 16x1 multiplexer functions; 8-bit format.
- **HDIC matrices**: high-density interconnection monolithic-on-monolithic switching matrices; 10x10 maximum with or without buffers. Circle (797)

Grass Valley Group
- **MAX-300 series**: 3RU modular DA frame with 12 cells, power supply: optional power supply; component analog video DAs with 3-in-6-out, single tracking gain adjustment; sync add, optional EQ, delay. Circle (807)

Grunder & Associates
- **GDA-1 DAs**: includes level meters and control; A-B input selection with 10 outputs; noise filter; cable EQ to 1,000’. Circle (810)

HEDCO
- **Routing switchers**: HDV-4X, HDV-8X 4x1 and 8x1 routing switchers for D-1, D-2 digital video signals; Model HD, 32x32 to 256x256 for audio, video, time code signals. Circle (817)

Image Video
- **S-128**: serial data router; RS-232/-422 data distribution to 128x128 matrix by groups of 16 in six rack units; redundant power supply available.
- **Distribution switchers**: 9540 40x20 video in 3RU; 9541 40x20 dual audio in 4RU; 9520/9521 20x10 video, dual audio in 1RU. Circle (840)

IRIS Technologies
- **Video Commander**: touch-screen interface routes 32 video, 64 audio inputs to any of 32 outputs with audio and video breakaway. Circle (1459)

J-Lab
- **Shirt Pocket VDAs**: video amp with looping balanced input; hum bucking; 575Ω outputs; EQ to 1,000’ Belden 8281 cable.
- **Shirt PocketADAs**: looping balanced input; four balanced outputs; transformer input option; 9Vdc operation. Circle (861)

J.N.S. Electronics
- **8300 routing**: audio distribution switchers; mono, stereo in 1x10-10x1 matrices, stackable; front-panel, single-cable remote control; optional audio metering; modern access.
- **Serie 8000 The Frame**: modular audio mono, stereo DAs; audio monitor, Video DAs for NTSC, PAL, SECAM; audio failure sensing, stereo presence sensing; program changeover, RF demod.
- **9000 routing**: audio distribution switchers; mono, stereo systems; 15x1 or 15x8 matrix cards, expandable to 3,500 crosspoints; full status tally-back; machine control; relay switching with magnetic latch. Circle (862)

Jem-Fab
- **DPatch system**: self-normalizing serial data patch panel; audio-style patch cords; 9-pin D connector interface; for computer data, universal machine control; Editor-VTR patching; remote control delegation.
- **DSW-128 router**: RS-422 data communications routing; 8RU frame for 128 ports; expandable from eight ports in increments of eight; each port may be configured wither as an input Tributary or as an output Controller. Circle (866)

Leitch Video
- **ADA-883 audio DA**: 2-channel amp; four low-impedance outputs per channel; 36dB maximum output, 100dB S/N, -95dB interchannel crosstalk; flat, controlled roll-off. Circle (895)

McCurdy Radio Industries
- **MDA-108**: 1x8 distribution, 8x1 mixing DAs; individual level adjustments. Circle (892)

Miranda Technologies
- **DR-105P digital router**: 10x1 matrix for D-1, D-2 signals; can be configured as 5x1 system or stacked for 5x5 configuration; 10-bit data paths; dual digital, analog outputs. Circle (1491)

Modulation Sciences
- **AEA-1 adapter**: expands audio I/O of GVG TEN-1XL 1x10 switcher; adapts 37-pin D connector to 11 Neutrik, audio, XLR connectors; by Multidyne.
- **SW-5 A/V selector**: switch selection of one of five audio and video sources; from Multidyne. Circle (851)

Omicron Video
- **Model 887 DA**: wideband distribution product; three levels of 40MHz bandwidth signals with one level of sync. Circle (897)

Ramko Research
- **RS-1616/XFT software**: DOS compatible software with MCU-xx programmable audio and data distribution switching control; line graphic screen display shows destinations on pseudo map of the facility; controls from 8x16 to 128x64. Circle (1435)

Sierra Automated Systems
- **SAS 32000 router**: stereo audio distribution, routing system; 114dB dynamic range with full summing capability; basic unit is

---

Circle (91) on Reply Card

110 Broadcast Engineering June 1990

www.americanradiohistory.com
Nature has its own professionals of sound and vision.

The wonders of sound and vision found in nature are hard to reproduce. In fact, if anyone has come close it's EEV.

Whatever your broadcast requirements, you'll find EEV has the technology to match. High-efficiency UHF Television Klystrons from 5kW to 70kW for Television Transmitters. A range of Broadcast Tetrodes and Vacuum Capacitors for AM and FM transmitters, and Ledicon® camera tubes to fit virtually every broadcast color camera available today.

Our experience is the key to technological leadership. Our manufacturing know-how ensures the highest quality and reliability. Above all, our professional dedication to our customers' needs makes us the natural choice of broadcasters the world over.

EEV

Technology for the Broadcast Industry

© Ledicon is the Registered
Trade Mark of EEV Lead Oxide
Camera Tubes.

USA: EEV Inc., 4 Westchester Plaza, Elmsford, NY 10523 Telephone: (914) 592 6050 or 'Toll Free' 1-800-DIAL EEV Telex: 681096 Fax: (914) 682 8922
CANADA: EEV Canada Ltd, 67 Westmore Drive, Rexdale, Ontario M9V 3Y6 Telephone: (416) 745 9494 Telex: 86 989363 Fax: (416) 745 0618
UK: EEV, Waterhouse Lane, Chelmsford, Essex CM1 2QU, England. Telephone: (0245) 493493 Telex: 99103 Fax: (0245) 492492

Sigma Electronics
- Series 2100: signal distribution modules for HDTV and high-resolution graphics; A/V, pulse modules; fiber-optic and wired models; 1x6 units; 6x1 switching modules, switcher control; black burst generator.
- Circle (1092)

Solutec
- SOL-2510: audio distribution amps.
- Circle (1101)

Sony Communications/Broadcast
- DVS-3232, A3232: serial digital video, audio routing switches; video unit ranges from 12x1 and 16x16 to 256x256 matrices; audio expands to 256x256; handles D-1, or D-2 with four audio channels per coax.
- Circle (1103)

Teltel
- Routing switchers: 982 A-FV switcher; stackable 10x1 format; 1616 video only 16-1, 16-2 versions; 1100 series A/V in 10x10 and 20x10 expandable configuration.
- Circle (1168)

360 Systems
- AM-16/R controller: AM-16/M audio routing remote control; interface software for PC, MAC computers; X-Y, audio switching to four audio levels; Patch-it editor, librarian.
- Circle (1172)

Utah Scientific
- VDA-4x2B, VDA-8xB A-DAs: 4x2 offers two DAs per card in 1x4-4-4out; delay trim, EQ, video level control; 4x8 1x8-out single DA per card.
- AVS2: production model audio, HDTV router; SMD technology reduces size; 1.280x1.280 matrix array, eight addressable levels; 30MHz video bandwidth; programizable from dumb terminals or PCs.
- AVS-IWB router: 100MHz bandwidth distribution router; 1290x1024 60Hz non-interlaced computer graphics, HDTV, NTSC, PAL and audio capabilities.
- VDA-9/DL: 1x9x-out video distribution amplifier; four outputs have minimal path length, four have delay section, 9th output switchable, relay or mode, ±3dB gain, ±3s delay adjustment on front panel.
- Circle (1256)

VGV Inc.
- DVDA distribution amps: 10-bit signal distribution with 1-in-6-out; output signal is resynchronized; PAC series with A/D and D/A converters.
- Circle (1216)

Vortex Communications Ltd
- Eurogold video: DPC-300 digital comb filter decoder; SCG-101 component SFG/encoder: CPC-100 comb filter coder: TCP-300 PAL/SECAM transcoder; intermatrix converters, DAs, routing systems; format converters.
- Circle (1237)

**S6: Test equipment**

- **Instruments, tools**
  - Allen Avionics
    - Matchman Mk II: BAL color patch generator; for rapid assessment, calibration of video cameras through side-by-side comparison of camera output with electronically generated patterns; NTSC/PAL dual standard.
    - Circle (525)

**Altronic Research**
- Omegaline 9700 Unibody: power measurement system; available in power ratings from 50kW to 50kW; lower pressure drop for enhanced water flow control.
- Model 6775: coaxial dummy load; 75kW rating; air-cooled.
- Circle (533)

Anritsu America
- MS6301 series analyzer: for MS6301 series generator; provides complete automatic testing of video systems; with printer, associated hardware; NTSC, PAL models test microwave, broadcast transmissions.
- MG3633A signal synthesizer: generates signals in 10kHz to 2.7GHz range; AM, FM, PM functions; maintenance or R&D tool.
- MS3606A network analyzer: 10kHz-1GHz range; dynamic range of 120dB covers analog characteristics of components, circuits, transmission lines; analyzes reflections, impedance characteristics; CRT display; GPIB interface.
- MS6301 series generator: digital pattern source for NTSC, PAL; 200 reference waveforms meet all regulatory bodies; unrestricted waveform generation through programming; adjustable H/V sync; full control of all parameters.
- MS610 spectrum analyzers: 10kHz-23GHz range with extension to 140GHz through options; GPIB programmable; resolution bandwidth 100Hz-3MHz; 100dB dynamic range; CRT display, printer/plotted options.
- Circle (546)

**ASACA Shibasoku**
- TG919E HDV test signal generator.
- Audio analyzers: AM50B, 2-channel analyzer; model AM51A analyzer.
- Circle (557)

**Audio Precision**
- BITTEST.DSP program: bit-error test program for Dual Domain audio package; uses a series of various bit patterns to check bit-level errors created during digital audio signal manipulations.
- System One enhancements: APM-FM audio proof of performance package, performs FM stereo audio proofs; Dual Domain analog, digital domain audio test package.
- Circle (567)

**AVCOM of VA**
- DCF-20 dc power inserter: designed to insert power onto a coaxial transmission line or may function as a dc block; available with SMA, BNC, Nand F connectors; protects test equipment from excessive dc voltages appearing on test ports.
- PSA65A spectrum analyzer: portable unit: 2MHz-1GHz in single sweep; sensitivity to -95dBm over narrow spans; battery operated; optional frequency extenders available; weight 18 pounds.
- RFP-24 prep;amp: extends sensitivity of LSA-1000 log surveillance antenna or low-noise amplification needs; 22dB gain, noise figure 2.2dB at 1.2GHz; 12Vdc operation.
- Circle (577)

**B&B Systems**
- 1M-1HR: ImageScope stereo audio display; in-side-by-side half-frame model.
- Circle (582)

**Bio-Electronics**
- SG-2B, SG-W, SG-3SB: signal generators for black burst, white level, SMPTE color bars; various options for NTSC or PAL and S-VHS models for both standards.
- Circle (601)

**Briel & Kjaer Instruments/Pro Audio**
- Model 2143 analyzer: real-time, portable frequency analyzer; mic pre-amp or direct input; 80dB dynamic range; DOS disk drive; 100-step learn mode; 4-range digital filters.
- Circle (623)

**BTEC Test & Equipment/Philips**
- PM 5664 waveform monitor: for Y/Y, B-Y, RGB, Betacam, M-I formats; STAR display of timing differences; measures amplitude, static non-linearity; vector, bow-tie displays; Gain/L detector of illegal levels.
- PM 5543 SPC: component sync generator; component format, composite signal, 2-3-3-2 wire formats; added black-burst output; 128-pattern memory; 1kHz audio tone; IEEE-488, RS-232, TTL remote control port.
- Circle (1010)

**Coaxial Dynamics**
- Model 53910: peak/CW rack wattmeter; 0.1W-5kW range; average and peak measurements performed with appropriate line sections, elements; measures peak power in pulsed systems, PEP in AM/SSB.
- WATCHMAN 8017S: meter monitor, alarm system and low forward power meter; electronic relay meter detects selected power condition and causes relay state to change until power level is restored.
- Circle (667)

**Control Concepts**
- Isabot/PPLUS: power protection systems; hybrid surge suppression, transient filtration; ringwave format; rated for high-energy absorption with headroom; epoxy encapsulated.
- Circle (695)

**Cortana**
- Radial chaser: metal detector-type device senses current flow in good ground wires and buried transmission lines; finds shorts, opens, reradiated RF, 9Vdc power.
- Circle (696)

**Current Technology**
- MPA, MPAP: integrated powert panels, providing "digital" quality power for µ-based equipment.
- Optisitor: optically isolates device, data cable; boosts power of original data signal; protection from power-related transients.
- PC-series: professional power protection for small systems.
- Circle (702)

**Delta Electronics**
- PBI-1: high-power pulse reflectometer.
- Circle (715)

**Dorrough Electronics**
- Model 404: loudness meter with peak hold feature.
- Circle (734)
Your station, like most, is racing into the digital domain. Just think about your growing CD library. Wouldn’t it be marvelous if your audio processing chain could be fully digital, too?

With the new Spectrum System, that option is yours, today.

Spectrum System includes the Digital Prizm, a four-band pre-processor that allows you to shape your signal with digital accuracy, for maximum apparent loudness right to the fringe.

Then there’s our all new FM limiter/stereo generator, the Digital Lazer. The Lazer gives you incredible stereo separation and keeps your signal at optimum modulation. Plus, with 8 separate pre-sets, you can infinitely fine tune your sound, A/B the results and return precisely to where you started. All at the touch of a button with absolute repeatability.

Get your personal demonstration today. Just give your authorized Spectrum System dealer a call.
'Electro impulse
- CPTN series: RF coaxial loads: CPTN-1000 1kW, CPTN-1500 1.5kW, CPTN-3000 2.5-3kW; single-resistor units, oil dielectric.
  Circle (752)

FloriCal Systems
- Validator: monitors baseband video, audio signals for levels and timing; RS-232/222 port; check for bad horizontal, vertical sync, reference burst, audio level out-of-limits on three channels.
  Circle (781)

J-Lab
- Color bar source: portable SMPTE bar generator; color bar source 2 generator; 9V dc operation.
  Circle (951)

Jensen Tools
- STK-3TEK: field engineer’s electronic service center; deep case tool kit; more than 70 tools; Fluke 88 DMM, TEK 222 scope with other oscilloscope options; also available without meter, scope.
  Circle (867)

L. E. Nelson
- Spectra Tricolor meter: full spectrum color temperature meter; measures RGB primaries for still, cine photography; predicts filtration needed for correct color reproduction.
  Circle (884)

Leader Instruments
- Model 425 generator: component video signal source; "shark fin" relative timing pattern; RS-170A unit offers 23 component signals; select Y/R-Y/B-Y, Y/time-processed chroma: ROM for Betacam, M-6.
  2100R oscilloscope: 100MHz instrument. CRT readout; setup cursors for direct reading of measured values; CRT readout shows factors, vertical mode coupling, main, delayed sweep times, triggering controls.
- Model 5100: component video waveform monitor; NTSC 525/60 and HDTV 1125/60 component or composite signals; 12Vdc and 90-250Vac operation; vector display of VAC; "shark fin" pattern.
- 3060D digital oscilloscope: 4k word memory, 40MS/s sampling rate, 60MHz bandwidth; automatic time base prevents aliasing; CRT cursor readout of voltage, time, frequency, phase, voltage, time difference ratios.
- Model 1100 oscilloscope: 100MHz bandwidth instrument; 3-channel, dual time base for 6-trace capability; 300μV sensitivity; 5ns maximum sweep speed; three preset sync separator circuits for H, V triggering.
  Circle (892)

Letch Video
- DSM-T152 monitor: digital signal monitor from D-2 Digipeek series; assists in troubleshooting D-2 signal paths; produces 75 NTSC output from parallel 8/10-bit signals, switch selected H/V triggers.
  Circle (895)

Magni Systems
- Y/C waveform, vector monitors: option for WV560, WV561 combo monitors; allows instruments to offer complete Y/C testing.

Marconi Communications
- B1001 remote monitor, AM, optional FM, monitor AM, LSB/USB broadcasts. UPS power, DTMF telco control; provides remote real-time feedback of station’s signal strength at a target area within a 100kHz-29,999kHz tuning range.
  Circle (922)

McCurdy Radio Industries
- SA 140234: VU audio level meter, test set; extended range capabilities; options include PPM indicator; response of -0.25dB 20Hz-20kHz referred to 1kHz.
  Circle (932)

Microsonics
- Surface-wave delays: for various radar, transponder, computer and other applications; 0.15μ-15μs delay range over 20MHz-300MHz frequency range.
  Circle (943)

Minolta
- CA-100 CRT analyzer: color analyzer for objective white balance adjustment of CRTs, regardless of phosphor; 11 memory channels, 100 with optional memory card; displays chromaticity coordinates.
  Circle (949)

The NEWS from PERROTT

Another of our INNOVATIVE "441" Series
The 441-90 eliminates memory and extends battery life!

- 4 independent Minichargers and dischargers in one unit
- Discharges 4 packs simultaneously
- Charges 4 packs simultaneously
- High impact all metal casing
- 115/230 volts AC

Reliability
Quality

Call 703-552-0700 or write:
PERROTT
Engineering Labs, Inc.
7201 Lee Highway,
Falls Church, VA 22046

Circle (97) on Reply Card

The NEWS from PERROTT

Circle (98) on Reply Card
AMEK's CLASSIC offers a unique range of facilities for all types of audio production work. Unparalleled flexibility of configurations is possible using the numerous chassis, module, automation, metering and jackfield options.

The CLASSIC at VIDEOLONDON's new film and video post-production suite is a perfect example. The console is equipped with 24 mono and 8 stereo inputs, 8 stereo subgroups, and 24-track buss/tape monitoring. Stereo inputs and subgroups have both image width and pan controls. NTP plasma meters have been specially supplied and the jackfield is remoted for rack-mounting. Extensive machine control switching has been built into the central section of the console.

Automation for VIDEOLONDON'S CLASSIC is the GML Moving Fader System which is fitted to both mono and stereo channels and subgroups. The GML System, with 10-bit resolution, uses several 68020 processors combined with hard disk and massive RAM to allow high speed precision control over both levels and mutes. Complete mix editing subroutines are standard equipment, and the system will slave to all forms of SMPTE.

VIDEOLONDON is one of the UK's leading post-production houses and has chosen the AMEK CLASSIC as the best console for the next step in their dynamic growth. Some of the many notable users worldwide include ABC, Central TV, Granada TV, Molinare, Turner Broadcasting, TV New Zealand and TV2 Denmark.
Modulation Sciences
- Multidyne TSSeries: TS-4, NTSC color bar, sync generator with gen-lock, cursor-based character generator; TS-8 digital NTSC pattern generator with 8-bit accuracy in RGB format and RF ch 3-4 outputs.
- VLD6 detector: determines status of six video sources with computer interface; from Multidyne.
  Circle (891)

Neutrnik USA
- Audiograph 3300: modular audio, acoustic measurement system; reads room characteristics, audio recording equipment, system distortion; programmable system.
- 72702 test set: stand-alone audio test lab forms core for automated, PC-controlled system; programmable with Audio Measuring System Language through panel or via IEEE-488 port and personal computer.
- A test system: single instrument combines audio sweep generator, distortion analyzer, level/frequency monitor, crossTalk, noise, wow/flutter measurements, curve tracer and oscilloscope functions; backlit LED screen.
  Circle (970)

Phillips TV Test Equipment
- PM 5564 waveform monitor: component monitoring, YPR, R-Y, R-Y, G-Y, B-Y, V levels; limits; YPR, R-Y, G-Y, B-Y levels; limits; 2 line, phase, display of timing differences; measures amplitude, static non-linearity; vector, bow-tie displays; Gamut detector of illegal levels.
- PM 5643 SFC: component sync generator; output as component, composite signal, 2-wire, 3-wire formats; additional black-burst output; 128-pattern signal memory, 1KHz audio tone; IEEE-488, RS-232, TTL port.
  Circle (1010)

QSI Systems
- 6100 microwave AGC meter: generates variable-length flag on a line in VBI, based on microwave receiver AGC; as AGC varies, flat length indicates received signal strength to assist in ENG antenna alignment.
  Circle (1029)

RE Instruments
- RE 330 RDS generator for receiver tests.
  Circle (1445)

Rohde & Schwarz
- SGMP, SGFP: NTSC, PAL signal generators; 30 test patterns including composite test signal; 12-bit digitalization; optional VIT inserter, source ID; for SMPTE, NT-C, FCC.
- GMP: NTSC, PAL, SECAM color subcarriers; measures jitter from VITRs; non-volatile memory; portable; constructed with SMD multilayer technology.
- UAF video analyzer: measures 25 video signal components at three rates; eight VITs configuration points; selects limits; parameters; non-volatile memory card retains setup, results, operation modes.
  Circle (1058)

Schmid Telecommunication
- SAT test system: short-interval audio test; 10-parameter audio test procedure is completed within five seconds after operator presses one button; transmitter, receiver units for all audio networks; can run broadcast system tests between announcements without interruption of programming.
  Circle (1076)

Seleco/Sifam
- Meter light: LED illumination kit for full specification UV, PPM meters.
  Circle (1081)

Solutec
- SOL-20/20 enhancement: improved graticule on color-keyed-in video audio level meter.
  Circle (1101)

Sound Technology
- CD-1 test disk: automates CD player test procedures in conjunction with 1500, 3000 series test systems; 19 test tracks.
- RTA-4000 analyzer: real-time program, acoustic analyzer; quantifies audio by spectral energy content, display on integral CRT; analyzes pink noise for use as acoustic, room analyzer with RT-60 function.
  Circle (1109)

Techni-Tool
- Tec-Tuff tool kit: case with valance design; 3-tumbler combination lock.
- Tech Duster: precise cleaning; 12 oz, 20 oz premeasured dry, Freon gas removes dust; non-corrosive, non-flammable; variable flow control valve; extension applicator.
- Degasser: for various CRT displays; demagnetizes tools; continuous service time 2.5 min; weight one pound.
  Circle (1152)

Tektronix
- ASG-100 audio generator: provides test tones, voice recording source; for VM700A Opt 40 marked parameters; 6 sec voice memory stored in solid-state memory can loop for continuous signal; auto, manual modes.
- TSG1001 HDTV generator: programmable, multiple format environment package; signal library in NTSC, M-J, Betacam, SMPTE, EBU and all proposed HDTV formats; downloaded signals in memory.
- Models 2121, 2722: sweep transmitter, receiver package for broadband, CATV system; transmits sweep pulses in any portion of 5-600MHz spectrum during vertical interval for non-interfering test operation.
- Model 2170 power enhancer: #2704 input, #2705 battery pack for option. 2170 portable power supply and analyzer; battery provides 1-hour operation, inverter offers unlimited operation from multiple batteries or external 12Vdc.
- VM700A option 40: automated audio measurements expand capability of video monitoring unit; characterizes an audio path within 35 seconds with no interruption of video measurements; use with ASG-100 audio generator.
- Tracking generator: option for 2170 spectrum analyzer; Option 4 extends coverage from 100kHz to 1.5GHz with 100dB dynamic range; internal unit controlled from 2170 keypad or IEEE-488 interface.
- GPIB interface (Opt 3): for 2170 portable spectrum analyzer; permits automated testing, waveform acquisition and direct plotting without an external controller.
- 7275 vectoroscope: dual standard with integral graticule to easily distinguish PAL and NTSC vectors; parallax-free display; companion to WFM-300A component/composite waveform monitor.
  Circle (1155)

Telefun
- T2-H-5-SLC gauge: tape tension measurement for U-matic, U-matic SP and S-VHS transports.
- TSH BT gauge: Betacam spindle height and 6-function reference plane gauge.
- TQ-1800 gauge: motorized dial torque system for U-matic VCRs; device simulates 9.5cm/sec pulling speed on 100mm tape pack; scale readings are given in gm/cm to correlate data provided with service manuals.
- T2-H-5-UMC tension gauge: tape tension measurement instrument meeting requirements of all recorders.
  Circle (1176)

Video Accessory
- Scope terminator: 75Ω in-line termination with 3Pf input capacitance; voltage reflective coefficient of 5% at 70MHz.
  Circle (1220)

Videonet
- VNG-1 noise generator: tests sensitivity of video equipment to non-standard signals; inserts hum, noise with level control to 10dB S/N, video from 0-280IRE; for signals to 6MHz bandwidth; bypass mode.
  Circle (1232)

Wireworks
- TE-3: mic cable tester system.
  Circle (1255)

S7: Facilities
- Studio, mobile, design
- Construction, consulting

Audio Broadcast Group
- Rolling Radio II: mobile radio studio; complete installation in a van.
  Circle (565)

BAF Communication
- Broadcast vehicles: ENG-18 ENG van on Ford E-350 chassis; model MRS-31 mobile radio studio, 31-foot unit with interview set for nine people, BMX-22 audio board, Marti redundant stereo transmitter.
  Circle (563)

E-N-G Mobile Systems
- News gathering vehicles: ENG C-Van quick-response vehicle; ENG Suburban 4-wheel drive vehicle; ENG/FVP Van; gasoline generator; equipment rack; 13GHz mount, pneumatic mast and control; custom production equipment packages.
  Circle (743)

Ellis & Watts
- Remote production vehicles: van-based production vehicles; options include expanding side models; custom electronic packages.
  Circle (757)

Giant Boom Box Industries
- Giant Money Machine: money machine booth for promotional uses.
  Circle (801)

Media Concepts Inc.
- Production vehicle: three Ikegami 730A cameras; GVG 1600-3F switcher, Sony BVU-110, -800 VCRs; ClearCom intercom, IFB; Dubner 5K CG; Yamaha 2404 audio mixer; dux limiting.
  Circle (1445)
The Ergo Industries Gallery

The Masterpiece Collection

Consoles

Tilt Slides

Patch Bays

RS 422 Data Patch

Oops, Not Ours!

Filtrol

Vertical Racks

Coming Soon

Rack Slides

We Have What You're Looking For...

But, If We Don't, We'll Find It For You

1-800-635-9297
3080 East Miraloma, Anaheim, CA 92806
(714) 632-1763 Fax: (714) 632-1764

ERGO INDUSTRIES, INC.

www.americanradiohistory.com
Talk To The People Who Use It

Smooth productions depend on your intercom not letting you down. From master control to on-site remotes, Clear-Com has a reliable intercom system to meet your exact needs. With belt packs that work in the rain and interfaces that connect to just about anything, Clear-Com has a proven commitment to reliability and innovative design. But don't just take our word for it, call us for a comprehensive list of satisfied customers and talk directly to the people who use it.

Clear-Com

"Hear The Difference"

USA/Canada:
945 Camelia St., Berkeley, CA 94710, TEL 415-527-6666 FAX 415-527-6699
International:
FAX 415-932-2171

Mobile-Cam Products
- Production vehicles: Modular One modular news truck, 4-wheel drive cab and chassis, Production One, 4-camera production vehicle, Mobile-Cam Four, Suburban-based news truck
Circle (950)

National Supervisory Network
- Station control system enables monitoring of broadcast facilities via satellite data link; offers complete remote control with equipment parameter logging; Trend Analysis Reports enables early location of pending equipment problems and failures
Circle (1266)

Panasonic A/V Systems Group
- SVP51 S-VHS cam pre-engineered production vehicle, two cameras, editing options for 3-cameras, ENG camcorder configurations, rooftop platform, 6-input switcher, audio mixer, A/C, on-board generator
Circle (1480)

Roscor
- Elite Fleet III TV remote vehicles; TV 19 ENG news van, TV 14 steppan configuration, TV 45 40-foot van system
Circle (1081)

Shook Electronics USA
- Production vehicles: model 48-63-102 network production trailer for sports, 48' length, model 25-34 mobile TV production vehicle, 25' length
Circle (1088)

Sure Shot Satellite Network
- Sure Shot I production vehicle with uplink, 48-foot vehicle, 5 cameras, 4 VTRs, complete production capabilities, C/Ku-band uplink; five units available for use anywhere with continental U.S.
Circle (1129)

Television Engineering
- TEC series mobile units TEC-14BX in Ford E350 cutaway, TEC-18 in GMC van, TEC-19 in Ford E350 Super cargo van; generator, cable reels, pneumatic mast, A/C, equipment determined by customer requirement
Circle (1163)

Turner Engineering
- System design, production facility design, engineering, construction for corporate, commercial, HD TV, designers of NAB HD TV exhibition
Circle (1466)

Wolf Coach
- 240K Ku Uplink vehicle Radiation Systems offset fed antenna and positioner, 230 units of rack space with storage areas behind the racks; antenna stows flat against top of vehicle during travel
Circle (1257)

S8: Programming
- Music, effects libraries
- Site-site services

Aircraft Digital Music Library
- Premiere Edition "Hollywood Edge" sound effects library, collection of over 1,500 sounds on 20 CDs, originally recorded on R-DAT, digitized with AMS Audiofile
Circle (518)
It’s Here!

It’s all digital. It’s fast. It’s two channel. And most importantly, it’s a Chyron character and graphics system . . . and can convert your valuable “library” of fonts and logos on the tens of thousands of Chyron IV disks that pervade the industry.

 Appropriately named for its virtually infinite capabilities and future potential, the iNFiNiT! is a dual-channel, dual user, full color, fully anti-aliased graphics system that is compatible with the Scribe family.

Standard features include: 2 full channels, 32 bits per channel, 16.7 million colors on-line, 256 levels of anti-aliasing/transparency, 2d animation, 16 fonts on-line, dual encoders, mix and effects between and within channels (wipes, dissolves, etc.), soft roll mask, continuously variable roll speeds, 80Mb Winchester, 2Mb 3.5 floppy in keyboard, 4Mb font memory, a graphical user interface and Fonts-by-Wire™.

Options include: Real-time 3D transformations, 3D animation software for solid objects, third internal mix channel, dual user software, real-time color video capture, CCIR 601 in and out, networking, Chyron IV font and logo convertor, advanced font utilities (glows, neon, partial shading, etc.), Intelligent Interface™ for connection to election, sports reporting and new room systems, logo compose, expandable mass storage, 44Mb IOMEGA removable disc and mouse.

Chyron makes the most widely used character and graphics systems in the video industry. Bar none. Draw on the wealth of thousands of trained Chyron operators and the treasure chest of available Chyron graphics. The iNFiNiT! The new standard. It’s here.

© Copyright 1990 Chyron Corporation

A member of The Chyron Group
The company the whole world watches.
516-845-2022
Circle (93) on Reply Card
Video Products

VI: Cameras
- ENG, EFP, studio
- Tubes, CCDs
- Lenses, filters, matte boxes
- Pedestals, tripods
- Pan/tilt heads
- Studio automation

Amplex Corporation
- CVR-400 camera, 1-piece Betacam SP camera-recorder; FIT CCD with 768-line resolution; options feed other VTRs; stop/start, viewfinder playback of both VTRs; AFM, longitudinal audio channels type Dolby C N/R.
Circle (539)

Angenieux Corporation
- 15–65.5 zoom: studio/ob CCD camera lens; 68.5° wide-angle view with MOD of 0.5m (19″); f/1.6 for 2/3″ cameras; f/1.4 for 1/2″ units; μP-controlled accuracy, subsystem status diagnosis.
Circle (544)

Benchler
- 900X30 Copymate II copy stand: light arms attach to rear of baseboard for more freedom in copy area; 3,200°K quartz light; safety glass, polarizers, light control options.
Circle (585)

Brabury Porta-图案/BPI
- #001-50, 001-SI: concentric, radial resolution charts for CCD cameras; available as illuminator transparencies, 18″x24″ Durachart and 9″x12″ field charts.
Circle (604)

BTS
- LDK 391 camcorder: combines 1/2″FT-5 CCD camera and model 300 Betacam VCR; 700TVL resolution; processing for film look; 1.5″ viewfinder with diagnostics; variable shutter speeds.
Circle (628)

BURLE INDUSTRIES
- Camera tubes: Saticon mixed-field types; Harpicons for HDTV.
Circle (630)

Canon USA/Broadcast Optics
- U4 system: remote-control pan/tilt; multi-purpose, weatherproof; allows off-site control of pan, tilt, zoom, focus, iris, extender via modem or wired operation.
- U5 robotic system: remote pan/tilt control for ENG; 32-shot memory with zoom, focus, tilt, pan and manual trim features.
- J14a lens accessories: MB100 matte box for two 4x4 filters; upgraded zoom demand based on larger, smoother potentiometer for lighter focus, fluid start.
- J14a-8.5B-R5: internal focus zoom; 8.5–119mm range; square lens shade, lens attachments remain fixed during focusing, avoiding readjustment of polarizers.
Circle (639)

Century Precision Optics
- Wide-angle adaptor: 0.6x for S-VHS, Hi8 industrial, consumer camcorders; converts zoom to super-wide fixed focal length lens; increases field by 40% without light loss.
Circle (652)
LEADERSHIP HAS ITS REWARDS.

Video leaders see the Sony difference not only in the quality of their pictures, but in their trophy cases.

Award-winning producers, editors, news teams and duplicators rely on Sony professional videotape to capture their best creations. They see a virtually perfect balance of durability, reliability, audio-video performance and responsiveness in sales and service.

That's why Sony, the leader in professional videotape, is the choice of video leaders. Worldwide.
Cinema Products
- J-T zoom: for fingertip control with Steadicam EFP.
- EFP Steadicam: lightweight camera support for EFP/ENG applications, all standard Steadicam features.
- WRC-4 control: 4-channel wireless system for focus, iris, zoom lens control; CP amplifier for Heden Lens motors.
- Steadicam Jr. for professional 8mm, VHS-C camcorders.

Circle (659)

Cinekinetic Pty Ltd
- No Van Grip Kit: production accessories reduce camera support requirements, no tripod needed; easily carried by one person; special equipment vehicle; Naro-Jib, SavRad-Board Pocket Dolly, Leveler, Master-Jib, Cinesaddle, Sand Sack counterweights, Sand Wedges, chain tripod spreader.

Circle (1267)

EEV
- XQ14/10: 30mm Leducon tube; variable linear bias improves picture quality, reduces picture smear; extend life.
- CO7 CD series: 1" FT CCD Imager, 1,032 lines per picture width; available for 625 CCIR, 525 RS170A; antiblooming, with 4,000:1 dynamic range; additional elements enable overscanning.
- LS57: 3" mixed field Leducon replacement for Sony BVP30, -350, -360; Hitachi SK97D, Ikegami HK323P.

Circle (749)

ergiment
- Ektor: its standard coupling on dolly or end of Mini-Jib; bearings for easy motion; permits routine vertical travel movement.
- Lightweight Bazooka set: five risers of aluminum, nylon top; triangular base; adjustable leveling.
- Mini Jib dolly: double 3-wheel base frame, 360° by steerable front; rear wheel brakes; riser tube stores flat on base.
- Dolly Riser Pump-up column: hydraulic riser column operates completely separately from dolly; 1.3m max height, 0.6m min.

Circle (1439)

FGV Panther
- Lightweight dolly: platform design for Panther accessories; runs on floor, track; motorized column for mini-Panther dolly, in-shot vertical movement from stable motor control.

Circle (774)

FOR-A
- HMC-1020 still camera: 1,280×1,035-pixel images for disk-based picture file system; Hi-Vision 1.125-line 60Hz interface; RGB analog output, HDTV analog; C-lens mount.

Circle (784)

Fries Engineering
- Action Tracker: stabilizer for 35mm, 16mm film, portable video cameras; suspends camera at center of mass, increases moment of inertia in three degrees of freedom.

Circle (1460)

Fujinon Optics
- Graphics lenses: A4×7.5MD, A8×12MD for copy stand cameras; maximum resolution at MOD of 0.45m; maximum aperture 1/2.8.
- CCD lens enhancements: minimum lateral, longitudinal chromatic aberration; eliminates ghosting, reflection-based flare; optically matched lens, dichroic prism.
- A16-70X6.3: 3/4" zoom with 2x extender weighs 130kg, covers 5-12mm range, f/2.2 at 152mm; MOD at 0.95m.
- HR22×18ES HDTV lens: 18mm-400mm zoom; maximum f/1.8 aperture, stops to f/2.0 above 350mm; 2x extender; MOD 5.5m; "floating group" correction optics.
- A24×16.5ERD: 24x zoom, 2x extender; maximum aperture f/2.8 to 250mm, f/3.9 at 300mm; weatherized, macro focus.
- HR11×11ES-HDV lens: 11-121mm zoom for 1" format; f/1.8 flat to 110mm with range to f/2.0 at 121mm; available with, without servo iris, zoom and focus module.
- A16×9.5ER: 3/4" zoom with 2x extender weighs 1.4kg; f/1.8 aperture flat over 9-156mm range, f/2.2 at 152mm; MOD at 0.95m.
- HDTV lens design: "floating group" between iris, rear elements, µ monitors focus, zoom, focus to position group for least lateral, longitudinal chromatic aberration.

Circle (789)

Future Productions
- MCU-400: 4-camera control unit; for Ikegamis HJ-79 series, HR-95, ICT-730, Sony BVP-3, -30, -5, -50, others; PS-400 powers four cameras, each with 300-foot cable.
- AVD-10A, AVD-24A: A/V DAS; 1×10, 1×24 designs; improved models.

Circle (780)

Geocam
- 4×1:0:1 matte box mounts directly to ENG or film lens, may need adapter depending on lens; 4×4 holder and one adapter ring; additional holder stage and rings available.
- GeoFilter filters: 1mm thick optically clear in 16-frame filter frames; soft gradations, soft colors, effects selections.
- 4×2:0:1 matte box; direct-mount to ENG, film lenses; carbon-fiber material.

Circle (790)

Hitachi Deshui
- SK-F730 camera: 800-line resolution in 450,000-pixel array of 3-FFT CCDs; linear matrix mask, chroma compensation; 6-speed electronic shutter.
- SK-550 camera: three Harpoon tubes; 30× greater sensitivity than Satinons; S/N at 57dB NTSC, 700-line resolution.
- SKF2 camera: EFP camera with three IT CCDs; 700-line resolution, -10dB vertical smear; direct mount to Betacam, to Mii via adapter; 400,000-pixel array.
- Z-ONE camera: 3-chip dockable ENG camera; IT CCDs; smart auto-knee, flare compensation, masking, contrast functions; for Betama Mii, S-VHS VCRs; adjust shoulder mount for best balance; variable shutter.
- HV-C1 camera: IT 3-CCD design; 280,000 pixel array; 660-line resolution at 58dB S/N; auto-white, auto-gain.

Circle (821)

Hoodman
- HVF-37: viewfinder hood; reduces ambient light, eliminates glare for camera operator during outdoor use; nylon, fiberglass rod, hook-and-loop construction.

Circle (826)

Ikegami Electronics (USA)
- HL-V55 camcorder: Betacam SP format; FIT CCD for 420,000-pixel array, 700-line resolution; 62dB S/N, 2,000 lux f/6.2 sensitivity; 15.2 pounds with lens, viewfinder, battery; composite video output.
- HL-55A Unicon: CCD camera, adapters for ENG, docking VCR, remote triax, multispeed shutter; audio level control and indication in viewfinder; dynamic detail enhancement.
- HK-353 CCD camera: studio, field unit; IT imager for 400,000-pixel array; S/N 62dB, 700-line resolution; multiscope, triaxial, FO cable; reduced smear, 3-channel detail correction; electronic shutter.

Circle (838)

Innovative TV Equipment/ITE
- T/H series: ENG tripod/head combos; T/H-400, low cost; T/H 500, compact unit; T/H 600, highest quality.

Circle (846)

JVC
- GY-317C camcorder: 3-CCD camera with S-VHS-C recorder; 1/4" CCD 330,000-pixel array; µ/iris control; 58dB S/N, 4-memory system for gamma, master black, contour, flare, iris, gain, 14× lens.
- TK-H70U camera: R/G/B, S-VHS outputs from image capture unit for graphics systems; 1/4" CCD offers 480-line resolution; 6-step shutter; Type C lens mount.
- KY-38U, KY-90U: IT, FIT CCD cameras; 700-line resolution; direct docking to BR-5411U, KR-M250U; adapter for Betacam; 62dB S/N ratio, 400,000-pixel array; voice warning features; multiscope, triax remote options.

Circle (868)

Karl Heitz
- Pro Reporter TriPod: for camera, lens support to 20 pounds; 5-6 pound; 1" diameter legs; 3-section, 4-section models; cromarilel gearlift column, 1/4"/2"x1.53m; MOD at 0.95m; accepts various Gitzo pan/tilt units.
- Models 580, 580, 660; Gitzo fluid heads; drag_adj for motion of leveling balls.
- Studex pan/tilt balls: 340B3-48B InterPro Ball 3; 410B4-480 Pro giant ball 4; 505B4-480 Tele compact ball 4.

Circle (874)

Matthews Studio Equipment
- Mini-Jib arm: 59½" length with maximum 8½" vertical travel; counterbalanced, heavy-duty pedestal, dolly.
- Tulip ll crane: 12-foot crane arm, pedestal base; camera position permits two seats, camera mount; pneumatic conversion for vertical pedestal post movement.

Circle (829)

Miller Fluid Heads (USA) Inc.
- Fluid head units: model 155, a 30 series II fluid head; model 160, a 50 series II fluid head.

Circle (947)

Nikon Photo/Electronic Imaging
- RF3AD, RF3AD-H: super-wide-angle, standard range with 1/1.2 apertures; fixed focal lengths.
- H-1500C still camera; high-definition product; 1" Mat Saticon; Nikon F-type lens mount; image capture rate of 0.3fps per frame; 1-tube error-free registration.
- ENG/EFP zooms: S19x8 ENG/EFP lens, 2x extender; S9x5.5 ENG/EFP lens, 2x extender; high-magnification, 1/1.7 maximum aper-
The best just got better!

Announcing the 7.5 MHZ Series of Time Base Correctors and Synchronizers.

Now, Prime Image brings you the 7.5 MHZ Series, the latest in sophisticated time base correctors and synchronizers for superior bandwidth signal handling: 7.5 MHz with impulse response of 0.25%.

The 7.5 MHZ Series also provides variable noise reduction up to 20 dB, passes VITS and VIRS, and transcodes between Y/C, Y/688, Y/R-Y/B-Y, and composite—all outputs available with any input type. Time base correction for 1/2” and 3/4” VCRs in Betacam, Betacam SP, MII, U-Matic, U-Matic SP, Hi-8, S-VHS, and ED Beta formats.

Ideal for down-link cable and wide bandwidth broadcast applications, 7.5 MHZ products feature the same reliability and high operating standards as all Prime Image TBCs and Synchronizers.

Find out more about this dynamic new line of TBCs and Synchronizers. Write or call Prime Image today.

Prime Image, inc. 19943 Via Escuela, Saratoga, California 95070
(408) 867-6519, Fax: (408) 926-7294, Service: (408) 926-5177,
East Coast: (301) 544-1754, Central: (217) 787-5742.

Circle (103) on Reply Card
tecture; f2.8x5.5 super-wide-angle exhibits reduced distortion at wide setting.
  * R10x12AED-HD2 zoom: high-definition lens; 10x with servo zoom, iris, focus control; Macro setting.
  * R10x12AED-HD2 zoom: 24x super-wide-angle 8mm with 90° diagonal picture angle; integral extending; high-modulated transfer function over entire range.
Circle (975)

O’Connor Engineering Lab
  * Ultimate 15-30 fluid head: for cameras to 30 pounds; fully 24-bit digital; 8mm super-wide-angle 8mm with 90° diagonal picture angle; integral extending; high-modulated transfer function over entire range.
Circle (983)

Panasonic A/V Systems Group
  * WV-D3100 camera: 1/3" CCD unit offering 480 lines; Panasonic-Y/C, composite outputs; configuration kits for portable, studio, multicamera systems with gen-lock; compatible with S-VHS VCRs.
  * WV-F250 CCD camera: three 1/3" CCDs offer Y/C, component outputs; compatible with S-VHS, VHS, MI, Betacam; 380,000-pixel array; 700-line resolution; 30 lux minimum sensitivity; 50dB S/N/shutter.
Circle (1480)

Panasonic Broadcast
  * AQ-11 CCD camera: digital signal processing with 75Hz+45V-pixel IT CCDS for 700-line resolution: 60dB S/N; electronic shutter; 4:3 sampling; direct connection to digital composite VTRs; accepts docking VCR.
Circle (999)

Phillips Components
  * Camera tubes: XQ550, XQ3550 HDTV Plumbicon, XQ3477 Plumbicon, ultra miniature size, ES deflection, focus.
Circle (1008)

Quickset International
  * QTTHB, QTTHS: black, silver tripodods; QRH-7 pan/tlt; head; 40-pound capacity; 38-71" height range; adjustable spreader; +45° tilt angle, 360° pan.
Circle (1034)

Sachtler
  * Video 10 system: dolly, tripod, spreader; elevation column with compact fluid head for 400 cameras.
  * 2-in-1 tripods: ENG/EFP camera support, for fluid heads with 100mm, 150mm bowls; Carbon fibre, Duraluminium.
Circle (1067)

Schneider Corporation of America
  * 8-16x WPR optical filters for color correction, compensation, effects.
Circle (1077)

Schwein Technology
  * CX3 "ENG": hand-held camera, stabilizing lens; CCD pickup for 430TV: 6x zoom, 1/2", stabilized on 87% at 1Hz, 98% at 10Hz.
Circle (1078)

Sony Advanced Systems
  * HDC-300 camera: HDTV per SMPTE 240M; 3-Saticon ES focus/deflection tubes for 1.45 at 2,000 lux, 1,000-line resolution; image enhancement, lens/scope files; knee, slope, black stretch controls.
Circle (1478)

Sony Communications/Broadcast
  * BVP-370, BVP-270 cameras: production models, 768 FIT, 768 IT CCD devices.
  * BVW-400 camcorder: FIT CCD, hole-accumulated diode technology; 700-line resolution; moving sensor dynamic range; reduces vertical smear, lag, burn; Betacam SP VTR; output option for second original recording.
Circle (1103)

Stanton-Video Services
  * Dolly accessories: coupler links PVC pipe sections to make a dolly track; truck-wheel assemblies attach to plywood dolly for use with temporary track.
  * Counterweights: 45 lb head weights; provide additional room on the counterweight bar for remote head controls.
Circle (1118)

Tamron Industries
  * CCTV CCD lenses: three series include high-resolution, vari-focal, wide-angle; C mount units; for 1/4", 3/4" format cameras.
Circle (1141)

Teletrols
  * TM8550 control: coax, triax remote control to Sony, Panasonic, Hitachi, Ikegami cameras; stand-alone product.
  * TM8615 interface: links Betacam to Mill recorder for ENG.
  * Model 68060: motorized camera trolley; remote pan, tlt, zoom, focus head; for newsgroup, teleconferencing, industrial systems.
  * TM8800 pan/tlt head: remote pan, tilt, zoom, focus control for broadcast, teleconferencing systems.
Circle (1159)

Television Equipment Associates
  * Model 150 camera units: miniature CCD color camera; with cover, camera units.
Circle (1164)

Thomson Video Equipment
  * TTV 1645 Sportcam: for fast-action sports coverage; 3/3 C-C 440,000-pixel array; electronic shutter; triax, portable, EFP, studio configurations; wide-range white compressor.
  * PROSCAN: 85° Saticon camera for EDTV/HDTV; studio/OB system uses non-interlaced scanning; enlarged bandwidth, 16:9 aspect ratio; 2,000 lux sensitivity; 20MHz bandwidth RGB outputs.
  * TTV 1647 3C4 camera: lightweight unit with electronic shutter; docks to various VTRs, adapters for EFP, studio, OB.
  * TTV 1542: 3-CCD design for OB/studio; mechanically similar to 1530/1532 series; 3/3 CCDs with low fixed-pattern noise; dynamic lens correction; wide-range contrast compressor.
Circle (1178)

Tiffen Manufacturing
  * Ultra Contrast series: lower contrast by lightening shadow areas; smooth consistent effect throughout scene; no highlight flare; ¼, ½, ¾, 1, 2, 3, 4, 5 densities.
  * Black Pro-Mist filters: pale gray, light scattering properties of filter reduce reflectivity, absorb more light, image softening; possible image by control of flare produced from light reflections and reflections; filter densities range from 1/4 through 5 grade.
Circle (1180)

Toshiba
  * SK-307 camcorder: two 1/2" CCD sensors for S-VHS camcorder; 1,000-pixel array; produces 3-D images which are viewed through glasses connected to an electronic adapter; recording on S-VHS format.
  * K-series surveillance: cameras for special applications; all CCD designs for low-light operation with and without electronic shutters, monochrome and color units.
Circle (1185)

Total Spectrum Manufacturing
  * VS-3000 Pan/tilt head: for ENG cameras, lenses; electromechanical positioning system for 36 arc-sec repeatability at 36 feet.
  * M-4000 controller: 4-camera control for VS-3000 heads; pan, tilt, zoom, focus functions; shot storage with recall features; 100-shot memory per camera.
  * Autocam software upgrade: Move Edit, Motion Edit modules; for manual layering of difficult dolly moves, camera motions; also Tally, Link Dolly Moves, remote ACP-2000 operation panel features.
Circle (1186)

Vicon Industries
  * Vectorcam systems: pan/tilt units and controller units, permit remote positioning of cameras for broadcast, video production, teleconferencing.
Circle (1219)

Vinten Broadcast
  * Microsight H-PED: robotic pedestal, remote-controlled servo height adjustment; triax, 55°-59°.
  * OSPREY: portable, field, studio pneumatic pedestal; 2-stage unit; casting sled supports weighs to 120 lbs.; 27°-59° vertical adjustment.
  * Microsight EXY-PED: programmable robotic camera pedestal; with elevation, X-Y mount; 500-shot memory combines floor position, pan, tilt, height, zoom, focus and rates of change; control can handle eight units.
Circle (1235)

V2: Recording systems
  * Analog, digital
  * Tape, disk
  * Editing, animation
  * Time code equipment

2 mtv media products
  * Scriptview: time code reader, display, to any Mill; S-VHS VCR, 28mm height LCDs; reads SMPTE/EBU tape code, user bits from compatible source.
Circle (1465)

ACCOR Inc.
  * DIS-422 image store: 4:2:2 CCIR-601 architecture; D-1525/525-line standards; auto switching between standards; optional removable media drive for image transfer, archiving; wipes, windows.
Circle (505)

Adams-Smith
  * ZetaThree2™ audio, video, MIDI synchronizer, emulator; supports more than 100 different ATR interfaces with direct editor control of associated ATRs; all Zeta-Three

Circle (1180)
Use the 1647 on problem scalps and you will once again enjoy full, rich colours undamaged by the sun.

Introducing the 1647, the CCD portable broadcast camera from Thomson Vidéo Equipement. It’s the most effective product on the market for eliminating bothersome problems like burnt out areas, washed-out colours and loss of detail.

The active principle? Advanced Thomson CCD technology including the industry’s most effective white compressor. What it means to you are rich, highly-detailed colour images whether you’re shooting in the bright of day, the dark of night or anything in between. Indeed, with the remarkable 1647 you can see more, and do more, than with any other camera!

Take a look at the numbers:

- 450 000 pixels/new high resolution CCD.
- Up to 21 dB gain.
- Shutter speed variable between 1/50 and 1/2000 sec—enough to stop the fastest action! And it takes aliasing and smear to new, breathtaking lows.
- Lightweight and rugged like the 1640, its thoroughly ergonomic design makes your job easier than ever. It also doubles as a superb EFP camera ready to work alongside your studio cameras. There’s a whole range of EFP rear modules for Triax operation.

The 1647: highly recommended for all those who want brilliant images, not images with burnt out areas. Contact us at the address below for a demonstration.

TTV 1647 CCD CAMERA.

Circle (104) on Reply Card

THOMSON VIDEO EQUIPEMENT
AVITEL. THE BEST IN THE BUSINESS.

Avitel introduces a new high performance, modular line of equalizing Video Distribution Amplifiers. Utilizing extensive hybrid SMD technology, Avitel is setting the standard for VDAs with an impressive list of features which include: integral 3dB cable equalization, 7 matched 75ohm outputs per DA, differential looping input, 13 modules per frame, front panel controls for gain and equalization. In addition, the Avitel DA has the following plug in, user installed module options: variable clamp, user adjustable video delay, extended cable equalizer, DARTbus sync signal monitoring, dual power supplies, 30 MHz HDTV bandwidth. But that's not all. Avitel, with over 10 years of worldwide product leadership, has put a highly competitive price tag on each of their new DA's. Now that's a line too good to resist.

AVITEL ELECTRONICS CORPORATION 3678 W. 2100 S., SALT LAKE CITY, UTAH 84120, (801) 977-3553

Circle (110) on Reply Card

2050 S. Bundy Drive, Los Angeles, Calif. 90025. Toll free: 1-800-377-7979, extension 21
1-213-820-1234; FAX: 1-213-826-7790

HENRY RADIO

Over a half-century of reliability in communications.

Circle (109) on Reply Card

features are retained in this unit.

Circle (510)

Adrienne Electronics
- AEC-Box-1: LTC-to-RS-232/RS-422 control signal converter.
- AEC-Box-15: VITC-to-LTC translator.
- AEC-Box-19: Ampex-to-Sony VTR serial protocol converter.
- PC-VITC/RG1: VITC reader, enhanced generator board, for IBM PCs.

Circle (513)

Alpha Video & Electronics/AVEC
- CVR-222ES: modified Betacam SP for TBC, LTC, user bits, machine control; vertical advance, coherent subcarrier inputs; wired, wireless remote control; front loading; four audio tracks; RF modulator.

Circle (531)

Amplex Corporation
- ACE upgrades: enhanced interface to GVG 200 switcher, AMX-170 audio mixer, Sony DVR-10, Panasonic MIU; upload/download control of AVC Vista switcher panel memory; TurboTrace list management.
- ACE 25 V3.0: software expands file input/output control; source/recorder VTR sync roll, new interfaces.
- ESS 5 network: still-store network for multiple users to record, browse through storage; supports multiple operations from single still-store system.
- VPR-200, -250, -500: accepts all three D-2 cassette sizes; -250,-500 accepts small, medium sizes; -200 series optimized for broadcast; -300 series targeted for post; complements VPR-300.
- ACE 10 editor: 1/2", 1/2" edit control; A/B 3-machine system on standard PC; simplified operations keyboard; Help text; status displays, 250-event EDL, list management, full switcher control.
- ACE MIS: serial-parallel interface for control of Sony type 5 VTRs, various parallel-control audio transports.

Circle (539)

Amtel Systems
- EPIX: hybrid, non-linear editing; machine control to 16 transports; complete production logging; 10-input switcher, 8-input audio mixer; film format; compatible EDL; by Evertz.

Circle (542)

ASACA ShibaSoku
- TM036A6: HDTV, NTSC video memory.

Circle (557)

Automation Associates
- B-22P interface: 33-pin parallel device introduces remote control port for type 5, 7, 9 VCRs, low-cost Betacam SP players from Sony, Ampex and BTS.
- DUB-IT/Chiks: Dub-Out upgrades U-matic VCR with SVHS, Y-3.58 feature; Dub-In offers Y/C, SVHS capability to U-matic recorders.
- B-22S: sync kit for external sync to V-loc VCRs, external 3.58 in, DOC out, SMPTE TC output, component video and second video output.

Circle (576)

Avitel Electronics
- TPR-1040 time code processor: 24, 25, 30, 30-drop frame; reads, generates sync/non-sync codes; LTC, VITC, parallel, RS-232, bi-phase, sine/square wave signals; 2-in, 2-out;
Your Next Cart Machine is Digital

Radio World called it The Talk Of The Atlanta NAB Show. Broadcast Engineering’s panel selected it as one of their NAB “Pick Hits.” And C.E.’s from everywhere proclaimed it a winning combination of digital performance and analog price.

The Digital Cart for Broadcast

360 Systems presents the tool broadcasters have been asking for—the sonic excellence of CDs in a convenient user recordable format. DigiCart™ is a true digital audio cart machine. It looks and operates a lot like an analog cart, but under the surface, it’s a powerful production tool that reshapes the quality and speed of broadcast operations.

Now you can store up to ten minutes of stereo at 15 kHz (or 40 minutes in mono at 10 kHz) on a rugged, removable magnetic disk cartridge. With true 16-bit linear encoding, fast access and an unlimited number of cuts per disk, DigiCart performs the daily tasks of broadcasting in a direct and reliable way.

Random Access for Automation

If automation is part of your stations’ business plan, DigiCart’s serial control port can be the key to cost-effective operation.

Optional internal (and external) hard disks hold a full day’s programming, and can be loaded at greater than ten times normal speed from the removable cartridges!

And since each cut has its own ID, cue lists can be created and stored within DigiCart to speed production. It’s even possible to cue up a second spot while the first one is playing on the same machine!

DigiCart uses rugged, removable Digital Audio Disks.

Call for a free brochure on how DigiCart can upgrade the quality of your station.

360 SYSTEMS
18740 Oxnard Street, Tarzana, CA 91356
Phone (818) 342-3127 • Fax (818) 342-4372

Compare

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>ANALOG</th>
<th>DIGICART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random Access</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cue Title Display</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Time Remain Display</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Instant Cueing</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjustments</td>
<td>10-20</td>
<td>None</td>
</tr>
<tr>
<td>HF Loss With Wear</td>
<td>Yes</td>
<td>None</td>
</tr>
<tr>
<td>Stereo Phase Error</td>
<td>Poor</td>
<td>&lt; 1°</td>
</tr>
<tr>
<td>Wow &amp; Flutter, %</td>
<td>1-3</td>
<td>Zero</td>
</tr>
<tr>
<td>Start Time, Sec</td>
<td>1-3</td>
<td>Zero</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>58 dB</td>
<td>92 dB</td>
</tr>
<tr>
<td>Distortion</td>
<td>1.5%</td>
<td>.005%</td>
</tr>
<tr>
<td>Cost, R/P Stereo</td>
<td>$3K-6K</td>
<td>$3,995.</td>
</tr>
</tbody>
</table>

Circle (105) on Reply Card
www.americanradiohistory.com
for PAL, PAL-M, NTSC-DN, film formats.
Circle (579)

Bio-Electronics
- TC-3 time code unit: reader, generator, drop-frame, field 1 indicator; jam sync; window dubs: auto backtime; NTSC, LTC.
Circle (601)

Bowen Broadcast Service
- TCR-100 conor guide: post guide, lower tape guide, post; construction from super hard metal or coating; plating eliminates tape stickage.
Circle (607)

Broadcast Electronic Services
- RETABOX: converts Betacam, MIL U-matic sources for editing system.
- Network 410: expands mid-priced editors; four GPI pulses trigger 10 devices; salvos.
Circle (614)

BTS
- D-2 recorders: DCR-10, DCR-18 digital composite video systems.
Circle (628)

Calway Editing
- CE-25: 2-VTR cuts-only editor; expandable to 8-VTRs; optional CMX XT-11 disk controller.
- CE-75/80: A/B roll 3-VTR edit controller; features simplified keyboard; expands to 8-VTR system; disk-loadable system, creates CMX, GVG compatible EDL.
- Software release: available CE-100, CE-150, CE-200 edit controllers.
Circle (1482)

Case Editing Systems
- Case editing controller: modular edit control software: CMX type keyboard, display screen; VTR interface via serial communications, V-LAN on coaxial cabling.
Circle (643)

CEI Electronics
- P167-10 still store: digital image library for Maurice digital effects; menu-control via Maurice II controller; optional keyboard, VDU control, 100megabyte hard drive for 100 frame storage.
- CEL P159 ER/CE/Plus: edit control with 57-key tactile switches, 3-machine A/B roll, dynamic tracking, slow motion; mixed VTR types; auto, manual tags, matched tags; LCD status panel.
Circle (810)

Cipher Digital
- 8415 Phantom II: VTR emulator; protocol conversion, synchronizer; time code functions; links parallel audio, video transports to Ampex, CMX, Sony edit systems.
- CDI series: CDI-1000 VTC reader, translator; CDI-1200 time code reader, inserter; CDI-1400 TC generator.
Circle (661)

CMX
- OMNI 1000 editor: X-windows display, 40megabyte hard disc stores CMX, SMPTE, OMNI EDLs; context sensitive keys; Sync Group multitimeline roll, slaving; Learn Keys, Lookahead Auto Assembly.
Circle (666)

Comprehensive Video Supply
- LOG MASTER: software, TC reader board; logs film, video footage; search for scenes; generates best take list, CMX compatible EDL; CVNET hardware interface for VTR control.
Circle (678)

Convergence
- ECS-985 series editor: 4, 6-VTR serial interface; 3-keystroke VTR assignment; 409 list management, 1,000-line EDL; programmable motion control; includes Special Function Cells feature.
- PSI interface: parallel-serial for ECS-185, ECS-985; switch selector, proper parallel control cables convert parallel VCRs to RS-422 without software changes.
- ECS-185 series editor: low-cost with 500-line EDL, management software; auto-assembly; upgrade to A/B roll with RS-422; 3-VTR configurations.
Circle (696)

Corvis Communications Ltd
- OSC/R software: offline support to conform, reformat; for film, tape editing; bi-directional film-tape translation; interface to EDL managers; EDL Disk Rx utilities.
Circle (1495)

Dwight Cavendish
- CS811: automated VCR for duplication; alternative to mechanical changes.
- CM7000: auto QC station for duplication tests finished cassettes electronically; provides failure documentation.
Circle (738)

Editing Machines Corporation
- Enhanced EMX: upgrade for 30 frames/sec capability, expanded storage capacity, improved image quality.
Circle (747)

Evertz Microsystems
- Model 4015: LTC/VTC generator for video post-production of material from film; generates TC, encodes film edge numbers in user bits from telecine bi-phase quadrature pulse output.
- Model 71000 emulator: enhanced ATR interface; supports auto track arming for some ATRs; multirack edits synchronized with video; integrates audio edits in EDL; operates as stand-alone resolver for dubs.
Circle (768)

Fast Forward Video
- Remote module: SMPTE, EBUTC interface; RS-422 link to editing controllers.
- Model F30: SMPTE, LTC generator, reader; RS-422, GPI: converts from-to MIDI; 24-frame/60Hz, 25-frame EBU; user bits, window dubs; drop/non-drop, jam sync, sync regenerate; XLR, RCA connectors.
Circle (772)

FOR-A
- ICS-1010 image capture: digital zoom camera, high-resolution monitor and video printer; optical disk memory and controller; designed for electronic analysis of motion.
Circle (784)

Future Productions
- Duplication systems: FP duplicators; three models for 80-100, 200-500, 1,000 or more VCR transports; QC station operates 80-to-100 VCRs.
Circle (790)

GDL/CDTV Designs
- GD-722 serial adapter: serial-parallel interfaces; for RS-422 control of 1/4", 1/2" VCRs; full duplex channel; LTC reader retrieves code from audio, TC track for integrated communication to editor.
Circle (793)

GML
- Machine control: includes cue list editor to operate Sony BVU 950; options include serial Ebus or Sony standard, parallel control for all transports, synchronizers.
Circle (803)

Grass Valley
- VPE-141/IPS-100 keyboard; options for editing, production; 141-K3 dedicated keyboard for fast-paced news editing, 141-K2 QWERTY style keyboard.
Circle (807)

Horita
- Scene Take counter: user bit system with "Scene Take" window, preset scene, take numbers; auto updates take number with camera, remote start-stop; for FP-50/TG.
- User Bit event counter: for TRG-50PC; switch closure updates counter to log external events; window display shows counter or time code.
- TRG-50PC interface: TC-to-PC interface with user bits; EasyLog tape logging software included.
- FP50/TG; FP-50/GRP interface: displays time code on camera viewfinder; 14-pin cable connects between VCR, camera.
Circle (827)

Hotronic
- ALS2: solid-state frame recorder; 5.6 sec time delay for audio, video; use as a profanity delay, full bandwidth video, 16-bit digital stereo audio, 20Hz-20kHz.
Circle (829)

Innovation Optics
- Mini-Moer: portable animation motion control; joystick controllers; transportable for on-location use; 20° X-axis, 6° Y-axis travel; 360° rotation; variable speed.
Circle (847)

Interactive Motion Control/IMC
- Model 3025H: hand-held control for 3025 remote camera head; on-board µP with 4-line, 20-character LCD display; 32 keys and numeric keypad, single encoded knob for jogging; function keys; menus.
Circle (855)

Jemati Ltd
- Rix ii/VIP production center: combo editor, design workstation, machine control; storyboard, pictorial edit lists, interactive linear, nonlinear operation; multiwindow capability via UNIX, Ebus, flexinet multituser.
Circle (1473)

JVC
- EditorMaster II/Editrack: offline editing; NTSC, PAL, with SA-F200U interface for S-VHS, MIL 1/4" VCRs; creates video, audio EDL on floppy disk; XT type computer runs Editrack software.
- BR-S405U portable: S-VHS recorder, ENG, other portable applications; ALU boosts signals to safe max level for recording, reduces to original level for playback; rotary erase heads; 400-line resolution.
The Tek 1780R: We don’t mind if you judge by appearances.

Nobody’s watching closer.

Even at first glance, you can see that the Tek 1780R is in a class by itself. Only the 1780R offers full-bandwidth analog measurement capabilities with separate, complementary waveform and vector displays. Component and composite capabilities are provided through four video inputs and a front-panel probe input. You get polar SCH presentation, precision differential gain and phase displays required to test modern television systems, and more. All made easy enough for even first-time operators.

But enough said. Ask your nearest Tektronix representative for a demonstration of the 1780R: by all appearances, the most advanced analog video measurement set you can buy!
BR-S811DU S-VHS: full-feature editing VCR; digital audio, hi-fi, linear audio tracks; D-MPX depth-multiplex involves Q-PSK, high-frequency bias to reduce chances for interference between signals.

PR-D1000U VCR: prototype composite digital tape recorder for 1/2 metal particle tape; developmental design with NHK, compatible with Panasonic digital.

S-VHS cart: prototype S-VHS-C system; 6-transport configuration, three in cabinet, two cabinets per rack; a rack stores 25 cassettes; for editing, automated playback; programmable control.

BR-S420CU S-VHS-C VCR docks with KY-25U, KY-17U, BY series CCD cameras; 400-line resolution; 20-minute cassette; two rotary FM audio heads, linear audio track; assembled edit functions.


BR-S770U S-VHS duplicator: three record-only units in one cabinet; SP/EP recording; IC code generator, remote control by 34-pin parallel; hi-fi VHS stereo sound; Dolby B NR.

Circle (888)

LaserDub

LD-2000 duplication: laserdisc-to-VHS duplicator; D2 compatible system sends audio, video from dual drive to Panasonic, JVC VCRs; operation at 2x normal speed.

Circle (888)

Leitch Video

Still File enhancements: network option (3100NW); software upgrade with read, write optical storage; Bernoulli optical storage; D-2 frame buffer, D-2 I/O, version 3.0 compatible with Abekas A42 streamer tape.

Circle (885)

McR Data Services

Video editing systems: ENSEMBLE PC-based A/B-roll; ENSEMBLE PLUS expanded upgrade; Video Manager real time video enhancement for Symphony, Ensemble.

Circle (915)

Macrovision

VES-200 encryption: recordable video encryption; two levels for prerecorded consumer formats; 1 tape, transmitted signals; effective security against unauthorized viewing, video piracy.

Circle (918)

Mitsubishi Electric Sales

DV-1000 S-VHS deck: pro VCR with 430-line resolution; deck-to-deck editing with frame accuracy; flying erase heads, edit window jog-shuttle for variable speed, still, frame-by-frame advance.

Circle (949)

NEC America

VHS editing: integrated post-production system; edit control, still-store, digital production switcher; VSR10 solid-state memory for 136 sec of video; operates on Mac Ilx PC.

Circle (966)

Otari

TMD T-700 Mk-II: enhanced video duplicator; modular, forced, filtered air, digital control of reference levels; auto copy tape cutting; centralized air, water, power hookup.

Circle (994)

Paltek

Abner V775: upgraded Abner A/B-roll edit control includes all V775 reader; retains compatibility with LTC, controltrack reference and other Abner accessories.

Aston Wallet: general-purpose still-store; extended keyboard and 105Mbabyte fixed drive; 99-frame storage with associated key signals; U.S. distributors for Aston line.

Circle (998)

Panasonic A/V Systems Group

IFIP-232CDJ adapter: machine control by PC; links RS-232C PC COM port by 3-conductor RJ-11 telco cables; for 7000 series S-VHS/VHS; 5000 series S-VHS VCRs with 34pin parallel interface; interface: serial-to-paralolink allows editing control with RS-422 controllers, Panasonic 34-pin control VCRs; LTC reader, capstan override; no modifications needed to VCRs or RS-422 serial controllers.

AG-5200 HiFi VCR: VHS plays S-VHS tape with VHS quality; full-function portable with 414 heads; special effects playback with slow, still, cue/review functions; 2-channel for dual languages.

LQ-4000 optical disc: rewritable optical media; 10-year minimum life with one million erase-write cycles; FM recording system achieves 515sb N; circuitry suppresses color smear, noise; NTSC, S-VHS, RGB modes.

AG-7750 editing recorder: S-VHS with full editing facilities; integral TBC, serial interface adapts to broadcast use; field-coefficient dynamic noise reduction produces 400-line resolution; amorphous heads.

AG-7450/500 VCR: S-VHS VHS forthcoming dock; to several Panasonic cameras or operates as portable unit with other equipment; 400-line resolution; playback standard VHS tape; LTC, VITC record, play.

Circle (1480)

Panasonic Broadcast

AJ-D350 digital recorder: 1/2 composite digital VTR; 2-hour run time on metal particle media; 8:14 channel coding for 2.5x data packing density; full editor features; amorphous heads; 100x search speed.

AU-635 MI player: auto tracking playback for editing; dub; tape speed override adjust; plays 20,90-minute cassettes without adapter; integral TBC; AU-F65 LTC/VITC option; slow motion, S-video, RS-422A.

AU-665 studio VTR: MI editing; 9-bit TBC with optical CCR-601 output; full edit feature package; S-VHS, adaptive edge comb filter precision improved resolution in slow motion, still modes; auto-tracking.

AU-410, AU-4105V:VTR: diskable VCRs for ENG/EFP; camcorder operation; 4:10 with broadcast response, performance; 54dB S/N, video confidence heads; luminance playback; two FM, two linear audio tracks with Dolby C.

Circle (999)

PEP

PEP Edit Control Adapter: integrated solid-state change-over switch routes 35-pin parallel signals to 3/4 VCR or alternate format VCR; switch, placed beside edit controller, includes 3/4, VHS positions.

Circle (1005)

Skotek

TCG-333 system: generator, reader, character inserter for VITC, LTC, dual standard NTSC, PAL per SMPTE/EBU spec; translates LTC-VITC.

TCG-371, TCG-312: LTC generators, readers; TC-313 with character inserter.

TCF-412, TCF-421: LTC-VITC and VITC-LTC translators.

Circle (1096)

Sony Advanced Systems

HDH/HDH-1000: HDTV DVTR pattern after BVH-3000 compatible to SMPTE 240M; 1.186GB data rate; 30MHz luminance, 15MHz chroma; 8-channel DASH audio at 48kHz/16-bit sampling; time code, editing features.

HDD-500: digital frame recorder; solid-state with VTR emulation in editing, random access; DRAM stores 32 frames of RGB 3072x2048; SMpte 240M 1125/60 16:9 level sync format.

HDV-10 recorder: UNIHI format with 20MHz luminance, 7MHz chrominance; analog component recording.

HD-2000 optical disc: laser disc player for archival, exhibition, 20MHz luminance bandwidth; 15-minute play time, stereo PCM audio; RS-232 control.

Circle (1478)

Sony Communications/Broadcast

BZE-9001/02: Version 2 for BVE-9000 editing control; upgrade has more than 200 changes from user suggestions; easier menu access, improved list management, expanded expanded machine control.

DTR-3000 motion control: knob, T-bar handle controls VTRs; five random-access cues, additional cue storage; each unit controls two VTRs; additional capabilities through GPIB connection.

DNS-1000 still-store: combines WORM, rewritable optical disc for extensive image storage; multiple user interface, networking; images in 4:2:2 component digital format; wipes, dissolves, keying.

DVR/DVR-1000: D-1 component digital VTR; serial digital video interfaces with other Sony digital products; animation, parallel, sequence editing modes.

DVR-2, DVR-18: portable, studio D-2 format digital recorders; BVR-2 serial remote control for DVR-2, -18 accepts all three sizes of D-2 cassettes; 3x play speed format feature.

Circle (1105)

Sony Communications/Pro Video

EVO-9500, EVO-9700: H18 multipurpose and dual recorders, players, TC, stereo PCM audio features; 9500 includes Y/C S-video connections and external sync; 9700 for desktop editing; 400-line resolution.

LV-8000, LV-S5000: disc video database using laser videodisc recording, component video; adapter compresses full-screen pictures to windows for image comparison, selection; LV-7000 videodisc player.

EV-9900 video recorder: H18 format dockable recorder.

Circle (1105)

Spaceward Microsystems

Dashboard: presentation still-store; operating system with 2,000-picture capacity, 20 frames in live storage for immediate access, direct access; animation sequences, cuts possible.

Circle (1125)
THE HEART OF A GREAT TV TRANSMITTER!

Thomson Tubes Electroniques!

Make sure the UHF transmitter you invest in comes with the unique competitive advantage of a TH563 tetrode from Thomson. With 25 kW in common and 35 kW in vision-carrier amplification, the TH 563 is based on the same principles as the TH 582, which routinely achieves more than 20,000 hours of operational lifetime.

Efficient, compact, linear – TV transmitters using the new TH563 tetrode from Thomson outperform their competitors with unsurpassed reliability.

Circle (107) on Reply Card

For additional information, mention code FM
**TEAC**
- **LV-250HC videodisc:** laser disc recorder; high-bandwidth direct color; VY-250 TBC; normal, variable speed, interval recording; 2-channel FM audio with 60dB S/N; 400-line resolution in video; RS-232C port.
- **LV-2110A, LV-2110P videodisc:** records, plays one hour of video; stores 108,000 stills on a 12" disc; two FM audio channels; NTSC video using luminance, FM chrominance with low-frequency conversion.
  
**Circle (1149)**

**Timeline**
- **TC, VSI modules:** software enhanced features of Lynx TC; video system interfacing; includes most ATR, VTR, digital audio recorders; serial emulation of Ampex VPR-3 for editing.
- **Lynx KCU software:** keyboard control for multimachine synchronization, audio editing; programmable machine control for six tape or film transports via Lynx modules.
- **Lynx SSL interface:** direct link to SSL G series computer, ATRs, VTRs, film equipment from Lynx system; five TC modules controlled from the SSL console computer.
  
**Circle (1181)**

**Toshiba**
- **SV-E90 S-VHS VCR:** auto assemble edit, insert edit, pre-roll editing.
- **SV-E70 S-VHS VCR:** auto assemble, insert, pre-roll edit; >400-line resolution; 4-head system; on-screen programming.
- **KV-6110A VHS VCR:** time-lapse unit 360 hours of events per tape; alarm recording switches from EP to SP record mode when an intruder is sensed in the area.
  
**Circle (1185)**

**United Media**
- **UMI 500, UMI 600:** multitasking video edit control; standard keyboard; RS-422 serial control of 4, 6 transports; no dedicated key layout; amber monitor; full EDL, jam sync; switcher control standard on UMI-600.
  
**Circle (1200)**

**Video Access Software**
- **Easy Lister:** make edit decision lists viewing raw footage, film transferred to ¼", ⅝" VCR; EDL imports to on-line editing system.
  
**Circle (1475)**

**Video Central**
- **Service center:** factory-authorized service for Sony, JVC, Panasonic, Sharp, Hitachi; duplication, standards conversion; rental.
  
**Circle (1452)**

**Videomedia**
- **MICRON:** low-cost keyboard editor; V-LAN interface to Panasonic 4000 rewriter laser disc, GVG DPM-100 picture manipulator, Graham-Patten 612 ESAM, various transport interfaces.
  
**Circle (1231)**

**VTE**
- **DVS 1400:** digital video silicon recorder sequencing system; internal bus provides simultaneous recording, display with different TV rasters; 312 Mb/s data rates; 1.8GBytes RAM.
  
**Circle (1238)**

**Zaxcom Video**
- **IR-10 VTR control:** infrared remote play, stop, rewind, fast forward, pause, jog functions; with SMPTE reader in the VTR, can cue to specified TC address entered on remote unit keypad.
  
**Circle (1261)**

**V3: Film, cine**

**Arriflex**
- **ARRI 35mm film camera:** 35mm format; proprietary µP oversees all camera operations with diagnostic capabilities; Swingover Viewfinder, ARRIglow illuminated formats; variable shutter/frame; KeyCode.
  
**Circle (555)**

**AVS Broadcast**
- **ADAC TK 32:** converts video material on 24-frame film to 525/30 NTSC, 625/44 PAL; disruption of 4-field sequence resorts to 4-field motion adaptive temporal conversion until the sequence is restored.
  
**Circle (580)**

**Bretford Manufacturing**
- **MW projection screens:** rollable material with Blankana matte white reflective or Novalux mother-of-pearl surface; for conference, educational, large-screen requirements; motorized, manual/remote control.
  
**Circle (610)**

**Cinema Products**
- **CP Keymode reader:** accessory for Rank Cintel telecine; transfers film frame ID data to video for recording.
ERGO 90
- Fit-trol FU-1: waste management unit for telecine machines; special solution handling; contains gases released from developing processing.
Circle (756)

Nikon Photo/Electronic Imaging
- LS-3500 scanner: 35mm film scanner; converts stills to video; with ColorFlex software permits color separations for desktop publishing.
Circle (875)

Nyton Electronics
- VSS-I, VSS-2 scanners: flying spot systems for 2:2, 35mm slides: 80-slide trays for standard, glass slides; pan, zoom, 360° roll, 180° flips; joystick adjusts pan, width, height; programmable, 250 steps.
Circle (882)

Rangertone Research/MultiTrack Mag
- HS-16/35, HP-16/35: HS product a combo 16/35mm studio projector, high-speed operation; HP1635 telecine transfer system, for 16mm, 35mm film.
Circle (1045)

Rank Cintel
- MK-III Turbo: modified Digiscan 4:2:2 telecine; preprogramming computer; from Unimedia; digital servo shuttle, improved machine operation, user interface.
- USA: flying spot scan telecine; digital control; digital color channels; post-production special effects; 4:2:2 sampling; X-Y zoom, pan; rotation, perspective; five trackballs set parameters.
Circle (1046)

Research in Motion Ltd
- DigiSync: reader, digital counter using Kodak KEYCODE bar code technology; detects splices; LCD readout shows feet/frames, bar code, time code, total frames; adapts to all telecines, flatbeds, loggers.
Circle (1494)

Research Technology Int'l/RTI
- Model CF 3600-MKII: Lipsner-Smith ultrasonic cleaner; operates at 2,000 ft/min; improved solvent strippers, improved refrigeration efficiency enhances solvent recovery.
Circle (1652)

Snell & Wilcox
- DEFT processor: digital electronic film transfer; makes PAL copies from NTSC tape dubbed from film; removes 3/2 pulldown motion discontinuities; 8-field motion analysis controls interpolation of next six fields.
Circle (939)

Steenbeck
- ST 7230 film recorder: magnetic recorder, three independent film transports for 16mm, 17.5mm, 35mm film formats; ST-7320 35mm film scanner, 24-face holoscope with JVC 3-CCD camera.
- ST 7901 dubbing table: single system for

OR, FOR JUST $13,999 YOU COULD BUY A NEW MSR-24.

Maybe at one time it was worth risking second-hand sound, iffy reliability and outdated technology to save money on a used 24-track. Not any more.
At $1399* the MSR-24 actually costs thousands less than most used machines. And its cost-effective one inch format saves you even more.
But despite its low price, the MSR-24 has micro-electronically controlled functions that recorders even a year or two old can’t match. And when it comes to lock-up speed, no used machine can compete.
Best of all, the MSR-24’s incredible sound will knock you out, thanks to features like our superior head design, gapless punch in/out and spot erase. And, of course you also get Tascam’s legendary reliability.
See your Tascam dealer and try the brand-new very affordable MSR-24. And let Al keep the hand-me-downs.

*Manufacturer’s suggested retail price.

TASCAM®

©1989 TEAC America, Inc., 7723 Telegraph Road, Montebello, CA 90640, 213/772-6030.

Circle (108) on Reply Card
GLOBAL SUPPORT FOR GLOBAL COMMUNICATIONS

C-Band, Ku-Band and D.B.S. High Power TWT Amplifier Systems

For Video, Voice and Digital Communications 50-3000 Watt

Designed exclusively for satellite earth station use. MCL's High Power TWT Amplifier Systems meet the demand and discriminating stringent requirements for maximum signal purity and uncompromising reliability. All MCL amplifiers share commonality in operation, design and mechanical layouts to facilitate interchangeability and to minimize maintenance and repair. MCL equipment is designed upon worldwide to operate at optimum efficiency...even in the most remote, unattended locations and under the most adverse conditions.

MCL offers a host of C-Band, Ku-Band, and D.B.S. High Power TWT Amplifier Systems featuring:
- Double Drawer Amplifiers (300 to 750 C, Ku and D.B.S. Band)
- Single Drawer Amplifiers (50-300W Ku; 75-700W C-Band)
- Single Cabinet Amplifiers (2.5K-Ku; 3KW-C-Band)
- Special Tube/Helix Protection Measures
- Amplifier Performance Readout/Control
- High Voltage Component Protection
- Build-in "Remote" Capability

Turn to MCL for high quality, competitively priced satellite communications equipment of truly unequalled performance...guaranteed.

Technical specifications and details on the complete line of MCL C-Band, Ku-Band, and D.B.S. High Power TWT Amplifier Systems may be obtained by writing or calling MCL today. Simply request your complimentary copy of MCL's new comprehensive brochure #6008.

MCL, INC.
501 S. Woodcreek Road
Bolingbrook, IL 60449
708-759-9500 TWX 910-683-1899
FAX 708-759-5018


Circle (113) on Reply Card

film, sound editing, sound recording and transfer, mixing, dubbing.

V4: Batteries, lights
- Chargers, analyzers
- Lamps, lighting effects

Alexander Batteries
- Beta Battery Optimizer: combined charger, discharger, analyzer, conditioner.

Circle (524)

Ampex Corporation
- Videlight VIDILITE: studio, ENG/EFP lighting products; sustained plasmatic ionic light source concept; output balanced for spectral response matching Betacam CCD cameras.

Circle (539)

Anton/Bauer
- Lifesaver charger: 4-position fast charger; VDE certified, five independent charge termination modes; three charge modes; pulse routine for 100% charge without heat buildup.
- COMPAC-MAGNUM: 13V, 14V batteries; high-energy cell technology; All Cell Sensing, Micro-Code modules; gold quick-change mount; charge in one hour or less with Logic Series CMPC Fast Charger.

Circle (540)

Apollo Lighting/Audio Visual
- Expanded line: lamps for SSTV, floods, spots; dichroic materials, gobos.

Circle (549)

Arri
- Double telescopic hanger: supports lighting fixtures from studio grid; extends 40-77", stirs up 90°; stud Universal Hanger with pop-out 90° stud or Junior stud.
- Sparrow Plate: miniature 3" wall plate; 4"x1-1/2" with offset 3" stud.
- MiniFlooder, Mini-Cyc: high-output fixtures for portable use: 100W; lighting with high-fidelity design; hardwire.
- Lighting kits: 1000/3 with three 1kW compact Fresnels, stands, accessories; 2000/2 with two ArriLite 2000 cool-touch open-faced lights, accessories, stands, lamps.
- Electronic ballasts: supports 250W-12kW ratios; 5% increase in light output without flicker; high-speed photography; up to 11,000 frames per second; input fluctuation causes no output change.
- Fastlok Butterfly Frame: quick-assembly creates frames beyond standard 6'x6' sizes from 2", 4" square tube lengths.
- Pole-operated Fresnels: 1kW, 2kW, 3kW for studios; Compact 5kW Fresnel fixture.
- Flexions: Mini 6" flexible arm for Grip Head or other clamps in tabletop photography; Maxi 6" arm holds heavier flag and net media; Flag Arm 18" arm replaces French Flag arms.
- ARRI Magic Arm: 3-point articulated arm; single-lever lock in any position.

Circle (555)

Broadcast Marketing International
- RIFA-LITE: soft light with quartz-halogen lamp; model LC88 and I kW lamp produces equivalent of 2kW standard fixture; diffused output from 500W-1kW.

Circle (1486)
FUJINON’S FOCUS ON THE FUTURE.

THE BEST LENSES FOR TODAY’S CCD STUDIO CAMERAS.

The reason FUJINON delivers all the performance advantages of the new 1990 CCD studio cameras is our focus on the future. Long before anyone seriously considered CCD cameras for studio use (more than 3 years ago), FUJINON was developing and perfecting lenses in anticipation of today’s cameras. To meet their far higher transmission requirements, the drastically lower distortion, and advanced electro-mechanical demands, FUJINON made the commitment and the investment. The same resources and experience responsible for making FUJINON the leader in HDTV optics make FUJINON first in CCD lenses today.

Every studio and field lens shown above — for 2/3" and 1/2" cameras — is available now. And every one delivers maximum performance, total compatibility. That’s a FUJINON exclusive. So is our focus on the future.

If new CCD studio cameras are in your future, focus on FUJINON. For more information or a demonstration, call your nearest FUJINON representative.

FOCUSED ON THE FUTURE.

FUJINON
Christie Electric
- CAPS/1200: universal battery support; rejuvenation, charging, analysis; computer interface, printout of battery condition.
Circle (656)

Cinemills
- Compact 1200W PAR: versatile rotating hanging fixture; 1.2kW n 20A circuit; five lens rings for interchange of lens without opening front door.
- Sitter Ballet: HMI flicker-free lights; 1.2kW PAR; 1.2kW, 2.5kW axial design; 6kW, 12kW, 18kW Super; 208-250Vac, 230Vdc.
- Squarewave ballast: ac/dc models for 1.2kW PAR lights; no flicker, strobing, adapts to all 1.2kW lights; 2.5kW unit available.
- CMC 2500W spotlight: compact unit equivalent to 12kW in spot position from 2.5kW lamp; four lens rings allow change of 11" lens without opening front of instrument.
Circle (666)

Dedotec USA
- Dedocool light: COOLH light head uses 24Vac 250W lamp, COOLT2 transformer, control unit; special optical path, reflector concentrates light output, keeps heat generation down.
- DLHM Dedolight: miniature high-intensity optical light head with self-contained ac power supply.
Circle (717)

DN Labs
- PAR systems: flicker-free HMI PAR lights rated for 200W, 575W, 1,2kW; solid-state ballasts, solid-state igniter.
- 12kW HMI systems: magnetic ballast, QUICK-START color temperature correction; IMPACTO-GRAPH indicators; 24" Fresnel, solid-state igniter, improved cooling.
- HMI equipment: magnetic ballasts rated 200W-18kW; igniters 125W-18kW; flicker-free supplies for 123W, 200W, 575W, 1,2kW.
- MSR PAR light: single-ended, dimmable MSR lamp; retains color temperature to 40% of full illumination level; 2.5kW lamp with shorter arc for improved point-source effect; ground fault indicator.
Circle (722)

Electronic Theatre Controls/ETC
- EXPRESSION: for medium-to-large studios, theaters, road shows, concerts; 400-cue list stored on 3.5" floppy; 250 channels control 1,200 dimmers with proportional soft patch; 24 submasters.
Circle (1453)

Frezzolini Electronics
- Model 9754: advanced 4-channel charger; supports NP-1, other batteries.
- MFK-90: pro mini-fill light kit.
- Model BP-143: Frezzi On-Board high-energy power pack.
- Model 9704: 8-channel battery charger, management system.
- Universal NP1 charger/analyzer: dual-channel; auto-balance slow charge; regulated, timed 2A discharge; 10-segment LED voltmeter indicator; complete charge in 14 hours with full balancing.
- Frezzi/PAG SF1 charger: super-fast for NP-1 type batteries; charge one battery in 30 minutes, two in 60 minutes, four in eight hours; maintains cell balance; charge status indicator; detects faulty batteries.
Circle (787)

G&M Power Products
- GM4PS charger: 4-bank, 8-hour charger; full charge with auto charge cut-off for four batteries in eight hours; thermal sensor; switches to trickle charge; battery may remain on charger without harm.
Circle (791)

Great American Market
- Premiere Patterns: 22 patterns represent various worlds, types, clouds, torn forms, dots, triangles, windows.
- Model 4200 ColorQuick: rolling color changer; analog, digital dual switchable input; 110V/220V; auto pushbutton loading; variable speed, number of gels; gelstring position maintained during momentary power failures.
- ACCESS Pro control: 256-dimmer capability with 96 control circuits; 24 overlapping pile-up on Scenemasters; four memory banks, 96 assignable memories, programmable labels; supports standard protocols.
- Easy Rider playback: ACCESS system component, execution-only of cues written with Access console for automatic presentation; controller for each scene or location; software, cue card for each program.
- PANACHE lighting console: up controls; 250-channel for 999 dimmers; instantaneous storage, retrieval, editing of cues; DMX-512, C-156, E-Net, AVAB protocol support.
- ShadowPlay 4: projection templates for ellipsoidal spotlights; photo etched in 3" diameter area for 6" lighting instruments; numerous design categories for projected backgrounds, effects.
Circle (609)

L. E. Nelson
- PAR 64 lamp: 1.2kW PAR 64 tungsten-halogen; 3,200K color temperature, rated 600 hours; four base types.
Circle (684)

Lee Colortran
- Dimmer products: 196-001 ENR 96-dimmer freestanding system; LEC 2001 ENR 24-dimmer package in wall-mount rack; 600-106 ENR 12-pack; portable 20A, 50A rated; 600-902 ENR universal control.
- Lighting controls: STATUS 12/24, 24/48 (Cat #602-101, -102) consoles; Scene Master 60 Plus (#602-001), Prestige 2000 Plus (#602-030) series.
Circle (894)

Leonetti Company
- Sunny 2500W: HMI light output equal to 10kW lamp; operates from 110V/220V ballasts; 16-pound fixture mountable on baby stand; Philips MSR lamp for 13,000h at 20 feet; diffusion, intensifier options.
Circle (987)

Lighting Methods/ETI
- Impression lighting control: 512-dimmer control; 150-channel, stores 400 cues/show on 3.5" disk; overlap proportional submasters, bump switches; autodriver pairs.
- Remote Focus Unit: hand control sets channel levels, checks dimmers, runs cues; cue parameters viewed on LED display; connects through-pin XLR connector to lighting control console.

LTM Corporation of America
- Cinemap 2500: MSR 2.5kW lamp; highly polished parabolic reflector; output 6,480fc at 30 feet; ignites from head, ballast.
Circle (910)

Osmar/Siemens
- Metal halide lamps: HM035, 250W/SE for ENG; TV/film lamps for Fresnel, open face, followspot units HM040, 400W/SE; HM086, 1.2kW/SE; HM116, 2.5kW/SE.
- HMI 125W: gas-filled technology; 8,500 lumen light output; for on-location operation, stage, studio; average life to 150 hours; instant restrike feature.
- Metallogen HMI PAR: metal halide PAR type lamp; gas-filled design for greater luminance; 1.2kW unit has color temperature of 5,600°K.
Circle (983)

Paco Electronics USA
- DP-1240 battery: 12Vdc 4.4Ah NiCad; integrated thermal protection; heavy-duty plastic case; directly replaces Sony BP-90.
Circle (987)

Perrott Engineering Labs
- PRB 9037-2 dual carrier: for BP90 batteries to operate camera and light, camera only; in metal container.
- PE 90 A battery: enhanced 12V 5Ah NiCd battery; 25% more run time; high-impact Kydex molded case; about 2.5 hr operating time; PRB 90A clip-on version.
- Pocket Pak: accessory for lightweight beetle power source; 8.5x5.75x1.75" high-tech "teather" unit weighs 1 lb; fits normal belt; holds one BP90 battery.
- P-P/S power supply; ac supply; 115Vac input; 12Vdc output at 4A, on/off switch, indicator lamp.
- Mini Lite II: dual portable light; two 75W lamps operate individually or simultaneously; metal construction; 2 lb.
Circle (1086)

Phillips Lighting
- MSR dimmable: HMI studio lamps permit...
The 16X Router Series offers:

system compatibility

This latest family of broadcast quality 16 x 16 switchers allows video, audio and data routing in the same system, all operating on a common control bus.

Fill your routing requirements now and add on as you grow. Single or multiple units up through 8 levels can be controlled from one or more locations with a variety of control panels or the optional RS-232 interface.

FEATURES

Video
- Available in 16 x 16, 16 x 8, 16 x 4, 8 x 8, and 4 x 4 composite: 8 x 8, 5 x 5 and 4 x 4 component
- Vertical interval switching
- Terminating inputs
- Differential inputs/outputs
- Expandable to 64 x 64 with 8 levels

Audio
- Available in 16 x 16, 16 x 8, 16 x 4, 8 x 8, and 4 x 4
- Stereo, dual, or monaural in 1 RU
- Balanced Inputs/Outputs
- Expandable to 64 x 64 with 8 levels

Data*
- True 4-wire system providing 2-way digital paths for routing of RS-422 signals
- ANSI/SMPTE 207M-1984 interface standard pin-out using 9-pin subminiature "D" connector
- Regenerative, operationally transparent
- Expandable to 64 x 64 with 8 levels

Control
- Proprietary RS-485 compatible
- Panels available in local/remote 16 x 16, 16 x 8, 16 x 4, 8 x 8, 4 x 4, single/dual bus, and breakaway
- Alpha-numeric remote
- Thumbwheel (single, dual or triple bus)
- Optional RS-232 interface module

* HD-16 Data Router available only in 16 x 16

Contact your HEDCO dealer for information or call:

HEDCO (800) 433-2648
Fax: 916-273-6948

Circle (112) on Reply Card

HEDCO P.O. Box 1985, Grass Valley, Ca 95945

www.americanradiohistory.com
Wrong operator decisions can cause downtime. And what could be worse than dead air. Meet the Moseley PC-based MRC 2 Remote Control System. It automatically assumes command in crisis situations and supervises your day-to-day operations.

MRC 2

Intelligent- Customer pre-programmed responses automatically take charge in crisis situations, eliminating operator error and guesswork.

Accurate- The MRC 2 achieves greater facility management through fast and accurate real-time control of all desired parameters.

Diverse- The MRC 2 is a true building block system. Remote terminals, control terminals and display options can be configured to your facility's specific requirements.

Accessible- 24-hour dial-up access is available over the public telephone network via the PC and modem.

Diagnostic- The historical data generated from the system is automatically stored for reporting and trend analysis purposes.

*Thanks to KCCO for use of their master page
One Still Store Does More Than Just Store Pictures

Simply Storing Pictures Isn’t Enough Anymore.
Your still store had better deliver absolutely pristine images and be a multitasking production center, or you’re not getting your money’s worth.

Can Any Still Store Really Do This?
One can. ALTA’s Centaurus. Look at our bandwidth, for example. We don’t just meet broadcast specs. We exceed them with high-speed component processing throughout. That means you get the sharpest image possible.

Store More For Your Money!
Now compare Centaurus’ storage capacity. All on-line, for instant recall at the lowest cost per picture.
And when your storage requirements grow, we’ll grow with you. With additional on-line storage, and a digital tape cartridge for unlimited offline storage.

No Other Options Needed!
Our dual synchronizers and TBCs are built right in. So you can work directly with images from tape, camera, microwave and satellite feeds, whatever. All without having to invest in additional equipment.

Becomes a Master of Effects in Minutes!
Put some polish on your productions. Centaurus gives you more effects to work with, on a keyboard that’s simple to operate. Plus its built-in switcher and dual TBCs let this still store stand alone, so you won’t tie up your entire studio.

How Can This Be?
How can we make a full-featured, dual channel still store for less than the cost of other single-channel systems? Simple. We’ve been doing it for years. In fact, ALTA engineers were among the pioneers of the digital still store. That’s why our warranty is twice as long, and our still store gives you twice the value.

So if you’re looking for a still store that does more than just store pictures, choose the one that does more for your money.
Choose Centaurus.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ABEKAS A42</th>
<th>ALTA Centaurus</th>
<th>AMPEX ESS-5</th>
<th>HARRIS ESP II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>4.2 MHz</td>
<td>5.5 MHz</td>
<td>5.9 MHz</td>
<td>5.0 MHz</td>
</tr>
<tr>
<td>(± 0.25 dB)</td>
<td>(-3 dB)</td>
<td>(-5 dB)</td>
<td>(-5 dB)</td>
<td>(-5 dB)</td>
</tr>
<tr>
<td>Signal to Noise</td>
<td>52 dB</td>
<td>58 dB</td>
<td>?</td>
<td>56 dB</td>
</tr>
<tr>
<td>Storage Capacity*</td>
<td>200 fields</td>
<td>250 fields</td>
<td>207 fields</td>
<td>200 fields</td>
</tr>
<tr>
<td></td>
<td>100 frames</td>
<td>125 frames</td>
<td>207 frames</td>
<td>200 frames</td>
</tr>
<tr>
<td>Synchronizer</td>
<td>—</td>
<td>Dual</td>
<td>—</td>
<td>Dual</td>
</tr>
<tr>
<td>TBC</td>
<td>—</td>
<td>Dual</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Production Effects</td>
<td>1 wipe</td>
<td>9 wipes</td>
<td>1 wipe</td>
<td>3 wipes</td>
</tr>
<tr>
<td></td>
<td>dissolve</td>
<td>dissolve</td>
<td>dissolve</td>
<td>dissolve</td>
</tr>
<tr>
<td></td>
<td>—</td>
<td>7 digital</td>
<td>—</td>
<td>3 digital</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>2 years</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Single Channel</td>
<td>$19,900</td>
<td>$16,900</td>
<td>$31,500</td>
<td>$26,333</td>
</tr>
<tr>
<td>Dual Channel</td>
<td>$24,900</td>
<td>—</td>
<td>—</td>
<td>$30,995</td>
</tr>
</tbody>
</table>

*Basic System

Based on available data as of June 1988.

ALTA GROUP, INC
535 Race Street, San Jose, CA 95126 • FAX 408-297-1206 • Tel. 408-297-ALTA

Circle (142) on Reply Card
www.americanradiohistory.com
NEW

TECH CASE

TC-1  TC-T

This newly designed carrying case is an over-the-shoulder bag designed for engineers, technicians, reporters and other video professionals. It will carry an array of personal gear as well as a variety of tools and meters. This case can be used as a combination personal bag and service equipment bag.

As a companion to the Tech Case (TC-1), a small optional Engineer’s Tool Kit case (TC-T) is available.

The TECH CASE (model TC-1) measures 4” x 11” x 15”. The TOOLKIT CASE (model TC-T) is 2½” x 6¾” x 9¾”.

K & H Products, Ltd.

Box 246
North Bennington, VT 05257

Circle (126) on Reply Card

STOP GROUND-LOOP HUM!

VIDEO HUM STOP

COIL...HSC 2

Will ELIMINATE HUM and other INTERFERENCE in Video Lines caused by differences in Ground Potential.

- Rack Mountable
- FLAT-DC to 65 MHz.
- No low-Freq or Hi-Freq. Roll-off.
- No Differential Phase Distortion.
- No Differential Gain Distortion.
- No Envelope Delay.
- Passive Device - Failure Free-Low Price
- Small Compact Package 4” x 4” x 2½”.

ELIMINATES HUM AND INTERFERENCE:

IN STUDIO
- Between Buildings
- On long runs in Building
- Between Studio and Transmitter
- On Incoming Circuits
- On outgoing Circuits

IN FIELD
- Betw. Remote Truck and Telco
- Betw. Remote Truck and Microwave
- For Intertruck Hookup
- For VTR Units
- For Monitoring Lines

Available on 10 day free trial

AUDIO-VIDEO ENGINEERING COMPANY
65 Nancy Blvd., Merrick, N.Y. 11566
Tel. (516) 546-4239

dimming to 40% retaining a stable 5,600°FK color temperature; 575W to 2.5kW units designed for Hot Re-Strike; compact single-ended, MSR medium source rare earth.

Circle (1009)

Rosco Laboratories
- Super Blue video paint: high blue content for Ultimatte compositing when shooting film with sufficient separation in blue, green without saturation of blue layer of negative; reduces noise.

Circle (1006)

Sachtler
- Ballasts: accessories: accessories to assist in light modeling, instrument mounting; tripods for lighting support.
- Fresnel series lights: HMI daylight instruments 125W-2.5kW, tungsten fixtures 300W-2kW; 8”, 10” models.

Circle (1067)

Sater Inc.
- ARC PRO-200 light: 200W video light, glass diffuser for even light distribution; whisper fan; 24V quartz-halogen lamp; by Asahi Research Corporation.
- ARC NC-424 battery belt: dual voltage 24Vdc, 12Vdc; integral overnight charger operates from 110-240Vac.

Circle (1477)

Strand Lighting
- LP50 lighting controller: Light Palette 90: desktop console, double-tier with 48 fully overlapping, individually programmable submasters; also as single-tier design; 128 independently timed events on eight playback faders.

Circle (1125)

Teatronics/Lighting Innovations
- MTR-9600 rolling rack: modular with 96 20A dimming channels for tour companies; 10A, 20A, 50A dimmer sizes; select from AMX192, DMX512 protocols.
- Comstar Genesis 6120: 6-channel, 100A/channel dimmer; SCR pair handles 12kW/channel; input from 208V Y 3-phase; 0-10Vdc control simultaneously with AMX192, DMX512 protocols.

Circle (1159)

Theatre Service & Supply
- Micro Ellipse: lightweight unit produces narrow-to-medium, hard-edged beam; light spread determined by 2” lens, lamp type; low-voltage lamp, with transformer attached to support yoke.
- Micro Flood: lightweight unit produces narrow-to-medium, soft-edged beam; light spread determined by lamp type; low-voltage lamp with transformer attached to support yoke.

Circle (1173)

Theatre Vision/TVI
- Screenoak-IR/UV: shields people, objects from harmful IF, UV electromagnetic energy of high-wattage lamps.

Circle (1174)

Union Connector
- Polybox power cabinet: portable power distribution; 7-250kVA capability; simplifies distribution of power for lighting and other loads; four models, accessories include 3/5-wire mains.

Circle (1197)

Usbior America
- Halogen lamps: GCA, GCB, GCC for Pro-light, GDA for Lowel-Light V-light, FKW for ARRI300 Fresnel, FRK, FRG for ARRI650W.

Circle (1204)

V5: Digital systems
- Graphics, effects
- Titlers, promtters
- Weather graphics
- Integrated production systems

A.F. Associates

Circle (502)
ONE MORE REASON WHY WE’RE THE INDUSTRY LEADER.

INTRODUCING THE Tx5, MICROTIME’S NEWEST TBC.

Microtime, the recognized leader in Time Base Correctors, introduces the new, low-cost Tx5 model. It’s designed to stabilize the output of virtually any ¾", ½", or 8mm VTR.

Use the Y/C input with S-VHS and other Y/C VTRs. The 5.5 MHz luminance bandwith and 4:2:2, eight bit sampling offer wideband transparent processing. Use the composite input with virtually any type of VTR. Y/C and composite outputs let you transcode the video between formats if you have a mixture of VTRs.

With a full frame of memory, the Tx5 can operate without advanced sync to the VTR, so you can synchronize and time base correct to a remote feed. The built-in sync generator operates in genlock or standalone.

For production and post-production, frame and field freeze are standard. Pictures are viewable up to 40x play speed. In addition, proc amp controls are provided for easy access.

Call or write for more information on the new, low-cost Tx5 from Microtime today. Because if you’re in the market for a TBC, why not own the best the market has to offer.

MICROTONE
A Subsidiary of ANDERSEN GROUP

Microtime, Inc., 1280 Blue Hills Avenue
Bloomfield, CT 06002 USA
Telephone: (203) 242-4242 • 1-800-243-1570
Telex: 4938290 MICRO UI
Telefax: (203) 242-3321

Circle (128) on Reply Card
**Abekas Video Systems**
- A53-D enhancement: "corner pinning" feature; solid builder creates 4-to-10,000-sided sonic effects, full 3-D manipulation; Special Programs on Remote Terminal (SPORT).
- A72-E enhancement: full text editing; animation, effects options for character generator; Ethernet network; SPORT interface; CIRC-601 input, output; resizable fonts; block moves, word wrap.
- SPORT: Special Programs on Remote Terminals; open architecture interface; permits operation of equipment from PC, creation of material off-line with transfer to the video equipment network.

**Circle (504)**

**Accu-Weather**
- UltraGraphix: high color resolution weather graphics; satellite, 4-D "airplane perspective" RadarPlus, NEWRAD images; 3-D topography, color, motion; current forecast weather; 360,000-pixel.
- WeatherLink Software: automatic access of Accu-Weather graphics for Commodore Amiga; by Associated Computer Services; access, display; 2000 images per day via 9,600 baud modem, auto access.
- UltraGraphix 240 Animation: Mac-based weather graphics display; animation capability; zoom, cel animation; digital effects, animated transitions.

**Circle (506)**

**Advanced Designs**
- DOPRAD II enhancement: Collins Doppler turbulence detection via pulse-pair processing; 8-bit 768Kx84V resolution; attenuation compensation, ground clutter suppression; Graphics, Map Builder, Lightning; RWDS data displays; RRWDS controls: provides various options for display of weather information; permits user-defined limits on precipitation; time lapse capability; 768Kx84V-8-bit resolution; map scaling; menu-based.

**Circle (514)**

**Alden Electronics**
- WSS500 weather system: 80386U/W workstation displays RWDS/NEWRAD radar, GEOS satellite, DIFAX charts, alphanumeric data; NEWRAD velocity, turbulence, precipitation data.

**Circle (523)**

**Alias Research**
- Alias ASSIST service: user assistance via 800 telco number, modem for remote diagnosis, troubleshooting; specialty training, consulting.
- Alias Animator: software for 3-D computer animation; video effects for smaller video production houses, corporate video; integrated modeling, rendering modules; Silicon Graphics PC.
- Picturenet support: interface to Quantel Picturenet file access protocol enables computer workstation to share files in common image format; digitally transfers Alias images to Quantel Paintbox via SCSI link.
- AT&T TOPAS link: bidirectional path to AT&T TOPAS 3-D object processing, animation software; transfer between systems through CAD data translator stand-alone utility.

**Circle (1487)**

**ALTA Group**
- Pictoris EDE: enhanced digital effects; flips, tumbles, curvilinear, tension characteristics; sequences stored internally or on data card; upgrade from any Pictoris system through EDE option card.

**Circle (532)**

**Ampex Corporation**
- ADO 100 enhancements: 4:2:2 digital, analog component versions; 3-axis manipulations; 2-D, true variable perspective 3-D, Autocube; DOS disk storage; AVC Vista interface; Digit-Matte keying.
- ALEX titleer: frame-based animation; defineable paths for individual objects; trajectories assigned to characters; DAM dynamic attribute manipulation; resizing font editor; integrated drawing geometrics.

**Circle (539)**

**Aurora Systems**
- AU/280 Cadet: paint, animation; 325Mbyte hard disk, 150Mbyte streamer backup; SCSCI link for more storage, switcher effects, multiple plane animation, vector fonts; 3-D modeling; CCR-601 port.
- Graphics software enhancement: color, variable luminance masks; 3-D Phong shading, loads 2-D fonts in 3-D, Windows environment for AU/3D; Desktop Visualization System upgrade option.

**Circle (573)**

**HIGH ENERGY DEGAUSSER**
- Model TD-5
- Erases all formats including: Beta SP, D1 & D2
- Mill Reels up to 2" x 16"
- Features:
  - High Gauss Field
  - Gauss Field Orientation
  - Continuous Duty Capability
  - Built-in Timer
  - Thermal Overheat Protection

**Call to arrange your Free Demo Tape**

**Manufactured by:**
**AUDIOLAB ELECTRONICS, INC.**
5831 Rosebud Ln., Bldg. C
Sacramento, CA 95841
Phone (916) 348-0200
FAX (916) 348-1512

**Circle (120) on Reply Card**

**TIMECODE TRANSLATOR CONVERTS TIMECODE INTO R2522/RS-422 DATA FOR PROCESSING BY YOUR COMPUTER!**

A remarkable translator marked by DUEE SYSTEMS will convert long or short timecode data in either RSCD or 1642 format or separate data from 150 to 170 units which can be read and entered into your computer computer. Complex time code is useless for computer input unless transferred to compatible form by this translator. Send $15.00 and your set will be in your hands within 10 business days.

**DUEE SYSTEMS 7973 Santa Monica Bl. CA 90403 213-464-6759**

**Circle (122) on Reply Card**

**OH-OH LIGHTNING PROTECTION**

For Affordable Lightning Protection 505-325-5336
Box 2548, Farmington, NM 87405 - FAX 505-326-2332

**Circle (123) on Reply Card**

**PRECISION MAGNETIC TEST TAPES**

**STL**

Standard Tape Laboratory, Inc.
26120 Eden Landing Road #5, Hayward, CA 94545
(415) 786-3546

**Circle (124) on Reply Card**
Avid Technology
- Media Composer enhancements: Macintosh software V2.0 for Avid/1, introduces digital dissolves; increased image storage; enhanced audio editing; supports PAL sources; removable, optical and 8mm tape storage; non-linear editing.
Circle (576)

AVS Broadcast
- FloatingPoint: 3-D, 3-axis manipulation of text; multiple on-line, resizing fonts; 4:4:4 architecture; full kerning freedom; light sources for reflections; linear keyer; YUV/YC outputs.
- Manuscript: high-performance graphic titler; RISC design; 10ms resolution, anti-aliasing, dynamic character resizing; 14-font library; encoding, linear keying; supports 47 languages; by G2 Systems.
Circle (580)

Bio-Electronics
- MS65 series video tilter: module for AT/XT PCs; 40ns resolution character generation; 64-color, 32-font capability; for industrial, educational; S-VHS option; roll, crawl; RGB with key; mixer, keyer; edge effects.
Circle (601)

BIS
- VividFont II Plus: titler, low-profile keyboard; Window operating system, linked message structure moves from and between real time animation to video capture, paint; compatible with other models.
Circle (628)

CEL Electronics
- P-152B Maurice II: touch-screen control; menu-based for CEL digital effects equipment; 3-axis joystick and touch screen; six serial ports; 3½" floppy storage.
- MS-851, MS-852: digital effects units; integrates P164-38XP effects, TBC, frame-store with Maurice touch-screen control; integral mixer card combines 2, 3, 4-level picture with various effects.
Circle (640)

Chyron
- Outline Font Processor: converts Bitstream outline master typefaces to ACG fonts in 10-200 scanline heights; available separately or with AGC logo compose; includes a typeface font trim feature.
- Scribe Jr. updated: compact Scribe title/graphics system; latest software.
- iNFiNiTi: 2-channel anti-aliased titler, graphics system; full color displays, expanded effects and animation capabilities.
- ACG update: compact character, graphics generator; latest software updates.
Circle (557)

ColorGraphics Systems
- MORPH Animator: for DP4:2:2 graphics system; cel animation for layered cells from vector shapes, interpolates cells over time; control over key, ink, paint of each layer.
Circle (699)

Commodore Business Machines
- NewTek Video Toaster: processor card for Amiga 2000; four VLSI chips, RAM; output conforms to RS-170A standard; integrates switching, effects, TSCs, paint capability and 3-D animation.
Circle (675)

Comprehensive Video Supply
- CUE MASTER: teleprompter from laptop, desktop computer control; stand-alone with word processing for foreign characters, multiple fonts; hand-held controller, underlining, colors.
Circle (678)

Computer Prompting
- CPC-1000 SmartPrompters: software for IBM compatible laptop; 1000N software interfaces to any TV newsroom via LAN; 1000D 9-pound gas plasma prompter display, 940ft library; 4-hour scroll, accepts ASCII files.
Circle (683)

Cubicomp
- Vertigo 3D V 9.3: Silicon Graphics animation workstations; modeling, paint, choreography, render; VideoPak interface for RGB, Beta, NTSC, PAL; D1, D2 options; real-time preview, render at variable aspect ratios; luminance attenuation over distance; supports Bitstream typefaces.
- IGEs translator: converts files generated by specific CAD systems to Vertigo geometry formats to streamline 3-D animation and rendering.
Circle (701)

LET'S GET TO THE GOOD PART!

11 Genuine Ampex replacement parts
15,000 different parts in stock
13 Parts for out of production recorders
14 For overnight delivery, call 1-800-227-8402
15 AND FOR AN EXCITING OFFER, TURN THE PAGE!

AMPEX
Ampex Customer Support

Circle (174) on Reply Card

www.americanradiohistory.com
“For Dependability and Quality, You Can’t Beat the Odetics Cart Machine...”

“Since we switched over to the Odetics TCS2000 Cart Machine, on-air discrepancies have dropped from about six per day to virtually none. And the quality has improved dramatically.

Our old machines were labor intensive. Too much time was spent daily pulling carts from storage and programming. We needed a machine that would do away with human effort...and human error.

I shopped and compared for over two years before I settled on the TCS2000. The other machines I researched didn’t have the Odetics level of automation, and they were not nearly as dependable.

I’ve been especially impressed with the Odetics machines ability to download from our traffic computer and generate a play list. Not only does that feature save time and effort, it eliminates the error factor. And, of course, if we don’t have on-air failures, we don’t worry about makegoods.

The on-air appearance of the station is 100% better now. That’s a big morale booster for everyone here. And the machine has certainly made my job easier. I don’t miss those phone calls about our old machines problems at all hours of the night.

I didn’t know a lot about Odetics before I bought their equipment, so I asked for a factory tour and demonstration. After I saw the large-scale robotics work the company was doing for the space industry as well as the broadcast business, I knew Odetics had the automation expertise I needed. In fact, I would strongly recommend that any chief engineer looking at cart machines take that factory tour. Also, I knew Odetics had already installed about 80 machines at other stations, so I called some of those chief engineers. I didn’t talk to anyone who wasn’t happy with the Odetics machine.

Most of the engineers I talked to emphasized the exceptional after-sale service and support Odetics provided. We found that out for ourselves when our new machine was installed. The training and support our operations people got was efficient, thorough and highly professional.

If you’d like to know about what the Odetics cart machine has done for KPHO, why not get some firsthand information? Feel free to give me a call at (602)264-1000.”

Bill Strube, Director of Engineering
KPHO, Phoenix

Odetics Broadcast
1515 South Manchester Avenue, Anaheim, California 92802-2907    Phone (800) 243-2001 or (714)774-2200

Circle (101) on Reply Card
www.americanradiohistory.com
Digital Animation Systems/AFA
- **DIVA 200**: digital integrated animation, object-based 2-D system with multiple 32-bit RISC architecture; Moves Option digital effects, multilayer cel drawings; 4.2 2.4, 4.4 4.4 parallel processing.
Circle (1493)

Digital Arts
- **DG5/386 graphics system**: native mode 80386 µ; 80387 math coprocessor.
Circle (722)

Digital F/X
- **Paint F/X graphics** combines typography, paint, tools library, including perspective, curved cutout manipulation, machine control; effects channel; 4.4 4.4 architecture; digital key/fox; keyframe editing.
Circle (727)

Digital Services/DSC
- **Dual Channel Eclipse**: effects with page turns, scroll, twists, curves; A/B channel switching, auto cube builder, 3-D rotation, perspective; 40-keyframe effects length: Shot Box for on-line programmed effects.
Circle (730)

Dubner Computer Systems
- **BACKGROUND software**: background; additional fonts, backgrounds; supports Greek, Cyrillic, 20K, 20K, Graphics factory: textures, patterns.
- **GP-600/TP**: Graphics Factory tape input, output option transfers images as files to/from Alias, Wavefront 3-D systems; for compositing of backgrounds on-the-fly, no rendering, filmic effects.
- **K-Works software**: prewritten programs for 20K, 30K titlers; k programming feature standard for 30K, option for 20K, manipulation of character generator to perform additional tasks.
Circle (736)

Echolab
- **Tempes 900**: digital effects processor; meets broadcast specifications: mouse control interface.
Circle (745)

Electrohome/Jazz Systems
- **Jazz Harmony card**: effects RAM cards hold pre-programmed effects, initial card contains 2-D page turns, barndoorn swing, video slice, checkboards.
- **Jazz effects**: production models of digital effects system; upgrades for dissolves, transparent dropshadows, chroma-key, lumiance key, solarization, adjustable H, subcarrier phase, key output.
Circle (754)

Electronic Graphics
- **Pastiche enhancements**: paint with light, paint with transparent color, paint to image mix, coredless tablet, mapping, effects animation for 3-D, 3-axis rotation, perspective standard.
Circle (827)

Enterprise Electronics Corporation
- **DWSR-90CTV**: Doppler radar for TV; narrow-beamwidth antenna, pedestal, radome, transmitter, receiver, control, display console, RGB monitor, NTSC colorizer, HR graphics, map drawing, time lapse.
Circle (766)

FOR-A
- **VPS-500 production system**: switching, TBC and digital effects processing in one package; six Y/C, C-3 58 or composite inputs from S-VHS or U-matic sources without transcoders; dual independent TBCs.
Circle (784)

Getris Images
- **Venice 2/3-D graphics** on 80386 platform; includes paint, 2-D real-time animation, linear keying, 3-D modeling, animation by Digital Arts, pressure-sensitive tablet, Transputer render option.
Circle (1440)

Grass Valley Group
- **Kaledoscope Kuril**: effects enhancement, non-linear transformations, page-turn, page-roll, ripple, slits, sphere, position/size modulation; XYZ axis 1-light/multilight modeling.
- **Kaledoscope Import**: Version 5.0 upgrade; modify position parameters of Kaledoscope keyframes directly from a file on disk; permits direct motion control from devices providing position data.
Circle (857)

Harris Video Systems
- **Advanced Creation**: enhanced HarrisVWS workstation, 2-D Journal Animation; frame animation; capture, store, output linear key frames with associated images, erasable op-

---

**UNIVUE AUDIO MONITOR**

- The Original Audio Bargraph into Video Display
- Prevents Audio Level "Drifting"
- Stereo Phase/Polarity Error Detector
- Available with VU, PPM, and Custom Ballistics
- Compatible with 525, 625, and 1125 Line Rates
- H and V Size and Position Variable
- Remote Control, including Bypass and Box
- Wide Range of Audio Input Levels
- Variable Peak Flasher and Silence Sense

See Your Video Dealer, or:
© BOLAND COMMUNICATIONS
24306 Toledo Circle • Mission Viejo, CA 92691
Phone 714 951-7537 • Fax 714 560-1010

Circle (117) on Reply Card

---

**BUY FIVE, GET ONE FREE!**

Yes! For every 5 of our new C format universal AST™ heads that you order between March 31 and July 31, we'll include another one free. And because this same head fits Ampex VPR 80, VPR 60, VPR 36, and VPR 28, your inventory costs go down, so you save two ways. (We're so confident of these genuine Ampex heads that we've extended the warranty to one year or 1000 hours.) Call Ampex Customer Support: 1-800-327-8402 for complete details.

Ampex Customer Support

---

June 1990  Broadcast Engineering  145

www.americanradiohistory.com
tical disk storage provides for 750 images.
Circle (816)

Image North Technologies
- *Inscriber tiler*: graphics, presentation on AT-class PC, ATVista, Targa16 class graphics cards; resistable type, page description language; flexible alignment of text; effects manipulations; NTSC, PAL.
Circle (1451)

Kavours
- *Weather services*: worldwide weather database and service; PC-Weather database with interactive 2-way service runs on PC.
- *Triton A/P graphics*: 16.7 million color weather, production graphics; model with 21 light sources, vector fonts, airbrush, reflection mapping; 3D animation; wipes, transitions concurrent with animation.
Circle (875)

Knox Video
- *BMGR II tiler*: HR characters at 40MHz processing; proportional spacing, adjustable kerning; edge, 3-D effects; 3ns resolution with anti-aliasing algorithms; paint functions, graphic effects generator.
Circle (883)

Laird Telemedia
- *Tiler options*: dithered fonts reduces edge aliasing, scalable Master fonts; Font Developer 3rd post process dithering in font creation; Graphic Import access to GIF, TGA, IFF.
- *Model 1450*: upgraded 1450 tiling generator with integral remote disk drive.
Circle (885)

Listec Video
Circle (903)

Microtime
- *IMPACT digital effects*: maps live video to 3-D surfaces in single pass; page turns, fills cylinders with two sources, cubes from three inputs; user-defined hard-key control; VTR emulation; GPI triggering.
Circle (944)

Midwest Communications
- *ProPoint 16* graphics: NTSC, RGB video from PC-based system; 512x492-pixel resolution; 80386SX µP running 16MHz; tablet, encoder, decoder, 80Mbyte hard drive 5/4" floppy; 14" amber monitor, color monitor needed.
Circle (946)

NewTek
- *Video Toaster*: combines video effects, scene generation, frame processing, frame buffers, production switching, linear key, still-store, frame grab; Amiga host.
Circle (1455)

Paltex
- *Aston titlers*: Caption, Aston 4 titling systems; U.S. distributors for Aston.
Circle (898)
MULTIPLE CAMERAS.
ONE OPERATOR.

Impossible? Not if your news studio is equipped with the RADAMEC EPO ROBOTIC CAMERA CONTROL SYSTEM—the system that is changing the way television stations, networks and cable systems are presenting their news.

- Up to 500 preprogrammed positions per camera, including control of pan, til, height, zoom, focus and iris and black levels
- Programmable fade modes that provide smooth transition from preprogrammed shots
- Ability to operate via telephone lines or microwave
- Pan and tilt heads for a wide range of cameras—from full studio to ENG types

It's flexible, affordable—and it is sold and serviced in the U.S. by A.F. Associates.

NEW! THE AFA ROBOPED

Designed expressly for the Radamec EPO Camera Control System.

This laser-positioned, free-roaming robotic pedestal glides smoothly and silently at up to 1.5 ft./per-second anywhere in a studio without relying on a pre-determined path—without floor tapes, without target tiles. It's got a built-in intelligent collision-avoidance system that works faultlessly, and an incredibly simple manual override for special production needs.

THE RADAMEC EPO CAMERA CONTROL SYSTEMS

A.F. ASSOCIATES, INC.

ADVANCED SYSTEMS AND PRODUCTS FOR THE VIDEO INDUSTRY
100 Stonehurst Court, Norwalk, NJ 07647 (201) 767-1250
Western Region (619) 227-8289, Southern Region (408) 242-1661
A Video Services Corporation Company.

Circle (130) on Reply Card
www.americanradiohistory.com
Pansophic Systems
- StudioWorks options: Artwork, Brushwork 2-D, 3-D drawing, Chartwork business graphics, Shoot visual organizer; Scanwork images from scanner; Videowork motion scripted 3-D animation.
- Masterpiece graphics workstation on Silicon Graphics IRIS platform, UNIX multitasking operating system.
Circle (1006)

Pinnacle Systems
- Series 2100 workstation enhanced with optional PRIZM 3-D effects; dual channel combiner.
- DC2/21 combiner: dual-channel feature for 2100 series workstations, for manipulation of images from two separate workstations at a single control panel.
- Model 3000C, 3002: NTSC, PAL, graphics workstations, 768x484-pixel resolutions in composite NTSC; optional 200Mbyte hard drive, ETB-4 extended texture buffer memory, WORM backup, PRIZM effects; streamer backup.
- Version 2.03: brings page-turn effects to PRIZM PAL, NTSC video workstations, features of perspective, rotation, curvilinear motion, bursts, slats, unique manipulations.
Circle (1012)

QTV
- VPS-600LT LapTop: laptop, desktop computer running MS-DOS, word processor, editing on prompt screen, ac/dc operation, proportional fonts, underscore, printouts, accepts text from other word processors or via modem.
- FPD-9 flat prompter display, 10 lb package includes mounting plate, for ENG, EFP, operates with 600LT, QCP software, laptop computer, easily readable to 20 feet, assembled quickly.
- MVP-9, miniature prompter; 9" CRT mounts on camera adding 17.5 lbs; 525/60, 625/50 scans, ac/dc operation.
- QCP Mark II: PC-based, newsroom prompter, dual-screen, integrated communications, multitasking capability with no interruption script scrolls, closed captions, connects to host newsroom system.
Circle (1027)

Quanta
- Orion business graphics presentations graphics option, bar, column, pie charts, line graphs, animation for "growing" effects, 5ns resolution, composite, component keying.
- ACM message system: all channel message system for CATV/CCTV, key messages over one, all channels simultaneously, different messages possible for each channel; no external titler needed.
- Delta-1 editing: HR text, graphics, enhanced with 0.289ns resolution, unlimited planes; dual 32-bit frame buffers, character sizing; Pantinmovement of objects on user-defined paths.
Circle (1031)

Quantel
- Harry upgrade: parallel transfer drives for Harry system for more compact system, 75 sec storage expands to 150 sec; retains fast, random access to stored video for editing work.
- Harriet integrated random-access solid-state image storage, video effects, VTR control, paint, retouch, rotoscope, effects, perspective, cel/trace animation, wipes, dissolves.
- Picturenet networking for Picturebox as multiple user system, for eight devices including Paintbox, Picturebox, Central Library and other fixed or exchangeable storage systems.
- Pictureport: open interface permits image communication between Picturebox, Paintbox, third-party equipment; links to newsroom computers, 3-D systems and other graphic units.
- Picturebox: replay-only on-air presentations, 3RU package, 168Mbyte disk, twin framestore for cut/dissolve; RGB, encoded video with key outputs, Picturenet link to Paintbox, other sources.
- Paintbox HD: graphics for HD; compatible with SMPTE 240M, Eureka, 1050 HD systems, digital transfers with Graphic and standard Paintbox systems, Pictureport.
- HarryTrack: full digital audio for video editing with Harry editor, AES/EBU soundtracks recorded via VTR control facility, locked to respective video clips.
Circle (1032)

Sony Advanced Systems
- HD DME effects: 3-D effects, RGB-based with linear 3-D squeeze, expansion, rotation, perspective, pass-through, reposition, colorize, multiple keyframes, for HDTV Ultimate, motion control.
Circle (1478)
Sony Communications/Broadcast
- **DMA-5000 features**: 3-D effects with non-linear page turns, cylinders, spheres, presets operate from DS-8000 switcher or BVE-9000 editor; 10-bit communications, 3-field adaptive-image processing.
- **DMA-6000 features**: high-end System G; texture mapping, real-time manipulations; 4.2 2:4 10-bit architecture connects with D-1 equipment; controls from trackball, Z-ring, mouse; save, recall feature.

**Circle (1103)**

**Spaceward Microsysystems**
- **Rank**: 3-D animation, pen-tablet control, on-screen menus, paint, VTR setup, picture load, effects from master menu; model, render, perspective per observer's eye level.
- **Tiler**: 3-D animation, define characters, words, screen as objects for 3-D manipulation, paths for animation via keyframes, multiple light source effects.

**Circle (1125)**

**Symbolics/Graphic Div**
- **XL series animation**: software release of 2-D, 3-D capabilities on 30-bit VME-based XL400 computer with FlameThrower processor, PaintAnimation and standard graphics; tablet, ESDL disk, tape.
- **PaintAnimation workstation**: paint, 2-D animation, automation of repetitive tasks; FlameThrower processor; analog interface supports NTSC, PAL component video, 601-compatible, 4:3:3:4 with alpha channel.
- **FlameThrower** graphics processor: high-resolution video with computer technologies, configurable architecture supports current and evolving standards, VMEbus structure as building block to customized HDVT workstations.
- **Release 3.0 software**: upgrades to S-Paint, S-Render, S-Dynamics, S-Geometry; modules; automation functions free the animator for more creative tasks.

**Circle (1133)**

**Tekskil Industries**
- **ValidPrompt in-studio prompter**: entry-level unit; keyboard for creation, editing, prompting from a single unit, accepts files from IBM, MAC, Amiga; NTSC, PAL output; script storage in 32k cartridge; remote control.

**Circle (1154)**

**Tektronix**
- **X888 graphics workstation**: alliance with MediaLogic; places Artisan desktop presentation on X888/30 and X888/10 workstations or X stations, UNIX operating system using Motorola 32-bit 88000 17MIPS RISC processor.

**Circle (1155)**

**TelTest**
- **4001 Pattern Generator**: 30 matrix wipe patterns for key input of a production switch; frame-accurate transitions, NTSC, PAL, PAL-M; manual, GPI, RS-422 control; 3-source, key-fill key selections.

**Circle (1168)**

**Telescript**
- **TPOD off-camera monitor/prompter support device**.
- **Presidential System**: MPS monitor prompting systems for public speakers; for IBM, compatibles, Commodore 64; monitors with transparent reflective screens allow speaker to make better eye contact.

**Circle (1162)**

**Thomson Digital Image**
- **TDI Explore 2.2**: 3-D modeling, animation, increased rendering speed; interfaces to video, CAD/CAM systems; Silicon Graphics platform; Field render, Cubenv, Plane projection features.
- **TDImage software**: integrated 3-D animation, computer-aided design operates on IBM RISC System 6000 platform.

**Circle (1176)**

**TrueVision**
- **Horizon 860 card**: for IBM-PC/AT, compatibles; expands to 64Mbyte of zero wait state memory; at data rate of 264Mbyte/sec, performs 40,000 polygons/sec; RISC type 860 processor.

**Circle (1191)**

**Video Access Software**
- **Easy Prompt**: generates teleprompter scripts with live variable speed scrolls, forward, reverse, fast shuttle; mouse and keyboard control or trackball option; 16-color, edit while prompting, foreign languages.

**Circle (1475)**

**Video Techincs**
- **COMPOSER-FXS software**: for PIX-FXS fea-
Wohler Technologies, Inc.
1505 York St.
San Francisco, CA 94107
(415) 285-5462
Fax: (415) 821-6414

Circle (134) on Reply Card
“Auditronics’ 900 does just what we need for television audio,”

“and does it OUR way,” says KDKA’s Charlie Fagan. “Other manufacturers offered consoles, but they’d force us to conform to their way of doing things.”

“Auditronics asked, ‘What do you need to be able to do?,’ and we told them. ‘The 900 will do it,’ they said. And it does. We wanted to be able to manage our Utah router with simple, one-button commands from the console. The 900 computer does that, and gives us 64 preselect setups, with switching from live-to-live, back-to-back, different studios, different wall boxes, all without missing a cue. And the router interface was a simple five-wire RS-232C hookup to the 900’s computer,” says Fagan.

“This Auditronics 900 is the best board the station has ever had,” says Don Bell. “I especially like its physical layout; everything’s easy to reach. It’s got all the features I need, and some added touches other boards don’t have.”

Fagan says, “Auditronics’ mix-minus lets us manage up to eight satellite feeds and assign them to any of 20 IFB circuits without tying up aux sends or sub-groups on the console.

In short, the technicians working our 900 console love it, and when they’re happy, so am I.”

For information on the Auditronics 900 console Charlie Fagan selected for KDKA-TV2, call toll-free 1-800-638-0977. Do it today.
When the VIDEO AGE was born...

Circle (136) on Reply Card

Look to Sierra for flexibility in routing switchers.

Circle (137) on Reply Card

two film prints achieves composing functions; color mix for color error correction during edits.

- **M-VEP option:** adds video effects to MASTER-21 master control switcher; 10 wipe patterns; 5-input linear keyer, RGB chroma-key; mat, background generators; optional linear BORDERLINE.
- **Model 8466 switcher** preview switcher accessory for GVG editing or IPS-100 integrated production systems; for four stereo audio channels; NTSC, PAL or component analog video.

Circle (807)

JVC

- **KM-D690U:** Y/C switcher with digital effects; prototype expands S-VHS operation; dual integral TBCs; paint, mosaic, strobe, freeze, slide, compress, video reversal features; GPI control port.
- **KM-H600U:** Y/C effects generator, video switcher; 9 wipe patterns with soft effects; RGB chroma, luminance, DSK keys; four Y/C-358 inputs, S-VHS connectors; auto transitions; GPI output.

Circle (868)

Midwest Communications

- **A.C.E. ARENA C.16-input production switcher in video component format; extensive keying capability; Alpha-Trak link to effects unit for image manipulation.

Circle (946)

Paltex

- **DYAD2:** mixer, keyer; D-2 signal format; NTSC, PAL versions; linear keying, video mixing in digital domain.

Circle (998)

Panasonic A/V Systems Group

- **EGP7 switcher** 8-input production unit; NTSC, Y/C formats; interface to AG-A800 A/B roll, other edit controllers; for mobile vehicle installations; panel, electronics communicate via coax.
- **W-MX12 digital A/V mixer:** S-VHS, Y/C 500-line resolution, integral frame synchronizer; mix any two NTSC, Y/C sources without TBCs; effects programmable through four memories; 4-input audio mixing; three fade types.

Circle (1400)

Ross Video

- **Model 424 switcher** 24-input system; two MLEs, DSK; 50-event memory, disk-based extended memory for effects dissolve, sequences; allows 12 keys, four backgrounds simultaneously.

Circle (1082)

Sony Communications/Broadcast

- **DVS-800C switcher:** composite, component production system; serial connections in all inputs, outputs; 24-input, two background generators, 2.5 mix/effects, DSK linear keying; DME-link for effects system control.

Circle (1100)

Tel-Test

- 9300, 9400 production switchers: 20- and 10-input systems; dual mix/effects amplifiers; 6-4 bus architectures; flexible keying, wipe/pattern generator.

Circle (1168)

Thomson Video Equipment

- **IMPULS:** component digital mixing and switch; 4:2:2 system; for medium size post-production; "Key Compose" creative feature; linear keying; 26x6 matrix for distribution to peripheral equipment.

Circle (1178)

Utah Scientific

- **PVS series 2.24-input production video switcher:** live, post-production system; dual mix/key, program mix/key, DSK included for "on-air" capability; six 12-input linear keyers; EL status panel; disk memory; routing switcher, editor interfacing.

Circle (1205)

VGV Inc.

- **D3200 digital switcher:** composite digital production mixer; three multilevel effects banks; priority transitions, key capture, flying shadows, four wipe generators, E-Z Mem sequencing; 8-10-bit.
- **PVS2 preview switcher** digital system monitors between digit-
MAGNI's been your answer for flexible, multi-format test and measurement since 1984. Now you've honored our products with the Emmy® award for Outstanding Achievement in Engineering Development in Television Test and Measurement.

Thank you.
V7: Processing
- Compositing, keying
- Format, standards conversion
- Signal correction
- TBC, synchronizer
- VBI ID, sync generators

A.F. Associates
- DYNR 1000: noise reduction system; 10-bit architecture; H/V aperture correction; averages consecutive pictures with recursive factor to remove noise, scratches in film; by Digital Vision; 4:2:2 processing. Circle (502)

Vistek Electronics
- VISION 5005 mixer: digital switcher for production; 4:2:2 design, auto dual standard operation for 525/60, 625/50 signals; editor interface to GVG100 protocol; integral chroma keyer. Circle (1236)

Alpha Image
- c400: digital frame buffer, synchronizer; field-1, field-2, frame freeze; GPI control with confirm pulse; chroma off selection; 10-bit data path; 525/625-line operation; H/V sync phase control.
- 311, 320A: digital video encoder, decoder, switch-select of RGB, EBU-Beta inputs; H-sync phase control 10-bit A-D conversion; eight test patterns; auto selection of 525-, 625-line standards.
- 350N: digital frame decoder design.
- 330, 340: digital serial-to-parallel, parallel-to-serial converters; D-1, D-2 formats. Circle (530)

ASACA ShibaSoku
- GCR ghost correction: VK12A1 GCR signal inserter; TG9380X, GCR signal generator. Circle (557)

AVS Broadcast
- EOS: bidirectional standard conversion for PAL, NTSC, NTSC-4.43, PAL-N, PAL-M, SECAM; composite, component inputs, outputs; 4-field interpolation aperture; 8-bit CCIR-601 architecture; NTSC comb filter decoder. Circle (550)

Bio-Electronics
- EGAOL board: gen-lock system for AT/XT PC, EGA graphics board; provides NTSC output; select key color from any EGA option; supports 200-line mode. Circle (601)

Brabury Porta-Pattern/BPI
- DSD-101 decoder: converts 525/60, 625/50 8, 10-bit digital signals to RGB, Y/Cu/Cu with EBU or Betacam levels; sync on Y, G or separated sync output.
- DSE-101 encoder: RGB, Y/Cu/Cu, 525/625 inputs; sync from external source, Y, G, EBU, Betacam level color difference inputs; two separate 8-bit parallel digital outputs. Circle (604)

Broadcast Video Systems/BVS
- MASTERKEY series: absolute linearity of full gray scale; stand-alone or DSK of switcher; mix-to-key and fade-to-black; key masking, full preview, key source select with key set memory; GPI.
- D-100: multiformat decoder; NTSC to Y/C, Y/R-Y/B-Y and RGB; digital adaptive comb filter for 35dB luma, chroma separation.
- D100 decoder: NTSC input produces Y/C, RGB/sync, Y/R-Y/B-Y outputs; 35dB subcarrier rejection, 8-bit adaptive comb filter.
- SA102: safe area generator; miniature, portable unit.
- Models 734, 735: component transcoders; RGBs-Y/Pu/Pv signal translations; regener-ated sync, blanking, permits setup on Y; composite, non-composite RGB outputs; onboard H phase; Betacam, MIL, SMPTE levels. Circle (620)

Allen Avionics
- BALactive video, pulse delays: DL635 video amp, unity gain at any delay; DL735 has input amp for high input return loss; DL535 passive video delay; DL435 passive pulse delay; 2RU frame for 14 cards; 1,945ns max.
- BLC 100: black-level clamp for composite video signals.
- Digistream Mk II: CCIR-601/656 signal decoders. Circle (525)

ANALOG POST.

Sony's APR-5003V two-channel analog recorder with centertrack timecode provides maximum flexibility for video post production applications. It communicates serially with both Sony BVE-9000 and BVE-900 video editors and features a built-in timecode reader/generator.

To find out more, contact the Sony Professional Audio Office nearest you:
East: (201) 368-5185
West: (818) 841-8711
South: (615) 883-8140
Central: (312) 773-6001

APR-5003V
- Analog two-channel recorder with IEC centertrack timecode
- 8-pin serial port for communicating with Sony BVE-900/9000 video editors
- Video-style preview, edit, and review editing
- Built-in timecode reader/generator with a video reference input
- Built-in chase synchronizer which accepts LTC or VITC
- Microprocessor-assisted audio alignment

Sony Communications Products Company, 1500 Queen Anne Rd., Tannecoak, N.J. 07666 © 1989 Sony Corporation of America, Sony is a registered trademark of Sony
CEL Electronics
- **Pi65 Tetra**: standards converter; 4-field temporal, four 8-line vertical spatial filter, 8-field storage, DSP control pipeline; PAL- M, SECAM, PAL-M, NTSC 3.58/4.43, Y/C, DUB components.
- **Pi70-10 decoder**: for PAL standard; all-digital 9-bit A/D 17.72MHz sampling; progressive comb adaption; output matrix selection of Y/Pk/Pb, Y/C, RGB; for PAL-L/B-G; 12.5Hz flicker reduction; selectable bandwidths.

**Circle (810)**

Central Dynamics
- **85, 86 E-NTSC translators**: for D-1/D-2 and D-2/D-1 signal systems.

**Circle (649)**

COMULUX
- **Models 3803, 494**: quad 8-bit video codec; NTSC, baseband video scrambling; 4-channel with 5.2MHz channel bandwidths; uncompressed linear digitizing.

**Circle (674)**

Digital Processing Systems
- **DPS-265 synchronizer**: 4-field/frame TBC; corrects playback of color-under VTRs; auto mode switch; 6MHz bandwidth; fixed S/C/H phase; digital adaptive comb filter; freeze/capture 5 fields; VITS/VIRS inverter.
- **RC-270, RC-275**: remote control for DPS-270, DPS-275 TBCs.
- **DPS-245 quad framestore**: synchronizer; four independent 4-field buffers, RS-170A outputs; independent freeze; 6MHz bandwidth; separate previews, GPI inputs per channel; preview channel feedback.

**Circle (729)**

Ensemble Designs
- **TC-400 TBC controller**: independent control of four TBC proc-amps; dedicated video, chroma, setup, hue adjustments; 100-memory scene storage per TBC; serial, LAN expansion via Mac with Studio Controller.

**Circle (1472)**

ESE
- **ES-215 auto-fader**: integrated with video black generator.

**Circle (766)**

Faroudja Laboratories
- **CFD-3 decoder**: NTSC to RGB active comb filter suppresses dot-crawl; 6MHz bandwidth; enhanced chroma; produces RGB, Y/R-Y/B-Y, combined Y/C, delayed composite NTSC coincident outputs.
- **CFE-3 encoder**: RGB to NTSC with computer output; pre-filters luminance, chroma; Y/C (S-VHS) inputs; output; locked to black, separate syncs; advanced black reference.

**Circle (771)**

Field Engineering
- **Safe action/title units**: model 389 in-camera generator for most broadcast cameras; model 190 in-monitor generator for most video monitors.

**Circle (777)**

FOR-A
- **FA-125 TBC**: with full color frame or field freeze, variable time interval freeze.
- **CF-100 transcoder**: converts Y/Pk/Pb to Y/C-358, Y/C-433; enables integration of Beta format into S-VHS for NTSC, PAL.
- **EVM-1300 event memory**: use with color corrector, time code generator; permits color correction at preset times; 255-event storage; external trigger pulses.
- **FA-300 upgrade**: dynamic tracking from -1 to +3x play; interface directly to BVU-800; modification required with BVU-900 series.
- **FA-700 Dualist**: two TBCs compatible with S-VHS, U-matic in one package; composite video compatible; TBCs operate independently with full color frame memory, picture freeze and black stretch.

**Circle (784)**

**Grass Valley Group**
- **G3574 keyer**: RGB chroma-key module for Series 300 switcher; replaces previous 357 keys with no change to electronics frame, software, control panel; color aperture adjustment; shadow processor.
- **DSK-101**: rack-mount control panel for DSK-101 linear keyer; for vans, edit suites; luminance, linear keying; four key source/fill inputs; key mix/fade-to-black, frame accurate; GPI inputs.
- **Emphasis encoder**: converts component analog video to composite digital D-2, NTSC or PAL. 16 filters for encode processing, artifact removal, HF boost requirements; SPG, timing function; E-MEM register stores.

**Circle (807)**

**DIGITAL POST**

Sony's PCM-3402 two-channel digital audio recorder is the natural choice for digital video post production work. It's fully compatible with Sony's BVE-9000 video editor. It also features a built-in chase synchronizer with the ability to convert SMPTE, EBU and film timecode.

To find out more, contact the Sony Professional Audio Office nearest you:
East: (201) 368-5185
West: (818) 841-8711
South: (615) 883-8140
Central: (312) 773-6001

**PCM-3402**
- **TWIN-DASH 1/4" two-channel digital format** + pin serial port for control by Sony BVE-9000 editor. **Built-in machine-to-machine editing capability**
- **Digital fader and balance control**

Sony Communications Products Company, 1600 Queen Anne Rd., Tashkent, N.J. 07666
© 1989 Sony Corporation of America. Sony is a registered trademark of Sony
Grunder & Associates
- feral GS-100, GC-200: single-, dual-channel TBCs; audio insertion correction window; 8-bit 4xFSC freeze field or frame.
- DTC 1504, 2504: standards converters from Video International; 4-field, 4-line motion interpolation; 4:2:2 8-bit processing; 1504 is lower-cost unit with basic features; 2504 is full system.
- feral GC-19 enhancer: image enhancement, color processing; side-by-side test windows; includes noise reduction, additive light control; 5-input audio, video; four A/V outputs.
- feral GS-500: effects: 41-pattern wipes, softwipes; solarize, posteriorize; polarize digital effect; 4-field memory GPI interface; spotlight, strobe; DSK f3; 4-input plus DSK.
- YEM VSG-2000 generator: digital 10-bit signal source; RS-170A gen-lock sync; 16 integral test signals and special signal that can be inserted via ROM replacement.

Harris Video Systems
- Harris' VHS: 106: 2-channel broadcast frame-store system.

Circle (810)

Hotronic
- A98J: dual-channel TBC effects system; 3.58, Y/C-688, composite input selections; wide bandwidth freeze field/frame; chroma noise reduction; dropout compensation; audio switcher.

Circle (828)

Intelevision
- JV-6 NTSC encoder: dynamic detail enhancement based on color, saturation; digital comb filter, color modulation; optional D-2 output; vertical enhancement, detail enhancement, reduced interline flicker.
- JV-3 Precoder: luminance correction, color detail enhancement; intended for use prior to encoding for improved NTSC picture.

Circle (854)

1-DEN Videotronics
- IVT-7 TBC: S-VHS, composite, deinterlace; 450-line resolution; Y/C-688, Y/C-629 input; composite, Y/C-358 outputs; full-frame synchronizer; shuttle operation; 15.5MHz 4:2:2 IVT-7 PAL.
- IP-500: standards converter; NTSC, PAL, SECAM; accepts composite, S-VHS, Y/Y-Y/B-Y, RGB analog and sync; component processing at 4:2:2 sampling, 8-bit quantizing; TBC, noise reduction, enhancement.

Circle (836)

JVC
- SA-FJ9U: LTC, VITC reader, generator unit; 45-pin interface for animation, computer control; 9-pin D-connector; window dub feature for off-line editing; inserts VITC in Y/C-358 video for dubbing.

Circle (888)

Knox Video
- Black burst generator: NTSC, Y/C output on BNC, 4-pin mini-DIN connectors; powered from 15Vac plug-in module; H-scan phase-locked to subcarrier at 15.75Mhz.

Circle (883)

Letch Video
- SPG-2660 sync generator: SPG-1300 upgrade provides D-2 sync: color black, tone; optional 2600TG test generator module, 2600GE PROM-SLIDE signal source.
- SPG-1302N, TSG-1302N: pulse, test signal generators with NTSC, D-2 output formats; test package offers NTSC, RGB, YQ, B-MAC, MBI, D-2, 525-line standards; accepts various NTSC modules.
- DFS-2002N: D-2 frame synchronizer; if analog input is used, VRS corrector monitors input to produce best D-2 signal output; 4-field processing; integrated self-diagnostics, RS-232C control port.
- 1506/3F source ID: create custom messages with inch, message encoder or ASCII terminal; program eight IDs, 10-lines=24 characters.

Circle (865)

Magni Systems
- VGA-Phoenix: AT-class computer encoder; NTSC, PAL versions; S-VHS outputs with full gen-lock; remote control effect features; 640x480-pixel with 256 colors; horizontal underscan feature.

Circle (919)

Merlin Engineering Works
- Rogue Research TBC/FS/SW: modules may be combined to develop TBC, framestore for special purposes.

Circle (938)

Microtime
- FS-8, FS-10: frame synchronizers: 8-bit, 1-bit architecture; FS-10 produces D-2 composite digital outputs, 4xFsc sampling; dual inputs for AB source select; programmable "bad video" features.
- Ts 6 TBC: framestore: modular construction for 1/2, Y/4 TVI's; composite, component, dub, S-VHS inputs, outputs; VHS-Tracker standard playback; upgrades to dual TBC with effects options.

Circle (944)

Midwest Communications
- DPS-265: 4-field frame synchronizer.
- DPS-245: quad framestore; independent freeze of four 6MHz wideband NTSC pictures; RS-170A, separate GPI per channel; RS-232/422 control.

Circle (946)

Nova Systems
- NOVAsynC E, -2F: frame synchronizers with freeze (-2F with TBC); all features of NOVAsynC synchronizers; heterodyne, VTR-SC, S-VHS; video AGC; digital DOG; default to any input, black, color or freezeframe.
- NOVAsynC, NOVAsynC 2: frame synchronizers, -2 model includes TBC, A/B, black, color bar or alternate inputs; AGC with 25dB range; selectable frame, field-1, field-2 freeze; hot switching; wideband VTR-SC, Y/C processing.

Circle (977)

OKI Electric Industry
- LT1250TSC: standards converters: TBC, frame synchronizer functions; field, frame freeze; image enhancement; adjustable blanking: bidirectional NTSC, PAL; optional PAL-M, NTSC-4.43, SECOM.

Circle (985)

Omicron Video
- Amiga gen-locks: Omni-Gen 711/712 S-Video/synthetic video; Omni-Gen 721/722 multiformat composite, S-Video, Y/C-688, YUV, Y/R-Y/B-Y, RGB components; outputs are NTSC, PAL.

Circle (987)

Polar Video
- Roger TBCs, synchronizers: composite, Y/C format systems; single-, dual-channel versions; composite system upgrade to Y/C for S-VHS, U-matic dub; YUV outputs; PAL.

Circle (1461)

Prime Image
- 7.5MHz series: 20dB variable noise control with 7.5MHz bandwidth TBC, synchronizer; passes VBS signals, transcodes Y/C, Y/C-688, Y/R-Y/B-Y, U-matic (SP), Betacam (SP), M/H, S-VHS, HI-8, ED-Beta.
- Model 50 TBC/FREEZE: 8-bit luma, chroma TBC, freeze, 525-line memory frame synchronizer; use with free-run, V-lock VCUs: full sync amp control; 7LED, 3-color front-panel setup indicator.

Circle (1018)

QSI Systems
- 3100 safe area generator: portable with 4-pattern memory, front-panel intensity control; 12-hour operation from 12Vdc field production type batteries.
- 7700 programmable ID source: split-field bars, black burst, 1kHz tone from 8-character DIP programmable unit; operates from eight AA cells for 14 hours.
- 2401 ID generator: color bar, black burst source with 24-character ID and 1kHz tone; DIP programming of ID; ID and tone with bars: ID in VBI during external video input and audio lines switched to external source.

Circle (1029)

RF Technology
- RFACC corrector: when moving source cameras are used; samples color burst line-by-line, applies chrominance correction to maintain constant amplitude.

Circle (1052)

Rogue Research
- Model TBC/FS/SW: modular approach to TBCs, framestores for special purposes.

Circle (1448)

Sigma Electronics
- VYP-580 blanking processor: develops new sync, burst, blanking for signals from switcher or for satellite cable; establishes SC/H phase, permits H-sync advance, delay; AGC, white/black clips.

Circle (1092)

Snell & Wilcox
- ATLAS: standards converter for non-broadcast composite video; 4-field, 4-line interpolation; choice of inputs, outputs.

Circle (1098)

Sony Communications/Broadcast
- BXX-100: synchronizer: decoder, frame synchronizer; converts NTSC component to component D-1 or analog component form.
- DFX-1200, DFX-2100: format converters between D-1, D-2 formats; D-2100 also decodes composite signals to Y/R-Y/B-Y to match 4:2:2 format.
- PFV-100 peripheral: 14-module frame for A/D, D/A conversions, signal distribution.
There’s no faster, easier or better way to record incredible stereo.

When you compare Crown’s new Stereo Ambient Sampling System™ (SASS™) and a DAT recorder with traditional recording methods you’ll discover there’s no faster or better way to record natural, beautifully imaged stereo.

Lightweight, durable and extremely easy to set up, the SASS microphone is an exciting improvement in stereo recording. Combined with a DAT machine, it becomes a high-quality, no-compromise recording system that goes everywhere.

Crown’s SASS eliminates traditional stereo recording compromises in sound quality, ease-of-use, and cost. No longer do you have to settle for weak low-end or off-axis coloration common to Midside, X-Y and near-coincident pair mics. Assembly and positioning time is also reduced significantly compared with conventional stereo micing techniques.

The SASS is available in two versions: the SASS-P, with switchable battery or phantom power and Crown’s finest studio-grade PZM® capsules; or the SASS-B, which uses the famed Bruel & Kjaer 4003 and 4006 studio mics (not supplied).

Regardless of which you choose, you’ll enjoy full ambience without coloration, excellent sum to mono, and extraordinary broad frequency response. With SASS’s superb imaging capabilities, every sound is audibly reproduced in its precise position resulting in a stereo experience of uncanny realism.

Readily adaptable to all common stands, the SASS includes a carrying case and accessories.

No matter what your stereo recording requirements are—from sampling to electronic news gathering to remote recording of live events—you’ll find Crown’s SASS family the simple choice. See your Crown representative or call toll-free for information: 1-800-535-6289.
digital video delay, for 4FSC, 4:2:2, 625 PAL, 525 NTSC.
• BVX/D10 color corrector: composite, component units; individual controls for RGB; control from standard remote panel, editor or computer; 10-bit inputs, outputs; RS-422.
Circle (1103)

Telmac Television
• CE100 encoder: Noriki color coder, converts analog computer, RGB/sync to composite, Y/C video; ac/dc powered; NTSC, PAL, subcarrier not related to H-sync.
Circle (1166)

Thomson Video Equipment
• Colorado processor: enhanced 4:2:2 digital color processor; setup, user operator programming: fire, MultiFile scene file management, automatic scene detection; ATIS auto tape ID system.
Circle (1178)

Ultimate
• System 5: compositor; Screen Correction permits linear matte when blue screen exhibits vignetting, other imperfections; integral TC reader, 400-event programmable memory for on-line compositing.
Circle (1195)

Video Accessory
• Black burst generator: 9 outputs or 6 black burst plus subcarrier, composite blanking, sync; levels are trimmable by ±5EEU units.
Circle (1220)

Video Associates Labs
• MicroKey Mark 10: expansions for video, text, graphics overlays; uses one slot in IBM, compatible PC; fade, RGB, fade/RGB modules; videodisc control.
• MicroKey Mark 20: VGA video overlay adapter; for AT computer in interactive video, multimedia presentations; touch-screen; 16-bit bus interface; fade-dissolve; two input ports for NTSC/PAL, S-VHS.
Circle (1221)

Video International Development
• DTC504: standards converter; full-featured 4-field design; digital interface per EBU spec; image enhancement on DTC-2504 with comb filter decoder; 4:2:2/13.5MHz luminance sampling.
• DTC-2505: standards converter; digital image enhancement, noise reduction; 4-line, 4-field interpolation; NTSC, NTSC-C4.43, PAL support; 8-bit quantizing for luminance and R-Y/B-Y signals.
Circle (1226)

Videotek
• RGB-1 chroma-keyer for Prodigy switcher; remote control; adjustable sensitivity distinguishes between similar hues; “proximity” indication for relative closeness of keyer setting to background.
Circle (1232)

Vistek Electronics
• 10320/3021 multiplexers: enables analog, digital components distribution on single-channel link; /S version for SMAC signal transmission with stereo sound in-syncs.
• V4130 encoders: filter characteristics optimized for system encoding direct from original sources, re-encoding of material decoded for post-production work; all PAL, NTSC variants supported.
• VECTOR 4401 converter: bidirectional conversion; NTSC, PAL (B/G) composite, analog component, 4:2:2 inputs and outputs; units available for PAL-N/M, SECAM, HDTV; motion vector compensation option available.
Circle (1236)

Yamashita Engineering Mfg/YEM
• CVS-9000: auto scan converter; NTSC/PAL output from analog computer input, 1024x512-pixel resolution; composite, component, RGB, S-VHS outputs; covers scan rates from 15kHz to 38kHz.
• CVS-9110: real-time auto scan conversion; NTSC, PAL; RGB, RGB-TTL inputs produce RGB, sync, composite video, component video, superimpose, key outputs; 24-bit, HScans rates from 15kHz to 40kHz.
Circle (1260)

Zaxcom Video
• ZX400 TBC remote: controls four TCs, D-2 VTRs; ports have 99 tape setup memories; separate remote panels; real-time dissolve between tape memories: interface to ELD, GVG 200 E-MEM.
• CCI-100 Betacam interface: modification for BVW Beta SP gives improved Y, R-Y and B-Y gain control; does not disturb standard NTSC functions of TBC; controls component, NTSC outputs in editing.
Circle (1261)

V8: Displays
• Monitors
• Projection systems
• Video printers

ASACA ShibaSoku
• CM30AO: 31” HDTV color monitor.
Circle (557)

Barco Industries
• CVS NTSC decoder: digital adaptive comb design; 2-line filter separates luminance, chroma in 9-bit path; changes from comb to notch, bandfilter by measuring of difference between lines.
• Barcographics 800: video projector; integral a/p; ASIC devices allow setup, control of 256 projectors from PC through RS-232, RS-422: hand-held wireless control; tracks scans 15-90kHz H, 45-120Hz V.
• AVM series monitor: grade 2 color; auto alignment system with probe used with CMS series; RGBS, S-VHS, Y/R-Y/B-Y component inputs, 10” HR, CRT; 10”, 14”, 21” flat screen standard resolution.
Circle (586)

Brabury Porta-Porta/BPI
• GPM-37 color monitor: 14” unit; 15.625kHz scan with 50-60Hz field rate; PAL linear TTL level RGB inputs; optional Y/C, A33, Y/Pb/Pu, serial, parallel digital inputs.
Circle (604)

Conrac Display Products
• 2650 monochrome monitor: 15” monitor with 25MHz bandwidth, choice of scans from NTSC, PAL, various HDTV frequencies; ultra-rectangular CRT with D6500, P4 phosphor option.
• 2620: 9” monochrome monitor with CRT producing D6500 daylight color temperature from P4 phosphor; 12MHz bandwidth; NTSC, PAL rates.
Circle (693)

Delcom
• Presentation electronics: SAM systems, from single-screen to 16-screen displays through digitized video processing; TUBIC rear-screen projection: building block approach to construct display; CUBIC point-of-purchase modular monitor.
Circle (714)

Electrohome
• ACON projector: prototype projection unit with ACON automatic convergence; photodiode sensor and imaging lens produces correcting signal to achieve high-accuracy image alignment; based on 45-point system.
Circle (754)

FOR-A
• MV-160 Multiwiewer compresses images to 1/4 size for display in 256x1024x16; 32 inputs for two ranges of 16 each, each input synchronized before compression.
Circle (784)

Leader Instruments
• Model 5130: color video monitor in half-rack package: 6” screen, ac/dc power; dual inputs, external sync.
Circle (892)

Mitsubishi Electric Sales
• AM-2751A, 3151A: 27”, 31” multiscan monitors: track horizontal frequencies from 36-36kHz, vertical from 45-50kHz, compatible with PC, PGM, CGA, EGA, VGA, Macintosh II, S-VHS, RGB TTL, RGB analog and composite.
• CP-2000U printer: large format color copy processor; 6”x8” images; 260,000 colors in 1.28Kx912-dot-line structure; thermal printing; accepts computer, S-VHS, RGB and composite video signals.
• VS-1250 data projector: automatic adjustment to horizontal, vertical scan frequencies; liquid cooling and lens coupling improves image.
Circle (949)

Nikon Photo/Electronic Imaging
• CP-3000 video printer: thermal dye transfer; accepts analog, digital inputs; complete print in less than three minutes.
Circle (975)

Panasonic A/V Systems Group
• DSS-2000S monitor: 27” diagonal color video, data monitor; flat screen, tinted face for reduced glare; connects to PC graphics cards; integral audio system; multiple RGB, video, S-video inputs.
• BTR-5910T monitor: 9” diagonal S-VHS compatible monitor; 380-line resolution from 0.45mm dot pitch; sized for rack mounting; cross-pulse, blue-only modes; integral audio system; A/B video or S-VHS with audio inputs.
• BD-1920Y monitor: direct S-VHS monitor; 0.55mm dot pitch data-grade CRT; line A/B, ext. sync, RGB, 5pin VCR; A/B split screen, pulse cross, blue only; Y/R-Y/B-Y input.
• PT-5020 projector: video data projector; 70”-120” display, tracks 15-37kHz horizontal, 50-100Hz vertical scans; computer RGB, S-Video inputs; 1-Cathode CRT, hybrid IMF electron gun; 6-element lens.
Circle (1460)

SIA/IDS
• Eidophor 5170, 5171: TV projectors: adapt
It takes teamwork to produce the industry’s best-performing router. It takes confidence to guarantee it for ten years.

At Utah Scientific, people know how to work together to bring you the best in product design, product performance, and product support. Products like the AVS-2, the new generation of Utah Scientific routers.

With the best operating specs in the business, the AVS-2 offers these exclusive features:

- surface mount component technology — increased packaging density for maximum size reduction with no sacrifice in signal integrity
- up to 525 crosspoints per rack unit including power supplies
- 1280 x 1280 matrix sizes with 8 separately addressable levels
- HDTV compatible — video frequency response flat to 30 MHz
- matrix cards automatically assigned to location — change card positions without reprogramming
- full matrix salvo capability — reconfiguration in one vertical interval
- only multi-sourced components are used — no hybrid circuitry.

And even though the AVS-2 is a revolutionary new design, we have the confidence to guarantee it for ten full years — parts and labor.

That means you can have confidence every time you buy a Utah Scientific product. Confidence that you are buying the best. Confidence that our team of experts is available to help you whenever you need it. Confidence that your Utah Scientific switcher will keep working for you year-after-year with the best reliability record in the industry.

Call us today for more information about the AVS-2 or any other Utah Scientific product.
to 525/60 to 1077/60 or 15kHz-34kHz scans; $570 at 3,600 luminens, $571 to 7,000 luminens. Circle (1068)

Sony Advanced Systems

- **HDD Projectors**: 2-piece, high-brightness units, models for screen diagonals 100'-350'; HDIS-1290HR rear screen projector kit; HDR-550 55" rear screen projector. Circle (1478)

Sony Communications/Broadcast

- **BVM-F1915 monitor**: auto-set-up; high-stability linearity, brightness, colorimetry; 600-line; 19" convergence-free CRT; video, component RGB; BKM-2056 setup adapter. Circle (1103)

Sony Communications/Pro Video

- **PVM-320C cabie**: 32" cube-shaped: 658-line resolution; circuitry for reduced color blur, enhanced contrast; digital noise reduction; monochrome control of 800 V/A inputs.
- **GVM-1300**: 13" multiscan monitor; Tri-tronix CRT; auto scan from 15kHz-36kHz H, 50Hz-100Hz V; compatible with computer color graphics, composite video Y/C.
- **PVM-15HQ**: 15"4Qp Betacam SP monitors; 600-line from R/Y/B components; cross-pulse, underscan, blue only; Super Fine Pitch Tri-tronix CRTs with beam feedback; rack-mount. Circle (1105)

Tamron Industries

- **Pentax III processor**: displays 35mm transparency; negative pictures on NTSC, PAL monitor; 3x zoom; color balance corrects masking of negatives; RF, strip film adapters, auto slide feeder. Circle (1141)

Toshiba

- **CX253A**: CX2047M monitors: 32" "Super Tube" FST CRT; 700-line from 8-lens electron gun, 5-video input, MTS stereo with external speaker; CX2047J is 20" FST CRT. Circle (1185)

Vicon Industries

- **VM506-2 Triple Six**: three 6" video monitors in 19" rack frame; 20% greater viewing area; monitors are physically separate from one another permitting maintenance without downtime to the others, 12Vdc standby power unit available. Circle (1219)

Video Accessory

- **VMP-2 Monitor power switch**: senses video signal, applies power to the monitor only with signal present. Circle (1220)

Videoedge

- **AVM-130**: monitor 13" CRT with A, B, VTR inputs; B input switch between composite, Y/C video; 450-line resolution; internal audio with speaker; comb filter for detail; pulse cross, blue only modes. Circle (1232)

HELP WANTED

**TV & VIDEO JOBS — LOCAL & NATIONWIDE**

Beginners—Professionals. Engineers, production personnel, lighting staff, broadcasters, cable installers, cameramen and tech- nicians. 1-718-275-6666 Ext. T-60 06-00-11

**BROADCAST MAINTENANCE TECHNICIAN**

Home Office Box, Inc., is seeking an experienced Broadcast Maintenance Technician to join our engineering department in Hauppauge, LI.

Will be responsible for maintenance, repair and modification of all back-end electronic equipment installed within the facility. Applicants should possess a thorough knowledge of broadcast equipment including, but not limited to: production switches, video/audio routing switches, Ampex VPR 28, VPR 81-inch video tape machines, Sony Betacam machines.

Requirements include at least a two-year degree in electronic technology from an accredited institution and two years experience in digital audio/video distribution systems. Qualified applicants should forward resume and salary requirements to:

Diane Luberto
1100 Avenue of the Americas
New York, NY 10036
An Equal Opportunity Employer

**VIDEO MAINTENANCE ENGINEER**

We are looking for someone with three to five years experience in the installation and maintenance of broadcast audio and video equipment for our corporate television studio. Must be trouble-shoot "1" and composite VTR's, color switcher, Kaleidoscope UVE, Quanjet PizzaBox, Sony BVP 360 cameras, multi-track ATR's, satellite transmitter and associated monitoring and test equipment, with a hands-on, detail-oriented individual with FCC and/or SBE certification. Must be willing to relocate to New Hampshire. Send resume and salary requirements to Broadcast Engineering Dept. 715 PO. Box 12901 Overland Park KS, 68212 06-00-11

**TRANSMITTER MAINTENANCE ENGINEER**, WTN/ WCGD-TV is searching for an experienced RF maintenance technician to work at our UHF and VHF transmitter sites. This station is a rare opportunity in a very strong engineering environment to advance himself through experience gained in both UHF and VHF transmitter maintenance. Previous experience in RF maintenance of television transmitters is necessary. Send resumes to Skoeter Lansing, WTN, 341 Northern Blvd., Albany, NY 12204 05-00-11
Technical Training Manager
Broadcast Products

SONY's world renowned broadcast training group is expanding. As a result, we need a Technical Training Manager who can make sure our demanding, professional customers receive the finest training possible. The perfect candidate would be highly technical and have an understanding of issues related to the repair and maintenance of a wide range of broadcast products. Four plus years of management experience in the area of engineering or training is required. Chief engineers are encouraged to apply. Curriculum development and instructional experience would be preferred.

You get an excellent combination of salary and benefits, with dynamic growth potential. Send your resume and salary history, in confidence to: HUMAN RESOURCES, SONY CORPORATION OF AMERICA, 677 RIVER OAKS PARKWAY, SAN JOSE, CA 95134. We are proud to be an EEO/AA employer, M/F/H/V. We also maintain a drug free workplace and perform pre-employment substance abuse testing.

HELP WANTED

FULL CHARGE CHIEF ENGINEER
Fast growing market has immediate opening for hands on Chief Engineer at new full power UHF independent. State-of-the-art 16" facilities. Good management/people skills & strong background in complete control equipment a must. Min. 5 yrs. exp. as Chief or Asst. Chief. Good salary & benefits. Send resume & references to: Dorothy Owens, KVOB-TV, 1225 N. Chester Ave., Bakersfield, CA 93309. (805) 393-4500, E.O.E.

FOR SALE

VIDEO/AUDIO/RF
Buy * Sell
Consignment * Service
Over 3000 items
in inventory
Burbank, CA 818-845-7000
New York, N.Y. 212-258-8800

Circle (143) on Reply Card

FOR SALE

SANTA MONICA, CALIFORNIA
Herbert A. Schiff
Telephone: (213) 339-0215
Telefax: (213) 339-2381
Jason Perlman
Telephone: (213) 458-9987
Telefax: (213) 339-2381
Schiff & Associates
501 Santa Monica Blvd, Ste. 504.
Santa Monica, CA 90401

OXFORD, ENGLAND
Nicholas McGeachin
Intersec Publishing Corp
Roseleigh House
New Street
Dedington
Oxford OX5 4SP
England
Telephone: (0869) 38734
Telefax: (0869) 19840
Telex: 837466 BSC G

TORINO, ITALY
Masahiro Natsumi
Dentsu, Inc.
1101 Grand Avenue
Shinjuku-ku, Tokyo 162, Japan
Telephone: (03) 235-5601
Telex: J-33376 MYORIENT

NEW YORK, NEW YORK
Uma Kulkarni
Telephone: (212) 332-0600
Telex: (212) 332-0600
Mike Theokoly
Telephone: (212) 332-0600
Telex: (212) 332-0600
889 7th Avenue, 33rd Floor
New York, NY 10001

CHICAGO, ILLINOIS
Vlado Ursulcic
Telephone: (312) 455-2100
Telex: (312) 954-608
55 East Jackson
Suite 1100
Chicago, IL 60604

FREITZ, SOUTH AFRICA
John Williamson
109 Conyngham Street
Freitwitz 5003
South Africa
Phone: 739-822
FAX: 6879522
Telex: AA8711 HANDM

CLASSIFIED ADVERTISING
OVERLAND PARK, KANSAS
Renie Humbolt
P.O. Box 1235
Overland Park, KS 66212
913-883-4664

SANTA MONICA, CALIFORNIA
Herbert A. Schiff
Telephone: (213) 339-0215
Telefax: (213) 339-2381
Jason Perlman
Telephone: (213) 458-9987
Telefax: (213) 339-2381
Schiff & Associates
501 Santa Monica Blvd, Ste. 504.
Santa Monica, CA 90401

OXFORD, ENGLAND
Nicholas McGeachin
Intersec Publishing Corp
Roseleigh House
New Street
Dedington
Oxford OX5 4SP
England
Telephone: (0869) 38734
Telefax: (0869) 19840
Telex: 837466 BSC G

FOR SALE

THIS IS THE 90's..... DO YOU NEED DIGITAL?

anything audio offers a full range of professional Digital Audio products for every application and budget. Let our staff of sales engineers and technicians design a system to meet your facilities needs, from DAT to multi-track digital, new or used we have what you need to get the job done easily & cost-effectively. We carry a complete line of new & used audio and video equipment with prices and services unmatched nationwide. Call today and start saving time and money now! Take a look at some of our quality product lines...

ALPHA AUDIO DR-2 Hard Disk Recorder & Desk-2 Editing System • AUDIOMOTION Moving Fader automation • Digital Designs • AUDIO-KINETICS-MASTER MIX II Automation • Akai-ADAM • AMS • T.C. Electronic • API • BSS • RlarK-Teknik • Noselet • Eventide • Hafler

USED SPECIALS - SSL-4048E/Recall 179k Otari MTR-90/1 $18.5k AKG Tube $1.7k • 2-Panasonic SV3500 $1.5k ea. • Sony APR-24 Like-new $379k • Mitsu X-850 $87k • 2 Neumann U-74 Tube $1.7k each, 2 U-67 $1.9k ea. • Foster B1610 Diode $3.6k • AMS RPMX16 $4.6k • 3-Tascam MS-16 $4.7k • Sony C-48 $700 • 2 Pulled PEG1A $1.9k • Tascam M-520 $3.6k • List your 4-sale equip w/us FREE!!!

THE DIGITAL AUDIO SOURCE
NEW - USED - RARE - BUY - SELL - TRADE
PHONE 617-426-2875 FAX 617-226-2763
63 MELCHER STREET BOSTON, MA 02210

Circle (143) on Reply Card

FOR SALE

NEW JVC CR-400U Port VCR w/over $1300. Also: TK-299K-285 & parts. Sony 1100 WHT 9' & 20' Monitors. JVC KY-950 Camera. JVC TBCs. Call for current inventory. We also buy clean late model equipment. (603) 786-1903 06-99-11

3 SONY BVP-900A CAMERAS were good condition, primarily studio production links & special lenses. ENG viewfinders, CCI adapters, $10,000 each. Call 303-800-4000 Ext. 433 06-99-11

FOR SALE: Tubes 3C0X1500A, 4C0X250B, 4C0X3000A, 4C0X3000A, and more. We carry lg. inventory, all major brands (EIMAC, AMPEX, RCA) Call Steve 1-800-862-1489

HIGHEST PRICES for 112 Phase Monitors, vacuum capacitors and clean, one kw or greater powered AM and FM Transmitters. All duty and transportation paid. Surplus Equipment Sales, 2 Thorncliffe Park Dr., Unit 28, Toronto, Canada M4H 112, 416-421-5631.

6-99-11

www.americanradiohistory.com
FOR SALE

DEMO & USED EQUIPMENT BROKER
1" Auto-Loc. 13" Antenna TV/ICTC-28 v.h.f., C-300/3400 edti-
tor, Ampex 4000H SEC, RVM-2000 audio master-
package—$450. Chronton 4100XSP 2 channel graphics
generators—$3300. (EG&G) BFE-62C—$1300. BW-12,—
$1500. BW-10—$7500. (VEX's) Abbott A-52—$1750. NEX-
F-2/62C—$3200. CHARTER—Regen HL—$85000. HL-950 w/O'Connor—$13000. 1" VTR S-Sanyo BW-100UV/TV-
$8500. VPR-ICTBC-28—$16000. WOAT/IIT-Regem 1/1-
16BC—$3100. TM-206H/TV—$1300. 3/4" 1/4" ROLL-2 V0-
5000. V0-5000. WOAT Cl. 6109. Ted—$1800.

HUNDREDS OF ITEMS LISTED
LET US SHOP FOR YOU!
PROVIDE SUPPLY D—ANDY TURNER—
(701) 215-9199

(3) 28V 2500 w/TBC 2000 for sale. Very good condition! Available immediately! Also many more items. Major Video Equipment. 312-334-4300

PORTABLE SOUND PANELS

Isolate specific areas
Many sizes and options
Panels start at $19.95 ea.
Complete w/foam
Write for free catalog

MCA VIDEO DISC PLAYER PR-7800 ($100), RCA TP-7B
35mm Slide Proj. (3000), RCA machine control panel MI-
40257 FACTORY NEW ($55), RCA TP-66 16mm film proj
FULLY REFURBISHED ($2000). SIMBER BROADCAST
SERVICES, INC. 609-435-1091

Looking for a job? Have something to sell? Have a professional service to offer? Put Broadcast Engineering's Classifieds to work for you!

- BE's total readership of over 83,000 . .
- low, low rates of only $1.75/
word . .
- and
- magazine retention of over 1 year for longer exposure of your ad message

-means you get results for a very small investment!

Just send your classified ad to Renee Hamilton, P.O. Box 12901, Overland Park, KS 66222, or FAX it to 913-541-6697, and see your ad message in the very next available issue.

FOR SALE

D-Code TC-1
TIME CODE READER

- Reads Time Code from 150 - 500 speed
- Reshapes Time Code for copying
- 60 Hz sync from 24 or 30 frame code

DENECKE, INC.
5417-8 Canuenga Bl., No. Hollywood, CA 91601
(818) 766-3525
(818) 766-0269

FULLY REFURBISHED TP-66 16mm Film Proj 2K. NEW TP-66 Proj. Factory Fresh 3K, Parts, Services, and Accessories. SIMBER BROADCAST SERVICES, INC. 609-435-1091

Tremendous Savings on S-VHS Post Production Equipment
- Very Low Hours
- Unbeatable Prices
- Must Sell This Month

Alta Centaurus Dual TBCS/S-VHS Switcher w/Effects & Special Key Mixer Under Warranty
Pallwig Ahrens-Time Code/ATV Code/ATV Code Top2 JVC VTR Cables/Sony BVM Series R-GS
Chronton VP-2 Character Generator w/Multifont & 6 Extra Font Styles
Chronton Chameleon Art System w/WP-2 Capture Cable VideoTec VSG-201 Sync/Color Bar Generator
Rams & Inpit Audio Mixer JVC BRS-410 S-VHS Portable Recorder
Please, Serious Inquiries Only
Also, Looking to Buy Used ADO-2000 (Single Channel)

RBF VIDEO SERVICES
David Bine • (714) 855-3656

FOR SALE

SERVICES

WE PLACE TV MANAGEMENT, SALES & ENGINEERING PERSONNEL
America’s Leading Source For A Decade
For Information Phone or Write
Mark Kornish
key systems international, inc.
479 Northampton Street
Kingston, PA 18704
Phone (717) 283-1041
Fax (717) 287-5889

TRANSMITTER TUBE REBUILDING SINCE 1941:
3CX2500, 4CX5000, 4CX10000 and many others. Write for details. FREELAND PRODUCTS INC., 75412 Hwy 25 Covington, LA 70433. (504) 895-1243 or (800) 624-7626.
6-79-frf

UHF KLYSTRON TUBE REBUILDING. SAVE 50-70% on External/Integral cavity Klystrons, New and Used. Major market stations use our services. CALIFORNIA TUBE LABORATORY. For details (901) 324-4409 or (605) 995-1072

VIDEO HEADS REFURBISHED COMPATIBLE
C FORMAT VPR-BHV $162 - $945
QUAD $900 - $1600
WHY PAY MORE?
(209) 537-5151 • (800) 432-3887

EQUIPMENT WANTED

WANTED: USED VIDEO EQUIPMENT. Systems or compo-
nents PRO VIDEO & FILM EQUIPMENT GROUP; the larg-
est used equipment dealer in the U.S. (212) 699-0011.

TRAINING

FCC GENERAL CLASS LICENSE, Cassette recorded les-
sions with seminars in Washington, Maryland, Philadelphia, Bob Johnson Telemcommunications, Phone (213) 379-6461

NAPA VALLEY COLLEGE offers a 2-year telecommunications program with emphasis in 1 inch "C" format, T.B.C.S., component and digital video. Call or write Gary Vain, 707-253-3258, Napa Valley College, Napa, California 95650-1009

COMPUTER SOFTWARE

IBM PC APPU WIRE CAPTURE SOFTWARE. Key fea-
tures: Captures ANPA low/high speed wires. Sorts wire to
dOS S 2 or 3 directories. NETWORK Compatible Novel,
3Com, etc. Special directory viewing software, keyword
SEARCHING, file archiving, translates data to ASCII for-
mat, compatible with wordprocessors. Eliminates need for
printers, helps to automate the newsroom. Contact: Porter Communications, 579 DW Highway, Merrimack, N.H.
03054. Tel. 603-424-4161.

New, Lower BE Classified Display Rates for 1990!

New, Lower BE Classified Display Rates for 1990!

June 1990 Broadcast Engineering 163

www.americanradiohistory.com
| A.F. Associates, Inc. | 147 |
| Akeba Video Systems | 33,39,43 |
| AEQ S.A. | 101 |
| AKG Acoustics, Inc. | 17 |
| Alta Group Inc. | 139 |
| Amek Systems and Controls, Ltd. | 115 |
| American Broadcasting System | 150 |
| Ampex Corp (AVS) | 47, 72, 73, 143, 145 |
| Amsco Recording Media | 89 |
| AMS Industries, Inc. | 79 |
| Anvil Cases, Inc. | 152 |
| Arrakis Systems, Inc. | 21 |
| Audio Precision | 13 |
| Audio-Video Engineering Co. | 140 |
| AudioLab Electronics | 142 |
| Audionetics, Inc. | 151 |
| Avitel Electronics Corp. | 126 |
| Belar Electronics Laboratory Inc. | 150 |
| Belden Wire and Cable | 69 |
| Benchmark Media Systems | 106 |
| Boland Communications | 145 |
| Broadcast Electronics Inc. | 11 |
| Broadcast Store, Inc. (BCS) | 162 |
| Broadcast Video Systems, Inc | 46, 146 |
| Bryston Vermont | 62 |
| BTS Broadcast Television Systems | 105 |
| California Broadcasters Assoc. | 97 |
| California Tube Laboratory, Inc. | 146 |
| Camera Mart, Inc. | 60 |
| Canare Cable, Inc. | 96, 143 |
| Cel Electronics, Inc. | 55 |
| Chyron Corp. | 119 |
| Clark Wire & Cable | 142 |
| Clear-Com Intercom Systems | 118 |
| Comark | 11 |
| Computer Assisted Technology | 106 |
| Cortana Corporation | 123 |
| Crown International | 157 |
| Delta Electronics | 107 |
| Di-Tech, Inc. | IBC |
| Drake Electronics, Ltd. | 54 |
| Dynair Electronics, Inc. | 49 |
| EEV, Inc. | 111 |
| Electro-Voice, Inc. | 77 |
| Ensemble Designs | 96 |
| Ergo 90 | 117 |
| Fast Forward Video | 97 |
| Fujinon, Inc. | 130 |
| Garner Industries | 90 |
| Geleco Electronics Ltd. | 142 |
| Gentner Electronics Corp. | 113 |
| Grass Valley Group, Inc. | 39 |
| Gray Engineering Laboratories | 88 |
| Harris Corp. | 27 |
| Hedco | 137 |
| Henry Radio | 126 |
| Hitachi Denki America Ltd. | 3 |
| Hybrid Arts | 75 |
| Ikegami Electronics, Inc. | 56, 57 |
| illbruck | 1 |
| Image Watches | 92 |
| International Tapeitronics Corp. | 29 |
| Jampro Antennas, Inc. | 42 |
| JVC Professional Products Co. | 19 |
| K & H Products Ltd. | 140 |
| LDL Communications | 31 |
| Leader Instruments Corp. | 65 |
| Lectrosonics, Inc. | 99 |
| Leitch Video Of America, Inc. | 87 |
| Magni Systems, Inc. | 153 |
| Markertek Video Supply | 146 |
| MCL, Inc. | 134 |
| Microtime, Inc. | 141 |
| Midwest Corp. (DSP) | 71, 82, 94, 110 |
| Mohawk Wire & Cable | 62 |
| Moseley Associates, Inc. | 138 |
| Myat | 30 |
| Nikon Corporation | 5 |
| Odetics, Inc. | 144 |
| Ompal Labs, Inc. | 146 |
| Orban, Div. of AKG Acoustics, Inc. | 7 |
| Otari Corp. | 15 |
| Panasonic Broadcast Systems Co. | 66-67 |
| Panasonic Pro Industrial Video | 34-37 |
| Perrott Engineering | 11 |
| Philips Components | 83 |
| Polyline Corp. | 102 |
| Prime Image, Inc. | 123 |
| Pro Audio Asia | 111 |
| Quad Systems | 122, 146 |
| Ramsa/Panasonic | 93 |
| Rohde & Schwart | 91 |
| Roscor | 96-A-69D |
| RTS Systems, Inc. | 70 |
| Sachter Corp. of America | 85 |
| Schmid Telecommunications | 103 |
| Shintom Electronics | 46 |
| Shure Brothers, Inc. | IFC |
| Sierra Video Systems | 152 |
| Smell & Wilcox, Inc. | 53 |
| Solid State Logic, Ltd. | 61 |
| Sony Communications Prod/Broadcast Div. | 24-25, 40-41 |
| Sony Communications Prod/Pro Audio Div. | 154-155 |
| Sony Corporation/Broadcast Products | 81 |
| Sony Pro Video Tape Div. | 121 |
| Standard Tape Laboratory, Inc. | 142 |
| Tascam, Div. TEC Corp. of America | 132-133, 148-149 |
| Tektronix, Inc. | 50-51, 129 |
| Telrumentics, Inc. | 58 |
| Thomson Tubes Elecronics | 137 |
| Thomson Video Equipment | 125 |
| Thomson-CSR/LCT | 95 |
| Total Spectrum Manufacturing, Inc. | 109 |
| Utah Scientific, Inc. | 63-159 |
| Videotech, Inc. | 75 |
| Ward-Beck Systems, Ltd. | BC |
| Will-Burt | 102 |
| Winsted Corp. | 59 |
| Wohler Technologies, Inc. | 150 |
| 360 Systems | 127 |
MEMBERSHIP APPLICATION
SOCIETY OF BROADCAST ENGINEERING
317-842-0836

Please answer all questions.

Application for:
☐ New Member $30 (Currently active in broadcast/media engineering.)
☐ Associate Member $30 (Not currently active in broadcast/media engineering.)
☐ Student Member $10
☐ Reinstatement $30 (Former Member No. ________)
☐ Change in Grade $30.00 (Member No. ________)  
   ☐ To Member  
   ☐ To Senior Member (Member for 3 years and 15 years of active work in a responsible engineering position.)  
   ☐ Life Member (Retired from broadcast/media engineering — No charge.)

1. What is your title?  
   ☐ Technical Manager/Director  
   ☐ Chief Engineer  
   ☐ Engineer (staff)  
   ☐ Operation Titles (Please specify)  
   ☐ Non-Engineering Management Title (Please specify)  
   ☐ Consulting Engineer  
   ☐ Student/Educator

2. What is the ADI of your station or facility?  
   ☐ Top 20  
   ☐ 51-100  
   ☐ 21-50  
   ☐ Below top 100

3. Please check type of facility in which you work:  
   ☐ TV Station  
   ☐ UHF  
   ☐ VHF  
   ☐ AM Radio Station
   ☐ Class I  
   ☐ Class II  
   ☐ Class III  
   ☐ Class IV  
   ☐ University/School  
   ☐ Other (please specify)

4. Which statement best describes your role in the purchase of equipment, components and accessories (Check only one)  
   ☐ Make final decision to buy a specific make or model  
   ☐ Specify, recommend or influence purchase decision on make or model  
   ☐ Have no part in buying or specifying

5. What is the approximate annual budget for equipment purchases?  
   ☐ $25,000  
   ☐ $25,000—$49,999  
   ☐ $50,000—$99,999  
   ☐ $100,000—$249,999  
   ☐ Over $250,000

Experience record

6. Number of years responsible experience:  
   ☐ 0—4  
   ☐ 5—10  
   ☐ 11—15  
   ☐ More than 25

7. Are you SBE Certified?  
   ☐ No (If no, go to question 8)  
   ☐ Yes (If yes, go to question 7a)

7a. What level SBE Certification do you hold?  
   ☐ Technologist  
   ☐ Radio Broadcast Engineer  
   ☐ TV Broadcast Engineer  
   ☐ Senior Radio Broadcast Engineer  
   ☐ Senior TV Broadcast Engineer  
   ☐ SBE Professional Broadcast Engineer

8. Do you hold any other type of certification or license?  
   ☐ No other type of certification held  
   ☐ NABER  
   ☐ NARTE  
   ☐ Professional License—State Issued  
   ☐ Other (please specify)

Payment method  
☐ Credit Card  ☐ Visa  ☐ MasterCard
Card No. _______ Exp. Date _______
Signature ______________________
☐ Check

Admissions Committee Action

Signed ______________________  
(I agree to abide by the bylaws of the SBE, if admitted.)

www.americanradiohistory.com
11. List in chronological order, beginning with the most recent, all formal experience in broadcast or electronic media. If more space is needed, attach another sheet of information.

<table>
<thead>
<tr>
<th>From Mo/Yr</th>
<th>To Mo/Yr</th>
<th>Company Name and Location</th>
<th>Position or Title</th>
<th>Type of Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. List your education or specialized training.

<table>
<thead>
<tr>
<th>College, University or Technical Institute</th>
<th>From Mo/Yr</th>
<th>To Mo/Yr</th>
<th>Credits or Yrs. Compl.</th>
<th>Course or Major</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
“Did you have your serial today...?”

If not, try our

SERIAL DIGITAL VIDEO ROUTING SWITCHER

SERIAL IN • SERIAL OUT • NO CONVERSIONS

If you’re going directly to serial or upgrading from parallel to serial —
Go the Di-Tech way for your D1, D2 distribution solution

Revert forward to BNC connectors and coax cable for simplified signal distribution.

2 Frame Sizes - Both Expandable

Model 5216 (16 x 16) or
Model 5264 (64 x 16)

Advanced Technology Today
...For Tomorrow!

di-tech inc.
48 Jefryn Boulevard, Deer Park, New York 11729 • (516) 667-6300 Fax: (516) 595-1012
Circle (2) on Reply Card
MiniCOM® brings a totally new dimension to professional communications!

Until now setting up a production communications system required bulky hardware and plenty of space.

MiniCOM® changes all that! It delivers mainframe performance in a “desktop” sized package. A 24 x 36 matrix in just 8¾” of rack space (5 rack units).

And, because we’ve been able to put all that traditional Ward-Beck quality and performance into such a compact frame, the price has come down to “desktop” proportions too!

No need to dream any more about having a MicroCOM System sometime in the future… You really can afford one today!

WARD-BECK SYSTEMS

Ward-Beck Systems Ltd., 841 Progress Avenue, Scarborough, Ontario, Canada M1H 2X4.
Tel: (416) 438-6550. Fax: (416) 438-3865.