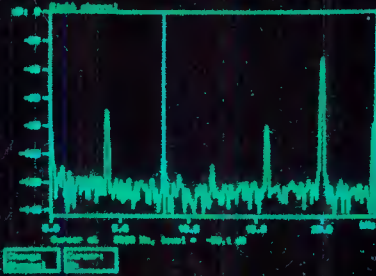


BROADCAST ENGINEERING

AN INTERTEC PUBLICATION

June 1990/\$4.50

NAB '90
begins
a new
decade



Waveform Verify Average
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Engineering
conference
p. 32

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.

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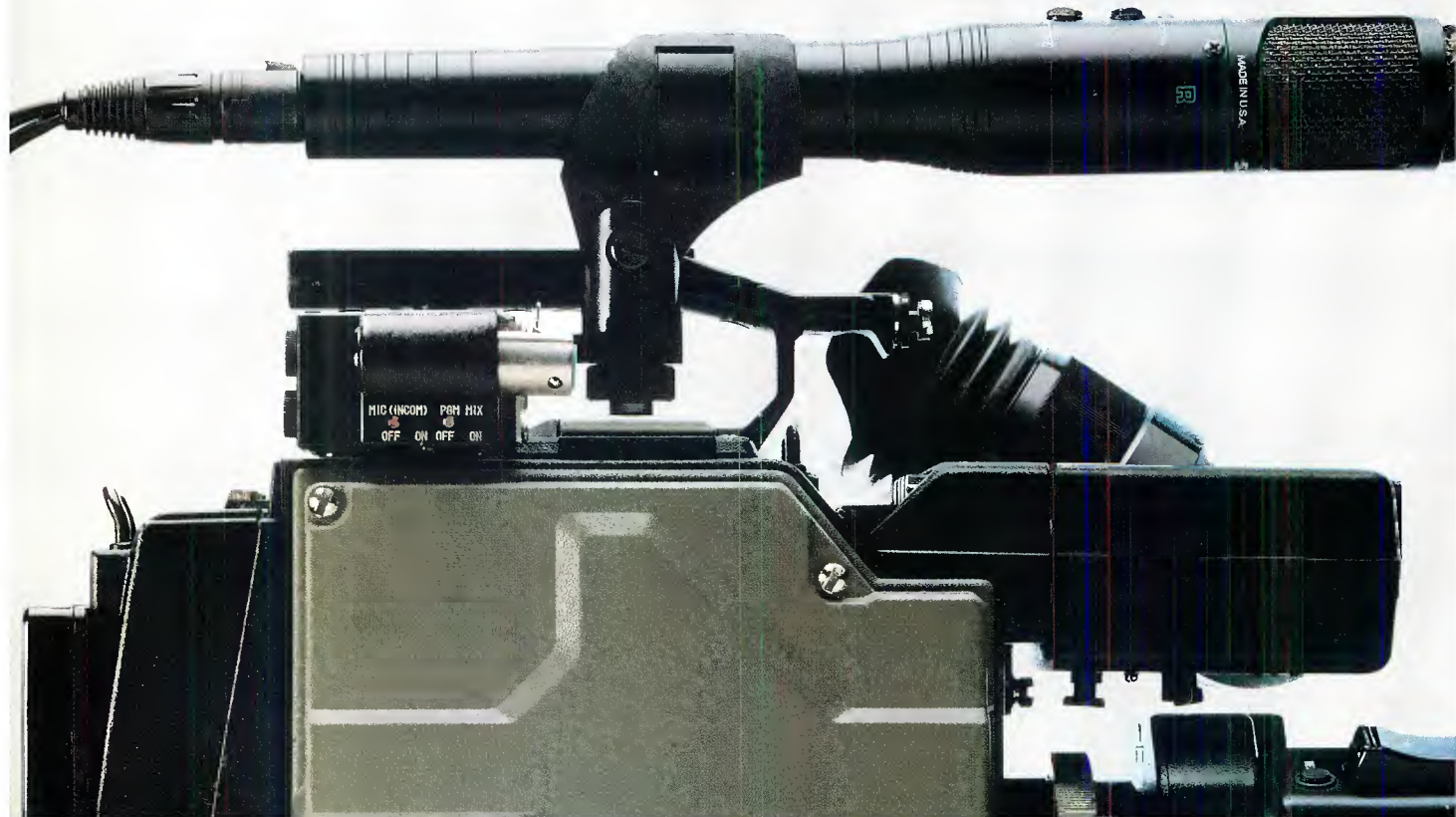
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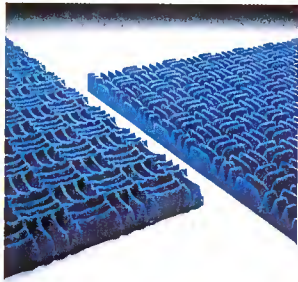
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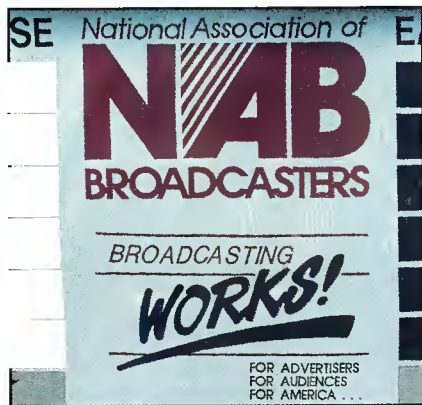
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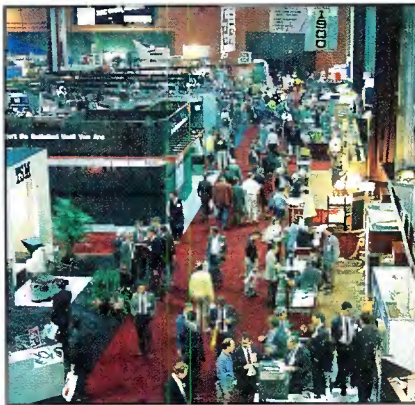
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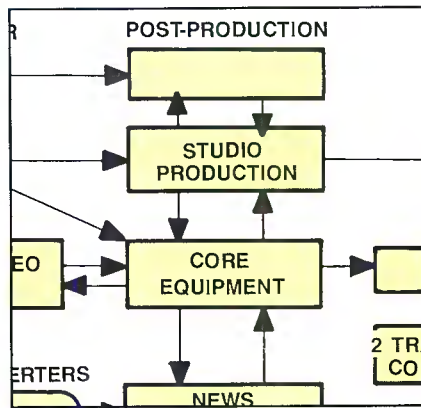
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NAB CONVENTION REPLAY:

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 Pizzi, 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.

DEPARTMENTS

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- 12 re: Radio
- 14 SBE Update
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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.)



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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 wide-

band 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 — France's TF1, 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 Europe-wide. 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 TF1, ITV and MTV, relations between him and Fininvest chief Berlusconi are known to be strained.

||-:-:)))))

BROADCAST engineering

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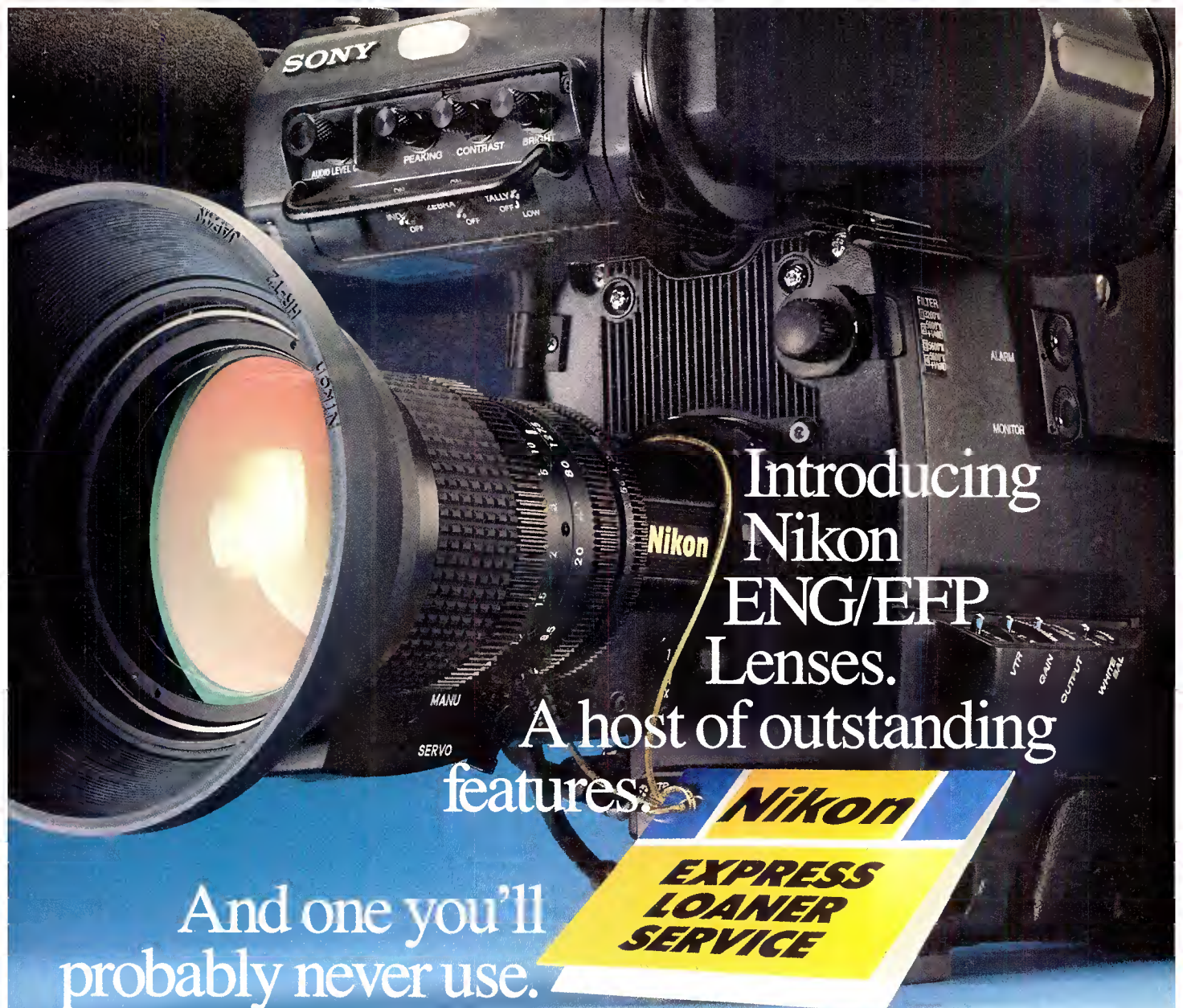
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Passing the buck

"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 stranglehold 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 two combative agencies refuse to resolve their differences is no reason to hold broadcasters hostage.



Brad Dick

Brad Dick,
editor

An interview with "Orbie," the Orban Dalmatian.

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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 floor" 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 areas 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

Martin is a partner with the legal firm of Reddy, Begley & Martin, Washington, DC.

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 intersignal 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 not 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 5mV/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 reimposition of the AM-FM non-duplication 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 boosters, 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.

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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.

Hammett & Edison study

A 1989 study resulted from a conversation between Dane E. Ericksen, consulting engineer for Hammett & 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. Ericksen 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. Ericksen 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.

Ericksen 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. Ericksen 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.

McCartney is an SBE senior engineer who works as a contract engineer in Bemidji, MN.

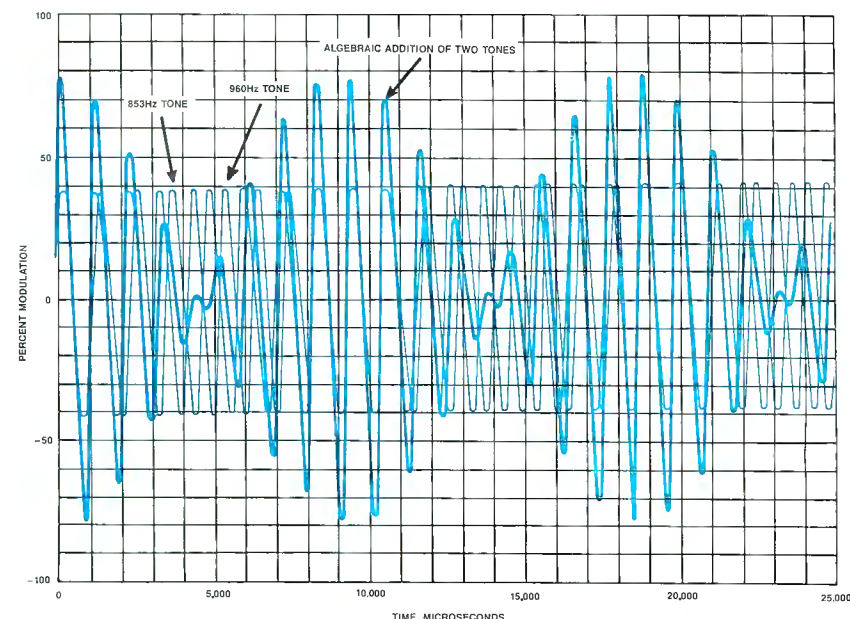


Figure 1. Hammett & Edison graph showing the two tones in phase approximately every 10ms, resulting in a peak modulation of 80%.

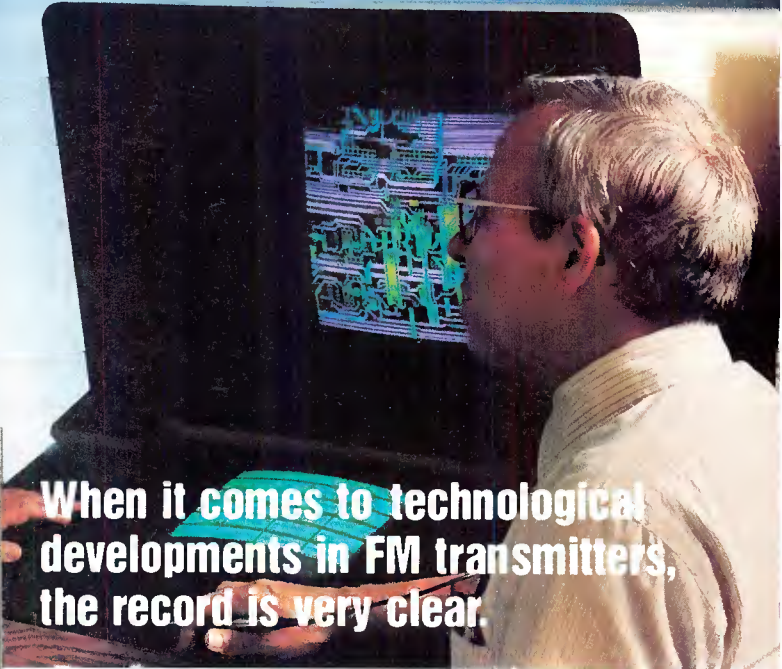
Confusion

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 on the matter. [:-(-)]

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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.

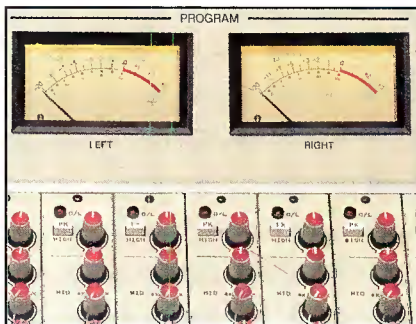
RF grounding

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 and metal oxide form, 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 radiator. 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. [:-=)]]

Battison, BE's consultant on antennas and radiation, owns John H. Battison and Associates, a consulting engineering company in Loudonville, near Columbus, OH.

Let's compare automated audio test equipment capabilities:

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

PRICES (U.S. DOMESTIC)

Computer-interfaceable instrument	\$7350-\$10350 ¹	\$6250	\$10280-\$12635	\$9795-\$10205
Software package	included	none available	\$595-\$2580	none available
Typical controller	\$600-\$3000 ²	\$6080 ³	\$1000-\$3400 ⁴	\$1000-\$3400 ⁴

¹ DSP spectrum analyzer/waveform capture option also available starting at \$3500.

² Personal computer. Interface card included in instrument price.

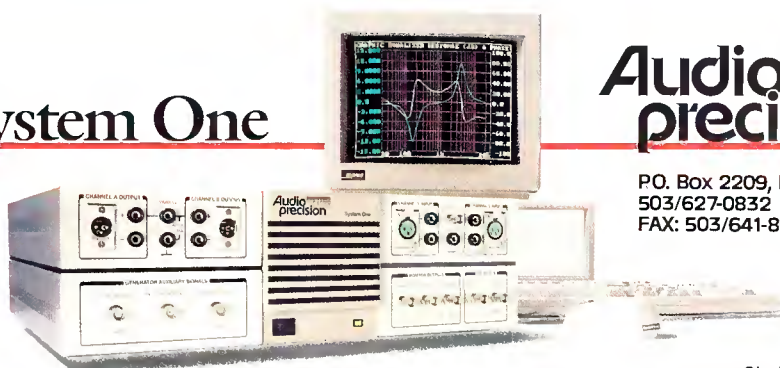
³ H-P Model 332MMA IEEE-488 compatible.

⁴ Personal computer plus IEEE-488 interface card.

Competitive data compiled from H-P 1990 catalog, S-T data sheet 3000A 1987, price list 1989, Tektronix 1990 catalog.

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

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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 Ericksen, 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 Ericksen 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 \$16,533, 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 previous-

ly 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

Issue:

To accept and implement the report of Steve Ingram, certified association executive, regarding professional management for the SBE.

Votes for professional management:

Brad Dick, Richard Farquhar, Paul Lentz, William Harris, Steve Brown, Dane Ericksen, Robert Goza, William Hineman, Edward Roos and Tom Weems.

Votes against professional management:

Phil Aaland, Paul Montoya.

Absent:

Jeff Baker, Charles Kelly, Joseph Manning.

Abstentions:

None.

Issue:

To permit rental of the SBE membership mailing list.

Votes for renting mailing list:

Brad Dick, Richard Farquhar, Paul Lentz, William Harris, Steve Brown, Dane Ericksen, Robert Goza, William Hineman, Edward Roos Paul Montoya and Tom Weems.

Votes against renting mailing list:

Phil Aaland.

Absent:

Jeff Baker, Charles Kelly, Joseph Manning.

Abstentions:

None.

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 Sahab, 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.

Van Buhler is manager of engineering at KNIX-AM/KCWW-FM, Phoenix.

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The Electronics

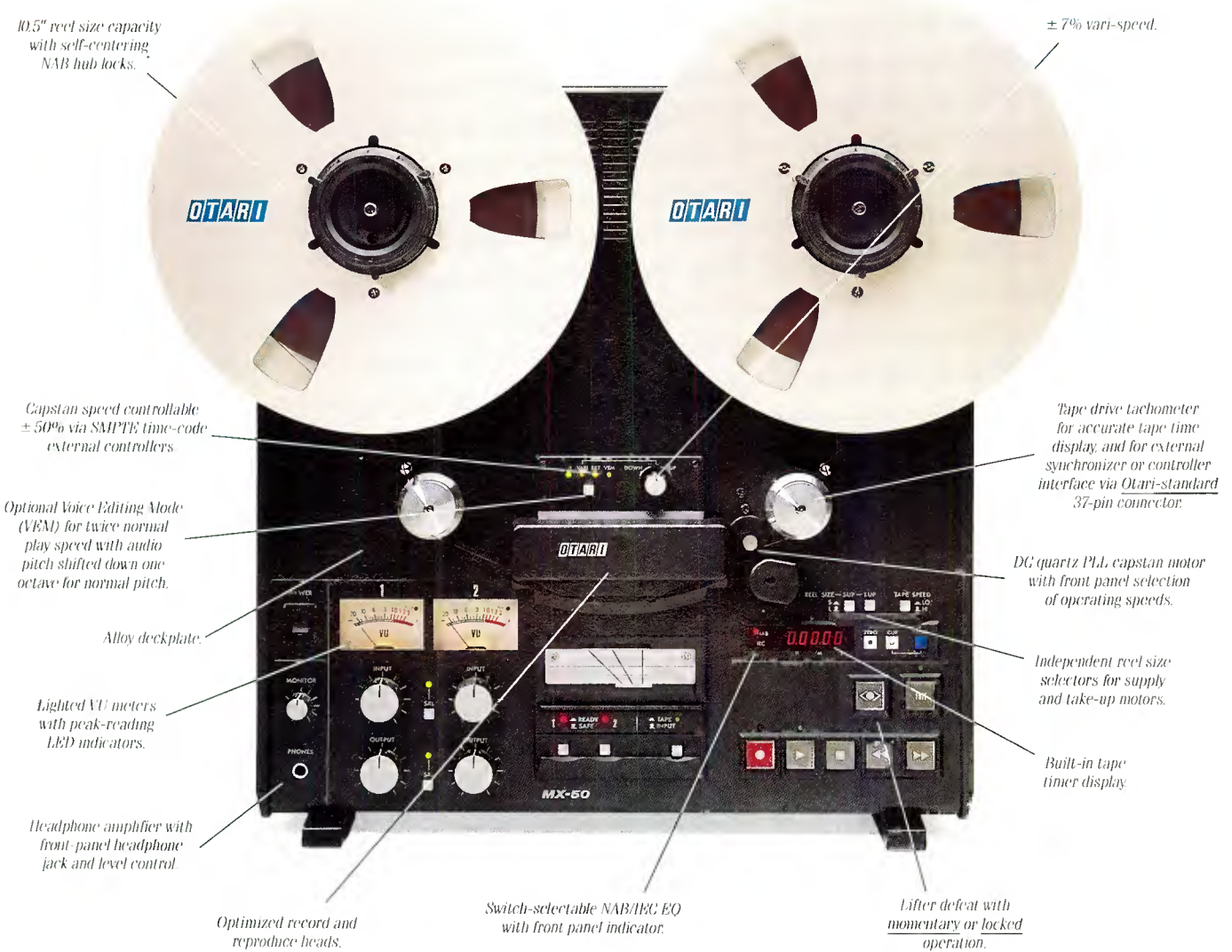
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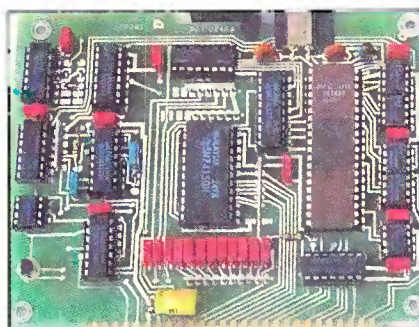
Lifter defeat with momentary or locked operation.

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Measuring reactance and susceptance

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 $+j0.6\Omega$ 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.

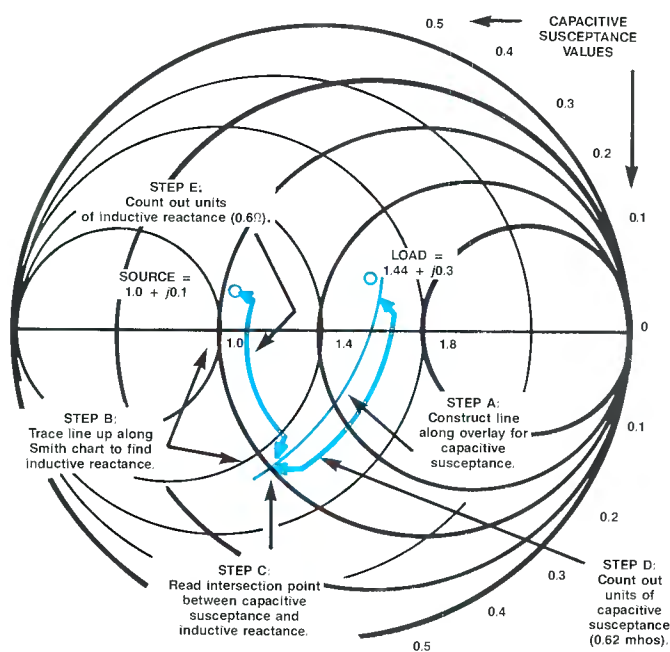
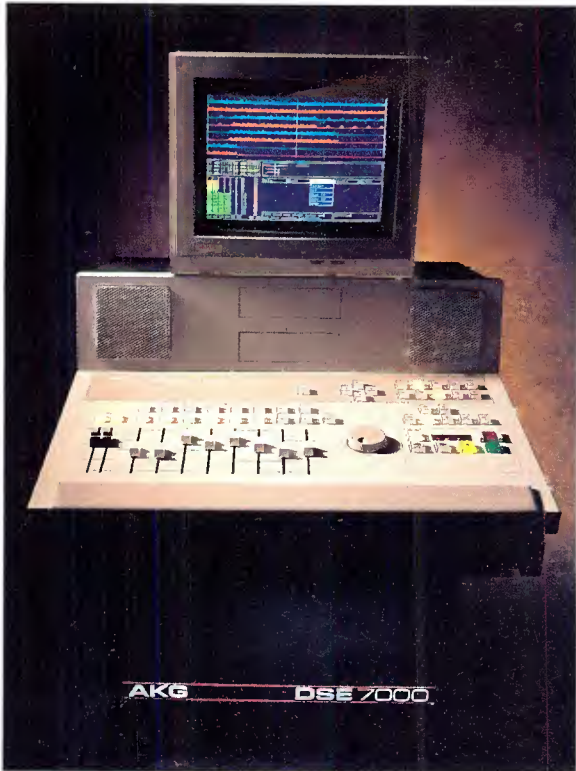


Figure 1. Intersecting curves on the Smith chart and overlay indicate how much reactance and susceptance is needed to achieve the design goal.

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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.

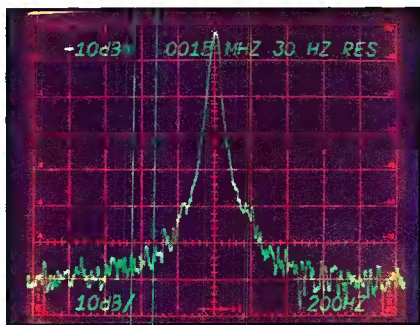
Basic terms

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-

Everett is manager of corporate communications with Videotek, Pottstown, PA.



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 $0.6\mu\text{s}$ 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.

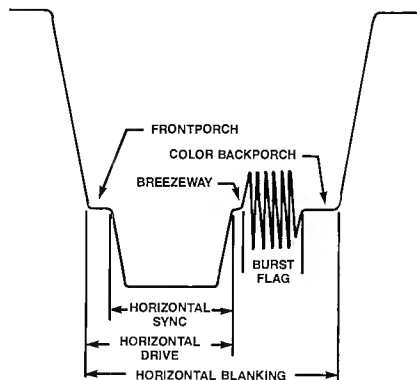
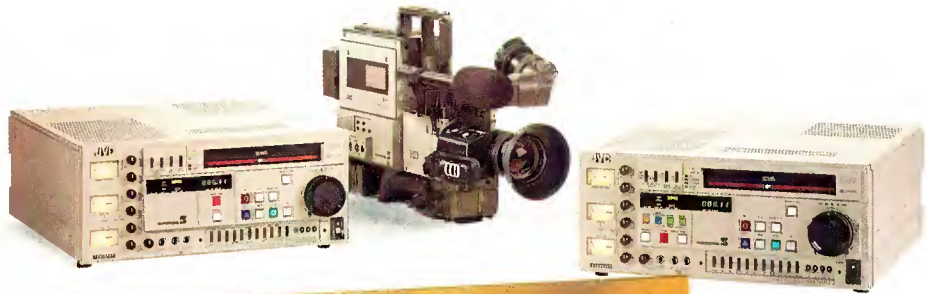


Figure 1. Basic video signal. Waveform monitors can display this signal in several ways. Each is useful in troubleshooting and aligning video systems.



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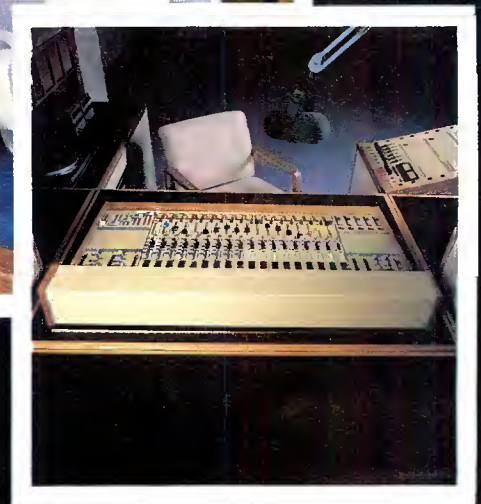
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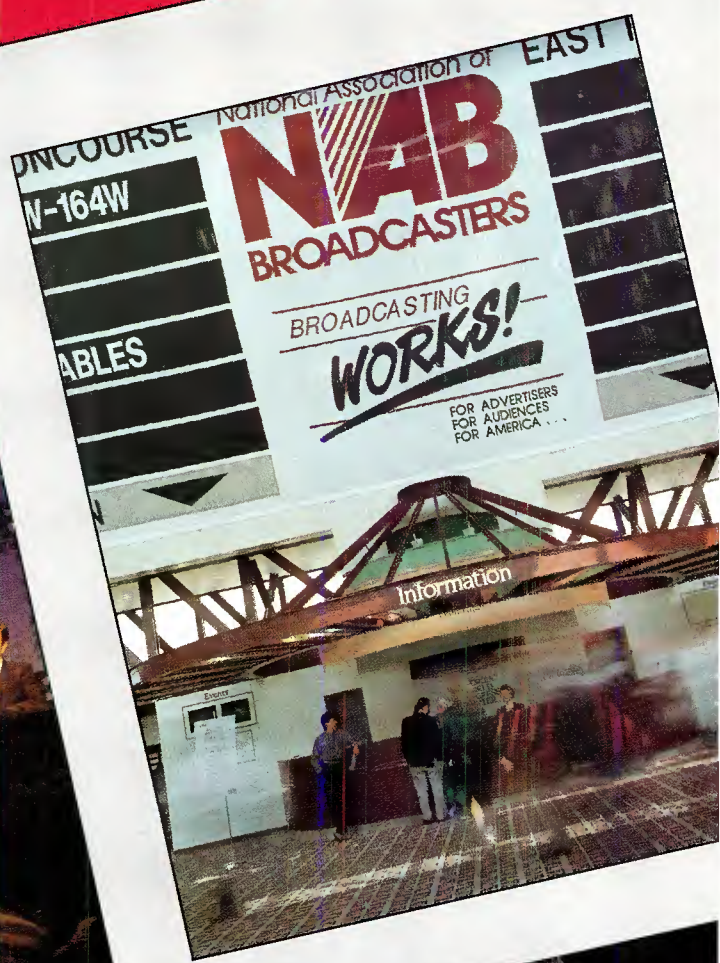
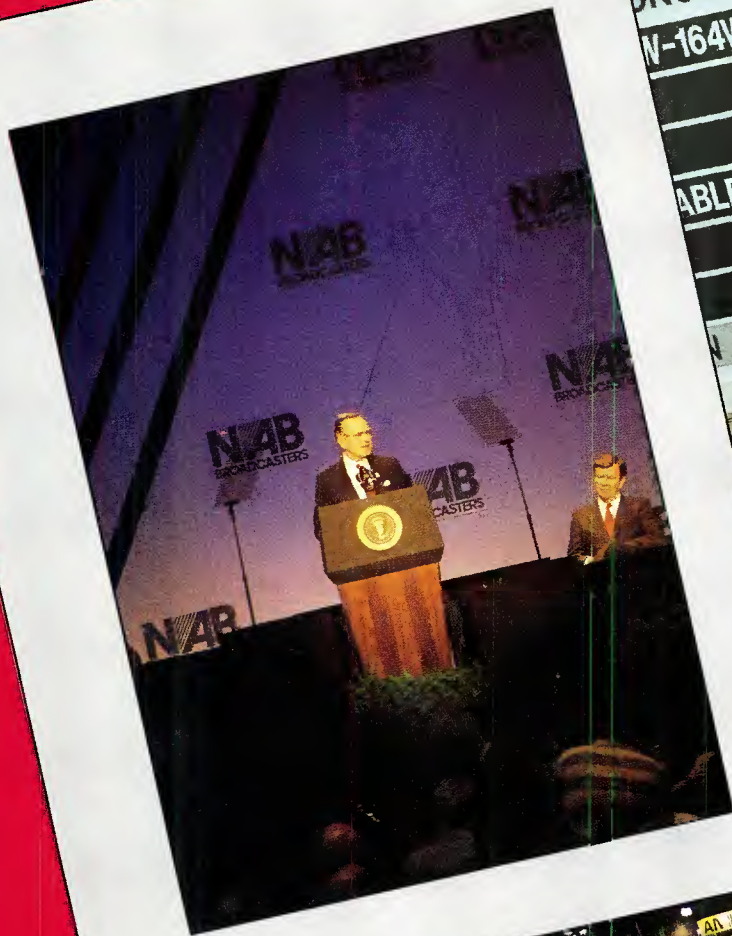
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NAB Convention replay

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 con-

cerns 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.

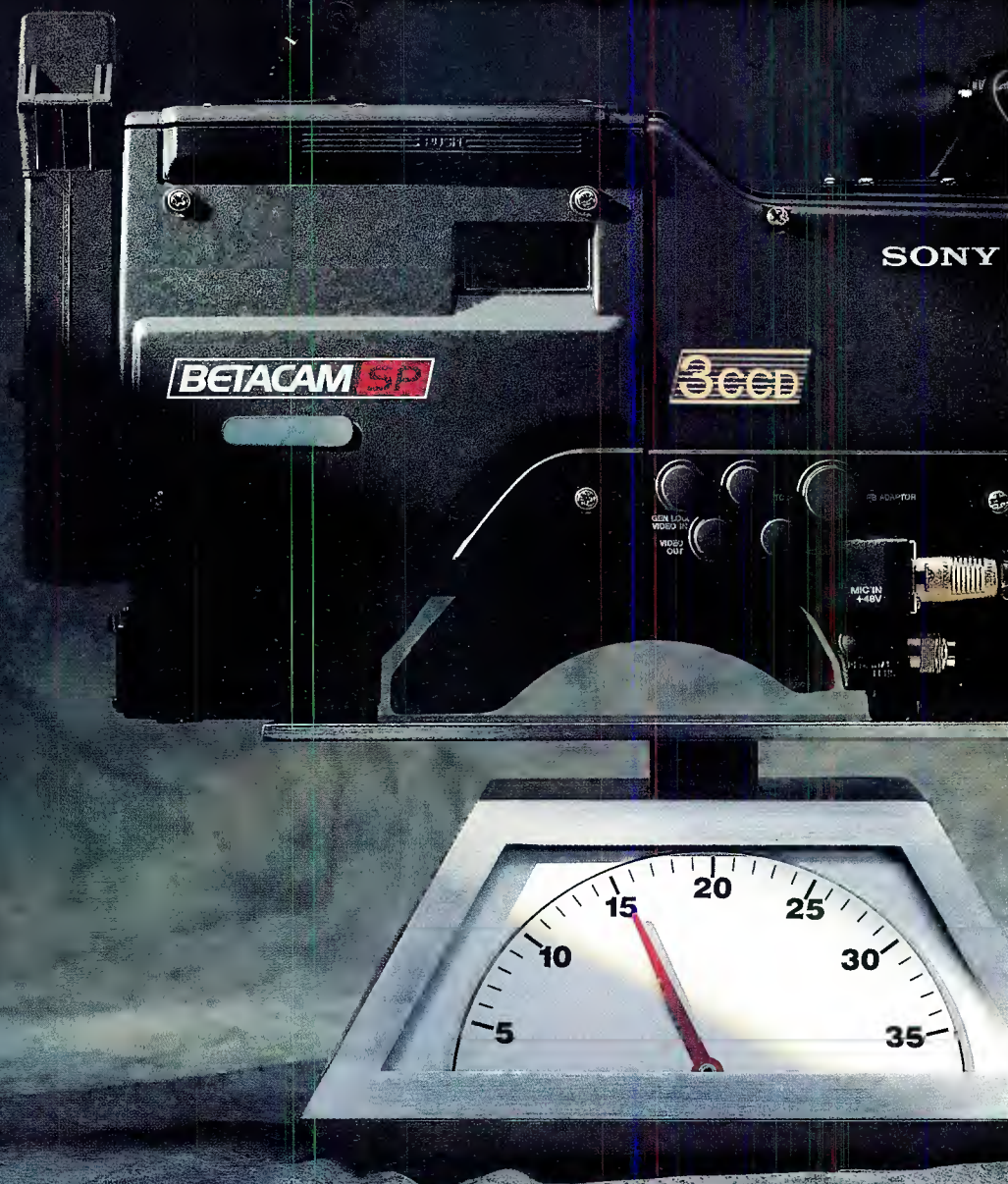
It is not possible to see and attend to everything at the NAB convention — it's just too big. Now is your chance to read about what you might have missed in Atlanta. And, if you missed the show because you were home tending to business, that's even more reason to follow the action in *BE*.

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

Brad Dick

**Brad Dick,
editor**

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

SONY

BROADCAST PRODUCTS

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 conven-

tion 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 exhibitor 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



Even the extra signs, computer-assisted pinpoint locators and the "Ask me" people couldn't solve the logistical problem of finding the room or exhibit that you wanted.

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

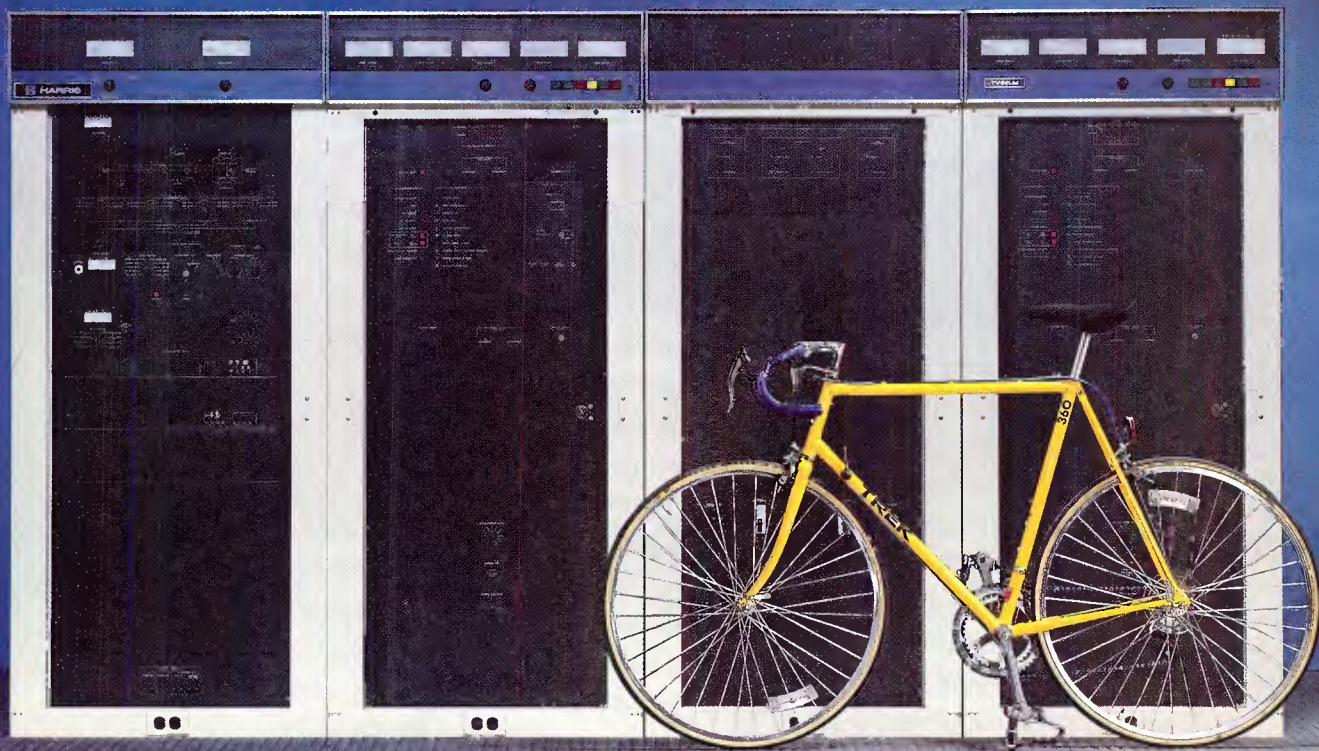
The main issue for TV broadcasters centered on competing technologies. Cable is breathing down our necks, DBS signals are falling from the sky (literally), and HDTV looms on the horizon. If those factors are not enough to give managers headaches, don't forget that telco also wants a piece of the action.

In the session "Advanced Television: Tuning into the Future," one of a TV broadcaster's worst dreams was voiced by Augie 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

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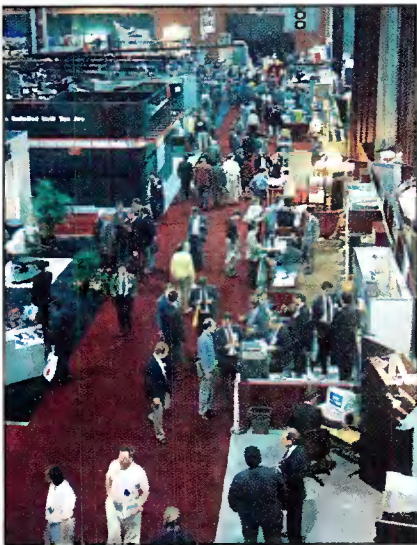
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new decoders, might be all that's needed. If so, the conversion costs for cable would be far less than for broadcasters.

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 all 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."



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.

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

Broadcasters must embrace HDTV or risk the AM-ization of the local TV broadcaster.

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. White said broadcasters 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, HDTV-NTSC and HDTV-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 were shown 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 *air-space model*. Once the model (which will tell broadcasters whether an interference problem may exist) is completed, the process should be smoother. Engineers were

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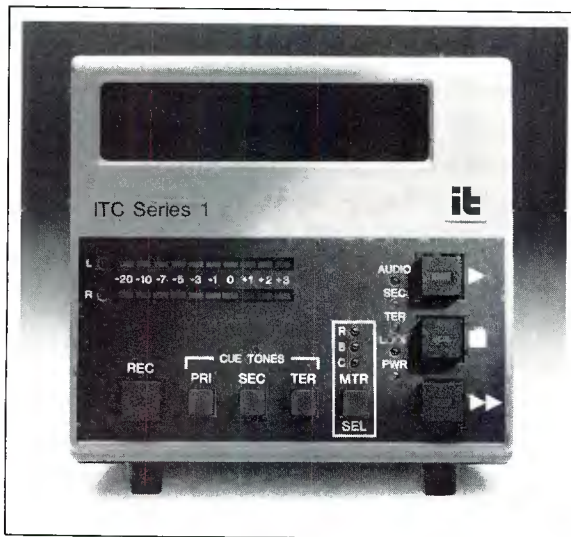
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warned that after the airspace model is adopted, it will be a go/no-go situation. If the model says the proposed installation will create interference, the license application will be rejected. Stewart and Bill Hassinger, FCC assistant bureau chief 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. Ericksen 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 technology 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.

1:7=)))

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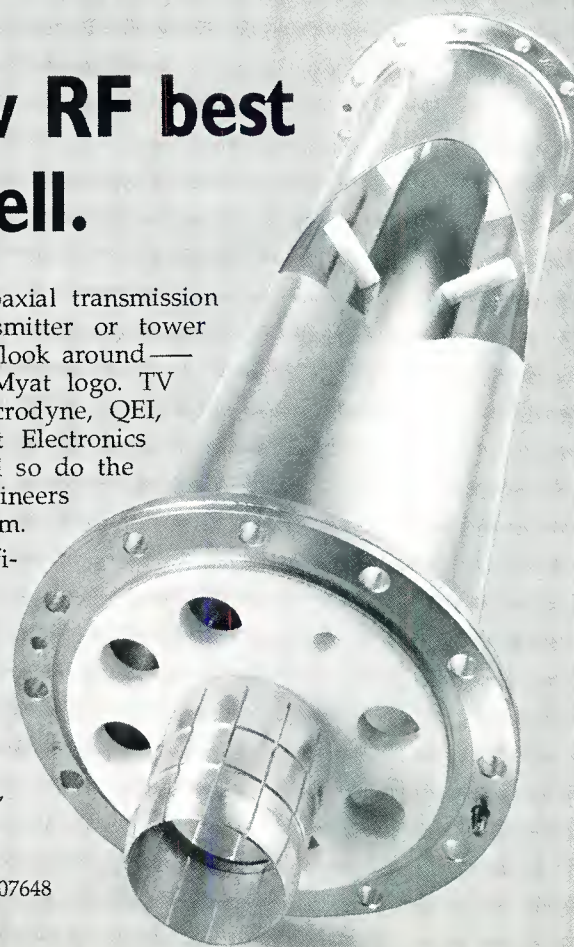
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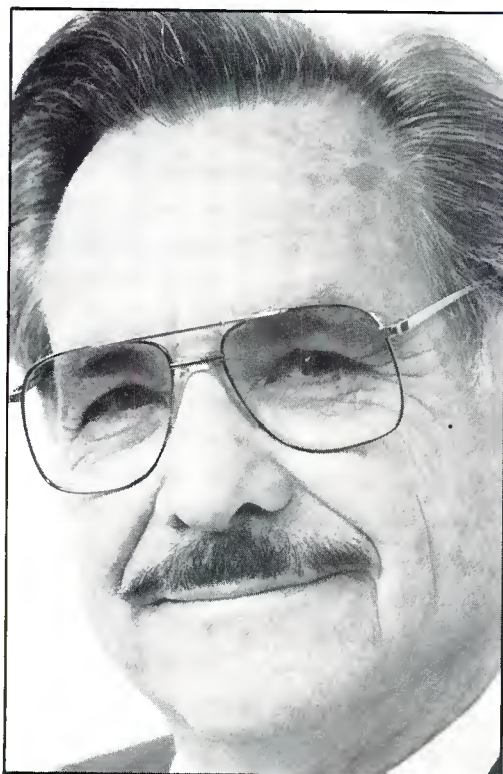


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NAB Engineering Conference report

By Brad Dick, editor

Practical technology was the key
to this year's sessions.

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 show 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 televisions. 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 proponent 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

Continued on page 38



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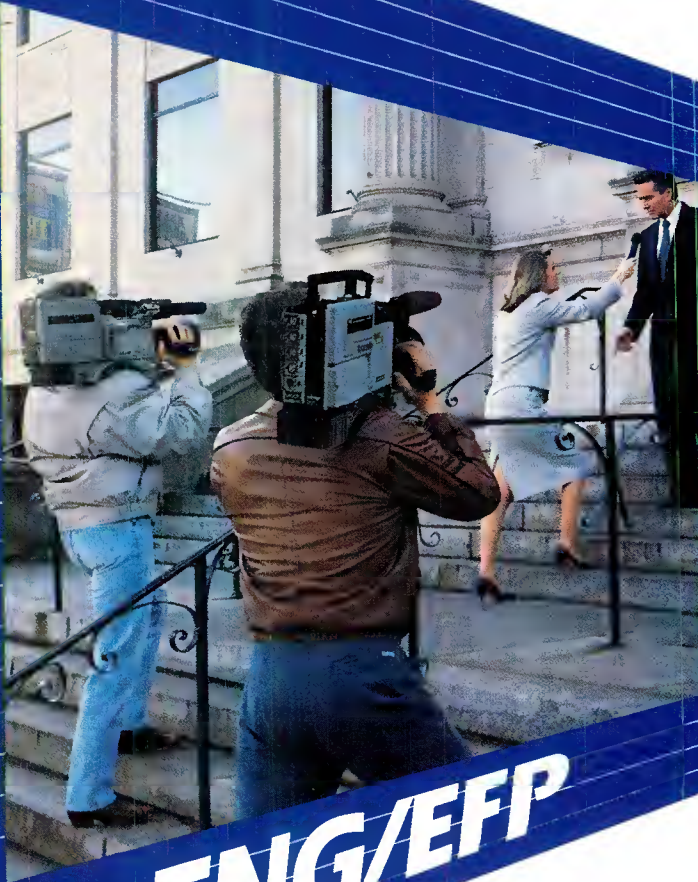
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Continued from page 32
 origination is in HDTV. It would require no modification to the core plant or transmitter.

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/Barmat 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, especial-

ly 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, WPRI-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

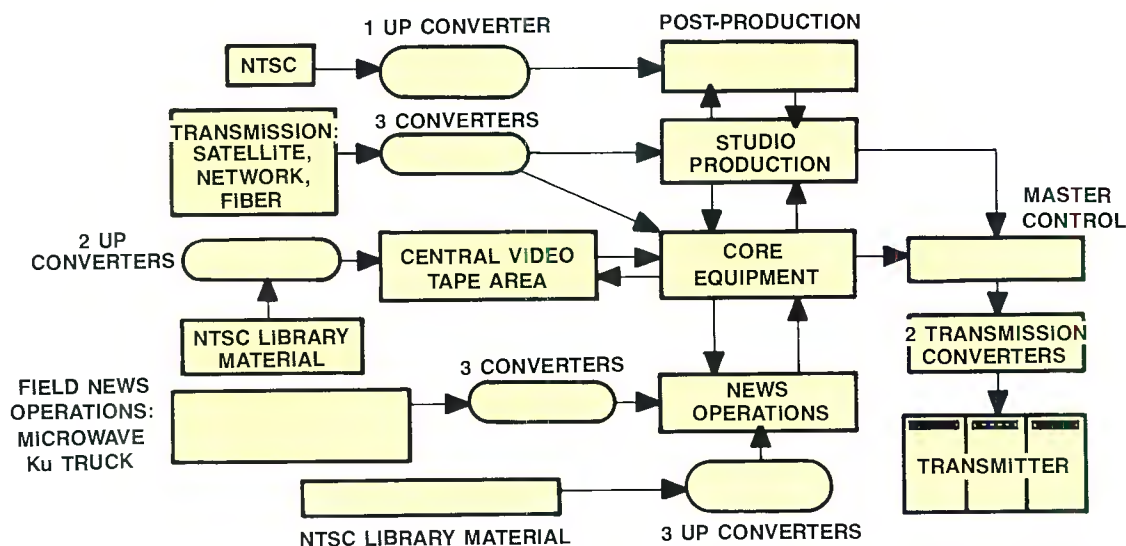


Figure 2. Standards converters will become a fact of life in tomorrow's ATV studios. Shown here is an example of where converters might be needed in a typical broadcast station.



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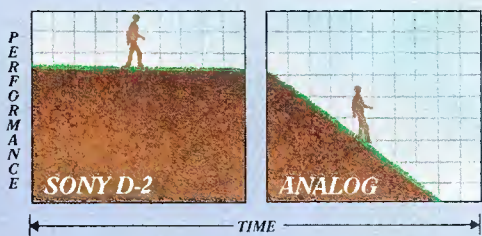
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Not long ago, these facts would have been fiction. Then Sony introduced D-2 composite video.

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



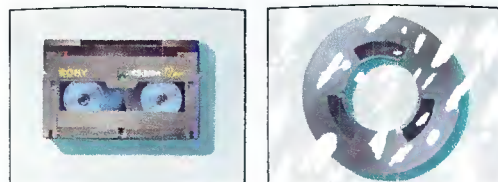
D-2 maintains consistently high performance.

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:

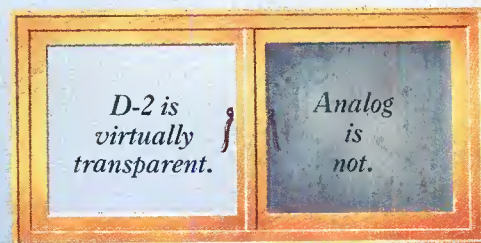


D-2 effectively eliminates dropouts.

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.



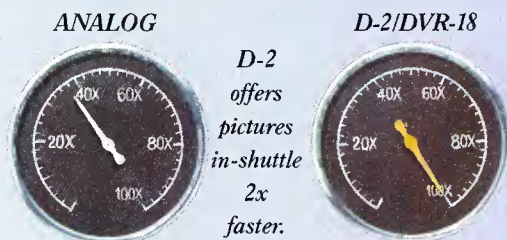
They're "clones." Digital replications indistinguishable from the original.

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



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-



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up to eight
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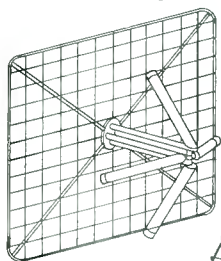
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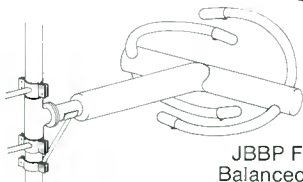
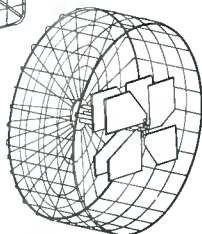
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or turning off the members of the design team.

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 Scammel 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 DVTR for production and image archival, and an M-II 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 cross-points, VTRs, still-stores, character generators and other support equipment. The system would use a PC-like interface with windowing and multifunctions, and would permit multiusers to access 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.

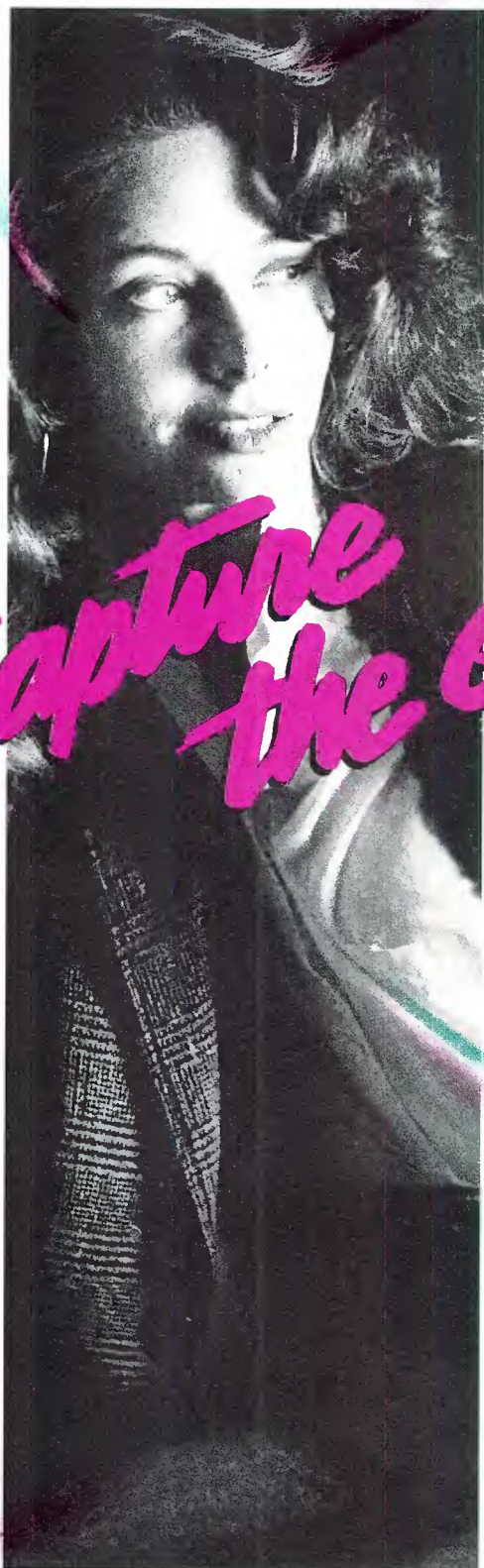
Radio sessions:

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 datastream 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



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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 added functional 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 KILS-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 suggest-

ed 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 progression 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 maintenance of tracking) and several types of dropout discs, both purposefully manufactured and off-the-shelf defectives. All of these were shown to be useful in helping to optimize the electronic and mechanical performance of a CD player.

The engineering session clearly demonstrated that digital audio is not a fad and that engineers want to understand it better. Nevertheless, its penetration into the industry is far from completed. Overall, the session gave an extremely useful look at real-world digital audio applications and struck a fine balance between current and emerging technologies.

AM systems-engineering

The 1990 NAB engineering sessions included a morning devoted to the ailing AM broadcasting system. The session was held Monday, April 2, under the chairmanship of E. Glynn 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, as 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 then 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 NRSC-1 compliance will be rigorously enforced at the end of May.



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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 super-heterodyne. 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 respon-

dents 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.

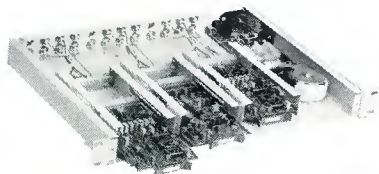
Acknowledgment: Appreciation is expressed to the following engineers who provided coverage of the NAB '90 engineering sessions: Skip Pizzi, National Public Radio; John Battison, Battison and Associates; Gary Krohe, KMCI-TV; and Marvin Born, WBNS-TV.

Editor's note: Many of the papers presented at the NAB '90 engineering conference are contained in the 1990 Proceedings. Copies may be purchased from the NAB.

[:?=>]]]]



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The Pick hits of NAB '90

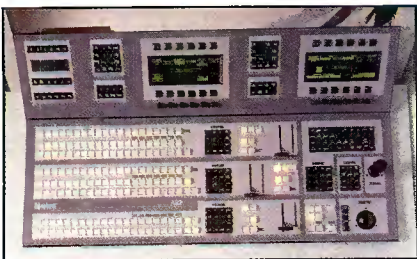
By Rick Lehtinen, TV technical editor,
and Skip Pizzi, radio technical editor

BE's judges pick the peachiest products in Atlanta.

For the fifth year running, BE's "Pick hits" judges scamped 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 keys. Seven inputs are internally delegable, with LEDs for identifying sources. A single control panel can control up to four mix effects systems. Six full chasses 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 trans-reflective 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 loophrough, 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

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- FIRST - 30 MHz bandwidth switching system (USAF), 1965
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- 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 V/A router, 1989

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Continued from page 48
the machine frequently.

The cost-efficient rackslides are fabricated out of aluminum and steel, using fully encapsulated bearings with no visible rolling surfaces. The tilt-mount rack kits are part of a larger series of human form-factor-engineered products, including cable 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 BPDA-1 battery-powered video D/A measures 1.3" x 2.8" x 5." The unit serves as a hum-bucker



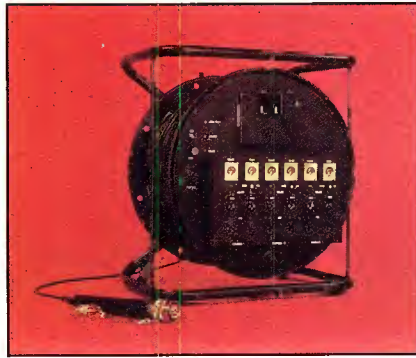
and a distribution amplifier for a minimum of 12 hours, longer with different battery options or a power supply. The unit has a loophrough input, five 75Ω outputs, ±20dB of gain adjustment, and can equalize 1,000 feet of cable. Frequency response is flat to above 5MHz.

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.

• **National Photonics: Sidewinder ENG video system fiber-optic snake**

National Photonics Sidewinder fiber-optic snake uses rugged, militarized multiconductor fiber-optic cables to connect up to three cameras with video, stereo audio, 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.

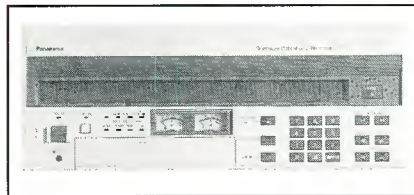
The field end of the system is an analog/optical interface mounted on the side



of a cable reel and powered by standard ENG-type NICAD batteries. The terminal end is a rack-mount chassis with modules according to the configuration desired. Circuit length is determined by how many lengths of cable you plug in between the receive and transmit assemblies. Suggested 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.



The unit accepts and outputs composite 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. Audio frequency response is 20Hz-20kHz, with >70dB dynamic range. An RS-232C interface and remote I/O port allow external control of the device (RS-422A interface optional).

• **Sony: DVR-2 portable composite digital VTR**

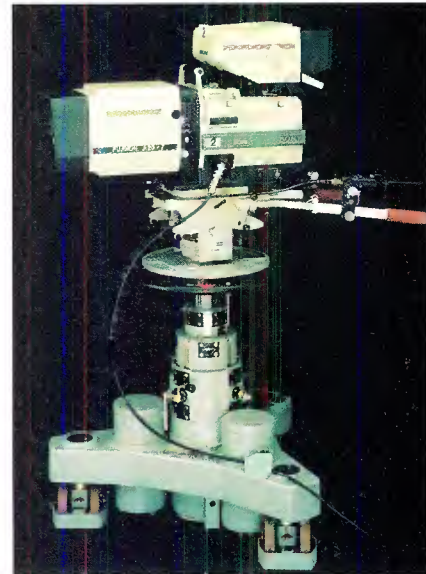
The Sony DVR-2 portable composite digital video (D-2) VTR achieves 6MHz response and 54dB S/N for video, and has four 20Hz-20kHz, 90dB dynamic range PCM audio channels. The VTR accepts RS-170A video or can take a signal directly from the 26-pin camera cable. The DVR-2 accepts M- or S-sized cassettes, 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 capacity. A 2-line sub-display menu guides servo setup and provides diagnostics. Mic power switches provide power output for condenser mics.

• **Sony: BVP-270 3-chip studio camera**

The Sony BVP-270 is a cost-effective, high-performance 3-chip CCD studio camera. A 768 IT (interline transfer) CCD and HAD (hole accumulated diode) technology greatly attenuate vertical smear. A total of 380,000 effective picture elements assure high horizontal luminance resolution (700 lines). The CCD imager is equipped with a 1/100- to 1/2000-second electronic shutter.



The camera's matrix is tuned to match the colorimetry of Plumbicon cameras. Many of the features resemble the tube-based BVP-360. The CCU master setup and operator panels are similar, with some options, such as the color viewfinder, common to both lines. A memory system stores eight camera setups, 64 scene files



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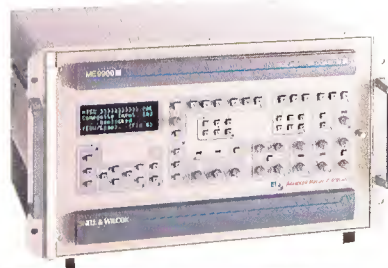
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(painting adjustments) and 16 sets of lens data.

• **Tektronix: VM700A option 40 audio measurement set**

Option 40, an add-on to the Tektronix VM 700A audio measurement system, al-

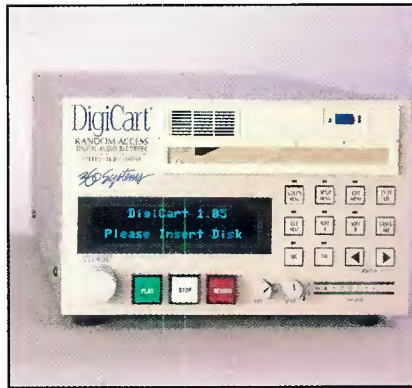


lows the device to interface with automated test tone generators. It monitors for the start of the test sequence (an FSK burst), then records out-of-parameter measurements in memory, including date/time stamped audio measurement results in the VM700A's auto-mode video measurements display. The device 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.

Radio Pick hits

• **360 Systems: DigiCart digital audio recorder**



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" x 3.5" circuit board can serve as a buffer between virtually any remotable electronic device and its control point. It also may be used to establish remote control and status indication on hardware that is not normally remotable. The unit accommodates pas-

Continued on page 58

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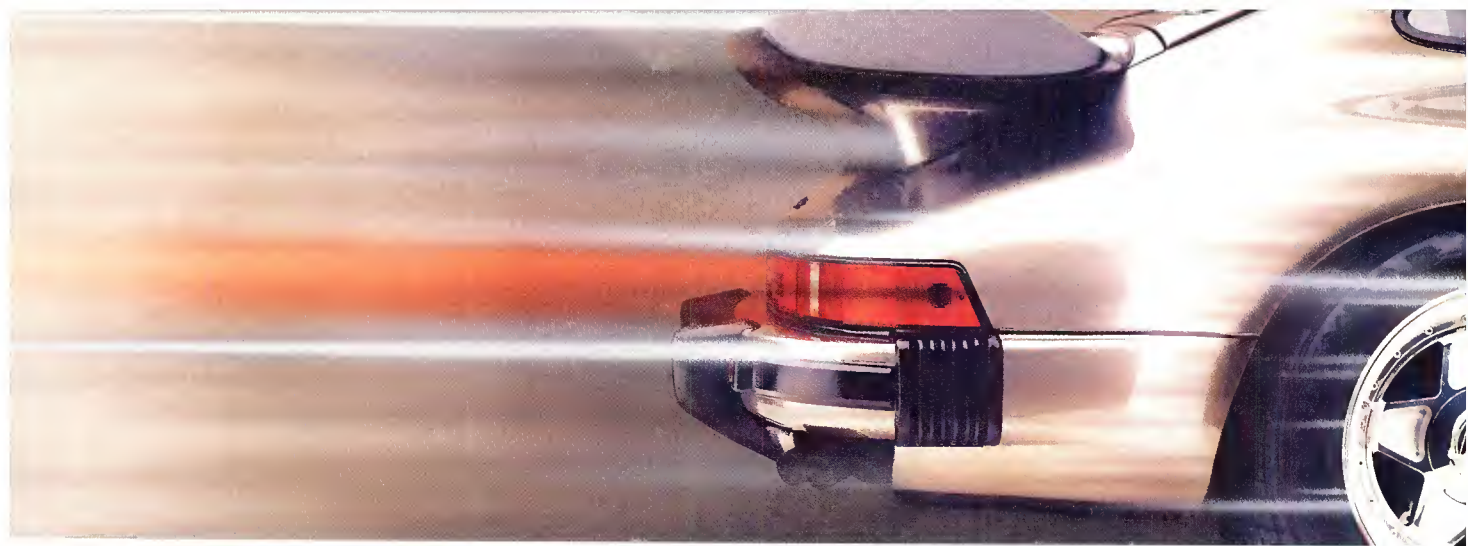
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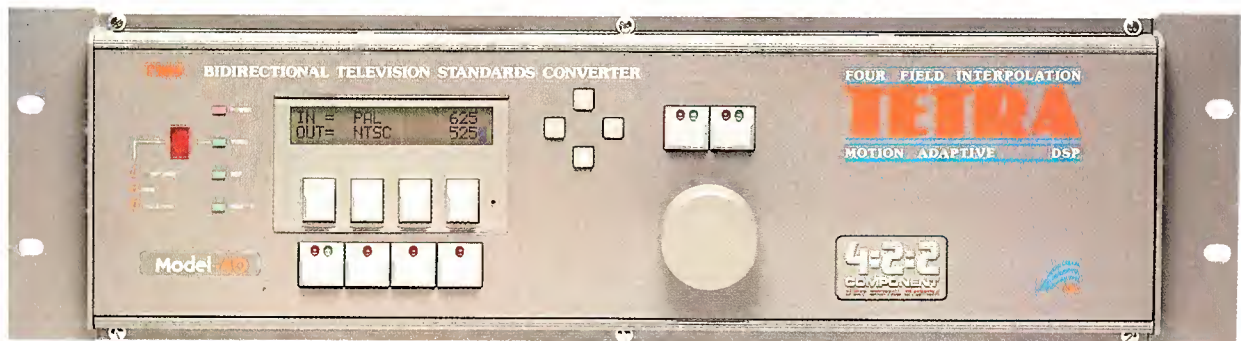
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If you're in the market for a broadcast quality chip camera that combines outstanding performance with outstanding price, consider Ikegami's HL-53.

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.

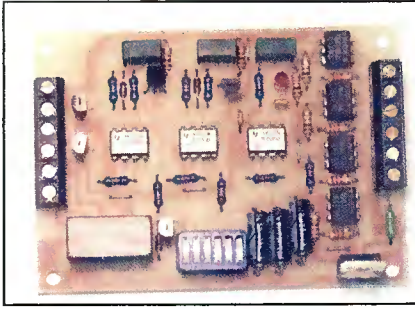
Accessory compatibility is just one more reason to stay with Ikegami, where quality combines with economy. The finest value in broadcast chip cameras is the HL-53. When a better value comes along, it will also be an Ikegami.

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

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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



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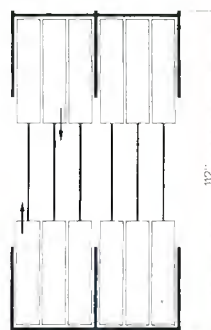
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stores frequency and phase response in mono and stereo. It also can store setups and test runs. Exchanging its removable ROM pack enables other programs. The PC-3000 has a large superbright EL graphic display, built-in speaker and RS-232C and graphic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



• **CRL Systems: audio signature processor**

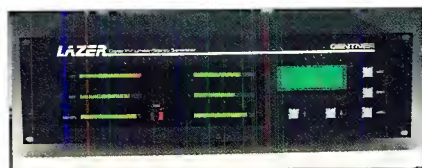
CRL System's microprocessor-based audio signature audio processor includes a wideband and a 4-band processing sec-

tion, 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**

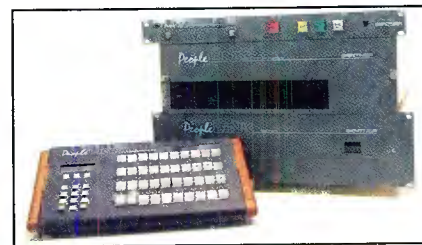
The Lazer digital FM stereo generator and 3-band limiter offer digital audio circuitry, plus storage and recall of eight configurations. Digital operation also reduces susceptibility to noise and RFI, and stereo generator parameters may be adjusted and stored digitally. Peaks are analyzed in level and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

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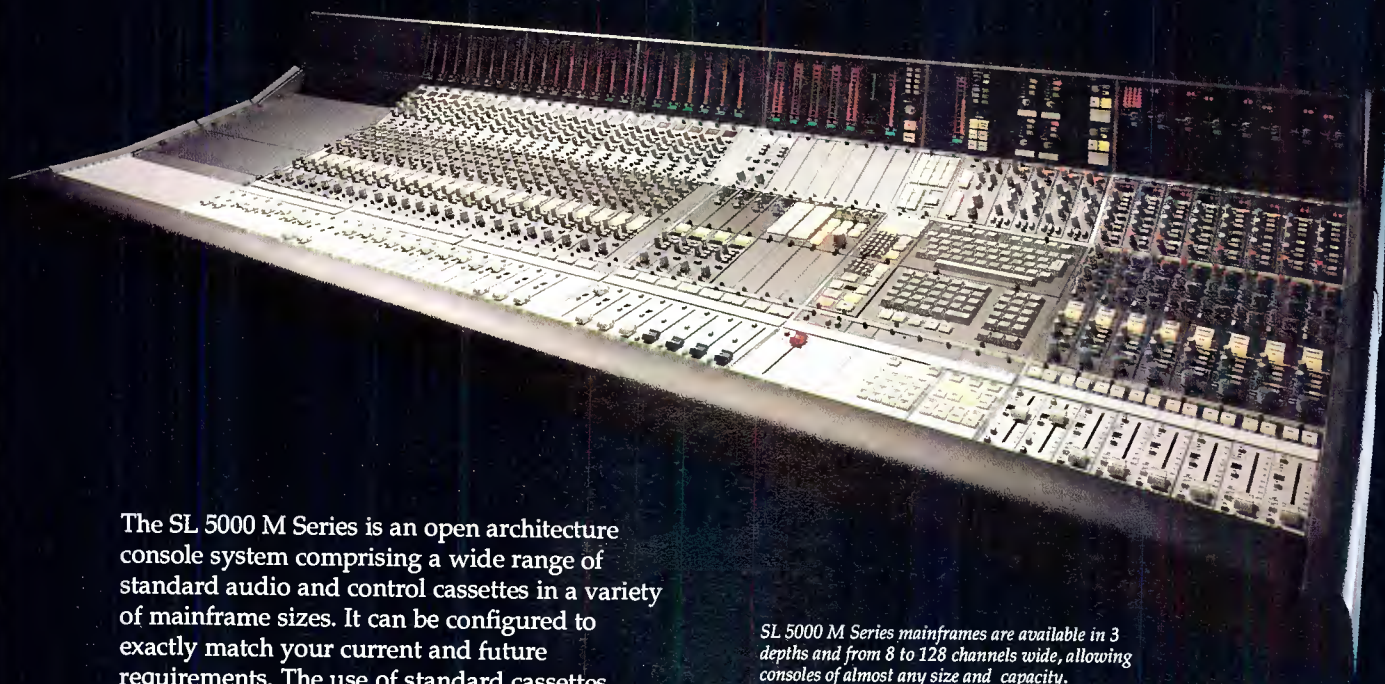
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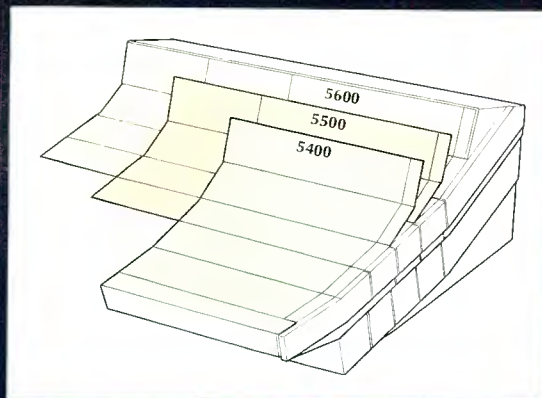
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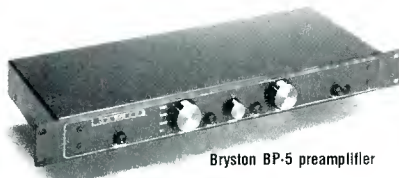
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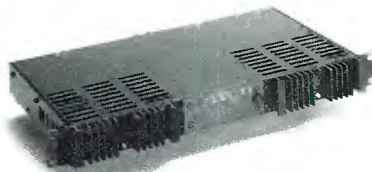
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tenders also can be incorporated. The features of each control surface can be individually programmed by a PC-based configuration program. PeopleLink can use central office or PBX lines. Up to four "hold" audio sources can be independently assigned 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

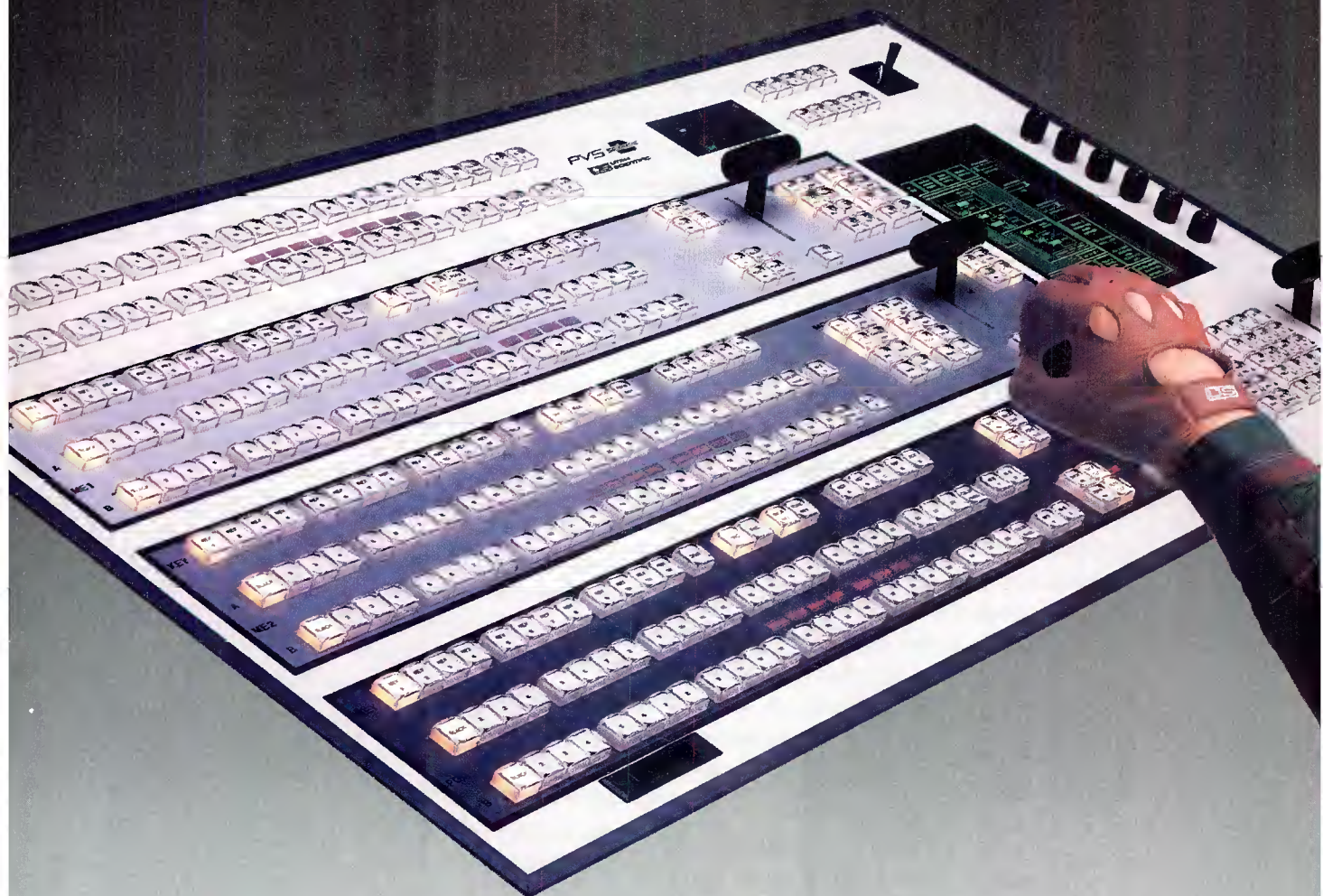


Harris "chimney design" air-handling system is included. The entire line is stereo-ready. Modulation capability is 130% on positive peaks and 100% on continuous sine wave.

• 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 pre-emphasis. The NRSC-FL defines the 10kHz stopband filtering. The NRSC-DM contains the de-emphasis 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.

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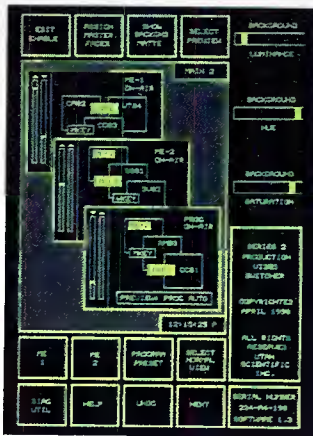
Utah Scientific customers have been asking us to build a production switcher for a long time. We agreed to do that, but only when we were able to offer significant improvements over existing designs. That time has come. We proudly announce the PVS Series 2 Production Video Switcher: built for speed;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

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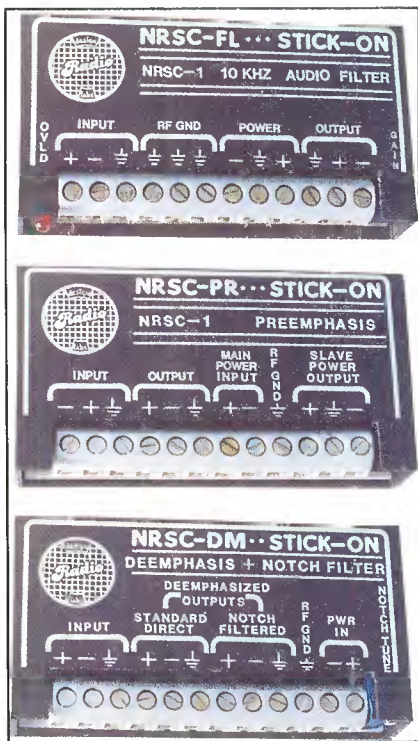


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Circle (36) on Reply Card



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 particularly 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
KMCI-38
Overland Park, KS

Karl Renwanz
Vice president, engineering and operations
WHDH-TV
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
Loudenville, OH

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

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

Charles Morris
Corporate director of engineering
KIRO
Seattle, WA

Richard Rudman
Engineering manager
KFWB
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,

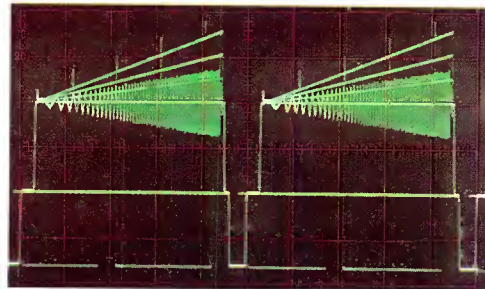
and Y/Time-Compressed Chroma) as well as the more familiar test signals applied to the composite feeds. You can order the 425 in either Betacam or MII format.

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.

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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.

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processing cameras, as well as some of the most cost-effective analog cameras ever made.

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Panasonic
Broadcast Systems

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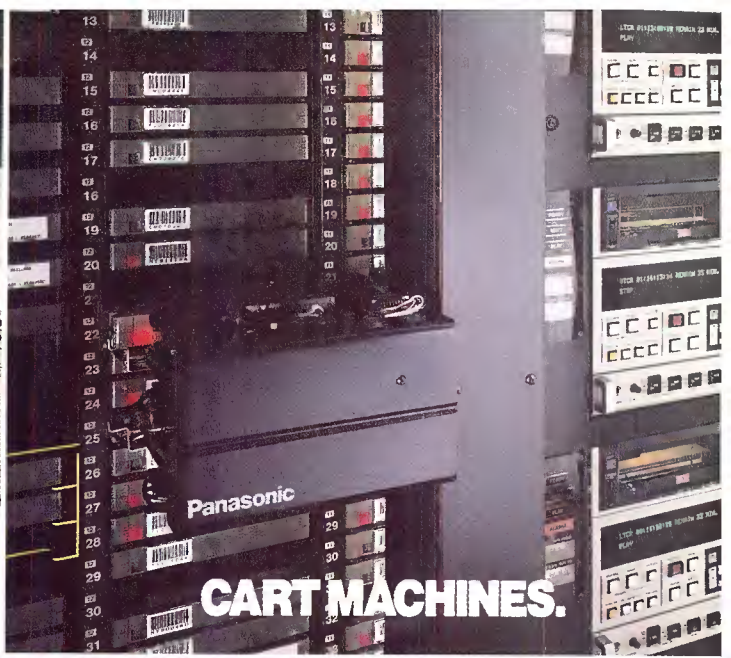
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Show of shows

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 newsworthy 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

- A1** (68): Mixers, console automation.
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, phono, CD).
A5 (80): Digital recording, MIDI.

Group R - RF Products

- R1** (84): Broadcast transmitters, antennas; transmission line; remote control, telemetry; towers, tower ancillaries.
R2 (88): Terrestrial microwave (aural, video; ENG, STL, ITFS, MDS, electronics, antennas.
R3 (92): Power amplifier cavities, 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.
S5 (108): Distribution amplifiers, routers.

- S6** (112): Test, measurement, tools; filters, delay lines; power conditioning.
S7 (116): Fixed, mobile facilities design, construction, consulting services.
S8 (118): Program services, music/effects libraries; promotional products.

Group V - Video Products

- V1** (120): Cameras, lenses; camera support.
V2 (124): Recording (all formats); still-stores; editing control; animation; time code systems.
V3 (132): Cine/film cameras, telecines.
V4 (134): Batteries, support products, lighting instruments, lamps; grip equipment.
V5 (140): Graphics, effects, titling systems; prompting, captioning, weather graphics, radar.
V6 (150): Production, master-control switching.
V7 (154): Processing systems (TBC, synchronizer, standards/format converters; sync, VID generators; compositing, keying).
V8 (158): Monitors, projectors, video printers.

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, dc-controlled switching; three stereo output, two telco mix-minus buses; prefader patch points; digital timer, stereo splits.
Circle (554)

Auditronics

- *Destiny 2000*: digital radio console; databus to electronics bay; four input types; 3-inputs/per channel; separate voice, music buses; "smart" 4-input telco interface buses.
- *Series 900 console*: TV on-air, production; computer control with memory storage; 24-, 32-, 40-input, 4- or 8-submaster buses, one mono, two stereo outputs; RS-232/422 bus to router for flexible input control.
Circle (572)

GLW Enterprises

- *PRO-790*: 8-track production console.
- *AP-100*: enhanced software; sequencing; selective operator lock-out of assignment, other functions; European fader logic.
Circle (802)

GML

- *Version 6.1 upgrade*: assign/reset groups off-line; dynamic group offset; increased speed, expanded peripheral data control; dual floppy support for 3.5", 8" drives in GML console automation system.
- *Series 2000*: automated graphics displays

- status, recall of console automation.
- *Stereo fader*: motorized GML/P&G design; 0.15dB track variation between 0, -20dB, minimum 1dB to -85dB.
Circle (803)

Graham-Patten Systems

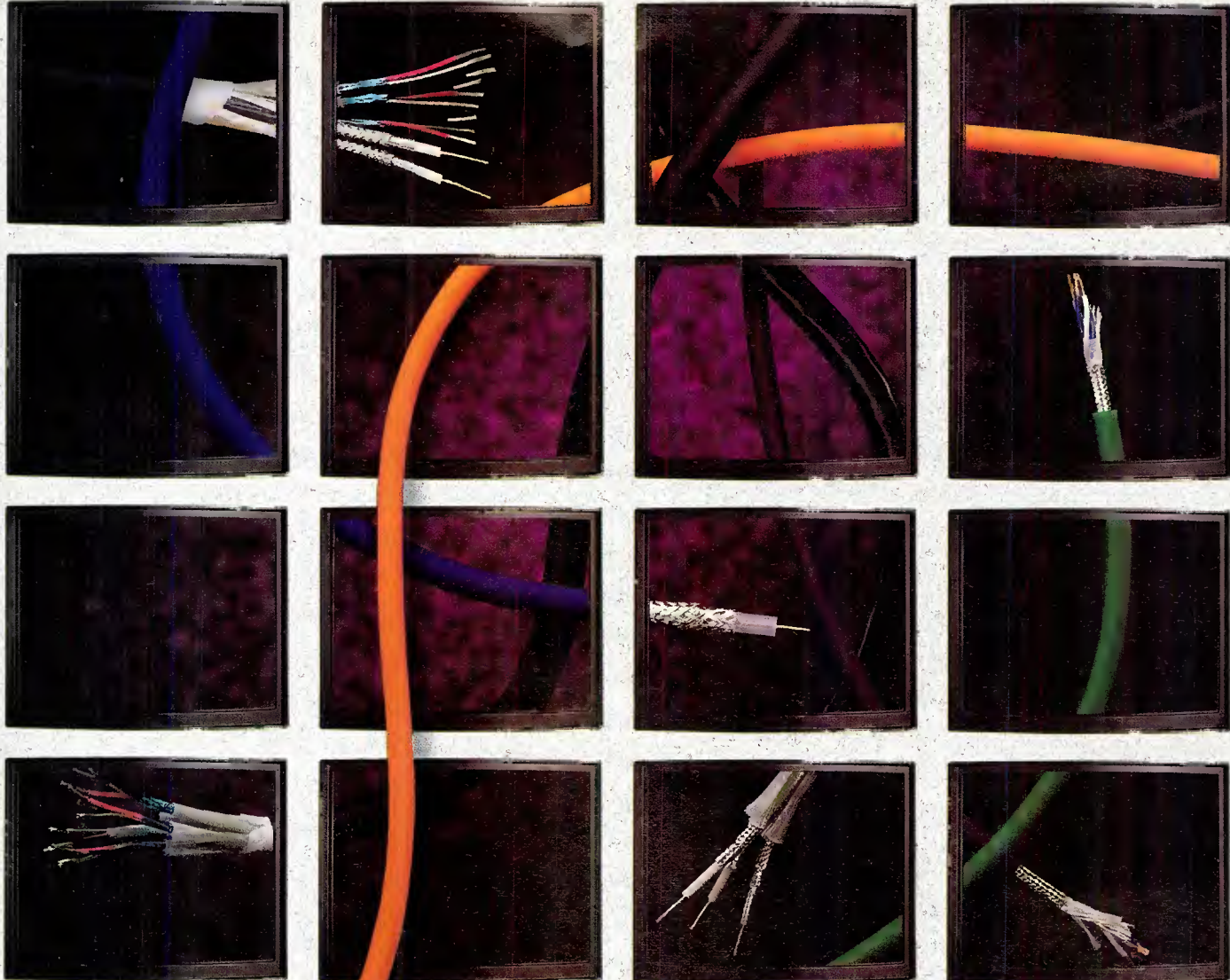
- *D/ESAM 800*: digital edit suite mixer; ESAM II protocol talks with any editor using ESAM protocol; Motorola DSP-56000 device; 32-input, 4-output analog or digital.
Circle (806)

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 pro-

tection 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

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Circle (40) on Reply Card

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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 IFF, 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.

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LPB

• *Citation II C2-10*: 10-channel on-air, production; 3-inputs/channel, lock-out switching; two stereo outputs; user-configured 4-position aux selectors; programmable monitor, cue mute.
Circle (909)

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 μ P control, reset recall switch status, input gain; fader settings; mix-minus; 4-band EQ.
 • *Model VRP*: post-production console.
Circle (971)

Otari Console Products Group

• *DiskMix 3*: VCA P&G moving fader automation; touch-sensitive controls; unlimited group ing of 128 console channels; 68000 series coprocessor; frame-accurate fader, mute data; off-line facilities.
 • *TC-100 transfer console*: for transfer, dubbing in film, video production; multiple card-frame rack units with meter panel; separate power supply; 9-18 inputs per rack; 4-bus output; solo functions; fader bypass.
 • *Series 54 consoles*: 24-, 36-input; DISKMIX 3 moving fader options; 4-band EQ, high-resolution monitoring; dual signal paths; 10 aux sends.
Circle (994)

Ramko 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 9-input.
 • *OptoPot faders*: 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

• *WM-1 wireless mixer*: 5-channel portable mixer; internal, external dc 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-, 26-, 30-channel frames; four groups, combinations 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 switcher; master faders for channels one, two; both units 8-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.
 • *VSA 24 II*: serial-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; 6 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-3500/24 ST console*: eight group buses, in-line distributed monitor; four assignable effects returns; 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 talkshow module; ICM-32 6-station intercom, SC-20 studio monitor, mute, multiline 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, cough 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; -60, +10dB channel gain adjustment.
Circle (1259)

A2: Processors

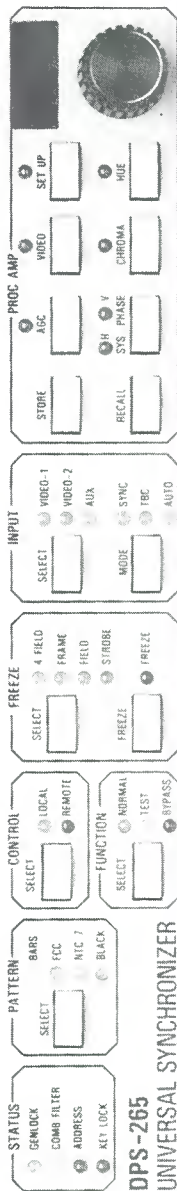
- ◆ Compressor, limiter, EQ
- ◆ Delays, effects, noise reduction
- ◆ Telephone equipment

Allied Broadcast Equipment

• *Gentner Telemix 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*: modular 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

• *Medici EQ*: dual-path, 4-band EQ; high-, low-pass filters per path; combines to single 8-band EQ system.
Circle (536)



DPS-265

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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 earthy \$5,495.



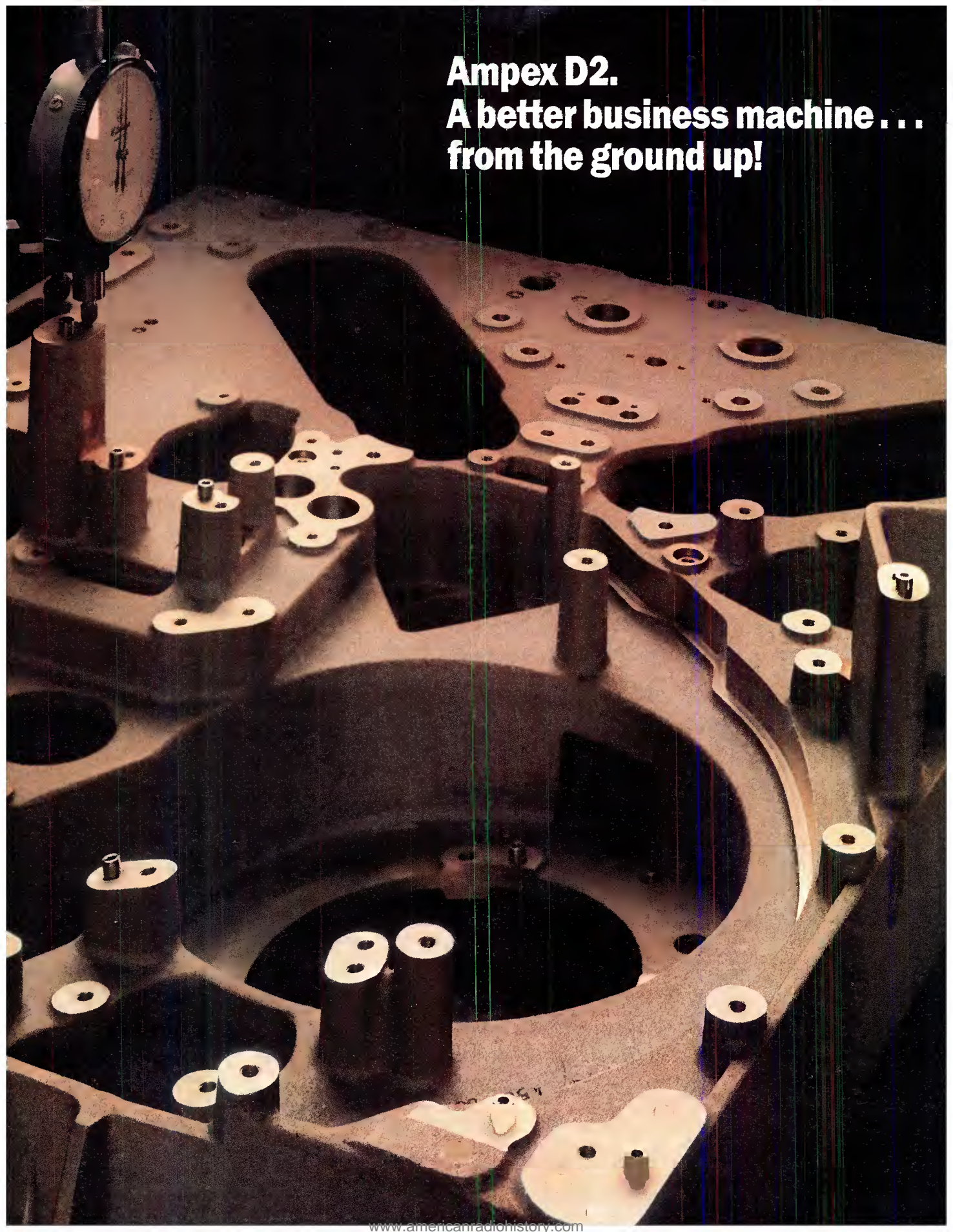
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Circle (42) on Fast Facts Card

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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 mainten-



Time-code information, error messages, even audio level bargraphs can be displayed over a separate video output. On-board speakers reduce equipment costs, save rack space, and make installation easier.

ance costs. Replaceable heads and easy access components reduce down-

time. We've given your operators some help, too. For example,

these are the only D2 machines

designed specifically for broadcast

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



Streamlined control functions reduce operator errors and cut training costs. All machine selections are clearly displayed and easily changed without cumbersome menus.

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,

The VPR-200 mounts all 3 cassette sizes for flexibility from spots to movies. The VPR-250 handles small and medium size cassettes if that's all you need.



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.

AMPEX

Aphex Systems Ltd

• #651 *Expressor*: compressor, limiter; voice, music, single track modes; enhances detail attenuated in wideband systems; SPR restores bass clarity, punch without increased amplitude.
• *Model 150 remote*: audio control with VCA technology; two independent channels, 15dB gain control; display LED indicators show attenuation levels in 4dB steps.
Circle (550)

Audio Developments

• *REBIS modules*: compressor, limiter, oscillator, pre-amps, equalizers, LED meters, mic/line amps, mixer/DAs, pan controller, VCAs, noise reduction, balance, noise gate, expander, digital sampler.
Circle (566)

Audio Processing Technology/SSL

• *Enhanced apt-X 100*: encoders-decoders; AUTO-SYNC synchronizes operation of decoder on satellite, radio transmissions.
Circle (568)

Broadcasters General Store

• *DigiMod 2000 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 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.
Circle (622)

CEL Electronics

• *P180 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.
Circle (810)

Circuit Research Labs

• *Audio Signature*: programmable 4-band 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.
Circle (662)

Comrex

• *TH-X extender hybrid*: telco to broadcast audio management; 1-line bandwidth extender; two cart starts; send limiter; band-pass 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.
Circle (684)

dbx Pro Products/div AKG Acoustics

• *140X Type II*: noise reduction with dual-channel encode, decode electronics; inputs, outputs at standard professional line levels;

½-rack package is 1RU high.

Circle (519)

Dolby Labs

• *AC-2 audio coding*: spectrum-adaptive transform coding; DP501 encoder, DP502 decoder at 128kb/s; frequency-domain processing in narrow bands masks noise.
Circle (733)

Eventide

• *HS322 sampler*: H3000 Ultra-Harmonizer option; 16-bit, 44.1kHz 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.
Circle (767)

Gentner Electronics

• *FMLAZER*: 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.
• *SPH-5, SPH-5E*: 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.
Circle (798)

GML

• *Model 8900*: compressor, limiter.
Circle (803)

Inovonics

• *Model 222*: NRSC AM-SW processor.
Circle (848)

Kahn Communications

• *POWER-talk*: processor; maximizes coverage for all-talk, all-news AM; FCC compliant filtering.
Circle (870)

Klark Teknik

• *DN500 dual compressor*: 2-channel, combines compression, expansion, limiting; stereo in-out switch; LED gain reduction meter; envelope auto-manual switch.
• *DN504 quad processor*: 4-channel compressor, limiter; 1RU package; complete function control per channel; may operate as two stereo pairs; LED meters gain reduction.
• *DN726 stereo delay*: 2-input, stereo in-phase output; 20Hz-20kHz; 0-1.3sec delay in 20sec increments; 16-bit linear design.
• *DN510 dual noise gate*: stereo, 2-channel mono; gate range 0 to -90dB; filter, gate, trigger, masking controls; envelope with duck, fixed, MIDI switches; adjustable delay; distortion is 0.05%, S/N -104dBm.
• *DPR-504 noise gate*: 4-channel; link in pairs for stereo; eliminates noise from tape, un-

controlled room reverb; 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.
Circle (879)

Lexicon

• *Model 300 effects*: digital reverb, pitch shift, effects; menu-driven; 50-event time code trigger; Dynamic MIDI; DAT interface; keypad, softknob, dedicated key control.
Circle (898)

McCurdy Radio Industries

• *TIF telco interfaces*: TIF-800 8-hybrid package for 3RU rack space; TIF-951 interface with DTMF decoder in 1RU cabinet for McCurdy intercoms.
Circle (932)

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 290RX*: harmonic, spectral restoration, Open Sound single-ended noise reduction revitalizes heavily processed audio.
Circle (991)

Solid State Logic

• *Logic FX processors*: G383 dual mic amp, EQ; G384 stereo compressor; functions of G-series consoles as stand-alone products.
Circle (1100)

Swintek Enterprises

• *MARK 200D/R.I.* remote telephone link.
• *MARK QDC-HiFi, 50A-HiFi*: high-fidelity pocket-sized receiver, transmitter.
Circle (1130)

Symetrix

• *SX-206 dynamics processor*: recording, broadcast, concert applications; compressor, limiter, expander, gate, duck, slave modes; LED GR display; balanced, unbalanced output, stereo operation link.
Circle (1134)

TC Electronics

• *TC 1280, TC 1380*: stereo, multitap delays; 20Hz-20kHz with 0.5dB variation; minimum phase shift; enter delay values in meters, feet; MIDI option.
Circle (1474)

Telos Systems

• *Direct interface*: module directly connects Telos 100 hybrid to office 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.
Circle (1179)

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 (1182)

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genius of Videotek.

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.

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Valley International

- *Model DCE*: stereo digital compressor, expander.
Circle (1208)

Vortex Communications Ltd

- *CH-2012, CX-2012*: amplifiers; CX module with 3-band parametric EQ; transformer or active balancing; 0.01% distortion characteristic; line driver, DA use.
Circle (1237)

A3: Recorders

- ◆ Non-digital recording
- ◆ Editing, synchronizing
- ◆ Ancillary equipment

Accurate Sound Corporation

- *6300 series*: instrumentation recorders; FM, direct, PCM, voice modules; 1/4", 1/2"; 4-, 8-channel may use one channel for voice; 20-hour or optional 160-hour record.
- *MCS-500, # 1053*: cassette recorders, loggers; 1 5/64"-3 3/4" IPS; 4-8 channel; dual Philips cassette transport; time code read, write; 16-hour record; #1054 duplicator.
Circle (507)

Apollo Lighting/Audio Visual

- *PA-2060*: portable cassette recorder with public address feature.
Circle (549)

Audio Services Corporation

- *Sound Assist*: tape counter utility package for Nagra recorders.
Circle (1023)

Fidelipac

- *CTR90*: audio cart recorder, player; mono, stereo, stereo Maxtrax versions; 3-tone cue, fast forward, 4-digit real-time timer; dynamic noise reduction; LED bargraph on recorders; Dolby HxPro.
Circle (776)

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.
Circle (786)

International Tapetronics/ITC

- *Series 1 cart deck*: NAB cart machine; available as playback or record-play; dc-servo capstan motor; new solenoid-cam design; opto-sensor sees carts with marking to trigger external user-selected functions.
Circle (860)

Otari

- *MTR-15 analog ATR*: 1/4", 1/2" mono, stereo, 2-track and 2-track w/center track time 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.
Circle (994)

Studer ReVox

- *Model A807*: 2/2-TC 2-channel recorder; SMPTE center-track time code feature.
Circle (1127)

TASCAM

- *BR-20T mastering deck*: 1/4" 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-20 half-track*: 1/4" 2-track recorder; independent channel recording; shuttle control with EDIT, QuickCue; NAB, IEC EQ, 250/320 operating level adjustments from front panel; dissimilar reel compensation.
Circle (1146)

A4: Ancillary audio

- ◆ Wired, wireless mics
- ◆ CD, phono products
- ◆ Headphones, headsets
- ◆ Intercoms, speakers

AKG Acoustics

- *K 270-S*: 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, higher power capacity; low distortion; open-air design.
- *Micromic series*: C401, 402 for acoustic string instruments; C408 for percussive instruments; C409 for wind instruments; C410 headset mic for vocalists; each has characteristics appropriate for source.
- *C 525S 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 1000S*: multiple pattern mic; 9Vdc, phantom-powered; pattern adjusts from cardioid to hypercardioid with PPC 1000 polar pattern converter; 200Ω unit with sensitivity of 6mV/Pa and 137dBspl for 0.5% THD.
Circle (520)

Allied Broadcast Equipment

- *Numark CD6020*: dual CD transport; 18-bit A/D conversion, 8× oversampling; separate or simultaneous operation with mixing.
Circle (527)

Alpha Video & Electronics/AVEC

- *NC-102*: telephone IFB system.
- *SW-206 IFB selector*: six XLR inputs with adjustable level control; includes cellular phones, 2-way radio, telco listen pairs; mic receptacle; switch for voice override; isolated outputs at mic and line levels.
Circle (531)

AMS/Calrec

- *ST250*: remotely controlled stereo mic; unit adjusts between X-Y, M-S stereo from end-fire to vertical operation; 20Hz-20kHz response; ac/dc powering.
Circle (541)

ATI Audio Technologies

- *SMDA200, SDA200*: stereo 1×4 modular DAs, with/without metering of L, R, sum signals; dipswitch selects stereo, sum, difference, L-only 1×8, R-only 1×8; single, full-slot stereo capability for DA-10000 series.
Circle (562)

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.
Circle (566)

Audio Services Corporation

- *PSC power supply*: universal unit for 12T, 48V phantom-powered mics.
Circle (1023)

Audio-Technica US

- *AT 877 shotgun mic*: 60Hz-14kHz with 350Ω output; -41.5dBm sensitivity; 12-48Vdc phantom, AA power; highly directional pattern, linear off-axis response.
- *Series 600*: studiotphones, oval earcup cavity for minimum standing waves, more natural sound; ATH609 40mm driver, 20Hz-20kHz; ATH611 44mm driver, 20Hz-23kHz; ATH610 closed back, 20Hz-22kHz.
- *PRO 22 mic*: close vocal, instrument mic; unidirectional pattern, 3-position output impedance switch; shielded cable for unbalanced hi-Z 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, AA 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.
Circle (569)

Auditronics

- *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.
Circle (572)

Barco Industries

- *EMT 981 CD player*: front loading system for mini, mornal CDs; universal cabinet for 19" rack mounting or desktop unit; line and digital outputs; 16-bit with 4× oversampling; integrates into automation system.
Circle (586)

Benchmark Media Systems

- *System-1000 enhancements*: 1201 input buffer/mixer; 1202 matrixed output module; 1203 gain control modules.
Circle (596)

beyerdynamic

- *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 elements.
- *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, MCE86, MCE5 or MCE10 mics for lavalier, hand-held interview, shotgun requirements in single attache case.
- *Model 32 audio station*: music library listening station; dual DT 220 stereo headphones; developed by Current Designs.
- *TG-X series*: high-output mics; neodymium rare earth magnet; transient response to 140dBspl; -180, -480 Macrolon diaphragm; -280, -580 Hostaphan diaphragm.

Nobody does it better



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, unequalled 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.

 **Vega**
a MARK IV company

• *SHM 20 mini mic*: podium unit; hypercardioid condenser; supplied with low-noise, low-profile matte black non-flex shaft.
Circle (598)

Clear-Com Intercoms

• *JCS-1000, -1500 Matrix Plus*: point-to-point intercom stations; 12-, 24-key stations; cost effective digital system; does not offer all features of ICS-2000.
• *Model 1021*: stereo monitor; fully amplified; IRU; front-panel mono-stereo switch.
Circle (663)

Denon

• *DN970FA CD cart player*: cues to present track of CD; dual 18-bit linear conversion, 20-bit filtering with 8x oversampling; ±10% variable speed, 0.5% steps; speed display.
Circle (716)

Digital Designs

• *LS6, LS161, LS261 speakers*: systems with 6.5" woofers, 1" polymer dome tweeters; rms power ratings 60W, 120W; music power ratings 100W, 200W; -161/-261 include attenuation switch in playback modes.
Circle (1456)

Gotham Audio

• *Audio+Design Tools*: PROPAKs interface high impedance analog units to low impedance professional equipment; PROBOXs interface different digital audio formats.
• *KM-131 mic*: Neumann instrument with AK 31 omnidirectional transducer; flat response frn 40Hz-20kHz.
Circle (805)

JBL Professional

• *Control 1 Plus*: personal monitor system; expanded bandwidth, extended bass, improved sensitivity; small size.
• *Control Series SB-1/-5*: subwoofer components; extend bass response, increase output with lower distortion; Triple Chamber Bandpass sub-bass technology.
• *SR series*: power amp; low feedback, distortion; SR615, 150W; SR6630, 300W; SR6500, 500W; SR6500 has high-frequency power supply for decreased weight, heating; 4Ω, 0.1% THD.
Circle (864)

Klark Teknik

• *MSR-604 mic splitter*: 4-channel unit; produces mic signal for two destinations; independent transformer isolation; remote gain features settings from local panel or house console phantom power switch.
• *Milab LC-25 mics*: cardioid condenser, full frequency response; LC-25LL cardioid condenser mic, line-level output; MP-30 pressure zone mic, 180° hemispherical pickup.
• *Milab mics*: D-37 dynamic studio instrument; VIP-50 studio vocal condenser with five pickup patterns; DC96B studio condenser for vocal, horns, piano; VM-44 small diaphragm cardioid condenser.
Circle (879)

McCurdy Radio Industries

• *CS-9500 intercom enhancements*: ISO-950 camera ISO software; CDP-100 camera delegate panel.
Circle (932)

Pivotelli/USA

• *Speaker supports*: discrete design for wall mounting; graphite-color finish.
Circle (1014)

R-Columbia Products

• *TR-160*: FM wireless intercom headphones; long range covers 1-2 miles with VHF, UHF models; 2-way operation.
Circle (1035)

Ramsa Audio/Panasonic

• *500 series*: speaker components; WS-A500 mid-high, WS-A550 low-frequency modules; full range, high output; acoustically inert enclosures.
Circle (1044)

ROH/Anchor Audio

• *192S-2D*: stereo audio monitor; time code monitor and Dorrough metering.
Circle (1057)

RTS Systems

• *Series 2100 wireless*: full-duplex to four portable stations per base unit; base units link for larger systems; 150-216MHz with selection of 10 frequencies; 2105 base station repeater, 2110 belt pack transceiver.
• *MRT 327 intercom station*: 2-channel component for TW intercoms; packaged arrangements as rack-mount/portable headset or speaker station or console mount station; call signal, "talk-off" feature.
• *MCE 325 user station*: programmable intercom in 4-channel modular design; component for TW Intercom; configurations for conference or dedicated line environments.

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 Alberta, Canada
ADAC Radio France
Alberta Studios England
ARD Television Germany
Aspect Ratio Los Angeles, CA
Bavaria Film Germany
BBC England
Blue Nile Recording Los Angeles, CA
BR-TV Germany
Canadian Broadcasting Quebec, Canada
Canal-Plus Television France
Castlesound Studios Scotland
CBS Television Los Angeles, CA
Centre Georges Pompidou Museum France
Commercial Pictures San Francisco, CA
Conway Studios Los Angeles, CA
Copra Film France
Cue Systems England
David Bowie Los Angeles, CA
David Holman Los Angeles, CA
Dierks Studios Germany
Digison Radio France
Dream Edit Newport, RI
EAG-Videp France
Elyson Radio France

Erolon France
Euromedia Television Production Holland
Focused Audio San Francisco, CA
FR3-TV France
Hank Smith Productions San Francisco, CA
Harbor Music New Orleans, LA
Hermandad Mexicana Nacional Los Angeles, CA
Hoi Line Studios Germany
Iggy Pop Los Angeles, CA
Integration Technologies Fort Worth, TX
Labeo-Films/Music France
Levin & Many Studios Los Angeles, CA
Lorimar Studios Los Angeles, CA
M6 Radio France
Midi Station Houston, TX
Milwaukee Sound Milwaukee, WI
Motley Crue Los Angeles, CA
Natalie Cole Los Angeles, CA
National Children's Theatre Minneapolis, MN
National Child Network Denmark
Nexus Productions New York, NY
Off Beat Studio Germany
Orinocco Studios England
Paramount Studios Los Angeles, CA
Pilot Studios Germany
Public Access Television Ontario, Canada
Renowned Sound Redwood City, CA
SAQ Thealer France
Silcom Services New York, NY
Sonic Perfection San Francisco, CA
Soundelux Los Angeles, CA
Spotwise Boston, MA
Star Truk Studios Ontario, Canada
Structured Dynamics Research England
Tech Arts San Francisco, CA
The Music Suite Wales
The Works Productions Alberta, Canada
Todd AO/Glen Glenn Los Angeles, CA
TruSound Films England
Twentieth Century Fox Los Angeles, CA
United Project San Francisco, CA
University of Arizona Tucson, AZ
Video 22 England
Westdeutscher Radio Germany
World Trade Los Angeles, CA
ZDF Television Germany
Zoetrope Films San Francisco, CA

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

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Honey I Shrank the Kids
The Fabulous Baker Boys
Steel Magnolias
Colors
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And God Made Woman
Camille Claudel
The Life and Times of Marco Polo
A World Without Pity
Chopin's Les Nocturnes
War of the Worlds
The Cosby Show
ABC Movie of the Week
Tattingers
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.



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AMS Industries Inc
1180 Holm Road, Suite C, Petaluma, CA 94954, USA
Tel: (707) 762 4840 Fax: (707) 762 4811

• *Series 2200 wireless cue*: 1-way communications to multiple receivers; 62-76MHz band with eight frequencies; 2205 base transmitter; 2210 belt-pack transceiver. **Circle (1066)**

Samson Technologies

• *CMT-1 conference mic*: Crown International 6-RB boundary mic, wireless transmitter and receiver; operating distance 300-1,000 feet; 14-channel; 9Vdc operation; receiver uses 110Vac.

• *UHF series*: wireless system; belt-pack lavalier or handheld mic transmitters with dbx noise reduction; UR-4 true diversity rack-mount receiver with cavity tuning and dielectric filtering. **Circle (1069)**

Sanken/Audio Intervisual Design

• *COS-11 lavalier*: Sanken, NHK ultra-miniature; 40-12,000Hz with 94dB dynamic range; measures 4mmx16.1mm; integral metal grill; metal mesh windscreen accentuates high-frequency response. **Circle (1071)**

Sennheiser Electric

• *HD-25 headphones*: studio monitor set; dynamic drivers in closed supraural design; split headband adjusts; single cable; one muff rotates off ear for single muff use.

• *HD-450 studio headphones*: supraural Open-Aire design; high-Z with neodymium ferrous magnets; 10-foot cable, 1/4" stereo phone plug; all field-replaceable parts.

• *MKH70 P48 mic*: condenser shotgun; symmetrical push-pull transducer with minimum intermodulation distortion and enhanced headroom; 10dB pad allows operation 124dBspl.

• *MKH60 short shotgun*: transformerless, symmetrical push-pull transducer, optimum resistive loading; ultra-linear response; 135dBspl; 50Hz-20kHz response; 40mV/Pa sensitivity. **Circle (1084)**

Shure Brothers

• *L2 hand-held transmitter*: SM58 dynamic element, SM96 condenser element or Beta58 element; changeable heads; 12-hr operation on 9Vdc alkaline, lithium battery.

• *Model VP88*: M-S stereo condenser; single-point unit; coincident cartridges and matrix produces M-S/L-R outputs; on-board battery; Y-splitter converts 5-pin output to XLR.

• *Wireless mics*: LS24/58, LS24/96, LS24/Beta 58 hand-held units; SM58, SM96, Beta58 capsules; MARCAD diversity receiver. **Circle (1089)**

Stanton Magnetics

• *Model 890AL*: back-cue phono cartridge; extra stylus; tracks 2-7gr.

• *Headphones*: 45M/MC with unidirectional mic for DJ, studio, announcer; ST-10 using closed-back dual-driver design titanium diaphragm of rare earth magnetic materials. **Circle (1118)**

Studer ReVox

• *A-723*: active studio monitor system.

• *A-729*: CD player system controller; operates multiple players. **Circle (1127)**

Studio Technologies

• *IFB system*: production intercom. **Circle (1128)**

Systems Wireless Ltd

• *Clear-Com intercom*: Matrix Plus digital 50x50 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-677 transmitter, R-662 true diversity receiver, in UHF channels.

• *Lectrosonics wireless*: CR-185 compact receiver and M-185 body pack or H-185 plug-on transmitters. **Circle (1138)**

Tannoy North America

• *Audio monitors*: AVM-DMT shielded, high resolution A/V reference monitor; PBM-6.5/8 playback monitors; NFM-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 (1163)**

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-signaling; 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; TR-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 mics; 4-pole resonator for selectivity; GaAs FET RF amplifier; Dynex III pre-emphasis, de-emphasis processor.

• *T-89 hand-held wireless*: E-VN/DYMN/D857 dynamic element with Vega Pro Plus transmitter; concert applications with cardioid pattern, extended response, low handling noise; dipole antenna.

• *UHF 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.

• *Q-Plus 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

• *M7884/M7885*: communications terminals for WBS MicroCOM II; enhanced software extends power of the intercom system. **Circle (1239)**

Wheatstone Broadcast Group

• *Intercom*: station communication system. **Circle (1248)**

Whirlwind

• *MICPOWER phantom supply*: portable

power unit delivers 12-18Vdc from two 9V batteries; operates 50 hours to 4mA load.

• *Line balancer*: isolates, splits, balances line level signals; XLR, 1/4" TRS jacks for input; male XLR output; transformer isolated 2nd output. **Circle (1250)**

Wolf Coach

• *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

• *MS60S*: powered 2-way speaker; 8-inch low-frequency, bullet-type high-frequency; Yamaha Active Servo Technology; two mic/line, one line 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 stereo recorder*: direct-to-optical disk unit with editor; rewritable optical disk for 650Mbytes sampled 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 backtiming; 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 720Mbyte disk for 60 minutes stereo.

• *DISC interface*: digital integrated storage, control; senses signal from satellite feed and initiates specified event, then rejoins satellite source; instant access for more than 500 spots; replaces cart machines.

• *PL-1 Pilot-Lok*: phase-linear filter by Somich 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 M.I.C.E.*: Multiple Interface Control Element; mute switching with MIDI. **Circle (536)**



In The Category Of "Innovative Broadcast Facilities," These Are The Nominees.

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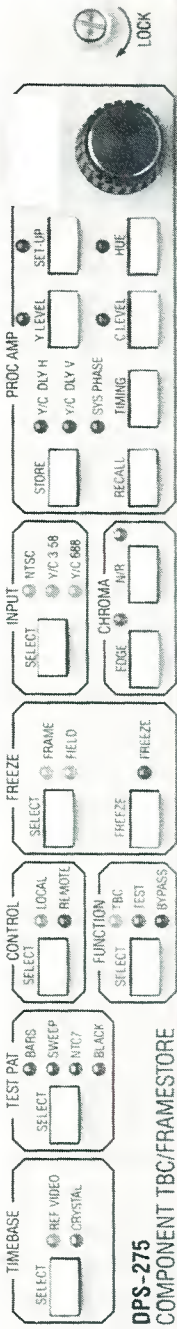
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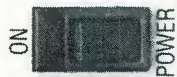
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Brüel & Kjær Instruments/Pro Audio

- *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 128x 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.
- *Sound Tools*: Atari digital recorder, editor; 2-track CD-quality with 56001 DSP processor; 44.1kHz samples for 30 minutes stereo on 300Mbyte drive; full edit capability. Circle (1498)

Digital Audio Research

- *WORDFIT*: auto dialogue synchronizer.
- *SoundStation II*: enhanced multichannel digital audio recorder, editor; optical disk for 2-hour rewriteable storage as removable 650MByte 5¼" magneto-optical cartridge; multidrive possible. Circle (724)

Digital Audio Technologies SA

- *Stellavox Stelladat*: 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)

Digital Dynamics

- *ProDisk-464 software*: waveform editing; retrofit provided for existing systems; simplified editing, reinforced high-quality scrubbing function. Circle (726)

Dolby Labs

- *DP501, DP502*: digital encode, decode; 2-channel, 128 kb/s per channel; encodes digital audio prior to storage, transmission. Circle (733)

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)

Gotham Audio

- *PRODAT*: upgrade package turns consumer R-DAT machine into a professional, rack-mount unit.
- *BW 102/50*: Harmonia Mundi Acustica sampling frequency synthesizer; A/V synchronization without sampling frequency conversions; for SDIFF-2, PRODIGI, JVC, AES/EBU, F1, S/PDIF formats.
- *HMA BA-102*: modular digital broadcast system; source-to-telco lines processing in digital domain.
- *Ferroglyph 9500*: 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-LC900U controller*: digital processor for recording; limiting, compression, noise gate, level control, parametric EQ; FIR, IIR filters; RS-232C serial port PC control. Circle (868)

Klark Teknik

- *DN775 preview delay*: for stereo mastering preview purposes; 2x2 matrix; 0-5.55sec 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; 29 slider pages; user-defined SysEx strings; hardware changes.
- *OPUS automation*: full control of knobs, switches; absolute, trim updates; auto-takeover, auto-release; 99-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; graphic 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 (989)

Radio Systems

- *RS-2000*: audiocart system; flutter compensation, phase correction, front-panel azimuth adjustment; available in mono, stereo; 1/3-rack size; R/P, play-only models with 3-tone, fast-forward, splice-finder. Circle (1041)

Circle (51) on Reply Card



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PHILIPS

Circle (52) on Reply Card

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Ramsa Audio/Panasonic

- *SV-3700 Pro-DAT*: digital recorder; front-panel shuttle wheel to 0.5x-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; keyboard entry of ID, PNO; shuttle wheel.
 - *SV-255 portable*: R-DAT recorder; 128dB EIN S/N; 87dB+ dynamic range; dual channel mono mode; MASH A/D converters; 64x oversampled; 18dB/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; assemble digital sound tracks with music, dialogue, effects from tablet, wireless stylus.
- Circle (1100)

Solidyne

- *Audicom ADX-900 editor*: PC-based recorder, editor; 60Mbyte 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-8000 sound processor*: control 4-channel PCM audio from DVTR; snapshot storage of EQ, dynamics, delays per channel; interface to BVE-9000 editor controls audio-follow; presets; optional 32x16 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; 64x oversampling.
- Circle (1104)

Soundmaster International

- *Soundmaster upgrades*: Professional Librarian, Sound Supervisor, Spotmaker, 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; VPR3 emulation; full system sync with SMPTE, MIDI; random-access record, playback.
- Circle (1126)

Symetrix

- *DPR-100 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-30 DAT*: stereo ATR; Delta-Sigma modulation in A/D, 64x oversampled; 18-bit with 8x oversampled D/A converters for 94dB S/N; 32kHz, 44.1kHz, 48kHz sampling.
- Circle (1146)

360 Systems

- *DigiCart*: digital cart system; 16-bit sampled audio, instant cues; 20 30-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 80386 PCs; 56K-PC 16-bit card with Motorola DSP56001 signal processor; 56K-D interface to AES, EBU, SPDIF; A/D converter; SoundState 2 edit software.
- Circle (1489)

WaveFrame Corporation

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

Yamaha

- *DMR8*: 8-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.
 - *DDL3 audio delay*: 3-input, 3-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, D/A Delta-Sigma conversion.
 - *AD2X A/D converter*: 2-channel A/D conversion with Delta-Sigma A/D converter, 110dB dynamic range; 19-bit resolution with THD to 0.018% from "digital floating" concept; 48kHz, 44.1kHz sampling.
 - *FMC2 interface*: direct-digital audio link between D-2 VTRs and Yamaha DMP7D digital mixing processor; 8-input capacity using AES/EBU format.
- Circle (1259)

RF Products

R1: Transmission

- ◆ Antennas, masts, towers
- ◆ Transmission line
- ◆ Remote control, telemetry

Acrodyne Industries

- *TRU/25KV transmitter*: 25kW UHF transmitter; solid-state driver has single Thomson TH-563 tetrode in combined amplification; system efficiency approximately 54%; linearity permits decreased precorrection.
- Circle (509)

Allen Osborne Associates

- *Hilomast products*: telescopic portable masts; several series include pneumatic, 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 NXC units; hand-held or fixed mount; 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 beamtilt per application.

- *ALPine series*: models to 20kW; higher power feed systems of Andrew Helix cable; full environmental protection; profile for low windloading; CP options, LPTV models.
 - *RADIAX CATVR coax*: riser-rated, fire-retardant slotted cable per NEC code; for installation in buildings without use of ducts, plenums or other air-handling spaces; ½" to 1½"; 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.
 - *SCL semi-flexible coax*: cable for LF, MF, HF frequencies to 30MHz and powers to 500kW; 38", flanged segments of 7", 8", 9" diameters; solar reflective paint avoids sunshields; permits short radius "S" bends.
 - *CATVR HELIAX coax*: NEC riser-rated, fire-retardant cable; ¾"-1½" foam, ½"-2¼" air types; superflexible foam in ¼" and ½"; 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 delay precorrection.
 - *NS series amplifiers*: cavities with integral circulator, RF load; modular; full telemetry 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 pressurization dehydrators; 0.7 and 0.58SCFM ratings; pressure swing drying system.
- Circle (631)

Catel Telecommunications

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

Comad Communications/SIRA s.r.l.

- *SIRA UTV-7-08*: UHF panel TV receiving antennas; H and V polarization; narrow-beam, high gain, low side lobe to aid in rejection of interference.
- Circle (671)

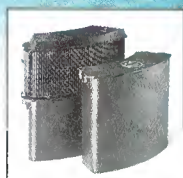
Comark Communications/Thomson

- *Air-cooled systems*: UHF TV transmitters to 240kW; based on Varian/Eimac Klystrode or EEV IOT devices; avoids costs of water pumps, plumbing, heat exchangers.
 - *Advanced SK series*: UHF transmitters; PA uses EEV inductive output tubes (IOT), similar to Eimac Klystrodes; power levels to 70kW per tube; water or air cooled, diplexed 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 (694)

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Circle (53) on Reply Card

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Crouse-Kimzey Company

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

Delta Electronics

- *TCT-XHV*: super high-voltage toroidal current transformers. Circle (715)

Dielectric Communications

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

Electronic Research

- *SMA-104 surveillance system*: uses SAM workstation, interfaces, sensors to monitor operation of antenna, combiner system; with alarms, reports 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 at studio; programmed via spreadsheet for logging; alarms, auto control; communications link made through telco, subcarrier, UHF radio. Circle (814)

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 repairable, 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 EEV, Philips, Varian; 120kW, 180kW, 240kW models.
- *Wavestar 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 MW 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 VL 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 lower 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)

Jampro Antennas

- *JBBP-FM antenna*: twisted-Z antenna design for FM broadcast; $1\frac{5}{8}$ " elements create 73-lb windload; omnidirectional characteristics; multistation system; 10MHz carrier separation without compromising performance. Circle (863)

Jaymen Broadcast

- *JBSS solid-state transmitters*: 2W exciter; amplifiers rated 100W, 2kW, 10kW, 55kW; UHF or VHF operation; redundant modular PA design; available for 216-460MHz international frequency assignments. Circle (1437)

LDL 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 (889)

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 TFT-7900 transmitter controller; various versions includes 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 470-1090MHz frequency range; VSWR $< 1.05:1$ over specific channel; handles 280kW to 900kW peak; flexible permissible in E or H plane axis.
- *Calorimeter*: usable with any water load; digital thermometer with analog flowmeter; iron constantan thermocouple sensor; calculates input-output water temperature differential; readout to 0.1°C .
- *UFHLPTV combiner*: for four UHF channels with minimum 2-channel spacing; interdigital filter for 1.0dB insertion loss and $< 1.15:1$ VSWR; >25 dB isolation; covers 470-800MHz.
- *Waveguide 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, 50dB isolation. Circle (940)

Midwest Communications

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

MYAT

- *Transmission line*: $9\frac{3}{16}$ " diameter line and associated components; Teflon crosspins; designed to avoid line burnout caused by environmentally caused motion of the line. Circle (911)

Nautel

- *AMPFET series*: ND1, ND25, ND50 solid-state AM transmitters; NRSC-2 compliant; 1kW and 25kW upgradable to 50kW; distortion $< 0.5\%$, response ± 0.25 dB; 80% efficient; on-air serviceability. Circle (964)

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 (965)

Potomac Instruments

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

QEI

- *BTT-500*: exciter/transmitter in $10\frac{1}{2}$ " of 19" rack; FET PA produces 10W to 600W; full remote control; replaces of IPA in older FM transmitters. Circle (1028)

Rohde & Schwarz

- *NU-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 (1058)

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)



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Automatically.

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

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*Generates SMPTE, EBU Time Code.

Circle (56) on Reply Card

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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-501 1kW, F-550 5kW, F-710 10kW, F-712 12kW; A-710 AM transmitter, 10kW. Circle (1094)

Stainless/SG 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 920*: 84" face tower; design capable of heights to 1,500 feet. Circle (1206)

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; 6-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/VO, HMD32HO/VO models; 16dBi, 17dBi gain respectively with 1.25:1 VSWR; wideband versions available; HO horizontal, VO vertical polarizations; radome enclosure; 1/8" 50Ω for Heliac, 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 200kHz. Circle (597)

Broadcast Microwave Service/BMS

- *BMT-2GP*: transmitters operating in 2GHz, 2.5GHz bands; 30-channel, frequency-agile. Circle (612)

Combant Technologies

- *Wireless cable antennas*: MMDS, ITFS models from 12dBi to 27dBi; 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, MMDS, OFS channels are received by different antennas. Circle (673)

COMWAVE/Communication Microwave

- *SBM1-8*: 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, MMDS, ITFS services; MOV lightning, surge protection.
- *QL-1015*: 31-channel wireless cable down-converter 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

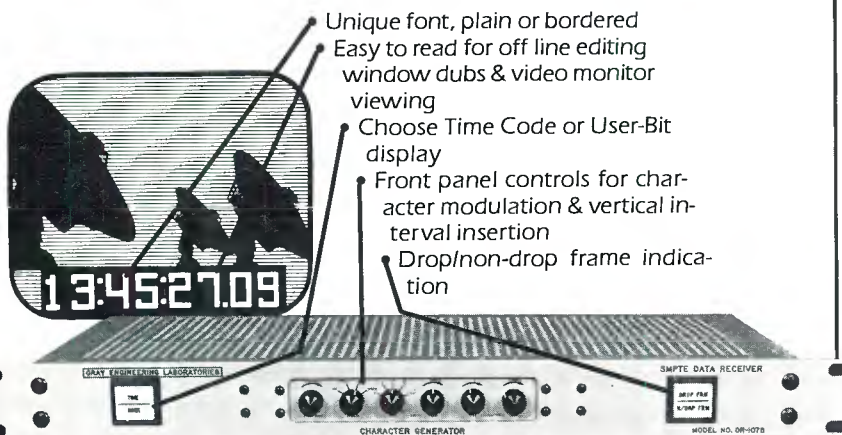
- *TTS 100MC*: internally multiplexed wireless cable transmitter; audio, video inputs for 12 channels; output at 2.5-2.59GHz band with 1W/channel. Circle (758)

Ikegami Electronics (USA)

- *PTR-1 tracking microwave*: for mounting on HL-53, -55, -55A, -95 cameras; auto-tracking permits freedom in camera maneuverability during live relay production; use with bidirectional transmitter, receiver units. Circle (838)

SMPTE/EBU Time Code Reader & Character Generator

Model DR-107B



- Superior code reading using "The McFadin Window®"
- Reads 1/100 to 100 times play speed (machine dependent)
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ITS/Information Transmission

• *ITS-1640D transmitter*: 31-channel frequency-agile unit rated 20W; ITS-1694D 4-channel combiner; remote backup switching option. Circle (860)

M/A-COM MAC

• *MA-23CX broadcast system*: RS-250B spec for 525/625-line video, three plug-in subcarrier modules; 21.2-23.6GHz spectrum; 10 mile range with 2', 4', 6' antennas; simplex, duplex four channels to one antenna. Circle (916)

Mark Antennas/Radiation Systems

• *Heated parabolic*: microwave grid antennas; heating cable attaches to grid rib elements; activated by de-icing controller in

temperature range of 25°F-35°F; 4-15 foot diameters for 335-2,700MHz range. Circle (914)

Marti Electronics

• *Model PA-48*: full parabolic reflector; 940-960MHz operation; 4' diameter with 19.0dBi gain at 950MHz; 50Ω, 1.3:1 VSWR; 1/2-power beam width 16°; 100 W maximum. Circle (925)

Microwave Networks

• *MicroNet 18*: video radio; simplex, duplex; three 15kHz audio subcarriers; T1 on video subcarrier option; all RF components in one enclosure, uses one antenna; interface for 15GHz, 23GHz systems.

• *4DS1/8DS1 terminal*: permits low, medium

capacity transmission of T1 circuits in short distance communications links; adapts to video radio in 15GHz, 18GHz, 23GHz bands. Circle (1462)

Microwave Radio

• *Troll site controllers*: master, local/slave, slave ENG site systems; TS-900 master has graphic operator interface; TS-950S, -950SL support NavTrack helicopter tracker.

• *API-xxx antenna interface*: control of ENG antenna pedestals, site peripherals; replacement unit on various brands, models of antenna pedestals; by Troll Technology. Circle (945)

Mobile-Cam Products

• *EasyLink control*: TMD microwave pan/tilt unit for ENG microwave antennas; 370° rotation, 45° elevation; auto stow; µP control. Circle (950)

Narda Microwave/Loral

• *8820 SMARTS detector*: 2-18GHz detection; audible, visual, TTL alarm options; field replaceable elements; surface-mounted radiation threshold sensor monitors non-ionizing radiation with thermocouples. Circle (962)

QEI

• *CAT-LINK*: digital STL/TSL for BTSC TV, FM; aux channels for PRO, SAP baseband; configured for T1 modems, carries BTSC digitally on standard subchannel above video; 24-bit, encoding causes no delay. Circle (1028)

RF Technology

• *Pathfinder*: central receive antenna for medium-haul ENG; offset feed, semi-parabolic for low sidelobes; 2-2.5GHz; pan table, radome, integral LNA, junction box and local, optional remote control.

• *RF-QUADSCAN*: central receiver horn; with dual, quad polarization, high gain; low-profile horn elements.

• *RF-03C series*: miniature portable units; 1.7-13.25GHz; frequency-agile, dual audio (mic, line), high transmitter outputs; 12Vdc or 115/230Vac operation. Circle (1053)

Rockwell International

• *DML-3X50 integrated shelf*: permits mix of digital multiplex, lightwave communications modules in one rack for reduced cost. Circle (1056)

Scala Electronics

• *Gabriel grid parabolic*: ITFS, MMDS, STL, ICR antennas; 4' to 12' diameters from 950MHz to 2.7GHz; 6-wire control; accurate within 4° of true position. Circle (1074)

TFT Inc.

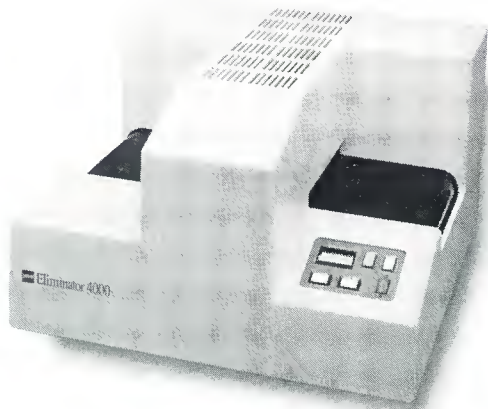
• *Model 9000*: composite aural STL transmitter; meets FCC July '90 rules; improves audio quality on older receivers; 82dB S/N, 0.05% THD and 60dB stereo separation; 7.5W.

• *Model 8900 Reciter*: STL receiver with FM exciter using IF interface; extends signals to areas experiencing poor reception from the main transmitter. Circle (1171)

Troll Technology

• *API-xxx antenna interface*: local controller

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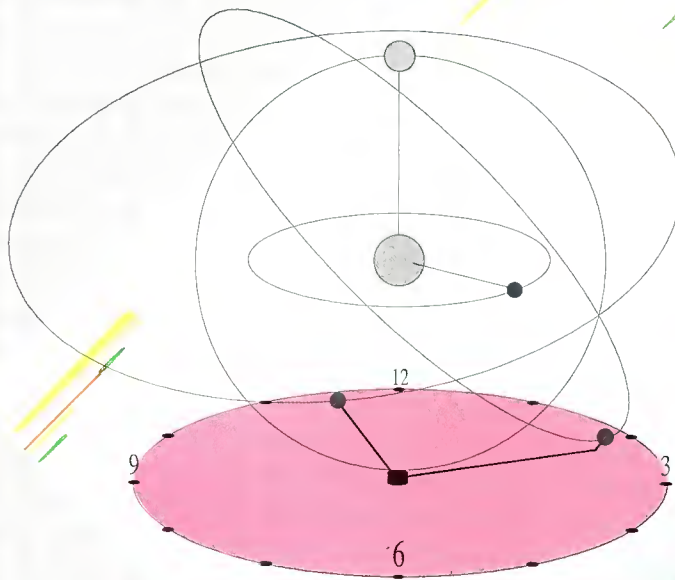


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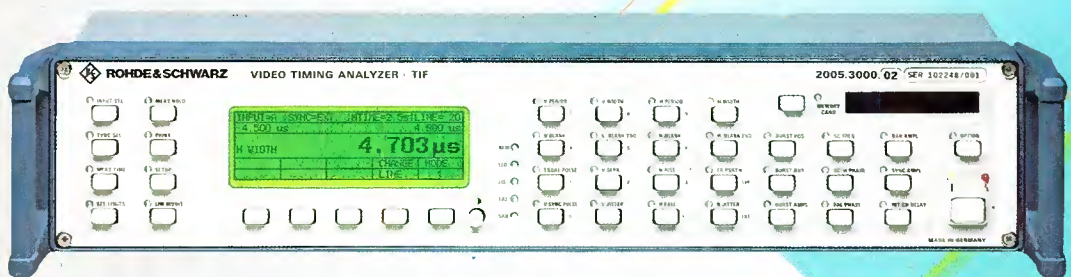
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for ENG antenna pedestal, site peripherals.

- *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-950S, -950SL 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

EEV

- *IOT7360*: 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.
- *KSC3360, KSC3371*: 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/5 klystron*: 5-stage depressed collector, 1.3 figure-of-merit; ABC design, 12MHz bandwidth, operations to 960MHz; improved linearity for less precorrection.
- *YK1267 klystron*: ABC visual PA device for UHF service; 70kW over 470-860MHz band; 65% efficiency, modulation circuit dependent; air-cooled system; companion YK1221 klystron for aural service.

Circle (1008)

Thomson Tubes Electroniques

- *TH 537 tetrode*: 350kW for long-, medium-wave service, 300kW at short-wave.
- *TH 563 tetrode*: for UHF TV service; 35kW separate, 25kW multiplexed visual/aural operation; Pyrobloc grids, Hypervapotron cooling.
- *TH 343 tube, cavity*: 25kW in FM broadcast service; coaxial metal-ceramic tetrode; 17dB gain operates to 120MHz; TH 18230G circuit uses device in ground-grid mode without neutralization.
- *TH 558 tetrode*: 600kW device for LW, MW.

Circle (1189)

Varian Microwave Division

- *2KDX60LA/LF 60kW Klystrode*: air-cooled device for 60kW, 120kW, 240kW UHF transmitters; link systems; 6-, 12-, 24- channel tuning from 58-6.425GHz.

Circle (1211)

R4: Reception

- ◆ Demods, receivers
- ◆ Modulation monitors

Belar Electronics Lab

- *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)

Boonton Electronics

- *Model 8220*: modulation meter for 0.01-1.3GHz range; to 500kHz FM deviation, 99% AM, 0-500 rad; -27dB to 19dB level; modulation displayed as ratio or level; IEEE-488 interface; rms, peak.

Circle (606)

Delco Electronics

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

Circle (1454)

Delta Electronics

- *Antenna amplifier*: avoids loading of an antenna from an attached 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)

Philips Consumer Electronics

- *FR50, FR60, FR70*: AM/FM receivers comply to NRSC standards; tunes 520-1,710kHz; 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 CCD Y/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 whine from monitors.

Circle (1039)

Videotek

- *DM-141S 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

- *FM 30G*: high-performance FM exciter.

Circle (647)

Inovonics

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

Circle (848)

ITS/Information Transmission

- *ITS-20A*: exciter-modulator retrofit; 3W visual, 3W aural to drive UHF TV transmitters; ready for stereo, SAP, PRO channels.

Circle (860)

QEI

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

Circle (1028)



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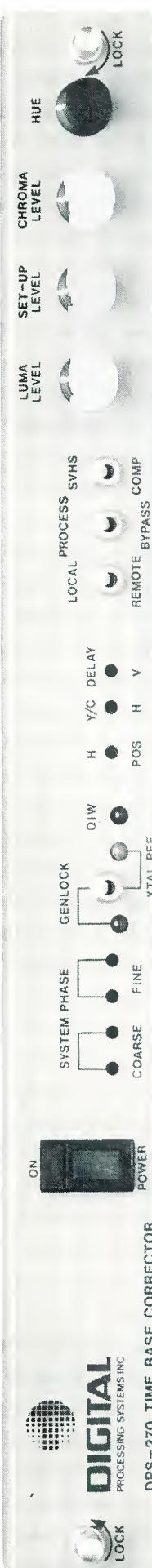
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Radio Design Labs

•NRSC-PR, NRSC-FL: "NRSC Stick-On" modules; -PR device introduces pre-emphasis between compressor, limiter; -FL controls "stop-band" emission between limiter, transmitter input.
Circle (1039)

R6: Satellite

- ◆ Antennas, electronics
- ◆ SNV systems

Advent Communications

•AVC27XX range: satellite communication up/downconverters; for Lynx SNG vehicles, Mantis 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.
•Mantis 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 Corporation

•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 positioning; multi-user to five terminals or PC consoles; context sensitive help; 16 receivers, two antennas, support equipment.
•1.8m Fly-Away: 8-segment FlashPac 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 R/T 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 (543)

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

•450-D, 450-C: satellite news vehicles with 6- and 4-camera production capability; -D, 32"; -C, 29".
Circle (583)

Comtech Antenna

•2.4m antenna: Ku-band transmit, receive; 2.4m diameter; available with or without EC-6 μ-based controller.
Circle (686)

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 feed; high aperture efficiency of 65% at C-/Ku-band operation.
Circle (834)

ISS Engineering

•Series III modulator: frequency-agile from channel 2 through CATV channel WW; audio subcarrier phase-locks to crystal for inter-carrier stability; RS-232 remote; MPX stereo, standard audio; ±offsets without IF change.
•GL1000A demods: frequency-agile unit; programmable memory with last channel recall, "lockout" feature; tunes all VHF, UHF, STD/HRC CATV channels; 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 descrambler.
Circle (858)

Keltec Florida

•K40-50CJ amplifier: HPA rated 65W 5.9-6.4GHz C-band, 70W 7.9-8.4GHz X-band, 48W 14-14.5GHz Ku-band; N output connector; environmentally sealed; remote control.
Circle (1457)

Microdyne

•CSD-BQR-1 receiver: meets 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.
•CSD-SR 1 receiver: CATV, SMATV; C-, Ku-band with vertical, horizontal polarization; clamped, unclamped scrambled video; two tunable audio channels.
Circle (941)

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.
•7530 receiver: four L-band inputs for C-, Ku-band reception; RS-250C spec unit offers six IF filters for bandwidths of different transponders; full-, 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

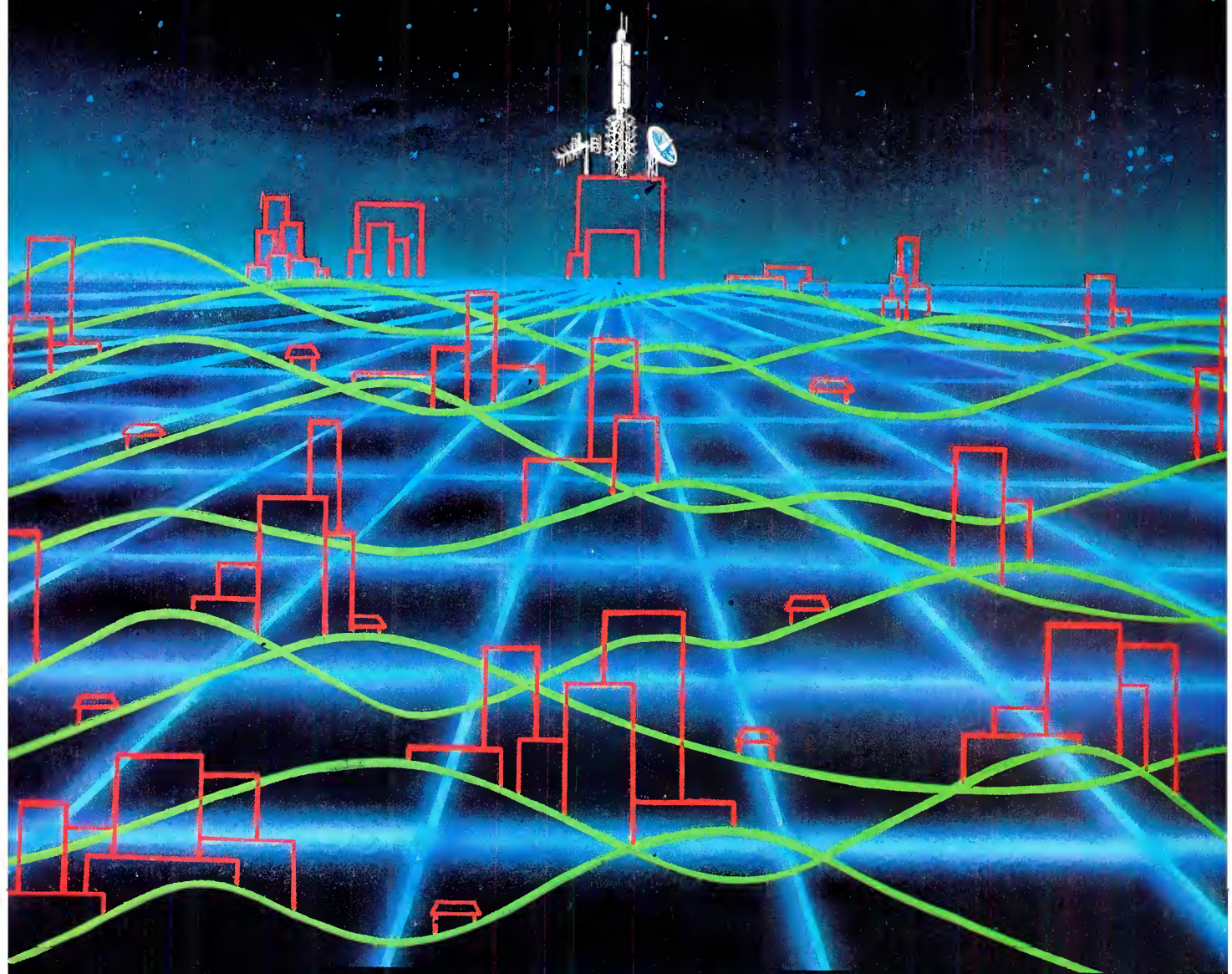
•HP TWT devices: products supporting 6GHz, 13GHz and 30GHz uplink systems.
Circle (1090)

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



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polarity, subcarrier frequencies.

• *CRC850 remote*: controls MT830 Agile Omni receiver; CP control of all satellite format functions in receiver; CRC includes video, audio level adjust, custom alarms, signal level readings, three subcarrier demods.
Circle (1117)

Thomson Tubes Electroniques

• *TH 2456*: 14GHz HPA klystron; 3kW output at saturation; instantaneous bandwidth of 85MHz; servo tuning of six or 12 preset channels, per model.
Circle (1189)

Wegener Communications

• *ProSwitch Channel Inserter*: for cross-channel promotions cable systems; Network Communications, Control for local commercial insertion in national cable networks.
Circle (1246)

Support Products

S1: Automation

- ◆Hardware, software
- ◆Business, program
- ◆Newsroom, equipment
- ◆Clocks, timers
- ◆Data transmission

ADx Systems

• *ADx-10*: "smart machine" controller; operates on time code.
Circle (516)

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.
Circle (1488)

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.
Circle (521)

American Lightwave Systems

• *LC series*: Lightwave Compact fiber-optic transmission systems; single, multimode fibers; for NTSC, PAL, SECAM; 67dB S/N with audio meets RS-250B over 15.5-mile links; two audio subcarrier capability.
Circle (537)

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; precue feature.
Circle (539)

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.
Circle (1492)

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.
Circle (578)

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 laptops; use as a field extension of the newsroom system.
• *PC NewsDesk*: single-, multi-user configurations of news wire service; for radio, TV stations.
Circle (588)

Beaveronics

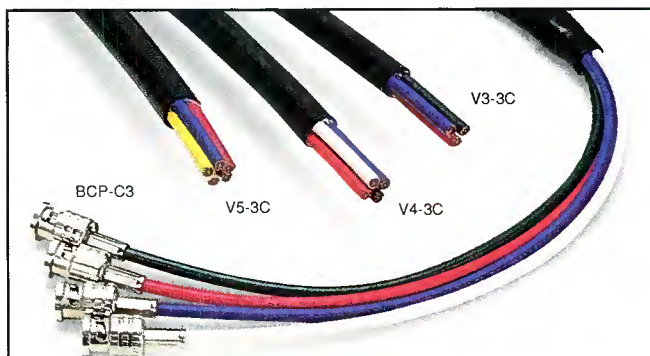
• *Station, studio clocks*: QMS series from Favaq & Bosshard; Master Clocks.
Circle (590)

Broadcast Automation

• *Personality Control Center*: changes liner, promo carts as satellite music service changes announcer; makes an automated station sound "live."
Circle (613)

Broadcast Yellow Pages

• *Directory*: telephone, data about broadcast industry; green pages for U.S., Canadian area codes; white pages for ad-



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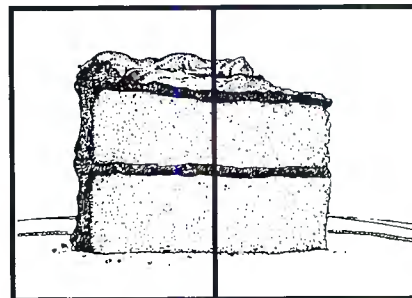
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dresses, telco numbers; yellow pages of vendors, services.
Circle (621)

Burk Technology

• *Remote control enhancements*: CI-8, CI-16 computer interfaces for TC-8, ARC-16 remote control system; options for TC-8, ARC-16 include dialup features.
Circle (629)

Calculated Industries

• *Time code calculators*: Frame Master Plus; shirt-pocket units calculate H:M:S, frames, 30 non-drop, 30 drop-frame formats; also provides 24-25fps PAL/SECAM, 16/35mm film, custom frame rates.
Circle (633)

Cam-Lok

• *Cam-Lok 200 Amp*: Posi-Lok sequenced distribution power panel; 200A service in 3½"×11"; per NEC specs, polarized shells to prevent potentially disastrous mismating.
Circle (635)

CBSI Custom Business Systems

• *IAS software*: interactive accounting integrates multistation or multidivisional operations with centralized control of some portions, decentralization of others; complete broadcast business accounting.
Circle (646)

Century 21 Programming

• *Digital music system*: system includes two Sony CDK-006 CD changers, cables, Auto-Faders, on-air studio software with interface

cards (computer, commercial players, Scheduler software extra).
Circle (651)

Channematic

• *ECU-400A editor control*: 4-VTR sync roll control; 1000-event EDL; mixed time code formats; RS-422 machine control; NTSC, PAL with 4-, 8-field color; three GPI ports.

• *Adcart CCU-202A*: channel control unit; for one VCR per channel using run of system or operate two VCRs on two channels.

• *ECU-300A edit control*: 3-VTR A/B roll, with mixed machine types; 250-event EDL; TC generator; auto assemble by TC, CTL reference; insert, assemble; serial interface.

• *CARE*: Channematic Automated Recorder Editor; 2-9 VCR capacity; SMPTE/EBU time code; 3,000-event EDL; generates spot tapes for ad insertion playback; supports serial, parallel interfacing.

• *ECU-600A editor control*: 6-VTR sync roll; 2,000-event EDL; mixed time code formats; RS-422 machine control; NTSC, PAL with 4-, 8-field color; six GPI ports; slow motion, learn, replay, fit-fill; serial switcher.

• *Adcart SCU-2A*: enhanced control for random access ad insertion; monitoring generates remote error, system status report; parallel printer.
Circle (653)

Clark & Associates Ltd

• *DBUS automation*: dedicated computer automation and control; each CU-188 control computer includes 11 interface cards for equipment operation of 11 devices in EDAAS system; can be locked to SMPTE time

code operation.

• *EDAAS automation*: extendable distributed architecture; 1 to 200 automated functions, buses; Ethernetlinks workstation, EBUS computer, interface and monitor.
Circle (1485)

Columbine Systems

• *Concept/2000 unified system*: software serves administrative, business, sales, news; overall station integration of automation on IBM AS/4000 computer.
Circle (670)

COMLUX

• *Models 3581, -82*: 780Mb/s optical terminal, sends eight video channels per fiber; 29dB optical span of 50km separates units.
Circle (674)

Commodore Business Machines

• *Amiga A2500/30*: personal computer, DOS compatible; A232 7-port serial card for RS-232 independent, simultaneous port operation at 19.2kbaud.

• *A2630 package*: 68030 accelerator, 68882 math coprocessor, 68851 memory management; 2Mbyte 32-bit memory, expands to 4Mbyte; enhances 3-D modeling.

• *A2091, 2091-40*: Amiga autoboot hard disk controller, 2Mbyte memory expansion; SCSI interface; space for 3.5" hard disk; -40 with 40Mbyte SCSI hard disk.
Circle (675)

Computer Concepts

• *CMS package*: Commercial Management System; PC-based, combines digital audio

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Western Engineers—
be sure to attend these sessions at the Western Regional Broadcast Convention, July 14-17

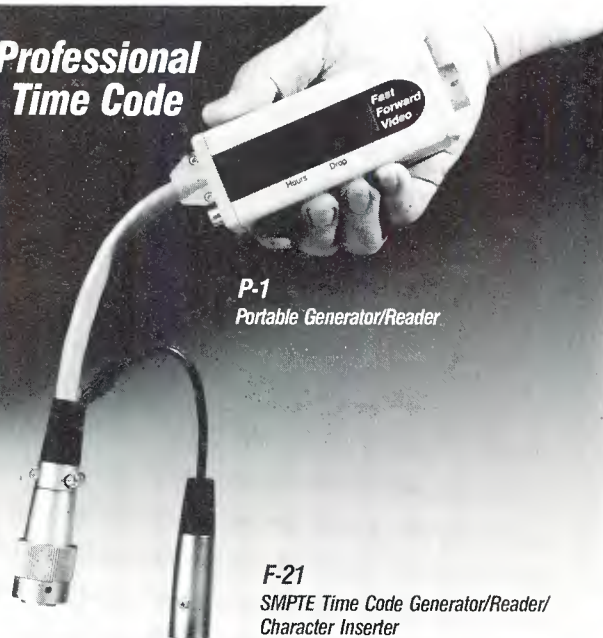
- ✓ Audio Processing
- ✓ Testing and Implementation of HDTV, including an IDTV demonstration
- ✓ FCC rules, applications, upgrades from FCC personnel
- ✓ The Future of EBS
- ✓ Digital Audio via Satellite and Cable

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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 avails. Circle (708)

Decision

- *Broadcast System III*: broadcast computer applications on IBM RISC System/6000; UNIX with LAN, wide area networks, multi-user. Circle (713)

Dynatech NewStar

- *PC Laptop PCLT system*: software for electronic newsroom; runs on Toshiba portable, Compaq LTE PCs; requires NewStar software release V4.31.
- *NewStar PC Tutorial*: software for PC/AT, hard disk and color monitor; instruction for NewStar basics. Circle (742)

EEG Enterprises

- *Data network*: high-speed, 9.6kbaud data service uses one VBI line; forward error correction; EN512 data inserter, TE511 data bridge; DD430 video data 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 on-line CDs; trigger for DAT, CART ID, advertisements; prints logs. Circle (796)

Grass Valley Group

- *E series codec*: permits full motion video, voice, data on single circuit; optional four T1, RS-232C data channels on one DS3 circuit; integrates to fiber optics networks. Circle (807)

GTE Spacenet

- *News Express Voice*: improved communications; rugged for mobile operation; voice terminal access public switched telco network over three GTE satellites. Circle (811)

IGM Communications

- *JGM-MC controller*: PC-based radio automation; 12-channel switcher, RS-232 proto-

col; 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 station 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 switchers or matrix router.
- *Mini T-IR controller*: event control with 5-input A/V switcher; four VTR control outputs; 64-event; automated playback, recording, channel blackout; permits titler video page control. Circle (1447)

Leitch Video

- *UDT-5700*: 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-250C spec. Circle (916)

Matco Mfg & Test

- *MA-201 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

- *PROtec*: PC-based programmable, remote control for equipment used with T.E.N. newsroom automation. Circle (935)

Media Touch Systems

- *OmniPLAY automation*: syndicated programming system with production library and broadcast multi-CD playback; complete control via Media Touch touch-screen. Circle (937)

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, TaskMaster20 software; extended I/O option to 32 status channels, subsets; alarm log.
- *DigiMux multiplexer*: synthesized digital program multiplexing; program channels centered on 1kHz step sizes between 1kHz-200kHz; interchannel spacing 100Hz minimum; to six full duplex programs.
- *9600 SCA data system*: FM SCA generator, receiver complements; error-free 1-way communications to 30 miles with single SCA channel; 9600b/s rate; compatible at 67kHz with 57kHz RDS-MBS paging systems. Circle (953)

Motorola Communications Sector

- *PMR 2000*: personal message receiver; tone, voice, numeric or alphanumeric display paging; hardcopy capabilities; 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, 800MHz Privacy Plus, SMARTNET systems with SECURENET voice message protection option.
- *HT600 2-way radio*: μ P-controlled portables; "personality" storage of frequencies, squelch codes, other operating data.
- *SABER Handie-Talkies*: 136-174MHz, 403-512MHz 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 SECURENET encryption with mode select switch; handheld control head/mic with unit ID, Call Alert decode, alphanumeric display. Circle (1468)

Nesbit Systems

- *VTL videotape library*: software manages data regarding videotape library; for AT, PS/2 compatibles with 3.1 DOS minimum. Circle (1469)

Neutrik USA

- *Infomatic System*: digital recording, announcing system; security, public address, telecommunications, broadcast applications; battery-backed memory stores maximum of 35 minutes of announcements. Circle (970)

NewsMaker Systems

- *NewsMaker Newsroom*: hardware, software for 33 80286 PC workstations with VGA color; Ethernet to dual 80386 file servers each with 300Mbyte 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.

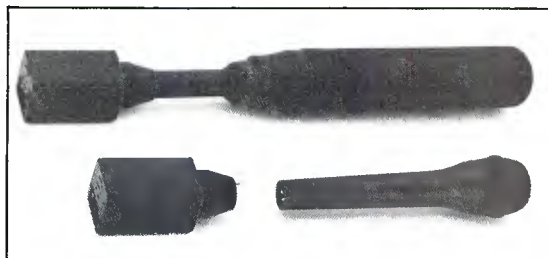


The best belt-pack transmitter . . .

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.

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Odetics Broadcast

- *TCS2000 enhanced*: control by RISC, UNIX-based Sun SPARC workstation; multitasking; current systems upgradable.
- *SCS800 sequencer*: 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 1Mbyte RAM, 20Mbyte hard disk; database search for music cuts by word, category, synonym, catalog number.

Circle (1026)

Radio Computing Services

- *RADIOLine 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 material, 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 531, 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.
- *Silent Dispatch*: POCSAG-coded "enroute-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

- *DMDC data decoders*: decodes VRF, RDS signals; DMDC.03 RDS test decoder to monitor, evaluate digital information; DMDC.05 for VRF, RDS measurements and tests.
- *DMC FM coder*: DMC.05 modulates 57kHz aux carrier with RDS, traffic signals; DMC.09 RDS coder for VHF transmission without traffic announcements.

Circle (1058)

Sage Alerting Systems

- *SAGE I*: transmits emergency information, procedures to industrial receivers; stationary data terminal permits secure communications for broadcast, safety agencies; includes receivers, sirens.

Circle (1467)

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)

Solutec

- *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 programmer*: automates broadcast, CATV, background music; 2,000-event, expands to 4,000; supports 12 stereo sources, 99 trays each; multiple network joins; external flags delay recording.

Circle (1102)

Sony Communications/Broadcast

- *SVT-2000 SNG codec*: digitizes, compresses, upconverts component video, stereo audio to Ku-band; reduced power requirement of SNG 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; COMBAK backup.
- *Library Management Systems*: DVC-80S, enhanced to use small and medium cassette sizes including D-2 format; BZC-2000 upgrade for DVC-1000S, -500S offers improved management and setup flexibility.

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.
- *TVSCAN software*: subscription service provides ratings databases from Arbitron, Nielsen, Scarborough, Marshall Marketing, Leigh Stowell, Mediamark Research, International Demographics.

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)

Telemet

- *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 multidisc 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 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-1C*: time code control of automation; Novell/Ethernet LAN, multichannel control; full facility interface; modular C programming, 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; predrawn 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 multipair 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)

Vyvx 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

- *Chester 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)

Quality Equipment for Professional Audio and Broadcast



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Arcor Broadcast Products

- *XH series*: retrofit shrink labels; heat-shrink covers for RG8, -11, -58, -62, twinax, precision video, A3M, A3F mic connectors for protected, secure connections. Circle (556)

Belden Wire & Cable

- *Brilliance precision video*: B8279A, 9209A miniature video, 96% tinned-copper braid; 8281B studio/retrofit, colors; 9202A, foil shield; 8279A, stranded center conductor.
- *SMPTE RGB cable*: meet SMPTE 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; 24AWG conductors, Z-fold Beldfoil shield. Circle (593)

Canare Cable

- *Patch panels*: 201U-VJ22W-C 20-position, 241U-VJ22W-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 clam-shell 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 (656)

Connectronics

- *Soundwires 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 8x8 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 Klips*: cable organizers keep mic, camera, coax cables unsnarled. Circle (873)

Kings Electronics

- *KS 6464*: RBGS component jackfield with patch cords. Circle (878)

Nalpak Video Sales

- *Cablemaster*: Velcro strips for quick installation on coiled cables, bundles for better organization; various sizes with logos. Circle (961)

National Photonics

- *SIDEWINDER 3130 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, 0.7dB 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

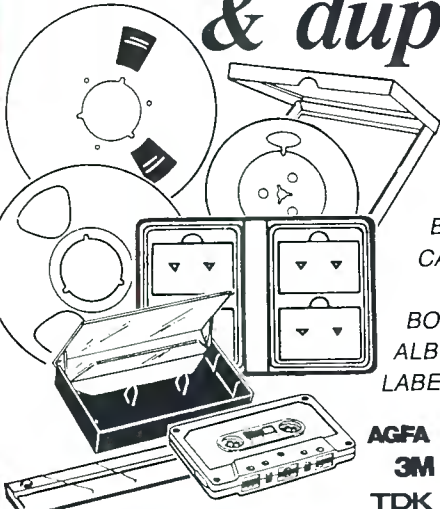
- *Power wiring, connectors*: distributors for Cam-Lok 200A Posi-Lok distribution panels, Coleman Cable Systems stage, lighting cables. Circle (1021)

RF Technology

- *RF-FOM-13*: fiber-optic link; 40-mile operation without repeaters; video, four audio;

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SZ Schmid
Telecommunication

Circle (73) on Reply Card

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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/Litton Systems

- *Connectors*: CIR series quick-disconnect, multipin connectors; 1-150 contacts, to 1,000A; VSC series Socapex compatible 19-pin connectors.
- *Connectors*: CIR/GRH series, 5-wire 100A power distribution; CCIS series ep-8, stainless steel for abusive environments; UL approved.
- *B-Lock*: sequential power panel; 600A capacity; operator safety features.

Circle (1215)

Whirlwind

- *Concert 32/42 systems*: mic splitters in heavy-duty steel stage box or 8-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"×30" work surface on welded frame; height adjusts in 1.5" increments to 26.5"; 4" casters; shelf, printer stand, electrical outlet options.

Circle (1499)

Alpha Audio

- *Azonic acoustic foam*: pyramidal-formed material; low-frequency sound absorption characteristics; in several colors.

Circle (529)

AMCO Engineering

- *Frugal Frame*: low-cost equipment racks; textured finish, 19" width, 21-78" height; 25.5-30" depth; uses AMCO accessories.
- *Vertical divider*: "new bracket" mounting rails for easier mounting of half-rack and unusual width equipment in standard rack configurations; wood-grain side panels.

Circle (535)

Apollo Lighting/Audio Visual

- *Carts, furniture*: for A-V and computer equipment.

Circle (549)

Atlas/Soundolier

- *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

- *Wood-steel utility trucks*: natural, dark oak finishes; QuietGlide casters; slanted, flat steel shelves; outer wood construction.
- *VTRPN44 cart*: wide-body; 8" pneumatic tires; for TVs to 35" screens; cart stands 44" tall; three shelves.
- *CL5 cable-lock*: avoids theft of video, computer equipment; adhesive-backed mounting plate, 5' steel cable, theft-proof screws and key.
- *BBULA4, BBULC48*: wide-body carts; 44", 48" heights; -44 with three shelves; -C48 with two shelves, locking cabinet; 32"W×27"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; ¾" design; melamine laminate in light oak, black, high-tech gray; rails tapped 19/32"; 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"×9" 42"×20".

Circle (634)

Clipper Products

- *770 super cart*: of telescoping tubing; 300 lb load; 13"×16" load deck; folds to 17"×15"×6"; fits under airline seat or overhead; 14 lbs.

Circle (664)

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 (1497)

K&H Products

- *Shoulder case*: lightly padded case for Sony BVW 200, 300 camcorders.
- *Video Vest*: production vest.
- *Equipment bags*: Light Pack, compact, soft-side 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 pack*: pockets for two BP-90A batteries, cable, microphones, cassettes including D-1 small, medium sizes; for Sony DVR-1 recorder.

Circle (873)

Marco Inc.

- *VC-4244 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'Connor Engineering Lab

- *100C-105 case*: foam-lined, molded container for model 100C fluid head.

Circle (983)

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 (996)

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 cabinets, consoles with 10½-21" panel space.

Circle (1017)

Rampart Cases

- *RuggedLine 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/RTI

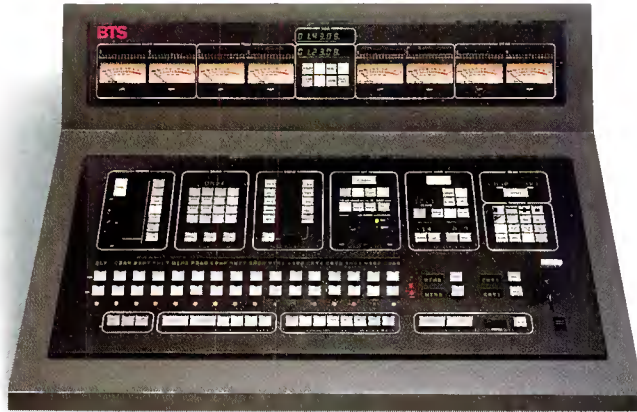
- *Modular tape racks*: 36" or 48" wide shelves provide storage for 350, 540 videocassettes, respectively.

Circle (1052)

Stantron

- *FasTrack 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.
- *Rack 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



BTA-2300 Automation System

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
The name behind
what's ahead.

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)

Storeel

• *Media storage:* CD1120 CD setup truck; SCD-64D CD storage system; RS240-II MII cassette storage system; S883612/10-I 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)

Winsted

• *Instant Assembly:* console design for quick setup; ships disassembled but uses positive locking pins for 3-minute assembly.
 • *Universal rack mount:* shelving for 19"

racks; secure support for equipment measuring to 17 $\frac{3}{8}$ "x14", 3 $\frac{1}{2}$ "-10 $\frac{1}{2}$ " heights; 14ga, 16ga.
Circle (1254)

S4: Recording media

- ◆ Audio, video
- ◆ Cassette, reel, cart
- ◆ Cleaners, degaussers
- ◆ Conditioners

Ampex Recording Media

• *Hanger 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)

Audiopac

• *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 250nWb/m recording; redesigned shell.
Circle (571)

DIC Digital

• *MicroFinity Video 8:* 8mm metal particle media; cassettes for 15, 30, 60, 90, 120 minutes; 1,500Oe coercivity with 2,300 gauss retentivity.

• *DIC///DAT tape:* metal particle media for R-DAT; 30, 46, 60, 90, 120 minute lengths; 95dB dynamic range possible.
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 (776)

Garner Industries

• *Model 4000:* bulk eraser for high-coercivity metal particle media.
Circle (792)

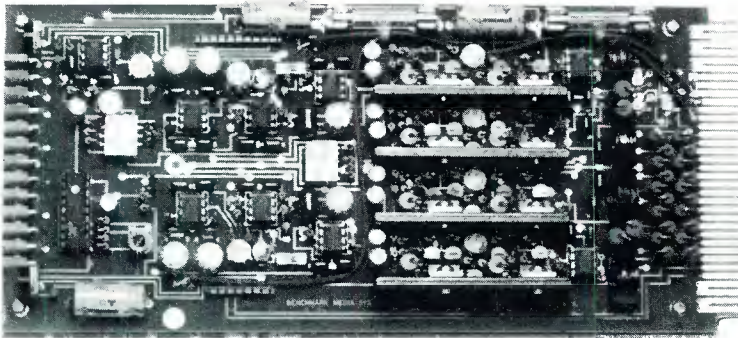
JVC

• *ST-PRO S-VHS tape:* high-performance, oxide in standard, compact cassette sizes; ST-30PRO, -60PRO, -120PRO, -C20PRO; 1,700 gauss residual flux density; improved carbonyl backcoat, 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; 1,500Oe coercivity; includes Anti-Stat to eliminate static build-up and reduce scratching.
 • *DSC-120L, DSC-150L:* D-2 media in 2-hour,

The 21 Bit Stereo Audio DA



The application of the digital process to audio has been well received. Unfortunately, digital audio has been given a 1970s standard of 16 bits, with its 96 dB dynamic range. To improve upon this, some are using 18 bit converters with 16 bit data, to wring the last drop from an undersized pipe line. Even when an 18 bit standard comes, it's dynamic range will be limited to 108 dB.

Compare that with the spectacular DA-102, and its dynamic range of 130 dB, (21 bits +). That's 34 dB beyond current digital and 22 dB beyond a future 18 bit standard. With digital still in its infancy, the mature analog technology of the System 1000 is the safe long term investment. At an affordable price, you can have the finest today, and build confidently for the future.

Benchmark - anything less is 2 bit technology!



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Circle (76) on Reply Card

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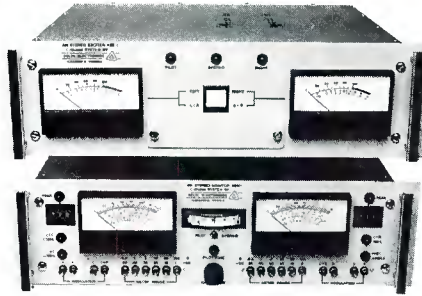
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Every day, all over the world, Delta's full line of products make sure the most important broadcasting standard of all is met—your total satisfaction.



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.

Circle (78) on Reply Card



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.

Circle (82) on Reply Card



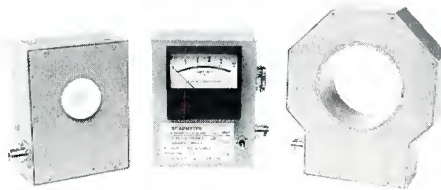
High Power Pulse Reflectometer—Strong interfering fields that would destroy time domain reflectometers are virtually ignored by the PRH-1. This instrument can handle up to 1,000 watts of induced power on an intermittent basis as it locates faults on transmission lines. Provides a visual representation of the transmission or sample line, STL coax, or antenna, using your oscilloscope.

Circle (85) on Reply Card



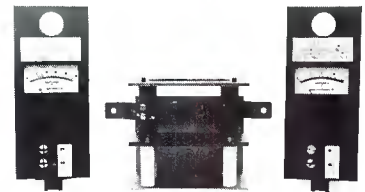
Coaxial Transfer Switches—These 1 7/8" and 3 3/8" motorized four port switches are designed to switch between antennas, transmitters, or dummy loads both quickly and efficiently. The switches can also be operated manually and are fully interlocked.

Circle (79) on Reply Card



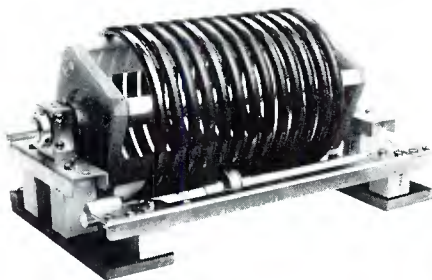
RF Ammeters and Sampling Toroids—Precision toroidal current transformers (TCTs) provide stable antenna monitor sampling while eliminating the problems associated with loops. TCTs also work well in supplying additional modulation monitor or test sample RF outputs. The transformer coupled ammeter (TCA) offers stable base or common point current readings, independent of modulation. The dual and single scale meters also provide remote DC outputs.

Circle (83) on Reply Card



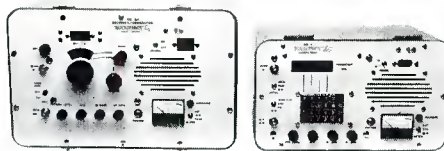
Low Power RF Ammeters—When every milliamp of current counts, depend on the accuracy of the TCA-Jr. This portable RF ammeter is designed to plug into either a Delta MJ-50 Meter Jack (pictured above), or a standard J-plug jack. Two current ranges are available: 0.2 to 1.0 Ampere, or 0.4 to 2.0 Amperes.

Circle (86) on Reply Card



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 μ H or 10 μ H versions (maximum inductance). Other values by special order.

Circle (80) on Reply Card



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.

Circle (84) on Reply Card



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.

Circle (87) on Reply Card



Digital Controlled Processor—This inexpensive, stereo tri-band processor boasts user-friendly controls and an aggressive sound. Mono stations can take a step toward AM Stereo, at a price that won't break the budget.

Circle (88) on Reply Card



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.

Circle (81) on Reply Card

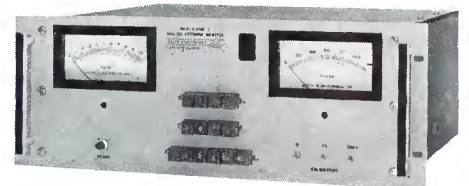
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AM Antenna Monitors—These are true ratio monitors which deliver a ratio reading without the need to continually reset the reference tower to 1.000. This simple operation reduces errors by non-technical personnel and makes tuning an array easier.

Circle (89) on Reply Card

2.5-hour lengths; 1,500Oe coercivity.

- *TapeCare library box*: tape storage containers in 9", 10.5", 14" sizes; impact-resistant, double-wall plastic; 33% reduction in space compared to cardboard boxes.
- *R120 professional DAT media*: available in 90-, 60-, 46-minute lengths; high-coercivity ultra-fine metal particle formulation. Circle (917)

Professional Label Service

- *Vid-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/RTI

- *TapeChek 6120 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 degausser*: for 1,500Oe 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 200x play speed; Micro-Pulse detection; color CRT graphic display of condition.
- *D-11 dropout counter*: use with any videotape format; analyzes RF signal from recorded tape without erasure; checks media for large catastrophic and less serious dropout conditions.
- *V5000 conveyor degausser*: high-coercivity bulk eraser accommodates all cassette and reel media to 10 1/2" reels; 4,000 gauss field, for 200 Betacam, MII cassettes per hour. Circle (1052)

Sony Magnetic Tape

- *HMPX Hi8 videotape*: metal particle media; to 400-line resolution, high S/N ratios; low dropout count; stable in editing applications; Hyper Cosmicle particles for high data density.
- *D-2 large cassettes*: to 208-minute lengths.
- *HD-1D tape*: high definition tape for HDD-1000 DVTR; 1" open reel; 33-, 48-minute on 10 1/2", 63-minute on 11 3/4" reels.
- *V1-KN 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

- *α216*: D-1, D-2 digital parallel router.
- *α264S 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 KRONE terminal block; full-, partial-, non-normalled versions. Circle (564)

Audio Developments

- *AD 081 Flexilink*: 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 15 switching units. Circle (1023)

Avitel Electronics

- *DJF 2035 jackfield*: CCIR 601 spec; 8-bit digital signal router with two rows of eight patch plugs; D-25 connectors on back; also as 10-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 module, 1-in/10-out use as stereo, dual mono; mix-and-match with video DAs in the same 3RU frame. Circle (579)

Barco Industries

- *BVRS 16x16*: 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-inx4-out video distribution drives four EGA monitors; input, isolated outputs on 9-pin sub D connectors. Circle (601)

Brabury Porta-Pattern/BPI

- *CDA-101 DA*: wideband, multichannel for RGB or Y/CB/CR components to HDTV frequencies; four amplifiers with sync separation, 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*: C216PP audio patch panel; C310PP video patch panel; C312PP video clamp, DA in 4x4 design. Circle (626)

BTS

- *BCS-3000 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.
- *BVA/BAA-3000 DAs*: permits 20 DA units per 5 1/4" 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.
- *BRC-2000 controllers*: automation controllers TVS/TAS distribution routers; -2000 switcher configuration editor for user-supplied IBM AT/compatible PC.
- *BRC-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.
- *BRC-2200 controllers*: automation control for TVS/TAS routers; combines -2000 and -2100 features with real-time machine control through TCS-1 machine control system; switching events under SMPTE code or internal system clock. Circle (628)

Datatek

- *D-2400 enhancement*: PC software automates D-2400 series routers. Circle (709)

Di-Tech

- *5216 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)

Dorrrough 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 source, destination display to five mnemonic characters; control operation from PC, VDT; for NTSC, PAL, SECAM, proposed ATV, HDTV, medium-resolution graphics.
- *Series 3100*: 30MHz utility video, EQ, pulse DAs; 1x6 mix/match DAs in 1RU, 2RU packages; EQ for 1,000 feet 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 5km 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 I/O connections for 10x10 to 50x100 matrices.
- *DYNASTY enhancements*: bandwidths 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
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AutoCam's™ ACP-8000
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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.

Circle (90) on Reply Card

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.

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DPS-175A TBC/FREESTORE

Circle (91) on Reply Card

ERGO 90

- *Mini jack unit:* 96-patch points using ADC bantam jacks; prewired with looped normals; Winchester, Elco connector options.
- *RS-422 Datapatch:* RS-422 data routing. Circle (764)

ESE

- *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.
- *GX4201 crosspoints:* 1x1 switch with tally output; for HDTV applications; 80dB off-isolation at 100MHz; ± 0.1 dB response.
- *GY4102 SPDT toggle:* switching time <25nsec; 300MHz bandwidth.
- *GM8116, GM8108:* prototype modules for 8x1, 16x1 multiplexer functions; SIP format.
- *HDIC matrices:* high-density interconnection monolithic-on-monolithic switching matrices; 10x10 maximum with or without buffers. Circle (797)

Grass Valley Group

- *MAX-900 series:* 3RU modular DA frame with 12 cells, power supply; optional power supply; component analog video DAs with 3-inx6-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

- *SDR-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; 5 75 Ω outputs; EQ to 1,000' Belden 8281 cable.
- *Shirt Pocket ADAs:* 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; modem access.
- *Series 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 3,600 crosspoints; full status tally-back; machine control; relay switching with magnetic latch. Circle (862)

Jem-Fab

- *DPatch system:* self-normalling 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 8 ports; each port may be configured with 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; +30dB maximum output, 100dB S/N, >95dB inter-channel crosstalk; flat, controlled roll-off. Circle (895)

McCurdy Radio Industries

- *MDA-100:* 1x8 distribution, 8x1 mixing DAs; individual level adjustments. Circle (932)

Miranda Technologies

- *DR-105P digital router:* 10x1 matrix for D-1, D-2 signals; can be configured as 5x1 system or stacked for 5xN configuration; 10-bit data paths; dual digital, analog outputs. Circle (1491)

Modulation Sciences

- *AEA-1 adapter:* expands audio I/O of GVG TEN-XL 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 (951)

Omicron Video

- *Model 887 DA:* wideband distribution product; three levels of 40MHz bandwidth signals with one level of sync. Circle (987)

Ramko Research

- *RS-1616/XPT 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 matrices 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



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32-inx16-out; expandable system with RS-232/-422 serial control; ESBUS interface.
Circle (1471)

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-V3232, -A3232*: serial digital video, audio routing switchers; 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)

Teltest

• *Routing switchers*: 982 A-F-V switcher; stackable 10x1 format; 1616 video only 16x1, 16x2 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, salvo switching to four audio levels; Patch-It editor, librarian.
Circle (1172)

Utah Scientific

• *VDA-4x2B, VDA-8B DAs*: 4x2 offers two DAs per card in 1-inx4-out; delay trim, EQ, video level control; -8B 1-inx8-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; programmable from dumb terminals or PCs.
• *AVS-1WB router*: 100MHz bandwidth distribution router; 1280x1024 60Hz non-interlaced computer graphics, HDTV, NTSC, PAL and audio capabilities.
• *VDA-9/DL*: 1-inx9-out video distribution amplifier; four outputs have minimal path length, four have delay section, 9th output strappable to either mode; ± 3 dB gain, ± 3 ns delay adjustment on front panel.
Circle (1205)

VGW Inc.

• *DVDA distribution amps*: 10-bit signal distribution with 1-inx6-out; output signal is resynchronized; PAC series with A/D and D/A converters.
Circle (1218)

Vortex Communications Ltd

• *Eurogold video*: DPC-300 digital comb filter decoder; SCG-101 component SPG/encoder; CPC-100 comb filter coder; TPC-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 gener-

ator; 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)

Altron Research

• *Omegaline 9700 Unibody*: power measurement system; available in power ratings from 30kW 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 MG6301 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.
• *MG6301 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/plotter options.
Circle (546)

ASACA ShibaSoku

• *TG91E6*: HDTV 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*: APP-FM1 audio proof-of-performance package, performs FM stereo audio proofs; Dual Domain analog, digital domain audio test package.
Circle (567)

AVCOM of VA

• *DGP-20 dc power inserter*: designed to insert power onto a coaxial transmission line or may function as a dc block; available with SMA, BNC, N and F connectors; protects test equipment from excessive dc voltages appearing on test ports.
• *PSA-65A 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 pre-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

• *IM-1HR*: Imagescope stereo audio display; in side-by-side half-rack 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)

Brüel & Kjær 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)

BTC Test & Equipment/Philips

• *PM 5664 waveform monitor*: for Y/R-Y/B-Y, RGB, Betacam, M-II formats; STAR display of timing differences; measures amplitude, static non-linearity; vector, bow-tie displays; Gamut detector of illegal levels.
• *PM 5643 SPG*: component sync generator; component format, composite signal, 2-/3-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 83010*: 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.
• *WATTCHMAN 80173*: 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

• *Isolatrol/PLUS*: power protection systems; hybrid surge suppression, transient filtration; ringwave attenuation; 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 (698)

Current Technology

• *MPA, MPAP*: integrated power panels, providing "digital" quality power for μ P-based equipment.
• *OptiSiftor*: 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

• *PRH-1*: high-power pulse reflectometer.
Circle (715)

Dorrough Electronics

• *Model 40-P*: loudness meter with peak hold feature.
Circle (734)

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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-232/422 port; checks 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; source ID generator; 9Vdc operation.
Circle (861)

Jensen Tools

• *JTK-87TEK*: 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 pat-

tern; RS-170A unit offers 23 component signals; select Y/R-Y/B-Y, Y/time-compressed chroma; ROM for Betacam, M-II.

• *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; 500µV sensitivity; 5ns maximum sweep speed; three preset sync separator circuits for H, V triggering.
Circle (892)

Leitch Video

• *DSM-7152 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.

• *Signal Creator*: software to design custom test signals for NTSC, PAL, D-1, D-2.

• *2030 HDTV upgrade*: expansion includes test signals for Zenith 787.5 system.

• *Staircase inputs*: remote input YRGB for WFM560, WFM530 waveform monitors.
Circle (919)

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-29.9999MHz tuning range.
Circle (922)

McCurdy Radio Industries

• *SA 14023A*: 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; 0.5µs-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 (948)

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AMEK CLASSIC

THE UNIQUE AUDIO PRODUCTION CONSOLE



Photo: Litrick Patchfield

VIDEOLONDON, STUDIO 4

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.



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Modulation Sciences

- *Multidyne TS-series*: 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 (951)

Neutrik USA

- *Audiograph 3300*: modular audio, acoustic measurement system; reads room characteristics, audio recording equipment, system distortion; programmable system.
- *TT402A test set*: stand-alone audio test lab forms core for automated, PC-controlled system; programmable with Audio Measuring System Language through front panel or via IEEE-488 port and personal computer.
- *A1 test system*: single instrument combines audio sweep generator, distortion analyzer, level, frequency, crosstalk, noise, wow/flutter measurements, curve tracer and oscilloscope functions; backlit LCD screen.
Circle (970)

Philips TV Test Equipment

- *PM 5664 waveform monitor*: component monitoring in Y/R-Y/B-Y, RGB, Betacam, MII formats; STAR display of timing differences; measures amplitude, static non-linearity; vector, bow-tie displays; Gamut detector of illegal levels.
- *PM 5643 SPG*: 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 530*: RDS generator for receiver tests.
Circle (1445)

Rohde & Schwarz

- *SGMF, SGPF*: NTSC, PAL signal generators; 30 test patterns including composite test signal; 12-bit digital generation; optional VIT inserter, source ID; for SMPTE, NTC-7, FCC.
- *TIF analyzer*: video timing check; supports all standards, NTSC, PAL, SECAM color subcarriers; measures jitter from VTRs; non-volatile memory; portable; constructed with SMD multilayer technology.
- *UAF video analyzer*: measures 25 video signal components at three rates; eight VITS configurations; user-defined limits, parameters; non-volatile memory card retains setup, results, operation modes.
Circle (1058)

Schmid Telecommunication

- *SIAT 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)

Selco/Sifam

- *Meter light*: LED illumination kit for full specification VU, 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.
- *Degausser*: 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 measurements; 4-sec voice message stored in solid-state memory can loop for continuous signal; auto, manual modes.
- *TSG1001 HDTV generator*: programmable, multiple format environment package; signal libraries in NTSC, M-II, Betacam, SMPTE, EBU and all proposed HDTV formats; downloaded signals in memory.
- *Models 2721, 2722*: sweep transmitter, receiver package for broadband, CATV systems; transmits sweep pulses in any portion of 5-600MHz spectrum during vertical interval for non-interfering test operation.
- *Model 2710 power enhancement*: #2704 inverter, #2705 battery pack for option 07 to 2710 portable spectrum 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 2710 spectrum analyzer; Option 4 extends coverage from 100kHz to 1.8GHz with 100dB dynamic range; internal unit controlled from 2710 keypad or IEEE-488 interface.
- *GPIB interface (Opt 3)*: for 2710 portable spectrum analyzer; permits automated testing, waveform acquisition and direct plotting without an external controller.
- *1725 vectorscope*: 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)

Tentel

- *T2-H7-SLC gauge*: tape tension measure-

ments for U-matic, U-matic SP and S-VHS transports.

- *TSH-B7 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-H7-SLCX gauge*: Tentelometer tape tension unit for D-2 VTR use.
- *T2-H5-UMC tension gauge*: tape tension measurement instrument meeting requirements of MII recorders.
Circle (1170)

Video Accessory

- *Scope terminator*: 75Ω in-line termination with 3pF input capacitance; voltage reflective coefficient of 5% at 70MHz.
Circle (1220)

Videotek

- *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 (583)

E-N-G Mobile Systems

- *News gathering vehicles*: ENG C-Van quick-response vehicle; ENG Suburban 4-wheel drive vehicle; ENG/EFP 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

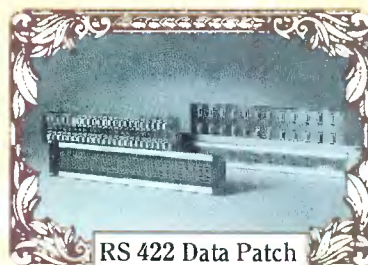
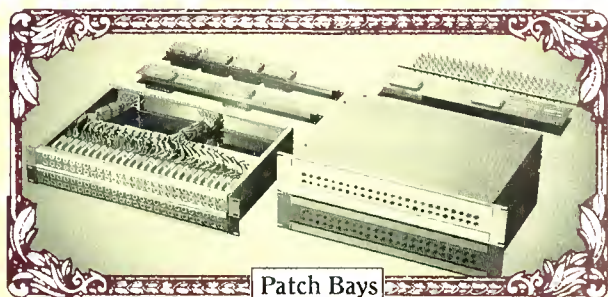
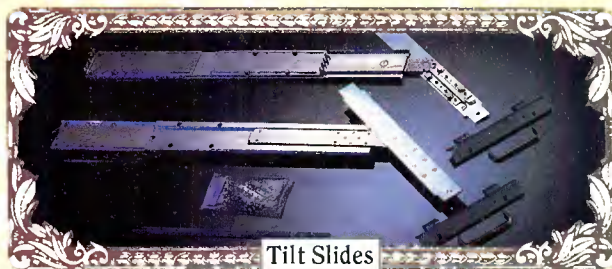
- *Giant Money Machine*: money machine booth for promotional uses.
Circle (801)

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; dbx limiting.
Circle (1443)

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Circle (118) on Reply Card

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

- *SVP-1 S-VHS van:* 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 stepvan configuration; TV 45 40-foot van system;

Circle (1061)

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, HDTV; designers of NAB HDTV 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
- ◆ Satellite services

Aircraft Digital Music Library

- *Premiere Edition:* "Hollywood Edge" sound effects library, collection of 1,500 sounds on 20 CDs; originally recorded on R-DAT, digitally edited with AMS Audiofile.

Circle (518)



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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 converter, advanced font utilities (glows, neon, partial shading, etc.), Intelligent Interface™ for connection to election, sports reporting and newsroom 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.

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CHYRON
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Circle (93) on Reply Card



Associated Production Music

• *Mini-package*: condensed music track library on 30 CDs; taken from a set of 270CDs, 800 LPs; each disc contains a specific category with 70 minutes of music; 99 cuts on "Fanfares-Links-Stings" volume. Circle (559)

BriteVoice Systems

• *CITYLINE enhancements*: StockQuote access to all stock data, continuously updated; SportsQuote for latest pro, college sports scores; WeatherQuote for current weather conditions around the world. Circle (611)

CASCOM

• *SelectEffects VII*: 200 more special graphics elements available for as-is use or for integration with other material in a paint system; entire library contains more than 2,000 animated elements for video production. Circle (642)

Catspaw Productions

• *Radio production services*: full-service agency; marketing assistance, concept development, writing, talent selection, original music; production functions, recording, trafficking. Circle (645)

Cycle-Sat/Winnebago Industries

• *Expanded satellite service*: relays include automated downloading of advertising, program materials during typical off-air time. Circle (706)

GTE Spacenet

• *Ku-band Transportable Uplinking*: service for reliable transmission from anywhere; ad hoc, long-term basis arrangements; site survey, delivery of uplink to origination point, professional staffing; Wolf Coach B104 unit. Circle (811)

NEP/CBT

• *Production services*: remote production services using SuperShooter series production vehicles. Circle (1481)

Network Music

• *ShowMusic library*: 6-CD set, musical elements for six multimedia shows; fanfares, transitions, vocal themes, instrumental. Circle (969)

New England Digital

• *Optical Disk libraries*: additions include Prosonus Library of string instruments; Valentino Sound Effects of 2,500 stereo cuts; LucasFilm Sound Effects; Sound Ideas "Ambience" and "Hollywood" CD libraries. Circle (972)

Omnimusic

• *OMNI FX Series One*: 12-CD collection of digitally recorded, edited sound effects; 1-3 minute environmental montage segments; selections from home, office, city, suburbs, transportation, sports settings. Circle (988)

Promusic

• *Broadcast Plus*: 45-CD library includes a wide range of musical styles in 59sec and 29sec cuts. Circle (1026)

RRN Inc.

• *Year of Great Promotions*: how to plan and execute promotional events successfully; book written by Mike McDaniel. Circle (1064)

Signature Music Library

• *CD music*: three additional discs to library bring a total of 121 full-length themes. Circle (1093)

Sound Ideas

• *LucasFilm effects*: 6-CD set of material include material produced by Skywalker Sound facility. Circle (1108)

Tapscan

• *SPOTS FROM SPACE*: service with Satellite Production Network for production, distribution of commercials via satellite; alternate distribution via FedEx. Circle (1144)

TRF Production Music Libraries

• *Carlin Libraries*: 75-CD library including all musical styles. Circle (1189)

27th Dimension Inc.

• *Music library additions*: Christmas music and other material; available on CD format. Circle (1193)

Valentino Production Music

• *Music, effects libraries*: 42 production music discs, CD format; 30 discs of production sound effects. Circle (1207)

Video Products

V1: Cameras

- ◆ ENG, EFP, studio
- ◆ Tubes, CCDs
- ◆ Lenses, filters, matte boxes
- ◆ Pedestals, tripods
- ◆ Pan/tilt heads
- ◆ Studio automation

Ampex Corporation

• *CVR-400 camcorder*: 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

• *15x6.5 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; μ P-controlled accuracy, subsystem status diagnosis. Circle (544)

Bencher

• *900-30 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 (595)

Brabury Porta-Pattern/BPI

• *#001-50, 001-51*: concentric, radial resolution charts for CCD cameras; available as illuminator transparencies, 18"×24" Dura-Chart and 9"×12" 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

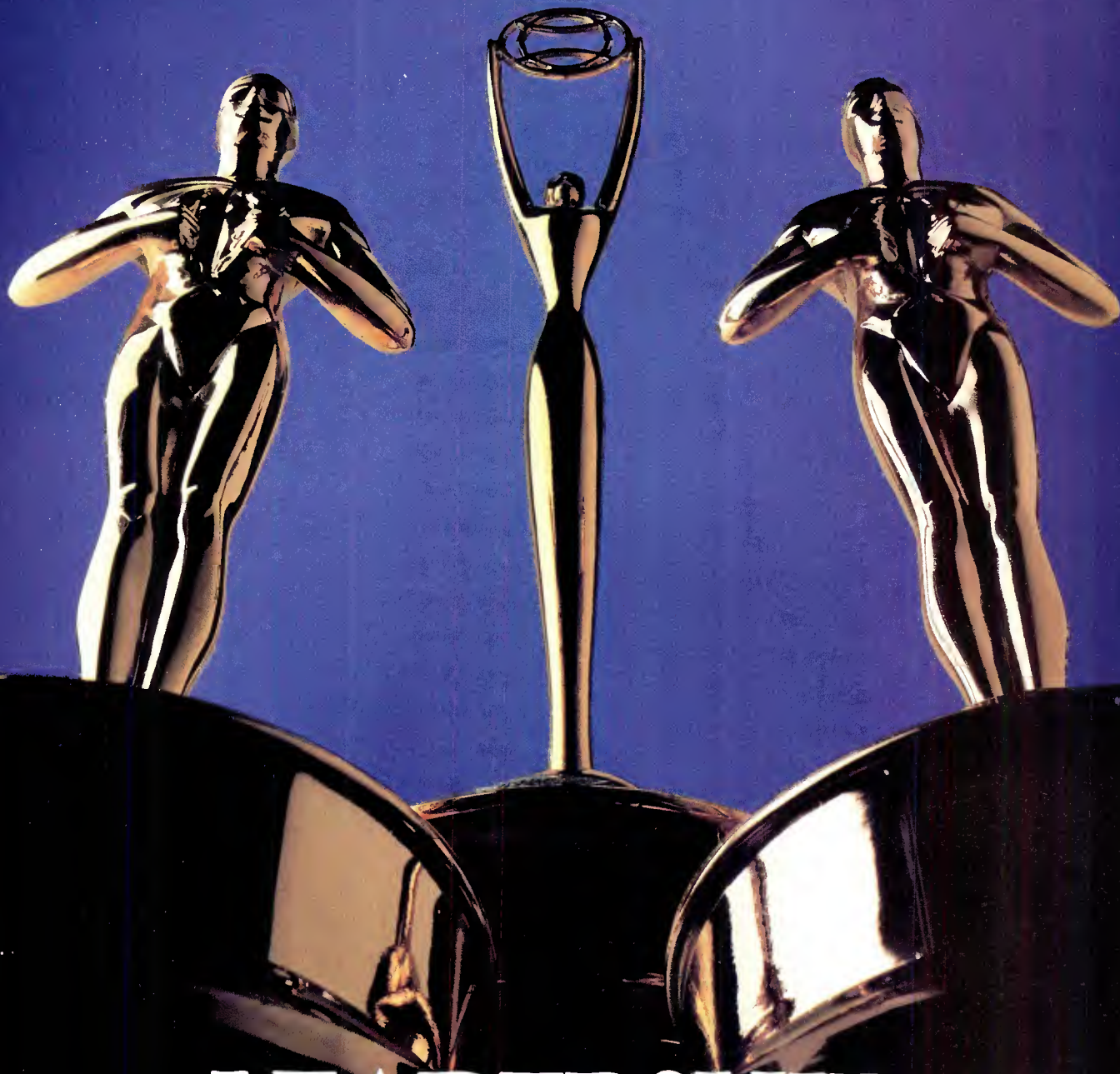
• *Camera tubes*: Saticons mixed-field types; Harpicons for HDTV. Circle (630)

Canon USA/Broadcast Optics

• *U-4 system*: remote-control pan/tilt; multi-purpose, weatherproof; allows off-site control of pan, tilt, zoom, focus, iris, extender via modem or wired operation.
• *U-5 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 4×4 filters; upgraded zoom demand based on larger, smoother potentiometer for tighter focus, fluid start.
• *J14a×8.5B-IRS*: 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*: 0.6× 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.

SONY
PROFESSIONAL VIDEOTAPE

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Cinema Products

- *J-7 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 personal 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; no special equipment vehicle; Nano-Jib, Sawed-Board, Pocket Dolly, Leveller, Micro-Jib, Cinesaddle, Sand Sack counterweights, Sand Wedges, chain tripod spreader.
Circle (1267)

EEV

- *XQ1410/06*: 30mm Leddicon tube; variable light bias improves picture quality, reduces picture smear; extends life.
- *CO7 CCD 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.
- *XQ3457*: 2/3" mixed field Leddicon replacement for Sony BVP30, -350, -360, Hitachi SK97D, Ikegami HK323P.
Circle (749)

ergipment

- *Rolam*: fits standard coupling on dolly or end of Mini-Jib; bearings for easy motion; permits absolute 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.
- *Dino Dolly pump-up column*: hydraulic riser column operates completely separate 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*: 1,920x1,035-pixel images for disk-based picture file system; Hi-Vision 1,125-line 60Hz interlace; 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*: A4x7.5MD, A8x12MD for copy stand cameras; maximum resolution at MOD of 0.45m; maximum aperture f/2.8.
- *CCD lens enhancements*: minimum lateral, longitudinal chromatic aberration; elim-

inates ghosting, reflection-based flare; optically matched lens, dichroic prism.

- *A16x7ERM*: 1/2" zoom with 2x extender weighs 1.45kg; flat aperture over 9.5-124mm range, f/2.2 at 152mm; MOD at 0.95m.
- *HR22x18ES HDTV lens*: 18mm-400mm zoom; maximum f/1.8 aperture, ramps to f/2.0 above 350mm; 2x extender; MOD 5.5m; "floating group" correction optics.
- *A24x16.5ERD*: 24x zoom, 2x extender; maximum aperture f/2.8 to 290mm, f/3.9 at 300mm; weatherized, macro focus.
- *HR11x11ESHDTV lens*: 11-121mm zoom for 1" format; f/1.8 flat to 110mm with ramping to f/2.0 at 121mm; available with, without servo iris, zoom and focus module.
- *A16x9.5ERM*: 2/3" zoom with 2x extender weighs 1.45kg; f/1.8 aperture flat over 9.5-124mm range, f/2.2 at 152mm; MOD at 0.95m.
- *HDTV lens design*: "floating group" between iris, rear elements, μ P monitors zoom, focus, iris to position group for least lateral, longitudinal chromatic aberration.
Circle (789)

Future Productions

- *MCU-400*: 4-camera control unit; for Ikegami HL-79 series, HL-95, ITC-730, Sony BVP-3, -30, -5, -50, others; PS-400 powers four cameras, each with 300-foot cable.
- *AVD-10A, ADV-24A*: A/V DAS; 1x10, 1x24 designs; improved models.
Circle (790)

Geocam

- *4/4.1-OB*: matte box mounts directly to ENG or film lens, may need adapter depending on lens; 4x4 holder and one adapter ring; additional holder stage and rings available.
- *GeoFX filters*: 1mm thick optically clear resin filters, 4mm carbon-fiber frame; soft gradations, soft colors, effects selections.
- *4/4.2-OB*: matte box; direct-mount to ENG, film lenses; carbon-fiber material.
Circle (799)

Hitachi Denshi

- *SK-F750 camera*: 800-line resolution in 450,000-pixel array of 3-FIT CCDs; linear matrix mask, chroma compensation; 6-speed electronic shutter.
- *SK-H50 camera*: three Harpicon tubes; 30x greater sensitivity than Saticons; S/N at 57dB NTSC; 700-line resolution.
- *SK-F2 camera*: EFP camera with three IT CCDs; 700-line resolution, -103dB vertical smear; direct docking 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 Beta, 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 Unicam*: CCD camera, adapters for ENG, docking VCR, remote triax, multicore operation; 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; multicore, 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-XITCU camcorder*: 3-CCD camera with S-VHS-C recorder; 1/2" CCD 330,000-pixel array; μ P iris control; 58dB S/N, 4-memory system for gamma, master black, contour, flare, iris, gain; 14x lens.
- *TK-1070U capture camera*: RGB, S-VHS outputs from image capture unit for graphics systems; 2/3" CCD offers 480-line resolution; 6-step shutter; Type C lens mount.
- *KY-35U, KY-90U*: IT, FIT CCD cameras; 700-line resolution; direct docking to BR-S411U, KR-M260U; adapter for Betacam; 62dB S/N ratio, 400,000-pixel array; voice warning feature; multicore, 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; cremaillere gearlift column, leveling ball; accepts various Gitzo pan/tilt products.
- *Models 583, 290*: offset and intermediate brackets; for camera mounting if lens, camera grips, other attachments cause interference to normal mounting.
- *Model 380, 580, 680*: Gitzo fluid heads; drag adjusts for motion of leveling balls.
- *Studex pan/tilt balls*: 340B3-480 InterPro Ball 3; 410B4-480 Pro giant ball 4; 505B4-480 Tele compact ball 4.
Circle (874)

Matthews Studio Equipment

- *Mini-Jib arm*: 59 1/2" length with maximum 8'6" vertical travel; counterbalanced; heavy-duty pedestal, dolly.
- *Tulip II crane*: 12-foot crane arm, pedestal base; camera position permits two seats, camera mount; pneumatic conversion for vertical pedestal post movement.
Circle (928)

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

- *RF9AD-HD, RF30A-HD2*: super-wide-angle, standard range with f/1.2 apertures; fixed focal lengths.
- *HQ-1500C still camera*: high-definition product; 1" MS Saticon; Nikon F type lens mount; image capture rate of 0.3sec 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, f/1.7 maximum aper-



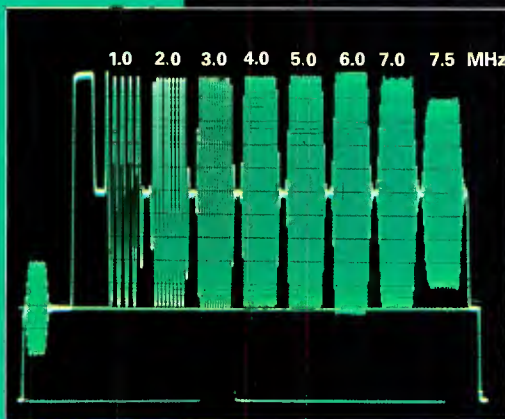
The best just got better! Announcing the 7.5 MHz Series of Time Base Correctors and Synchronizers.

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%.

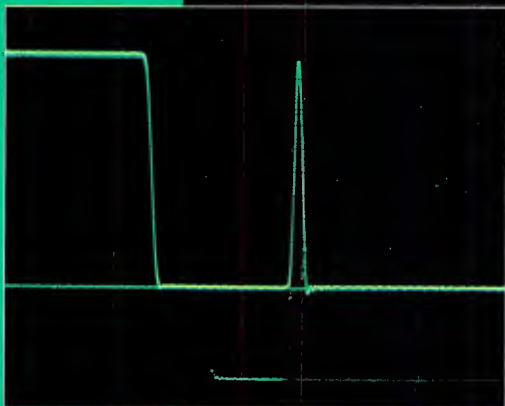
The 7.5 MHz Series also provides variable noise reduction up to 20 dB, passes VITS and VIRS, and transcodes between Y/C, Y/688, Y/R-Y/B-Y, and composite — all outputs available with any input type. Time base correction for 1/2" and 3/4" VCRs in Betacam, Betacam SP, MII, U-Matic, U-Matic SP, Hi-8, S-VHS, 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.



Flat at 7 MHz, the 7.5 MHz Series shows ultra stable signal response at a full 7.5 MHz with little or no degradation.



The 7.5 MHz Series faithfully produces a 2TK factor of less than 0.25%.

These photos show actual waveform outputs produced by an off-the-shelf 7.5 MHz unit.



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East Coast: (301) 544-1754, Central: (217) 787-5742.

**Prime
Image**

ture; S9x5.5 super-wide-angle exhibits reduced distortion at wide setting.

- *R10x12AED-HD2 zoom*: high-definition lens; 10x with servo zoom, iris, focus control; Macro setting.
 - *R6x8AED-HD2 lens*: super-wide-angle 8mm with 90° diagonal picture angle; integral extender; high modulated transfer function over entire range.
- Circle (975)

O'Connor Engineering Lab

- *Ultimate 10-30 fluid head*: for cameras to 30 pounds; fully adjustable counterbalances, ±90° tilt; smooth fluid drag; tilt, pan locks independent from fluid system.
- Circle (983)

Panasonic A/V Systems Group

- *WV-D5100 camera*: 2/3" CCD unit offering 480-line resolution; Y/C, composite outputs; configuration kits for portable, studio, multicamera systems with gen-lock; compatible with S-VHS VCRs.
 - *WV-F250 CCD camera*: three 1/2" CCDs offer Y/C, component outputs; compatible with S-VHS, VHS, MII, Betacam; 380,000-pixel array, 700-line resolution; 30 lux minimum sensitivity; 60dB S/N; shutter.
- Circle (1480)

Panasonic Broadcast

- *AQ-11 CCD camera*: digital signal processing with 754Hx487V-pixel IT CCDs for 700-line resolution; 60+dB S/N; electronic shutter; 4Fsc sampling; direct connection to digital composite VTRs; accepts docking VCR.
- Circle (999)

Philips Components

- *Camera tubes*: XQ3550, XQ3555 HDTV Plumbicon; XQ3477 Plumbicon, ultra miniature size, ES deflection, focus.
- Circle (1008)

Quickset International

- *QYTH-B, QYTH-S*: black, silver tripods; QRH-7 pan/tilt 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 CCD cameras.
 - *2-in-1 tripods*: ENG/EFP camera support, for fluid heads with 100mm, 150mm bowls; Carbonfibre, Duraluminum.
- Circle (1067)

Schneider Corporation of America

- *B+W filters*: optical filters for color correction, compensation, effects.
- Circle (1077)

Schwem Technology

- *GX-3 "ENG"*: hand-held camera, stabilizing lens; CCD pickup for 430TVL; 6x zoom, f/1.2; stabilization 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 f/4.5 at 2,000 lux, 1,000-line resolution; image enhancement, lens/scene 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, greater 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 lead 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 1/2", 2/3" format cameras.
- Circle (1141)

Telemetrics

- *TM8650 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, tilt, zoom, focus head; for newsroom, teleconference, industrial systems.
 - *TM8800 pan/tilt head*: remote pan, tilt, zoom, focus control for broadcast, teleconferencing systems.
- Circle (1159)

Television Equipment Associates

- *Model 150 camera*: miniature CCD color camera; with cover, camera units.
- Circle (1164)

Thomson Video Equipment

- *TTV 1645 Sportcam*: for fast-action sports coverage; 3-CCD 440,000-pixel array; electronic shutter; triax, portable, EFP, studio configurations; wide-range white compressor.
 - *PROSCAN*: 2/3" 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 3-CCD 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; 2/3" CCDs with low fixed-pattern noise; dynamic lens correction; wide-range contrast compressor.
- Circle (1178)

Tiffen Manufacturing

- *Ultra Contrast series*: lowers contrast by lightening shadow areas; smooth consistent effect throughout scene; no highlight flare; 1/8, 1/4, 1/2, 1, 2, 3, 4, 5 densities.
- *Star effects*: North Star, Vector Star, Hollywood Star, Hyper Star; unsymmetrical patterns for artistic use.
- *Black Pro-Mist filter*: pale gray, light scattering properties of filter reduce reflectivity, absorb more light; image softening possible image by control of flare produced from light sources and reflections; filter densities

range from 1/8 through 5 grade.

Circle (1180)

Toshiba

- *SK-3D7 camcorder*: two 1/2" CCD sensors for 300,000-pixel array; produces 3-D images which are viewed through glasses connected to an electronic adapter; recording on S-VHS format.
 - *IK-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-300P pan/tilt head*: for ENG cameras, lenses; electromechanical positioning system for 36 arc-sec repeatability at 36 feet.
 - *MCS-4000 controller*: 4-camera control for VS-300P 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-8000 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

- *Microswift H-PED*: robotic pedestal, remote-controlled servo height adjustment; 3-stage pneumatic unit, on-shot elevations from 24"-58".
 - *OSPREE*: portable, field, studio pneumatic pedestal; 2-stage unit; casting skid supports weights to 120 lbs; 27"-59" vertical adjustment.
 - *Microswift EXY-PED*: programmable robotic camera pedestal; with elevation, X-Y control; 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, mounts to any MII, S-VHS VCR, 28mm height LCDs; reads SMPTE/EBU time code, user bits from compatible source.
- Circle (1465)

ACCUM Inc.

- *DIS-422 image store*: 4:2:2 CCIR-601 architecture; D-1 525-/625-line standards; auto switching between standards; optional removable media drive for image transfer, archiving; wipes, windows.
- Circle (505)

Adams-Smith

- *Zeta-Three^{em}*: audio, video, MIDI synchronizer, emulator; supports more than 100 different ATR interfaces with direct editor control of associated ATRs; all Zeta-Three

- "Before..."

- "After just one treatment with the 1647."



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.



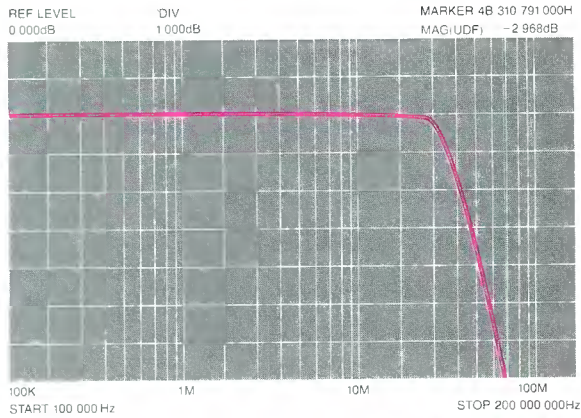
TTV 1647 CCD CAMERA.

Circle (104) on Reply Card

 **THOMSON VIDEO EQUIPEMENT**

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features are retained in this unit.
Circle (510)

Adrienne Electronics

- *AEC-Box-1*: LTC-to-RS-232/RS-422 control signal converter.
 - *AEC-Box-14*: 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-22ESX*: 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)

Ampex Corporation

- *ACE upgrades*: enhanced interface to GVG 200 switcher, AMX-170 audio mixer, Sony DVR-10, Panasonic MII; upload/download control of AVC Vista switcher panel memory; TurboTrace list management.
 - *ACE 25 V3.0*: software expands file input/output control; source/record VTR swap, 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, -350*: -200 accepts all three D-2 cassette sizes; -250/-350 accepts small, medium sizes; -200 series optimized for broadcast; -300 series targeted for post; complements VPR-300.
 - *ACE 10 editor*: 3/4", 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 MIF*: serial-parallel interface for control of Sony type 5 VTRs, various parallel-control audio transports.
- Circle (539)

Amtel Systems

- *E-PIX*: hybrid, non-linear editing; machine control to 16 transports; complete production logging; 10-input switcher, 8-input audio mixer; film conform; compatible EDL; by Evertz.
- Circle (542)

ASACA ShibaSoku

- *TM056A6*: 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-ITY/Ckits*: Dub-Out upgrades U-matic VCR with S-VHS, Y-3.58 feature; Dub-In offers Y/C, S-VHS capability to U-matic recorders.
 - *B-22S*: sync kit for external sync to V-lock 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.

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Stereo Phase Error	Poor	<1°
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for PAL, PAL-M, NTSC-DF, 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 canoe guide*: guide post, lower tape guide, post; construction from super hard metal or coating; plating eliminates tape stickage.
Circle (607)

Broadcast Electronic Services

- *BETABOX*: converts Betacam, Mill, 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)

Calaway Editing

- *CE-25*: 2-VTR cuts-only editor; expandable to 8-VTRs; optional CMX RT-11 disk compatibility; preview switcher; GVG, CMX EDL.
- *CE-75*: A/B roll 3-VTR edit control; 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)

CEL Electronics

- *PI67-10 still store*: digital image library for Maurice digital effects; menu-control via Maurice II controller; optional keyboard, VDU control; 100Mbyte hard drive for 100 frame storage.
- *CEL PI59 ERIC xPlus*: 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

- *#4815 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 VITC reader, translator; CDI-1200 time code reader, inserter; CDI-1400 TC generator.
Circle (661)

CMX

- *OMNI 1000 editor*: X-windows displays, 40Mbyte hard disk stores CMX, SMPTE, OMNI EDLs; context sensitive keys; Sync Group multimachine 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; generate 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 control 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; 2-, 3-VTR configurations.
Circle (696)

Corvis Communications Ltd

- *OSC/R software*: off-line 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; an alternative to mechanical changers.
- *CM7000*: auto QC station for duplication tests finished cassettes electronically; provides failure documentation.
Circle (738)

Editing Machines Corporation

- *Enhanced EMC²*: upgrade for 30 frames/sec capability, expanded storage capacity, improved image quality.
Circle (747)

Evertz Microsystems

- *Model 4015*: LTC/VITC 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 7100 emulator*: enhanced ATR interface, supports auto track arming for some ATRs; multitrack edits synchronized with video; integrates audio edits in EDL; operates as stand-alone resolver for dubs.
Circle (768)

Fast Forward Video

- *Remote module*: SMPTE, EBU TC interface; RS-422 link to editing controllers.
- *Model F-30*: 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 and 1,000 or more VCR transports; QC station operates 80-to-100 VCRs.
Circle (790)

GDJ/Generic Designs

- *GD 422 serial adapter*: serial-parallel interfaces; for RS-422 control of 3/4", 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 ESBUS or Sony standard, parallel control for all transports, synchronizers.
Circle (803)

Grass Valley Group

- *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 serial port interface with user bits; EasyLog tape logging software included.
- *FP-50/TG, FP-50/TRG interface*: displays time code on camera viewfinder; 14-pin cable connects between VCR, camera.
Circle (827)

Hotronic

- *AL82*: 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 (828)

Innovision Optics

- *Mini-Mover*: 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 μ P with 4-line, 20-character LCD display; 32 keys and numeric keypad; single encoded knob for jogging; function keys; menus.
Circle (855)

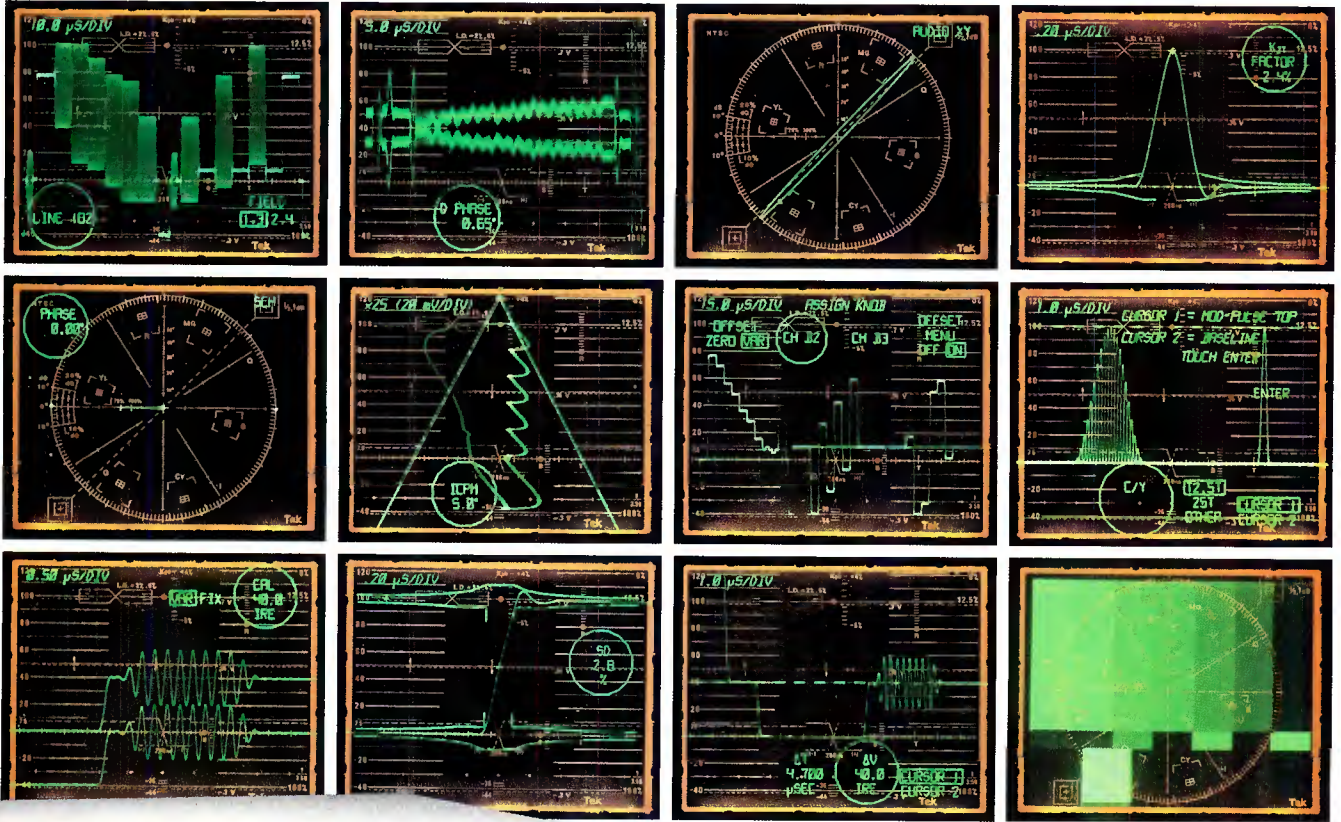
Jemani Ltd

- *flix ii/VIP production center*: combo editor, design workstation, machine control; storyboard, pictorial edit lists; interactive linear, non-linear operation; multiwindow capability via UNIX, ESBUS, flexinet multiuser.
Circle (1473)

JVC

- *Editmaster II/Editrack*: off-line editing; NTSC, PAL with SA-F200U interface for S-VHS, MII, 3/4" 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.



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

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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!

Tektronix
COMMITTED TO EXCELLENCE

- *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 recorder for 1/2" metal particle tape; developmental design with NHK, compatible with Panasonic digital.
- *S-VHS-C 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; assemble edit functions.
- *RM-860U edit control*: A/B-roll for S-VHS, other formats; 45-pin, RS-422 9-pin connectors; TC reference; GPI interface for switcher and effects, audio mixing; tape counter, lap timer TC/LTC modes.
- *BR-S777U S-VHS duplicator*: three record-only units in one cabinet; SP/EP recording; ID code generator; remote control by 34-pin parallel; hi-fi VHS stereo sound; Dolby B NR. **Circle (868)**

LaserDub

- *LD-2000 duplication*: laserdisc-to-VHS duplicator; D-2 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 (895)**

M&R 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

- *BV-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

- *VUES editing*: integrated post-production system; edit control, still-store, digital production switcher; VSR10 solid-state memory for 136 sec of video; operates on Mac IIx 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)

Paltex

- *Abner/VITC*: upgraded Abner A/B-roll edit control includes full VITC reader; retains compatibility with LTC, control-track reference and other Abner accessories.
- *Aston Wallet*: general-purpose still-store; extended keyboard and 105Mbyte fixed drive; 99-frame storage with associated key signals; U.S. distributors for Aston line. **Circle (998)**

Panasonic A/V Systems Group

- *IFP-232CJ adapter*: machine control by PC; links RS-232C PC COM port by 3-conductor RJ-11 telco cables; for 7000 series S-VHS/VHS, 6000 series VHS VCRs with 34-pin parallel port.
- *IFP-422 interface*: serial-to-parallel link 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 tapes with VHS quality; full-function portable with GT4 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 45dB S/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 dockable VCR*: S-VHS format docks to several Panasonic cameras or operates as portable unit with other equipment; 400-line resolution; playbacks 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-63 Mill player*: auto tracking playback for edits, dubs; 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*: Mill editing; 9-bit TBC with optional CCIR-601 output; full edit feature package; S-VHS, adaptive edge comb filter produces improved resolution in slow motion, still modes; auto-tracking.
- *AU-410, AU-410S VTRs*: dockable VCRs for ENG/EFP, camcorder operation; -410S with broadcast response, performance; 54dB S/N, video confidence heads; luminance playback; two FM, two linear audio tracks with Dolby C. **Circle (999)**

PEP

- *BP Edit Control Adapter*: integrated solid-state change-over switch routes 33-pin parallel signals to 3/4" VCR or alternate format VCR; switch, placed beside edit controller, includes 3/4", VHS positions. **Circle (1005)**

Skotel

- *TCG-333 system*: generator, reader, character inserter for VITC, LTC; dual standard NTSC, PAL per SMPTE/EBU spec; translates LTC-VITC.
- *TCG-311, TCG-313*: LTC generators, readers; -313 with character inserter.
- *TCT-412, TCT-421*: LTC-VITC and VITC-LTC translators. **Circle (1096)**

Sony Advanced Systems

- *HDD/HDDP-1000*: HDTV DVTR patterned after BVH-3000 complies to SMPTE 240M; 1.18Gb data rate; 30MHz luminance, 15MHz chroma; 8-channel DASH audio at 48kHz/16-bit sampling; time code, editing features.
- *HDDF-500*: digital frame recorder; solid-state with VTR emulation in editing, random access; DRAM stores 32 frames of RGB 30MHz components; SMPTE 240M 1125/60 16:9 3-level sync format.
- *HDV-10 recorder*: UNIH format with 20MHz luminance, 7MHz chrominance; analog component recording.
- *HDL-2000 optical disc*: laserdisc 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 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/DVPC-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 (1103)**

Sony Communications/Pro Video

- *EVO-9500, EVO-9700*: Hi8 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.
- *LVR-5000, LVS-5000 disc*: video database using laser videodisc recording, component video; adapter compresses full-screen pictures to windows for image comparison, selection; LVA-7000 videodisc player.
- *EVV-9000 recorder*: Hi8 format dockable recorder. **Circle (1105)**

Spaceward Microsystems

- *Showcase*: presentation still-store; operating system with 2,000-picture capacity, 20 frames in live storage for immediate access, cross-dissolves; animation sequences, cuts possible. **Circle (1125)**



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TEAC

- *LV-250HC videodisc*: laserdisc 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-210A, LV-210P 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-F990 S-VHS VCR*: auto assemble edit, insert edit, pre-roll editing.

- *SV-970 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 1/2", 3/4" 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 rewriteable laserdisc, GVG DPM-100 picture manipulator, Graham-Patten 612 ESAM, various transport interfaces.

Circle (1231)

VTE

- *DVSR 100*: digital video silicon recorder sequencing system; internal bus provides simultaneous recording, display with different TV rasters; 312 Mb/s data rates; 1.8Gbyte 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 535 film camera*: 35mm format; proprietary μ P oversees all camera operations with diagnostic capabilities; Swinover 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, 625/24PAL; disruption of 3-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 Keycode reader*: accessory for Rank Cintel telecine; transfers film frame ID data to video for recording.



AL'S
SECONDHAND
24-TRACKS

CUT A DEAL THEN CUT A TRACK

- *SteadyMag*: extended throat magazine for Arri 2C and 3C cameras used with Steadicam system.
- *CP workprint logger*: automatic, accurate workprint logging; operates with CP Keycode reader of data.

Circle (659)

Corporate Communications

- *Copernicus Hex*: hexadecimal digital color processor; 4-channel, 16-bit correction in Sunburst II color corrector system; accepts any standard digitized video format input.

Circle (697)

Dedotec USA

- *Petroff matte box*: 4x4 design for video, 16mm cameras; molded synthetic materials stronger than aluminum; dual filter compartments, one rotates 360°; follow-focus attachment; supports ARRI, Aaton.

Circle (717)

Eastman Kodak

- *Electronic Intermediate*: experimental system as an intermediate step between film, HDTV technology; film scanned to digital data for high-speed manipulation with computer workstation.
- *EXR media*: 16mm film; high-resolution emulsion proposed for HDTV source media; extended latitude with 500 exposure index; tabular-grain reduces grain.
- *Experimental HDTV telecine*: CCD sensors; 1125/60, 1050/59.94, 1250/50 systems supported; developed with Rank Cintel.

Circle (744)

ERGO 90

- *Fil-trol FU-1*: waste management unit for telecine machines; special solution handling; contains gases released from developing processing.

Circle (764)

Nikon Photo/Electronic Imaging

- *LS-3500 scanner*: 35mm film scanner; converts stills to video; with ColorFlex software permits color separations for desktop publishing.

Circle (975)

Nytone Electronics

- *VSS-1, VSS-2 scanners*: flying spot systems for 2x2, 35mm slides; 80-slide trays for standard, glass slides; pan, zoom, 360° roll, 180° flips; joystick adjusts pans, width, height; programmable, 250 steps.

Circle (982)

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.
- *URSA*: 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 3000-MKII*: Lipsner-Smith ultrasonic cleaner; operates at 2,000 ft/min; improved solvent strippers, improved refrigeration efficiency enhances solvent recovery.

Circle (1052)

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

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Circle (108) on Reply Card

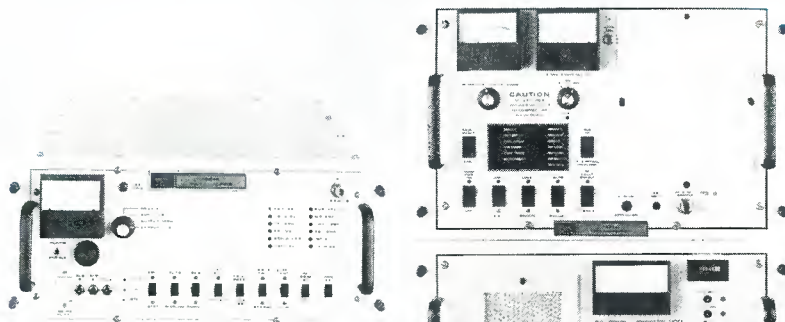
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Circle (1123)

V4: Batteries, lights

- ◆Chargers, analyzers
- ◆Lamps, lighting effects

Alexander Batteries

• *Beta Battery Optimizer*: combined charger, discharger, analyzer, conditioner.
Circle (524)

Ampex Corporation

• *Videssence 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; μ P controls all functions; three 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 CMFC Fast Charger.
Circle (548)

Apollo Lighting/Audio Visual

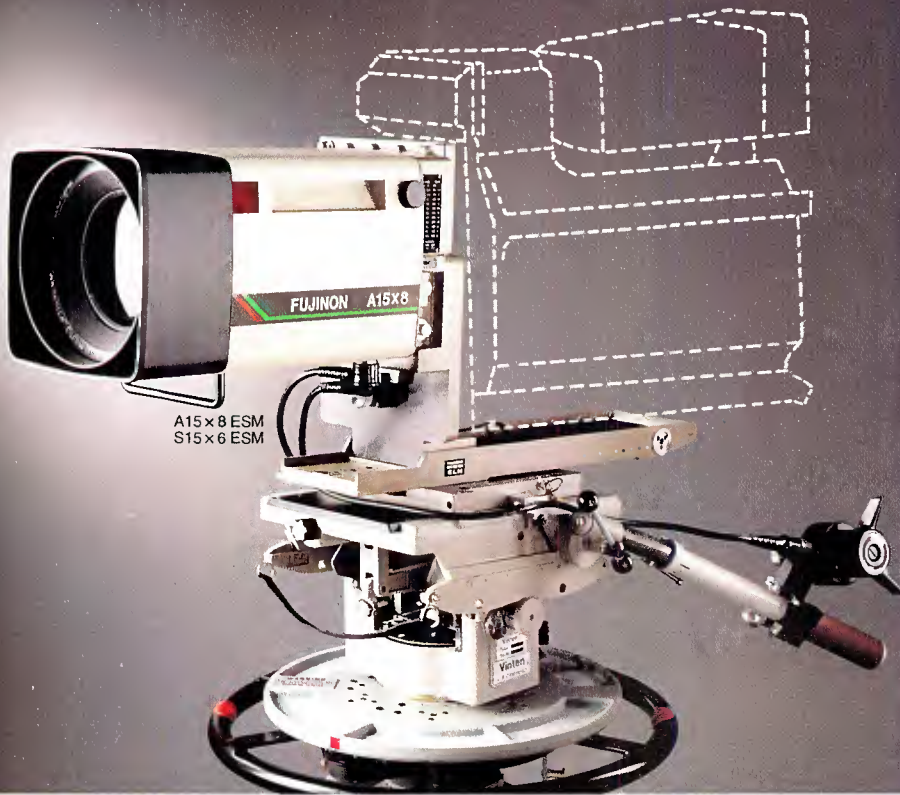
• *Expanded line*: lamps for SSTV, floods, spots; dichroic materials, gobos.
Circle (549)

Arriflex

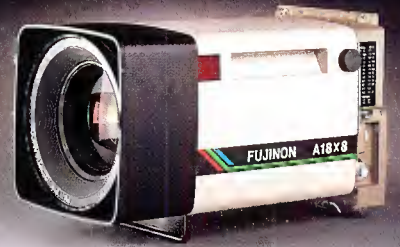
• *Double telescopic hanger*: supports lighting fixtures from studio grid; extends 40-77"; stirrup, $\frac{5}{8}$ " stud and Universal Hanger with pop-out $\frac{5}{8}$ " stud or Junior stud.
• *Sparrow Plate*: miniature 3" wall plate; 4" x 1-1/2" with offset 3" stud.
• *Mini-Flood, Mini-Cyc*: high-output fixtures for portable use; 100W rating with high-efficiency design, barndoor.
• *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 2.5kW-12kW ratings; 5% increase in light output without flicker; for high-speed photography to 10,000 frames per second; 10% input fluctuation causes no output change.
• *Baby Swivel*: snap-in for Super Clamp with $\frac{5}{8}$ " Baby pin in snap-in ball joint.
• *Fast-Loc Butterfly Frame*: quick-assembly creates frames beyond standard 6" x 6" sizes from 2", 4" square tube lengths.
• *Pole-operated Fresnels*: 1kW, 2kW, 5kW for studios; Compact 5kW Fresnel fixture.
• *Flexensions*: 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*: softlight with quartz-halogen lamp; model LC88 and 1kW lamp produces equivalent of 2kW standard fixture; diffused output from 500W-1kW.
Circle (1486)



A15 x 8 ESM
S15 x 6 ESM



A18 x 8 ESM
S18 x 6 ESM



A20 x 7 ESM
S20 x 5.4 ESM



A55 x 9.5 ESM
S55 x 7.3 ESM



A44 x 9.5 ESM
S44 x 7.3 ESM



A34 x 10 ESM
S34 x 8 ESM

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Christie Electric

- *CASP/1200*: universal battery support; rejuvenation, charging, analysis; computer interface, printout of battery condition. **Circle (656)**

Cinemills

- *Compact 1200W PAR*: versatile rotating housing; 1.2kW n 20A circuit; five lens rings for interchange of lens without opening front door.
- *Silver Bullet*: HMI flicker-free lights; 1.2kW PAR; 1.2kW, 2.5kW axial design; 6kW, 12kW, 18kW Super; 208-250Vac, 230Vdc.
- *Squarewave ballasts*: 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 (660)**

Dedotec USA

- *Dedocool light*: COOLH light head uses 24Vdc 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 ignitor.
- *1.2kW HMI systems*: magnetic ballast, QUICK-START color temperature correction; IMPACTO-GRAPH indicators; 24" Fresnel, solid-state ignitor, improved cooling.
- *HMI equipment*: magnetic ballasts rated 200W-18kW; ignitors 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 (732)**

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 1,000 dimmers with proportional soft patch; 24 submasters. **Circle (1463)**

Frezzolini Electronics

- *Model 975A*: 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 pak.
- *Model 9704*: 8-channel battery charger, management system.
- *Universal NP1 charger/analyzer*: dual-channel; auto-balancing 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

- *GMAX8 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

- *Fog Machine*: heavy-duty, variable volume, continuous delivery; local, remote, manual, autotoggle control; non-toxic, non-flammable, non-explosive, water-soluble non-oily Fog Power, Fog Light solutions.
- *Premiere Patterns*: 22 patterns represent various wall types, clouds, trellis 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-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*: μ P control; 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 (809)**

L. E. Nelson

- *PAR 64 lamp*: 1.2kW PAR 64 tungsten-halogen; 3,200K color temperature, rated 600 hours; four base types. **Circle (884)**

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 #602-100, -102) consoles; Scene Master 60 Plus (#602-001); Prestige 2000 Plus (#602-030) series. **Circle (894)**

Leonetti Company

- *Sunray 2500W*: HMI light output equal to 10kW lamp; operates from 110V/220V ballasts; 16-pound fixture mountable on baby stand; Philips MSR lamp for 13,000fc at 20 feet; diffusion, intensifier options. **Circle (897)**

Lighting Methods/ETI

- *Impression lighting control*: 512-dimmer control; 150-channel, stores 400 cues/show on 3.5" disk; overlap proportional submasters, bump switches; autofader pairs.
- *Remote Focus Unit*: hand control sets channel levels, checks dimmers, runs cues; cue parameters view on LED displays; connects through 6-pin XLR connector to lighting control console.

- *insight controller*: 108-fader system for total manual control; direct, overlapping proportional groups; bump switches for on-off control, programmable for timed fades; 512-dimmer capability; 200 cues.
- *Designer's Worksheet*: 12"x12" digitizer pad connects to Impression, Expression and Concept control panels; enables remote control of console functions.
- *Concept console*: 500-channel with proportional softpatch to 1,500 dimmers; stores 400 cues with playback times to 1/10-sec increments; Autoload feature to load, initiate autofader pairs; Macro features.
- *Expression lighting control*: 250-channel for 1,000 dimmers with proportional softpatch; two cue playback faders permit split fade times; effects, subroutine packages; 24 overlapping submasters.
- *ETCEDIT software*: for lighting designer, assistants, electricians to load, edit shows with a PC, laptop computer; includes spreadsheet, single cues, track sheet, submaster, softpatch and system settings.
- *MmicroVision*: 125-channel control features proportional patch to 512 dimmers; 200- cue memory; extensive flexibility includes options for MIDI, remote Go inputs, remote submasters. **Circle (1441)**

LTM Corporation of America

- *Cinepar 2500*: MSR 2.5kW lamp; highly polished parabolic reflector; output 6,480fc at 30 feet; ignited from head, ballast. **Circle (910)**

Osrsm/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 123W*: gap-shortened 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; gap-shortened design for greater luminance; 1.2kW unit has color temperature of 5,600°K. **Circle (993)**

Paco Electronics USA

- *DP-1240 battery*: 12Vdc 4.4Ah NiCad; integrated thermal protection; heavy-duty plastic case; directly replaces Sony BP-90. **Circle (997)**

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 NiCad battery; 25% more run time; high-impact Kydex molded case; about 2.5 hr operating time; PRB 90A clip-on version.
- *Pouch Pak*: accessory for lightweight belt power source; 8.5"x5.75"x1.75" high-tech "leather" 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 (1006)**

Philips Lighting

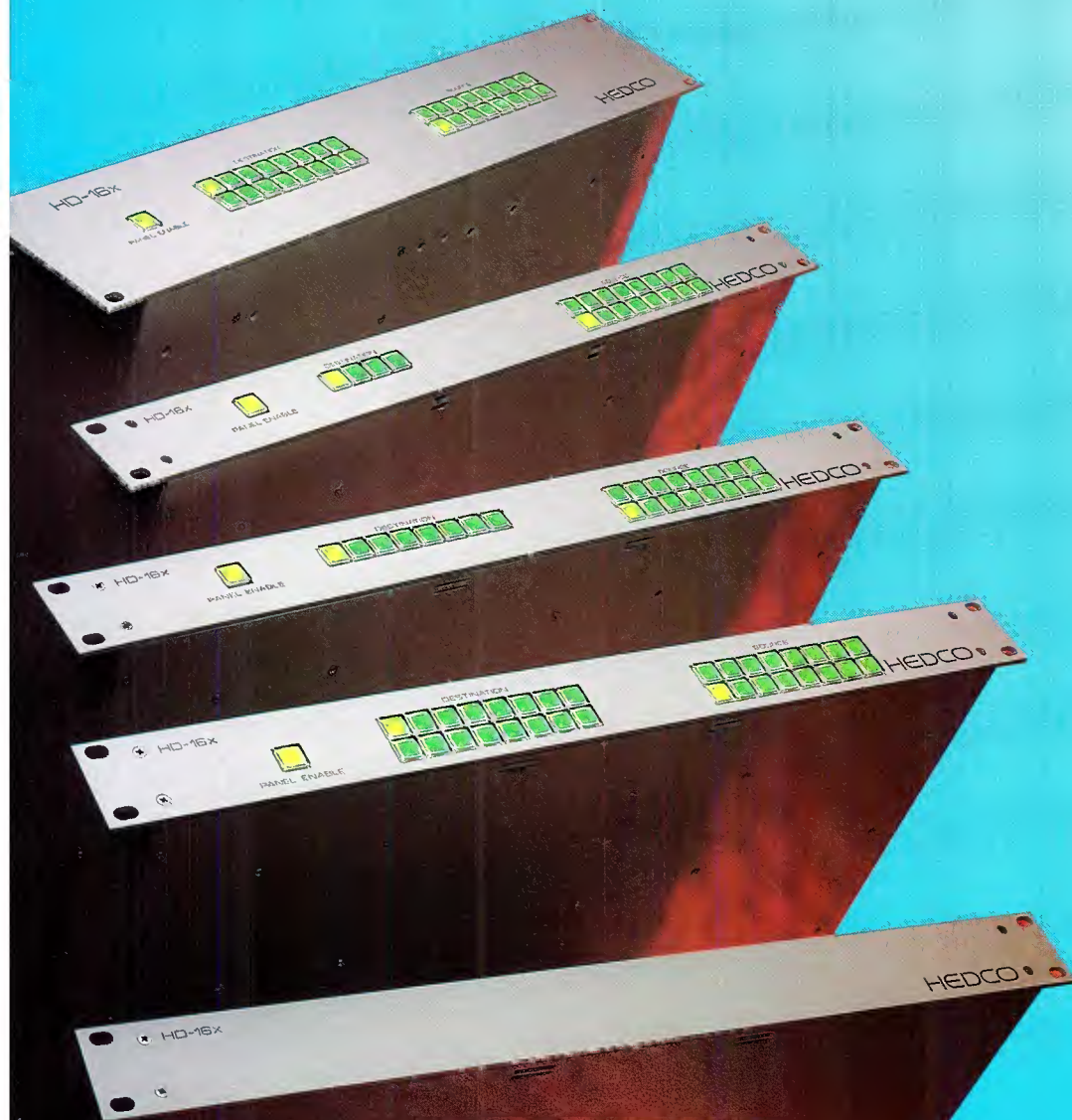
- *MSR dimmable*: HMI studio lamps permit

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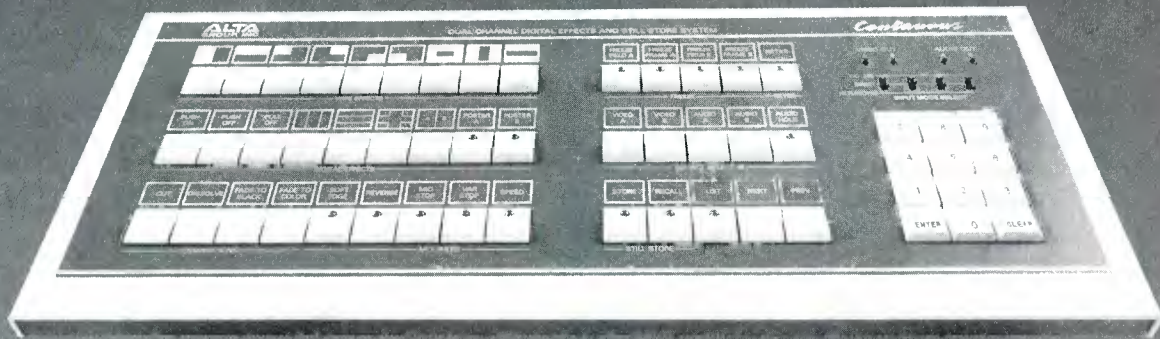
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Signal to Noise	52 dB	58 dB	?	56 dB
Storage Capacity*	200 fields 100 frames	250 fields 125 frames	207 fields 207 frames	200 fields 200 frames
Synchronizer	—	Dual	—	Dual
TBC	—	Dual	—	—
Production Effects	1 wipe dissolve —	9 wipes dissolve 7 digital	1 wipe dissolve —	3 wipes dissolve 3 digital
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Single Channel	\$19,900	—	—	\$26,333
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*Basic System

Based on available data as of June, 1988.

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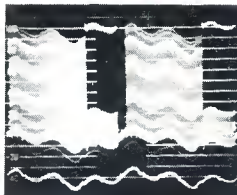
ELIMINATES HUM AND INTERFERENCE:

IN STUDIO

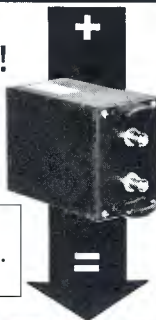
- Between Buildings
- On long runs in Buildings
- Between Studio and Transmitter
- On Incoming Circuits
- On Outgoing Circuits

IN FIELD

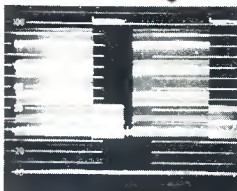
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dimming to 40% retaining a stable 5,600°K color temperature; 575W to 2.5kW units designed for Hot Re-Strike; compact single-ended; MSR medium source rare earth.
Circle (1009)

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 (1060)

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)

Satter 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

- *LP90 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 four 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 (1150)

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

- *Screenout-IRxUV*: shields people, objects from harmful IR, 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 handle 3-/5-wire mains.
Circle (1197)

Ushio America

- *Halogen lamps*: GCA, GCB, GCC for Pro-light, GDA for Lowel-Light V-light; FKW for ARRI 300 Fresnel, FRK, FRG for ARRI 650W.
Circle (1204)

V5: Digital systems

- ◆ Graphics, effects
- ◆ Titlers, prompters
- ◆ Weather graphics
- ◆ Integrated production systems

A.F. Associates

- *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 (502)

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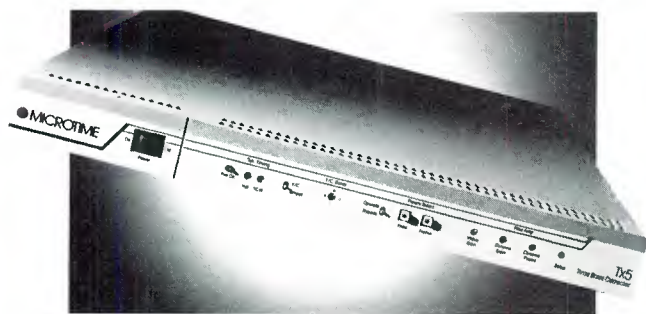
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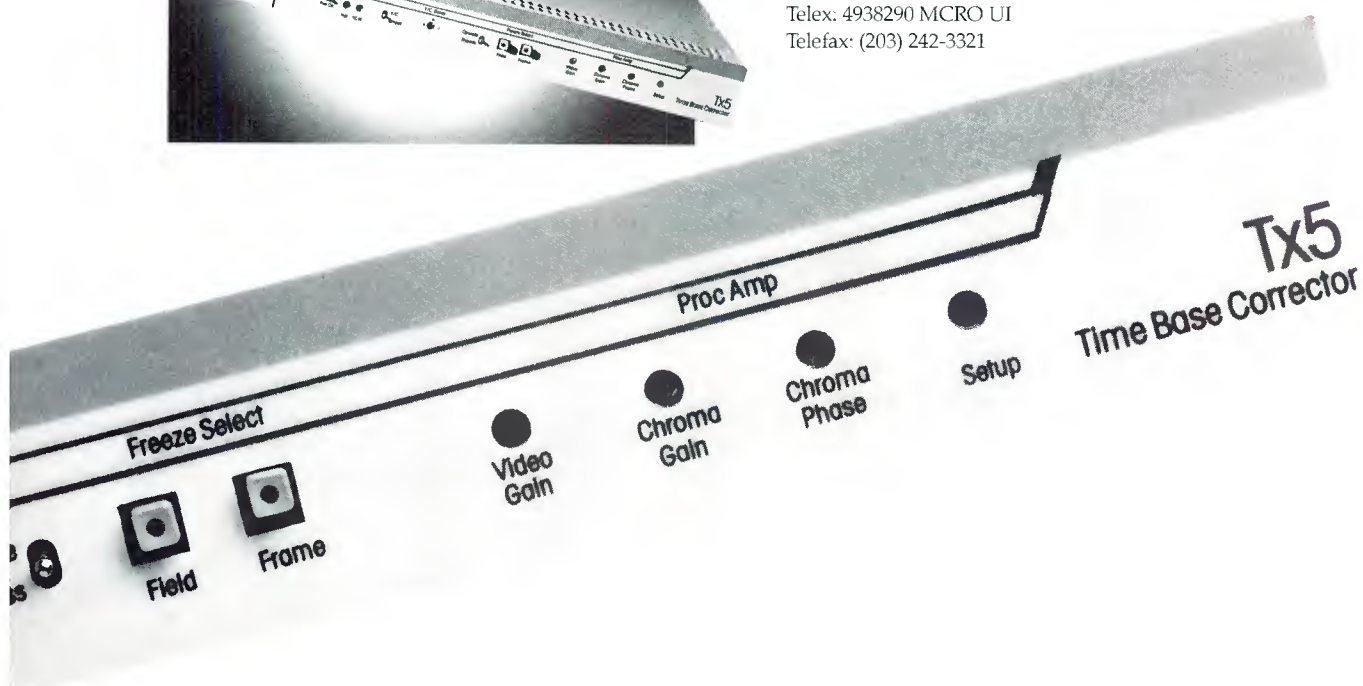
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Circle (128) on Reply Card

Abekas Video Systems

- **A53-D enhancement:** "corner pinning" feature; solid builder creates 4- to 10,000-sided solid objects, full 3-D manipulation; Special Programs on Remote Terminal (SPORT).
 - **A72 enhancement:** text editing, animation, effects options for character generator; Ethernet network; SPORT interface; CCIR-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

- **Services:** Forecast/Briefing, Weather Show, WeatherBreak.
 - **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.
 - **Weather-Link Software:** automatic access of Accu-Weather graphics for Commodore Amiga; by Associated Computer Services; access, display 2,000 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 768Hx484V resolution; attenuation compensation, ground clutter suppression; Graphics, Map Builder, Lightning, RRWDS data displays.

- **RRWDS controls:** provides various options for display of weather information; permits user-defined limits on precipitation; time lapse capability; 768Hx484Vx8-bit resolution; map scaling; menu-based.

Circle (514)

Alden Electronics

- **WS5500 weather system:** 80386 μ P workstation displays RRWDS/NEXRAD radar, GEOS satellite, DIFAX charts, alphanumeric data; NEXRAD 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 workstations 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; Digi-Matte keying.
 - **ALEX titler:** frame-based animation; definable 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; SCSI link for more storage, switcher effects, multiple plane animation, vector fonts; 3-D modeling; CCIR-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)

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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 (578)

AVS Broadcast

• *FloatingPoint*: 3-D, 3-axis manipulation of text; multiple on-line, resizable fonts; 4:4:4:4 architecture; full kerning freedom; light sources for reflections; linear keyer; YUV/YC outputs.
• *ManuScript*: high-performance graphic titler; RISC design; 10ns resolution, anti-aliasing, dynamic character resizing; 10-font library; encoding, linear keying; supports 47 languages; by G2 Systems.
Circle (580)

Bio-Electronics

• *MK85 series video titler*: 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)

BTS

• *Vidifont 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 (648)

Chyron

• *Outline Font Processor*: converts Bitstream outline master typefaces to ACG fonts in 10-200 scanline heights; available separately or with ACG logo compose; includes a typeface font trim feature.
• *Scribe Jr. updated*: compact Scribe title/graphics system; latest software.
• *iNFiT!*: 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 (657)

ColorGraphics Systems

• *DP/Mosaic*: enhanced DP4:2:2 graphics system; digital disk recorder, software for improved rotoscoping, animation; records, plays CCIR 601 video in 525/625 standards; 4:4:4:4 architecture.
• *MORPH Animator*: for DP4:2:2 graphics system; cel animation for layered cels from vector shapes, interpolates cels over time; control over key, ink, paint of each layer.
Circle (669)

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 with foreign characters, multiple fonts; hand-held controller, underlining, colors.
Circle (678)

Computer Prompting

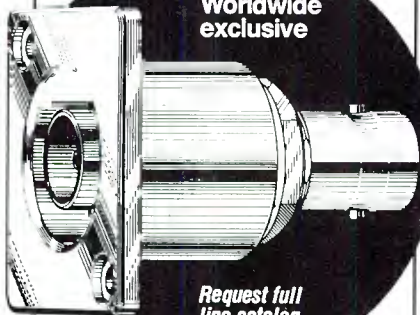
• *CPC-1000 SmartPrompters*: software for IBM compatible laptops; 1000N software interfaces to any TV newsroom via LAN; 1000D 9-pound gas plasma prompter display; 9-font library; 4-hour scroll, accepts ASCII files.
Circle (683)

Cubicomp

• *Vertigo 3-D V 9.3*: Silicon Graphics animation workstations; modeling, paint, choreography, render; VideoPak interface for RGB, Beta, NTSC, PAL; D-1, D-2 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)

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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**

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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

• *DGS/386*: graphics system; native mode 80386 μ P; 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/mix, 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

• *BACKGROUNDER sets*: software options; additional fonts, backgrounds; supports Greek, Cyrillic for 20K, 30K, Graphics factory; textures, patterns.
• *GF-600/TP*: Graphics Factory tape input, output option transfers images as fields to/from Alias, WaveFront 3-D systems; for compositing of backgrounds on-the-fly, no

rerendering, 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

• *Tempest 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, barndoor swing, video slice, checkboards.
• *JAZZ effects*: production models of digital effects system; upgrades for dissolves, transparent dropshadows, chroma-key, luminance 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; cordless tablet; mapping, effects animation for 3-D; 3-axis rotation, perspective standard.
Circle (857)

Enterprise Electronics Corporation

• *DWSR-90CTV*: Doppler radar for TV; narrow-beamwidth antenna, pedestal, radome, transmitter, receiver, control, display con-

sole; 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-3.58 or composite inputs from S-VHS or U-matic sources without transcoders; dual independent TBCs.
Circle (784)

Getris Images

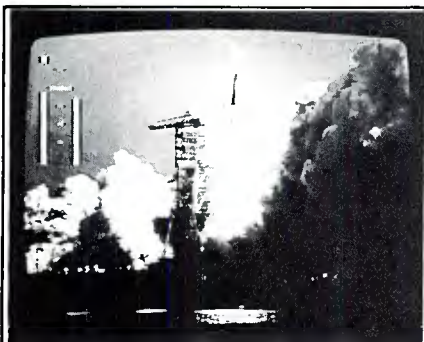
• *Venice*: 2-/3-D graphics on 80386 platform; includes paint, 2-D real-time animation, linear keying, 3-D modeling, animation by Digital Arts; pressure-sensitive tablet, Transputer render option.
Circle (1440)

Grass Valley Group

• *Kaleidoscope Kurl*: effects enhancement; non-linear transformations, page-turn, page-roll, ripple, slits, sphere, position/size modulation; XYZ axis 1-light/multilight modeling.
• *Kaleidoscope Import*: Version 5.0 upgrade; modify position parameters of Kaleidoscope keyframes directly from a file on disk; permits direct motion control from devices providing position data.
Circle (807)

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-



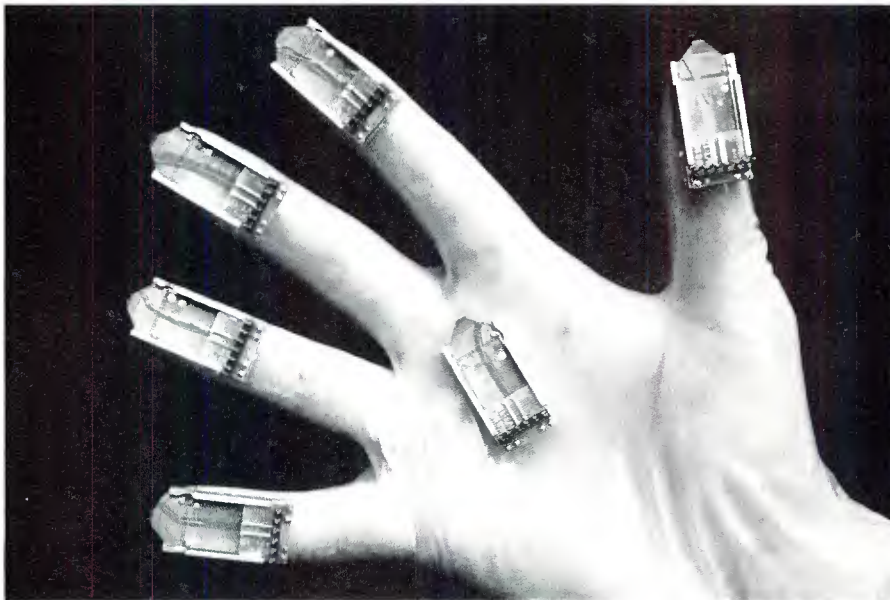
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tical disk storage provides for 750 images.
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Image North Technologies

• *Inscriber titler:* graphics, presentation on AT-class PC, ATVista, Targa16 class graphics cards; resizable type, page description language; flexible alignment of text; effects manipulations; NTSC, PAL.
Circle (1451)

Kavouras

• *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; 3-D animation; wipes, transitions concurrent with animation.
Circle (875)

Knox Video

• *IMAGR II titler:* HR characters at 40MHz processing; proportional spacing, adjust-

table kerning; edge, 3-D effects; 3ns resolution with anti-aliasing algorithms; paint functions, graphic effects generator.
Circle (883)

Laird Telemedia

• *Titler options:* dithered fonts reduces edge aliasing, scalable Master fonts; Font Developer III post process dithering in font creation; Graphic Import access to GIF, TGA, IFF.
 • *Model 1480:* upgraded 1450 titling generator with integral remote disk drive.
Circle (885)

Listec Video

• *Prompter equipment:* A-6000 prompter software editor; A-5000-NET LAN-based A-5000 prompter; A-5500 ScrollBox Script Generator with A-2009 Field prompter 9", fold-away mirror, hood assembly.
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

• *ProPaint 16 graphics:* NTSC, RGB video from PC-based system; 512x492-pixel resolution; 80386SX μ P running 16MHz; tablet, encoder, decoder, 80Mbyte hard drive 5 1/4" floppy; 14" amber monitor; color monitor needed.
Circle (946)

NewTek

• *Video Toaster:* combines video effects, character generation, color 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 (998)

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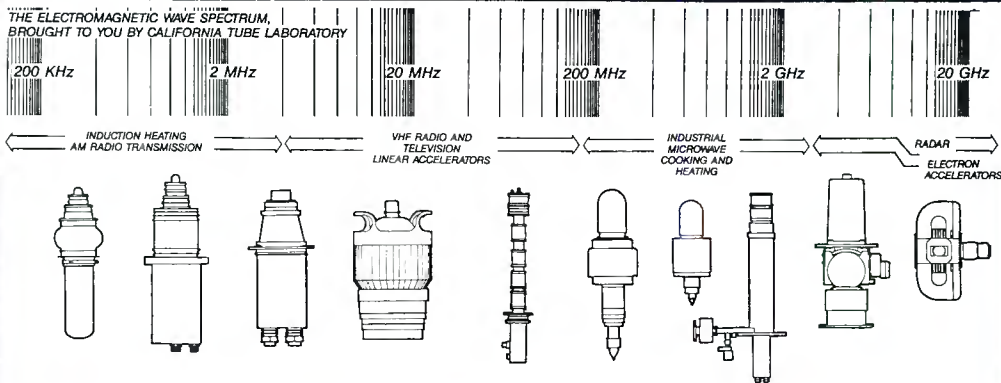
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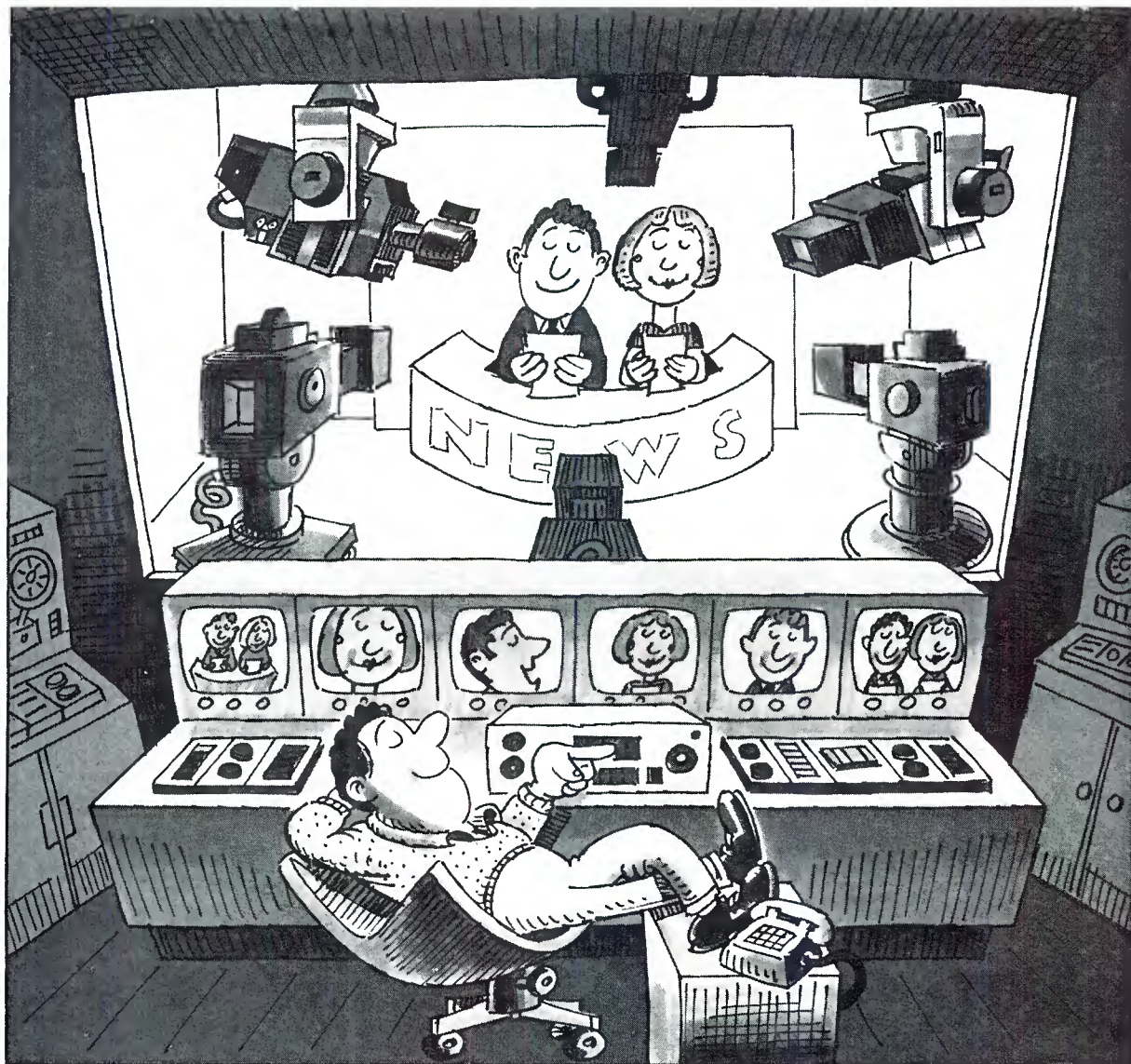
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Circle (130) on Reply Card

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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 multi-tasking operating system.
- Circle (1008)

Pinnacle Systems

- *Series 2100*: workstation enhanced with optional PRIZM 3-D effects; dual channel combiner.
 - *DCC-21 combiner*: dual-channel feature for 2100 series workstations; for manipulation of images from two separate workstations at a single control panel.
 - *Model 3000E, 3001*: 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)

Q-TV

- *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; assembles quickly.
 - *MVP-9*: miniature videoprompter; 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+ titling*: HR text, graphics; enhanced with 0.289ns resolution, unlimited planes; dual 32-bit frame buffers; character sizing; Panimation movement 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/frame animation, wipes, dissolves.
 - *Picturenet*: networking for Picturebox as multiple user system, for eight devices including Paintbox, Picturebox, Central Lending 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 for on-air presentations; 3RU package, 186Mbyte disk, twin framestores for cut/dissolve; RGB, encoded video with key outputs; Picturenet link to Paintbox, other sources.
 - *Paintbox HD*: graphics for HDTV; compatible with SMPTE 240M, Eureka, 1050 HD systems; digital transfers with Graphic and standard Paintbox systems, Pictureport.
 - *HarryTrack*: full digital stereo 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 Ultimatte, motion control.
- Circle (1478)

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Circle (131) on Reply Card

Sony Communications/Broadcast

• *DME-500 effects*: 3-D effects with non-linear page turns, cylinders, spheres; presets operate from DVS-8000 switcher or BVE-9000 editor; 10-bit communications; 3-field adaptive image processing.

• *DME-9000 effects*: 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 Microsystems

• *Rodin*: 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.

• *Titler*: 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/Graphics Div

• *XL series animation*: software release of 2-D, 3-D capability for 40-bit VME-based XL-400 computer with FlameThrower processor; PaintAmation and standard graphics; tablet, FSDI disk, tape.

• *PaintAmation workstation*: paint, 2-D animation; automation of repetitive tasks; FlameThrower processor; analog interface supports NTSC, PAL component video; 601-compatible, 4:4:4 with alpha channel.

• *FlameThrower graphics processor*: high-resolution video with computer technol-

ogies; configurable architecture supports current and evolving standards; VMEbus structure as building block to customized HDTV workstations.

• *Release 5.0 software*: upgrades to S-Paint, S-Render, S-Dynamics, S-Geometry modules; automation functions free the animator for more creative tasks.

Circle (1133)

Tekskill Industries

• *ValuPrompt 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

• *XD88 graphics workstation*: alliance with Media Logic; places Artisan desktop presentation on XD88/30 and XD88/10 workstations or X stations; UNIX operating system using Motorola 32-bit 88000 17MIPS RISC processor.

Circle (1155)

Tel-test

• *4001 pattern generator*: 30 matrix wipe patterns for key input of a production switcher; 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 sup-

port 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

• *Horizon860 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 1860 processor.

Circle (1191)

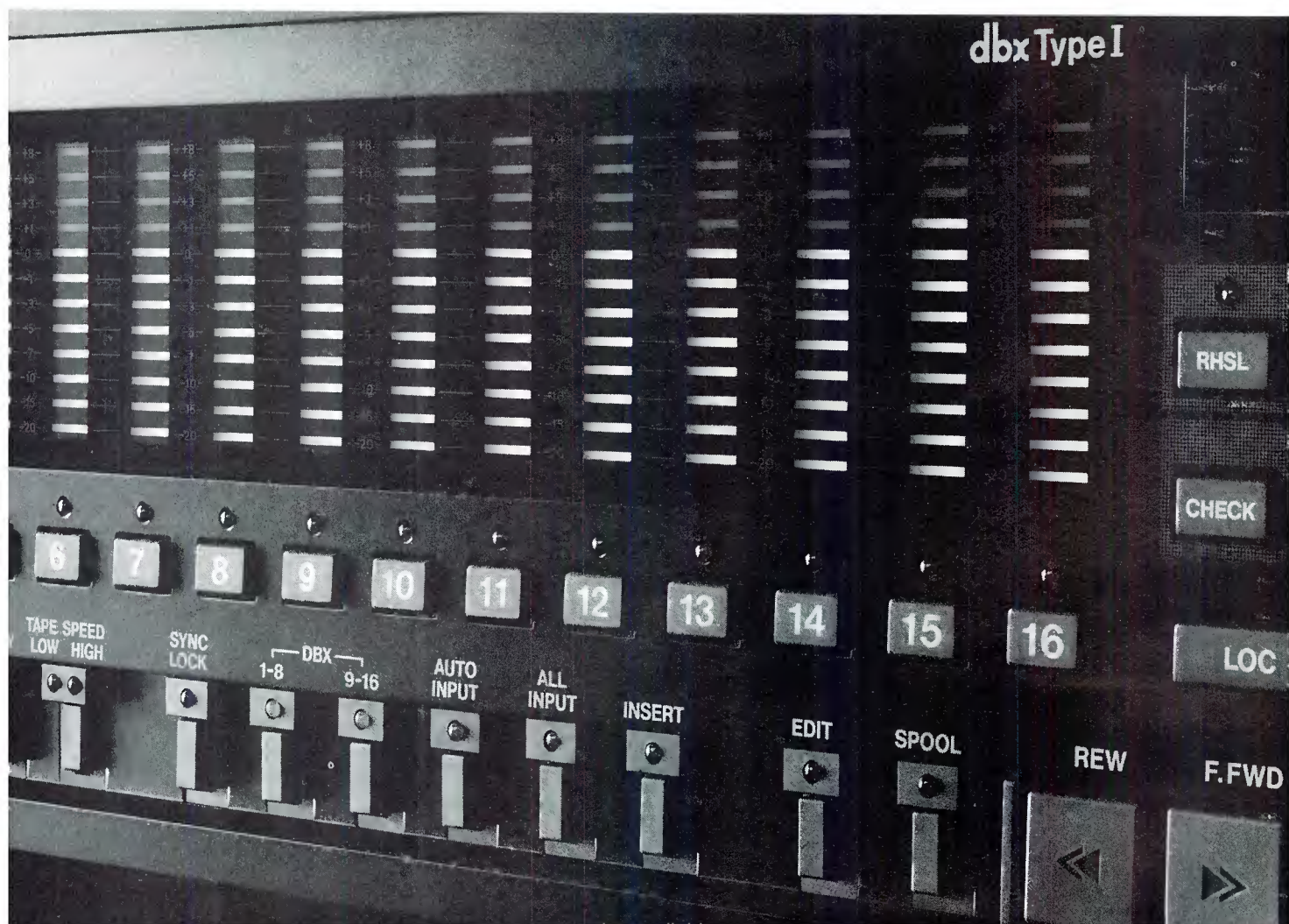
Video Access Software

• *Easy Prompt*: generates teleprompter scripts with five variable speed scrolls, forward, reverse, fast shuttle; mouse and keyboard control or track ball option; 16-color; edit while prompting; foreign languages.

Circle (1475)

Video Technics

• *COMPOSER-FXS software*: for PIX-FXS fea-



tures, including titling, effects on Pixelator Series One graphics system.

- *Pixelator series*: videographics workstations; 2-D paint, image grab; 3-D build, animate; RenderKit, File Manager software; 80286 running 10MHz, 20MHz.

- *PIX-FXS titler*: programmable effects switcher, 2-D paint, Image Grab features; 1,500 fonts, font manipulation with outline, kerning, embossing, font sizing; RGB, NTSC. Circle (1229)

Wavefront Technologies

- *Advanced Visualizer*: Model, PreView,

Image and Medit modules create graphics in single or sequential frames; for DEC VAX 3520/3540 or IBM RISC System/6000 AIX operating system; import from CAD and other systems.

Circle (1242)

WSI/ESD

- *NOWsat service*: overlays NOWrad multi-site radar composites on SuperSat satellite images; clear perspective of precipitation, cloud cover for viewers; auto synchronized radar, satellite images.

- *NOWrad High Definition Radar*: improved-

definition radar images, 20x higher intensity detail, 150 colors; six intensity ranges.

- *NOWvision radar display*: enhanced product; pop-up windows access radar composites, multiple databases; PC-based system.

Circle (765)

V6: Switching

- ◆ Master control
- ◆ Production control

A.C.E

- *T8 Plus switcher*: 10-input production switcher; compact 4-bus, 2-keyer architecture; 89 wipe patterns; clock, rotary wipes; 64-event memory; anti-aliased linear key; optional shadow chroma-key.

Circle (501)

Abekas Video Systems

- *A84 digital switcher*: D-1 component digital post-production system with color correction; eight keying layers with two keys per layer; 12-input, 10-bit architecture; 32 matte generators.

- *A82 digital switcher*: D-2 production switcher; 32 primary inputs with expandable M/E structure to permit expansion through additional modules; two full-function digital keyers; ASPiK adaptive sub-pixel intelligent keying.

Circle (504)

ALTA Group

- *Pegasus Y/C switcher*: 3-bus production; 8-input, four levels of keying with multilevel transitions in one pass; linear/hard key, Y/C component, composite, RGB modes; serial interface; 100-event memory; key preview.

Circle (532)

Ampex Corporation

- *AVC Century V15.0*: software, firmware package enables creation of user-programmable macros, macro button assign features; non-volatile storage; aux buses in panel memory; improved SMPTE communications; status monitor.

- *AVC Vista component analog*: 10- and 18-input systems; integrate with ADO 100 with DigiLoop connection to enable effects operation from switcher panel; for any video production project.

Circle (539)

Echolab

- *Production switchers*: DV-7 6-input system; DV-5 10-input analog switcher with memory features.

Circle (745)

FORA

- *PVM-650 video mixer*: 8-input composite video mixer with 4-bus multilevel mix/effects capability; develops up to five picture layers for effects, keys; autotransitions; 24-pattern system; DSK with non-additive mixing.

- *CVM-400 component mixer*: 8-source, 6-input switcher; mix/effects, 24 programmable wipes; 2-input external key; four autotransition systems with GPI triggers; DSK; input transcoding.

Circle (784)

Grass Valley Group

- *Kadenza enhancements*: mixing enhancement package option for switcher channels; additive mix similar to optical sandwich of

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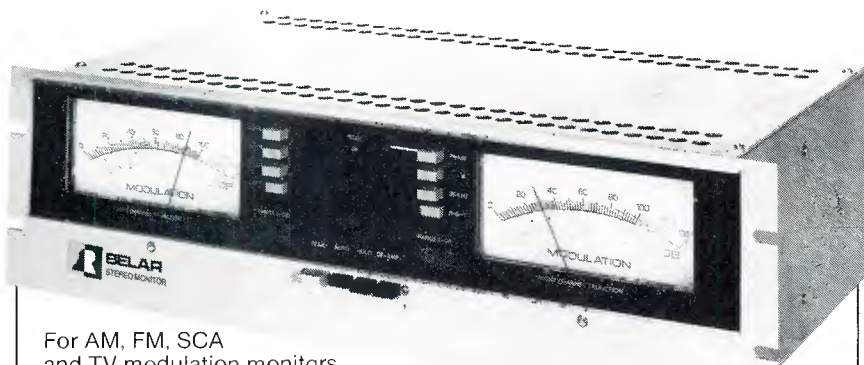
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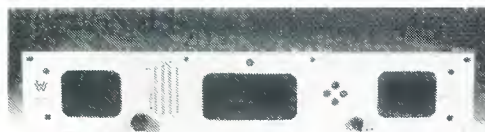
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Donald Bell
Audio Technician
KDKA-TV2 Pittsburgh
Westinghouse Broadcasting

Charles Fagan III
Operations Manager
KDKA-TV2 Pittsburgh
Westinghouse Broadcasting



“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.



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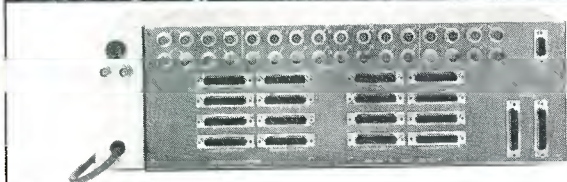
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Sierra Video's 16 input router, the Model 35, is available in the following configurations:

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- 16 by 8 Video + Two Channels Audio\$7,315
- 16 by 8 Video + Three Channels Audio\$8,860
- 16 by 8 Video + Four Channels Audio\$10,405
- Optional Serial Control.....\$745
- Optional X/Y Control Panel with 10 ft. Cable...\$780



SVS

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Circle (137) on Reply Card

two film prints achieves compositing 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-D600U*: 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-1600U*: 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

- *EGP-7 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.
- *WJ-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 (1480)

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 (1062)

Sony Communications/Broadcast

- *DVS-8000C 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 (1103)

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)

VGX 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.

- *PVS-2 preview switcher*: digital system monitors between digi-



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tal VTR and digital switcher output; operates manually or via editor control; D-1, D-2 compatible, serial, parallel inputs; VBI switching.
Circle (1218)

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 GVG 100 protocol; integral chroma keyer.
Circle (1236)

V7: Processing

- ◆ Compositing, keying
- ◆ Format, standards conversion
- ◆ Signal correction
- ◆ TBC, synchronizer
- ◆ VBI ID, sync generators

A.F. Associates

• *DVNR 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)

Allen Avionics

• *BAL active 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.
 • *Digitream Mk II*: CCIR-601/656 signal decoders.
Circle (525)

Alpha Image

• *α400*: 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.
 • *α311, α320A*: digital video encoder, decoder, switch-selection of RGB, EBU-Beta inputs; H-sync phase control 10-bit A-D conversion; eight test patterns; auto selection of 525-, 625-line standards.
 • *α 350N*: digital frame decoder design.
 • *α 330, α340*: digital serial-to-parallel, parallel-to-serial converters; D-1, D-2 formats.
Circle (530)

ASACA ShibaSoku

• *GCR ghost correction*: VK12A1 GCR signal inserter; TG98AX, ghost signal generator.
Circle (557)

AVS Broadcast

• *EOS*: bidirectional standards 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 (580)

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/C_B/C_R with EBU or Betacam levels; sync on Y, G or separated sync output.
 • *DSE-101 encoder*: RGB, Y/C_B/C_R 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/P_B/P_R signal translations; regenerated sync, blanking; permits setup on Y; composite, non-composite RGB outputs; on-board H phase; Betacam, MII, SMPTE levels.
Circle (620)

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.

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APR-5003V

- Analog two-channel recorder with IEC centertrack timecode
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- Microprocessor-assisted audio alignment

SONY

PROFESSIONAL AUDIO

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CEL Electronics

- *P165 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.
- *P170-10 decoder*: for PAL standard; all-digital 9-bit A/D 17.72MHz sampling; progressive comb adaption; output matrix selection of Y/P_B/P_R, Y/C, RGB; for PAL-I/-B/-G; 12.5Hz flicker reduction; selectable handwidths.

Circle (810)

Central Dynamics

- #5, #6 *E-NTSC translators*: for D-1/D-2 and D-2/D-1 signal systems.

Circle (649)

COMLUX

- *Models 3803, -04*: quad 8-bit video codec; NTSC, baseband video scrambling; 4-channel with 5.2MHz channel bandwidths; un-compressed 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 SC/H phase; digital adaptive comb filter; freeze/capture 5 fields; VITS/VIRS inserter.
- *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

- *TC400 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-235 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, combed Y/C, delayed composite NTSC coincident outputs.
- *CTE-3 encoder*: RGB-to-NTSC with computer output; pre-filters luminance, chroma; Y/C (S-VHS) inputs, output; locks to black, separated 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-425 TBC*: with full color frame or field freeze, variable time interval freeze.
- *CT-100 transcoder*: converts Y/P_B/P_R to Y/C-358, Y/C-433; enables integration of Beta format into S-VHS; for NTSC, PAL.
- *EVM-4300 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

- *#357A keyer*: RGB chroma-keyer module for Series 300 switcher; replaces previous

357 keyers with no change to electronics frame, software, control panel; color aperture adjustment; shadow processor.

- *DSK-102*: 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.

- *EMPHASYS 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.

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SONY

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Grunder & Associates

- *Feral GS-100, GC-200*: single-, dual-channel TBCs; infinite 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 GE-12 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, posterize; polarize digital effects; 10-memory GPI interface; spotlight, strobe; DSK fill; 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.
Circle (810)

Harris Video Systems

- *HarrisVus 100*: 2-channel broadcast framestore system.
Circle (816)

Hotronic

- *AH91*: dual-channel TBC, effects system; 3.58, Y/C-688, composite input selections; wide bandwidth freeze frame/field; chroma noise reduction; dropout compensation; audio switcher.
Circle (828)

Intelvideo

- *IV-6 NTSC encoder*: dynamic detail enhancement based on color, saturation; digital comb filter, color modulation; optional D-2 output; vertical enhancement, de-enhancement, reduced interline flicker.
- *IV-5 Precoder*: luminance correction, color detail enhancement; intended for use prior to encoding for improved NTSC pictures.
Circle (854)

I•DEN Videotronics

- *IVS series accessories*: IVS-3 transcoder, RGB-to-Y/R-Y/B-Y; IVS-4 Y/R-Y/B-Y-RGB transcoder; IVS-5 component decompressor for CTDM, CTCM signals; TR-9SP remote control for IVT TBCs.
- *IVT-7 TBC*: S-VHS, composite, dub video; 450-line resolution; Y/C688, Y/C-629 input; composite, Y/C-358 outputs; full-frame synchronizer; shuttle operation; 13.5MHz 4:2:2; IVT-7P PAL.
- *IP-500*: standards converter; NTSC, PAL, SECAM; accepts composite, S-VHS, Y/R-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-F911U*: 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 (868)

Knox Video

- *Black burst generator*: NTSC, Y/C output on BNC, 15-pin mini-DIN connectors; powered from 4Vdc plug-in module; H-scan phase-locked to subcarrier at 15.734kHz.
Circle (883)

Leitch Video

- *SPG-2600 sync generator*: SPG-1300 upgrade provides D-2 sync; color black, tone; optional 2600TG test generator module, 2600ES PROM-SLIDE signal source.
- *SPG-1302N, TSG-1302N*: pulse, test signal generators with NTSC, D-2 output formats; test package offers NTSC, RGB, YIQ, B-MAC, MII, D-2 525-line standards; accepts various 1300 series modules.
- *DFS-3002N*: D-2 frame synchronizer; if analog input is used, VIRS corrector monitors input to produce best D-2 signal output; 4-field processing; integrated self-diagnostics, RS-232C control port.
- *1300SI source ID*: create custom messages with integral message editor or ASCII terminal; preprogram eight IDs, 10-linesx24-characters.
Circle (895)

Magni Systems

- *VGA Producer*: AT-class computer encoder; NTSC, PAL versions; S-VHS outputs with full gen-lock; remote control effects 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, 10-bit architecture; FS-10 produces D-2 composite digital outputs, 4xFsc sampling; dual inputs for AB source select; programmable "bad video" features.
- *Tx6 TBC*, framestore: modular construction for 1/2", 3/4" VTRs; composite, component, dub, S-VHS inputs, outputs; Vari-Trak non-standard playback; upgrades to dual TBC with effects options.
Circle (944)

Midwest Communications

- *DPS-265*: 4-field frame synchronizer.
- *DPS remote controllers*: RC-270 for DPS-270; RC-275 for DPS-275.
- *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 F, -2F*: frame synchronizers with freeze (-2F with TBC); all features of NOVASync synchronizers; heterodyne, VTR-SC, S-VHS; video AGC; digital DOC; default to any input, black, color or freeze/frame.
- *NOVASync, NOVASync 2*: frame synchronizers, -2 model includes TBC, A/B, black, color bar or alternate inputs; AGC with ± 6 dB range; selectable frame, field-1, field-2 freeze; hot switching; wideband VTR-SC, Y/C processing.
Circle (977)

OKI Electric Industry

- *LT1250TSC*: standards converter; TBC, frame synchronizer functions; field, frame freeze; image enhancement; adjustable blanking; bidirectional NTSC, PAL; optional PAL-M, NTSC-4.43, SECAM.
Circle (985)

Omicron Video

- *Amiga gen-locks*: Omni-Gen 711/712 S-Video/composite 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 upgrades 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 VBI signals, transcodes Y/C, Y/C-688, Y/R-Y/B-Y; U-matic(SP), Betacam(SP) M-III, 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 VCRs; full proc amp control; 7-LED, 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

- *RF-ACC corrector*: when moving source cameras are used; samples color burst line-by-line, applies chrominance correction to maintain constant amplitude.
Circle (1053)

Rogue Research

- *Model TBC/FS/SW*: modular approach to TBCs, framestores for special purposes.
Circle (1446)

Sigma Electronics

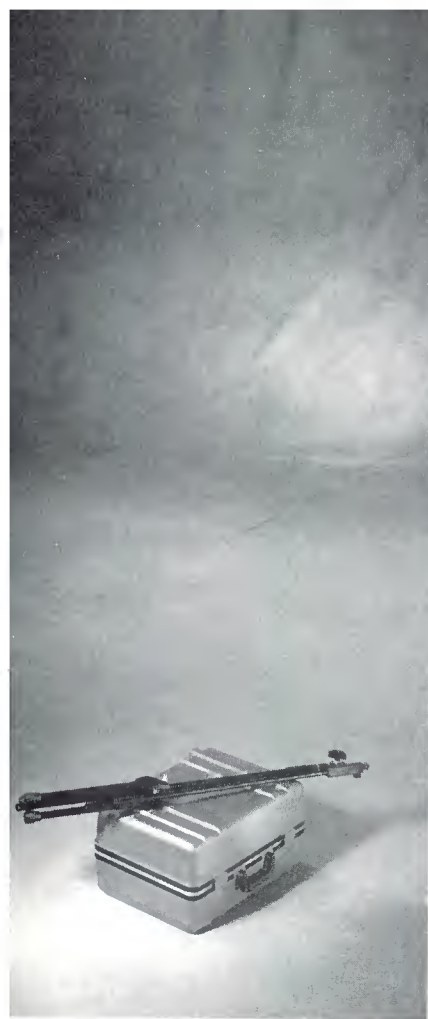
- *VBP-480 blanking processor*: develops new sync, burst, blanking for signals from switcher or for satellite, cable; establishes SC/H phase, permits H-sync advance, delay; AGC, white/black clips.
Circle (1092)

Snell & Wilcox

- *ATLAS*: standards converter for non-broadcast composite video; 4-field, 4-line interpolation; choice of inputs, outputs.
Circle (1098)

Sony Communications/Broadcast

- *BVX-100 synchronizer*: decoder, frame synchronizer; converts NTSC composite to component D-1 or analog component form.
- *DFX-1200, DFX-2100*: format converters between D-1, D-2 formats; -2100 also decodes composite signals to Y/R-Y/B-Y to match 4:2:2 format.
- *PFV-D100 peripheral*: 14-module frame for A/D, D/A conversions, signal distribution,



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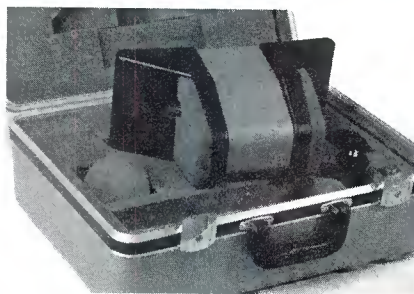
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digital video delay; for 4Fsc, 4:2:2, 625 PAL, 525 NTSC.

- **• 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)

Telmak Television

- **CE100 encoder:** Neriki 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; File, MultiFile scene file management, automatic scene detection; ATIS auto tape ID system. Circle (1178)

Ultimatte

- **System 6:** 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 ± 5 IEEE 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

- **DTC-360A:** standards converter; full-feature 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-2504:** standards converter; digital image enhancement, noise reduction; 4-line, 4-field interpolation; NTSC, NTSC-4.43, 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

- **V3020/3021 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 standards conversion; NTSC, PAL (I/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 Mfgr/YEM

- **CVS-900B:** auto scan converter; NTSC, PAL output from analog computer input, 1024x512-pixel resolution; composite, component, RGB/S, S-VHS outputs; covers scan rates from 15kHz to 38kHz.
- **CVS-910 series:** real-time auto scan conversion; NTSC, PAL; RGB, RGB-TTL inputs produce RGB, sync, composite video, component video, superimpose, key outputs; 24-bit; H-scan rates from 15kHz to 40kHz. Circle (1260)

Zaxcom Video

- **ZX400 TBC remote:** controls four TBCs, D-2 VTRs; ports have 99 tape setup memories; separate remote panels; real-time dissolve between tape memories; interface to EDL, GVG 200 E-MEM.
- **CC-100 Betacam interface:** modification for BVW Beta SP gives independent 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

- **CM30A6:** 30" 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 μ P with 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 CVS series; RGBS, S-VHS, Y/R-Y/B-Y component inputs; 10" HR CRT or 10", 14", 21" flat square standard resolution. Circle (586)

Brabury Porta-Pattern/BPI

- **GPM-37 color monitor:** 14" unit; 15,626kHz scan with 50-60Hz field rate; PAL, linear+TTL level RGB inputs; Optional Y/C-4.433, Y/P_B/P_R, serial, parallel digital inputs. Circle (604)

Conrac Display Products

- **2660 monochrome monitor:** 15" monitor with 25MHz bandwidth, choice of scan rates 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 scan rates. Circle (693)

Delcom

- **Presentation electronics:** SAM systems, from single-screen to 16-screen displays through digitized video processing; TUBIG 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 correction signal to achieve highly accurate image alignment; based on 45-point system. Circle (754)

FOR-A

- **MV-160 multiviewer:** compresses images to $\frac{1}{16}$ size for display in 4x4 matrix; 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 15-36kHz, vertical from 45Hz-90Hz; compatible with PC, PGA, CGA, EGA, VGA, Macintosh II, S-VHS, RGB TTL, RGB analog and composite.
- **CP-200U printer:** large format color copy processor; 6"x8" images, 260,000 colors in 1,280x912-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

- **DT-2700MS 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.
- **BT-S901Y monitor:** 9" diagonal S-VHS compatible monitor; 300-line resolution from 0.47mm dot pitch; sized for rack mounting; cross-pulse, blue-only modes; integral audio system; A/B video or S-VHS with audio inputs.
- **BT-D1920Y monitor:** direct S-VHS monitor; 0.55mm dot pitch data-grade CRT; Line A/B, ext. sync, RGB, 8-pin VCR; A/B split screen, pulse cross, blue only; Y/R-Y/B-Y input.
- **PT-200 projector:** video, data projector; 70-120" display; tracks 15-37kHz horizontal, 50-100Hz vertical scans; computer RGB, S-Video inputs; I-Cathode CRT, hybrid IMF electron gun; 6-element lens. Circle (1480)

SAIC/IDS

- **Eidophor 5170, 5171:** TV projectors; adapt



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KMPH-TV 26 IS NOW ACCEPTING APPLICATIONS for a full-time Television Maintenance Engineer. Applicants must be experienced in the component level repair of 1 inch, 3/4 inch and 1/2 inch VTRs, film and studio cameras, switching systems and digital control and editing equipment. Experience with component video and RF systems is desirable. A current FCC General Class license or SBE certification is required. Send resumes to: Personnel Department, KMPH-TV 26, 5111 E. McKinley Ave., Fresno, CA, 93727. No phone calls please. An E.O.E.-M/F/H. 06-90-11

BROADCAST ENGINEER for AM side of dominant AM/FM combo in mid-west. Good interpersonal skills and demonstrated knowledge of audio and studio construction a must. Five years minimum experience as chief or assistant. Send resume and salary history to: Jeff Glass, Nolte Communications, 3901 Brendenwood Road, Rockford, IL 61107. 815-399-2233. Nolte Communications, an Equal Opportunity Employer. 05-90-21

STUDIO MAINTENANCE ENGINEER experienced and skilled in broadcast maintenance and technology; able to lift and move VTRs, cameras, monitors, etc.; FCC General Class or SBE certified. Variable shift work. Send resume to Chief Engineer, WIS-TV, P.O. Box 367, Columbia, S.C. 29202 EOE 6-90-11

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 - Other (please specify) _____

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

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

2. What is the ADI of your station or facility?

- Top 20 51-100
- 21-50 Below top 100

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 16—20
- 5—10 21—25
- 11—15 More than 25

9. List any awards, patents, books or articles that apply to your professional career.

7. Are you SBE Certified?

- No (If no, go to question 8.)
- Yes (If yes, go to question 7a.)

10. List two references that are familiar with your work.

Name	Company	Address	Phone
1. _____			
2. _____			

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) _____

Sponsor signature _____
(Not required for Student, Member or Associate grades.)

Signed _____
(I agree to abide by the bylaws of the SBE, if admitted.)

Payment method

- Credit Card Visa MasterCard

Card No. _____ Exp. Date _____

Signature _____

- Check

Admissions Committee Action

Date: _____

- Approved for: Member
- Sr. Member Student Associate
- Candidate Notified Entered in Records

Admission's Committee Chair: _____

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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.

From Mo/Yr	To Mo/Yr	Company Name and Location	Position or Title	Type of Facility

12. List your education or specialized training.

College, University or Technical Institute	From Mo/Yr	To Mo/Yr	Credits or Yrs. Compl.	Course or Major	Degree



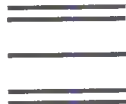
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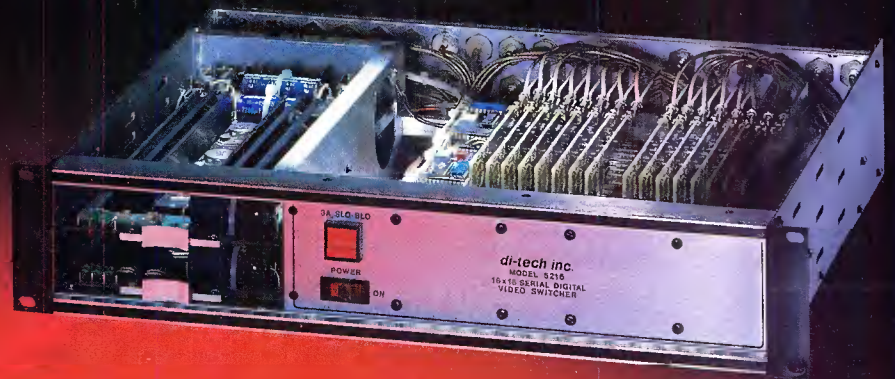
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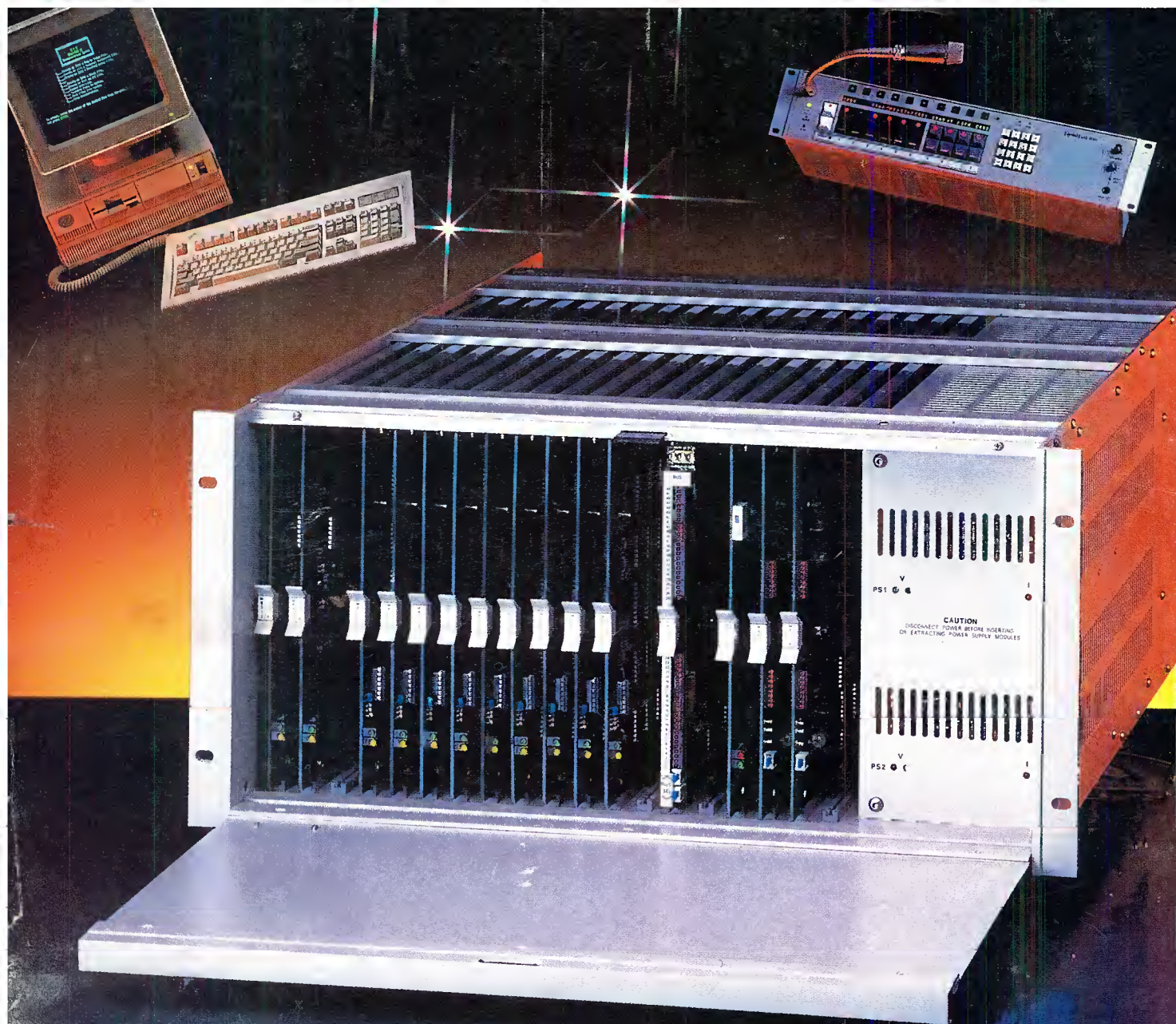
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