

# BROADCAST ENGINEERING

1988 Annual Issue/\$20

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RAYMOND MEYERS  
BENCHMARK COMMUNICATION CORP BE  
4700 SW 75TH AVE  
MIAMI FL 33155

1988  
Buyer's guide/  
Spec book

# CHANGE CONSOLE SETUPS IN SECONDS!

## The New ADM Computer Controlled BCS-PC



Once again, ADM has achieved a quantum leap in audio console technology. By adding a computer to our most successful stereo broadcast console, setups can now be changed in seconds, not just once, but as often as needed. More important, this is not merely an adaptation of a recording or post production console which lacks essential broadcast features. The BCS-PC is solely designed for broadcast console automation.

With the BCS-PC console it is possible to store and recall many of the most important console operations and make a setup in seconds. You can automate input pre-selection, module on/off status, input group muting and output bus assignment. The BCS-PC can address your house router and save its source and console destination selections along with the console presets.

Easy to use? You bet! Set up the console as you normally would and a couple of key strokes saves that setup for future use.

Editing can be accomplished by using either the integral keyboard or by resetting the console switches manually. Console status is displayed on the monitor as well as by the console LED indicators associated with each push button.

Computer failure? No problem! ADM has engineered the BCS-PC to totally ignore a computer failure. The console continues to operate manually, as it always has.

With the addition of automation to the BCS, ADM has not forgotten its primary goal of providing a fully functional stereo console. The BCS-PC still has such features as: input pre-selection and bussing, VCA control of all main program paths for superior noise free tracking, four band VCA controlled stereo equalizer, five stereo auxilliary busses, 4 independent stereo monitors, operation and muting for up to three studios - plus more.

Call your ADM representative or ADM for further information.

**ADM**®  
The  
Audio  
Company

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**ADM Technology, Inc.**  
1626 E. Big Beaver Road, Troy, Michigan 48084  
Phone: (313) 524-2100 • TLX 23-1114

# Hi-Performance Communication



## In A Compact, Maneuverable System

Midwest utilizes a heavy-duty structural system to combine a 1.8M dual offset-fed antenna with an extended body one-ton van. The result is a powerful satellite communications system that can maneuver easily in city traffic or on narrow country roads.

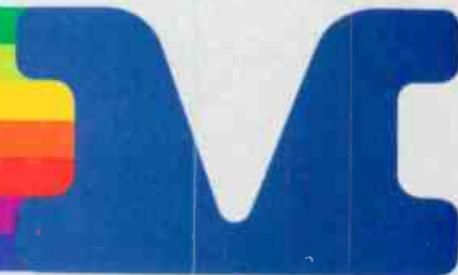
The Vertex 1.8M antenna has a transmit gain of 46.6 dbi and meets the 29-25 log  $\theta$  FCC 2° spacing curves. The standard RF package includes a single thread 300 watt TWT amplifier, a Ku exciter with two agile audio subcarriers, a Ku receiver and a spectrum monitor. Modular dual 200 watt phase combined amplifiers, providing fail-safe

redundancy are optional, as are several baseband equipment packages. The S-18's spacious, acoustically treated interior provides an optimum work environment. The unit has ample storage space, and there is enough room for the addition of a VTR editing system.

The S-18 is a flexible satellite communications system, ideal for up-linking news or special events, and easily adaptable for voice and data applications.

Contact Midwest for complete information.

The Midwest S-18. Performance and Flexibility. In a compact, maneuverable package.



**MIDWEST**  
Communications Corp.

One Sperti Drive  
Edgewood, KY 41017  
606-331-8990

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Advertising offices listed on page 242.

**INTERTEC**  
PUBLISHING CORPORATION

The Fall **Buyers' Guide/Spec Book** is a comprehensive reference manual for radio and TV broadcasters. This special **BE** publication can be used as a guidebook whenever an equipment purchase is being planned. Keep this annual publication on your desk for reference throughout the year. (Cover concept and design by Kristi Sherman.)

# ONLY HITACHI

## Hitachi waveform monitors and vectorscopes get a great reception from broadcast professionals.

Both screens shown actual size.

### Because they get...

...6" rectangular CRTs with internal graticule in both Waveform Monitor V-079 and Vectorscope V-069.

### With our Waveform Monitor they get...

...lines 9 through 22 of field 1 or 2, for observation of VIR, VIT and Teletext signals... guaranteed flat response:  $\pm 1\%$  over 25Hz-3.6MHz range, and  $+1\%/-2\%$  over the 3.6-6MHz range... frequency response selection: FLAT, IRE, CHROMA, DIFF GAIN... horizontal axis sweep selection: 2V, 2V MAG, 2H, or  $1\mu\text{sec}/\text{div}$ ... RGB display, YRGB optional... DC restore... fine adjustment of horizontal-axis position.

### And with our Vectorscope they get...

... $\pm 1^\circ$  vector phase accuracy... two loop-thru inputs and a loop-thru external sync input... independent selection of chrominance and sync signals... vector measurement of input A sub-carrier... calibration of input sensitivity to 1V full scale or 75% or 100% saturation, variably controllable 0.5-5 times... non-synced circle, for self-check of gain balance and quadrature phase... differential gain and phase measurements.

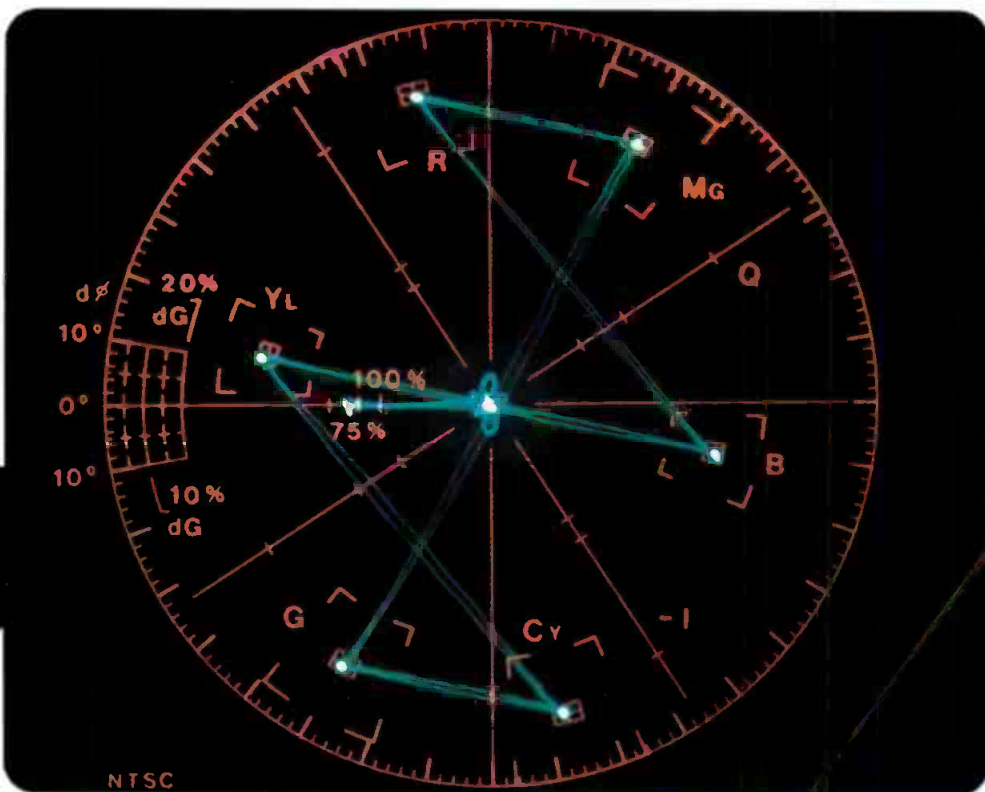
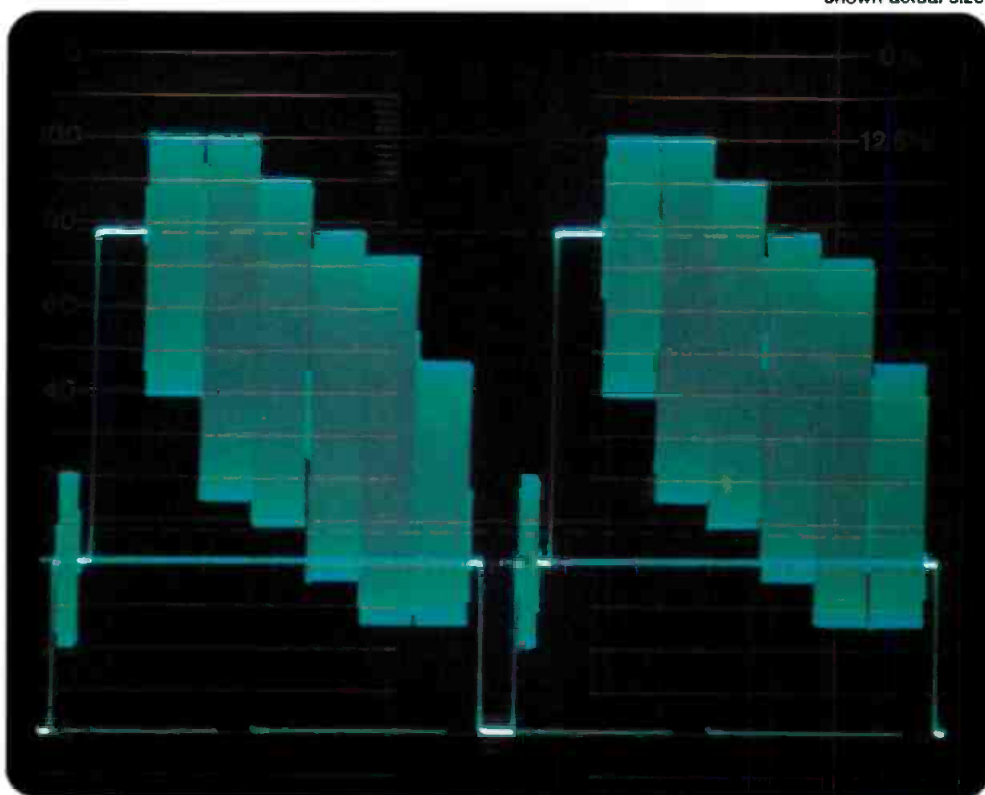
### For more information call

516-921-7200. Or write Hitachi Denshi America, Ltd., 175 Crossways Park West, Woodbury, NY 11797.

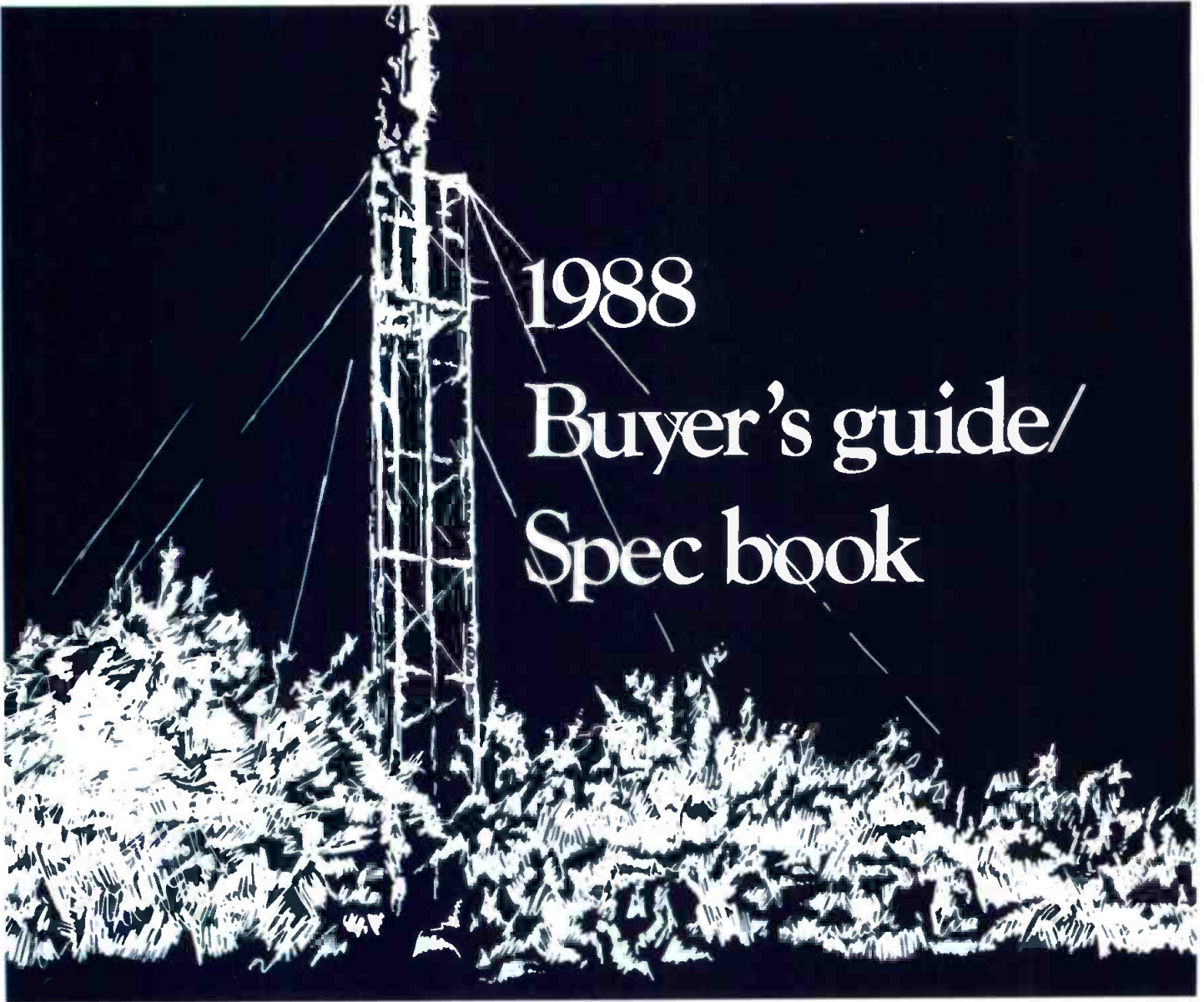
In Canada: Hitachi Denshi, Ltd., 65 Melford Dr., Scarborough, Ontario M1B2G6. Tel: 416-299-5900.



Hitachi Waveform Monitor V-079 & Vectorscope V-069  
(Also available: Models V-099 & V-089)



Circle (4) on Reply Card



# 1988 Buyer's guide/ Spec book

In compiling the 1988 **Broadcast Engineering Buyers' Guide/Spec Book**, we have tried to bring you information about the companies and products you need as a member of the broadcast community. The process of gathering material for this issue is a challenge, particularly in this dynamic industry. While there was a reduction in the number of companies responding to our inquiries for current information, the total remains at more than 1,000 entries under *Manufacturers' Addresses*, each listed with address and phone number to aid you in making contact with them. Following the address section is your reference to *Dealers and Distributors*, a convenient way to locate possible sources close to you to fill your equipment needs.

The *Product Listings* portion of this issue brings you more than 350 types of equipment and services you may need during the year. They are divided into basic sections following the Product Listings heavy stock page. The general divisions in products include:

Audio equipment .....	11
Video equipment .....	20
RF equipment .....	32

Meters, monitors, test equipment .....	40
Automation, computer products .....	46
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The 7th annual *Spec Book* portion of this issue has been compacted to bring you as much equipment information as possible. More than 40 categories of equipment are included with major specifications in a side-by-side presentation to allow easier comparisons to be made. The compilation includes a wide range of equipment. But in a publication of this size, it is not possible to include every manufacturer, on a worldwide basis, or every product available from those listed. In many cases, manufacturers may have other models that will more closely fit your needs and budgets. The names of advertisers in this issue are color highlighted throughout the issue. The advertisements may provide other information for your equipment search.

The *Spec Book* is provided as a place to start your search for new or replacement equipment. Accuracy is tantamount in preparing the material, but we advise

you to always check with manufacturers for possible changes resulting from equipment upgrades. Pricing, because it is subject to changes based upon the economy and special system packaging by the manufacturers, cannot be included here.

Finally, you will again find Reader Service Numbers for each of the products in *Spec Book*. From your response card choices, your request is quickly sent to manufacturers, indicating your interest in a particular equipment model or series of products.

The staff of **Broadcast Engineering** appreciates the chance to bring you this annual special issue as a reference book to simplify equipment acquisition. If you have questions or suggestions, you will find the staff ready to listen and to give you a hand on locating additional information, if possible. The purpose of our publication is to serve this industry of which you are an important part. Our ultimate goal is to assist you in continuing to be an active and growing member of the world of broadcasting.

*The Editors.*



Introducing the Model 200.

A powerful production switcher  
that won't wipe you out.



The new Model 200 Production Switcher.  
Two mix-effects, 20 inputs, five powerful keyers, an incredibly innovative wipe system,  
nine color matte generators and an E-MEM® Effects Memory System.  
More power than you ever thought possible for less than \$40,000.

**Grass Valley Group**

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Los Angeles (818) 999-2303; San Francisco (415) 968-6680

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**A.F. Associates**  
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201-767-1000

**Alpha Audio**  
2049 W. Broad St.  
Richmond, VA 23220  
804-358-3852

**Amber Electro Design**  
4810 Jean Talon West  
Montreal, Quebec  
Canada H4P 2N5  
514-735-4105

**AMEK Systems & Controls**  
10615 Burbank Blvd.  
North Hollywood, CA 91601  
818-508-9788  
(Salford, England)  
Phone: 44-618346747  
Telex: 668127 AMEK G

**Ampex AVSD**  
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Redwood City, CA 94063  
415-367-4423

**Ampex MTD**  
401 Broadway  
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**Aphex Systems**  
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818-765-2212

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(Richmond, IN)  
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**ATI/Audio Technologies**  
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215-443-0330

**Audioiab Electronics**  
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Sacramento, CA 95864  
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Beaverton, OR 97075  
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**Audio-Video Engineering**  
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Merrick, NY 11566  
516-546-4239

**Barco Industries**  
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Phone: 56/21.11.24  
Telex: 85842

**Barcus-Berry Electronics**  
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Huntington Beach, CA 92649  
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**BASYS**  
900 Stierlin  
Mountain View, CA 94043  
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(London, England)  
Phone: 01-631-0286  
Telex: 21852 BASYS G

**Belden Electronic Wire & Cable**  
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Richmond, IN 47375  
317-983-5200

**Bogner Broadcast Equipment**  
401 Railroad Ave.  
Westbury, NY 11590  
516-997-7800

**Broadcast Services**  
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Four Oaks, NC 27524  
919-934-6869

**Broadcast Video Systems**  
1050 McNicoll Ave.  
Agincourt, Ontario  
Canada M1W 2L8  
416-497-1020

**BTS Broadcast Television Systems**  
(A Joint Co. of Bosch & Phillips)  
PO Box 30816  
Salt Lake City, UT 84130-0816  
801-972-8000  
(Mahwah, NJ)  
201-529-1550  
(Darmstadt, W. Germany)  
Phone: 06151-808-1  
Telex: 419256

**Caig Laboratories**  
PO Box J  
Escondido, CA 92025  
619-743-7143

**Calhoun Satellite Communications**  
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North Miami, FL 33181  
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**Canare Cable**  
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Burbank, CA 91502  
818-840-0993

**Canon Broadcast Optical**  
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516-488-6700  
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(Chicago, IL)  
312-833-3070  
(Dallas, TX)  
214-620-2641  
(Mississauga, Ontario, Canada)  
416-678-2730

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6902 Sunset Blvd.  
Hollywood, CA 90028  
213-481-2701

**CEMTYS/SA**  
Explanada 4y6  
Madrid, Spain 28040  
Phone: 233 25 06  
Telex: 22230

**Centro**  
Billy Mitchell Road  
Salt Lake City, UT 84116  
800-654-4870

**Cetec Vega**  
9900 Baldwin Place  
El Monte, CA 91731  
818-442-0782

**Christie Electric**  
20665 Manhattan Place  
Torrance, CA 90501  
213-320-0808

**Cipher Digital**  
10 Kearney Road, #21  
Needham, MA 02194  
617-449-7546

**Circuit Research Labs/CRL**  
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Tempe, AZ 85282  
800-535-7648  
602-438-0888

**Clear-Com Intercom Systems**  
1111 17th St.  
San Francisco, CA 94107  
415-861-6666

**CMX Systems/Chyron**  
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Santa Clara, CA 95050  
409-988-2000

**Comark Communications/Thomson**  
Box 506  
Colmar, PA 18915  
215-822-0777  
(Chatou, France)  
Phone: (1)30.71.92.60  
Telex: 696833 F

**Continental Video**  
45485 Vedder Mountain Road  
Sardis, British Columbia  
Canada V2R 1B2

**Cottonwood Communications**  
774 Main St., Box 526  
Los Alamos, CA 93440  
805-344-3335

**Datatek**  
1121 Bristol Road  
Mountainside, NJ 07092  
201-654-8100

**Datum**  
1363 S. State College Blvd.  
Anaheim, CA 92806  
714-533-6333

**Delta Electronics**  
5730 General Washington Dr.  
Alexandria, VA 22312  
703-354-3350

**Dialight/HHS Smith**  
1913 Atlantic Ave.  
Manasquan, NJ 08736  
201-223-9400

**Digital Video Systems/SA**  
120 Middlefield Road  
Scarborough, Ontario  
Canada M1S 4M6  
Phone: 416-299-6888  
Telex: 065-25344

**DI-Tech**  
48 Jeffryn Blvd.  
Deer Park, NY 11729  
516-667-8330

**Dynatech Data Systems**  
7644 Dynatech Court  
Springfield, VA 22153  
703-569-9000

**EEV**  
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Elimford, NY 10523  
914-592-6050  
(Chelmsford, England)  
Phone: 0245-261777  
Telex: 99103

**Emcore Products**  
1600 Fourth Ave., N. W.  
Rochester, MN 55901  
507-289-3371

**ESE**  
142 Sierra St.  
El Segundo, CA 90245  
213-332-2136

**Evertz Microsystems**  
3515 Mainway  
Burlington, Ontario  
Canada L7M 1A9  
416-335-3700

**Fairlight Instruments**  
2945 Westwood Blvd.  
Los Angeles, CA 90064  
213-470-6280

**Faroudja Laboratories**  
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Sunnyvale, CA 94086  
408-245-1492

**For-A**  
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W. Newton, MA 02615  
617-244-3223  
(Los Angeles, CA)  
213-402-5391

**Fostex**  
15431 Blackburn Ave.  
Norwalk, CA 90650  
213-921-1112  
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Music Dealers Service  
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(Memphis, TN)  
901-327-0964

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Wayne, NJ 07470  
914-472-9800  
(Carson, CA)  
213-532-2861  
(Carrollton, TX)  
214-385-8902

**GML America**  
8150 Leesburg Pike #950  
Vienna, VA 22180  
903-790-0101  
(Reading, England)  
Phone: 0734-584948  
Telex: 847109

**Grass Valley Group**  
Box 1114  
Grass Valley, CA 95945  
916-273-8421

**Gray Engineering**  
504 W. Chapman Ave. #P  
Orange, CA 92668  
714-997-4151

**Hannay Reels**  
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Westerlo, NY 12183  
518-797-3791

**HEDCO**  
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Grass Valley, CA 94945  
916-273-9524

**Hitachi Denshi America**  
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Woodbury, NY 11797  
516-921-7200

**HM Electronics**  
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San Diego, CA 92131  
619-578-8300

**Hotronic**  
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Campbell, CA 95008  
408-292-1178

**Hubbard Communications**  
12495 34th St. N.  
St. Petersburg, FL 33702  
813-577-7759

**ICM Video**  
Box 26330  
Oklahoma City, OK 73126  
405-232-5808

**Inovonics**  
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Santa Cruz, CA 95060  
408-458-0552

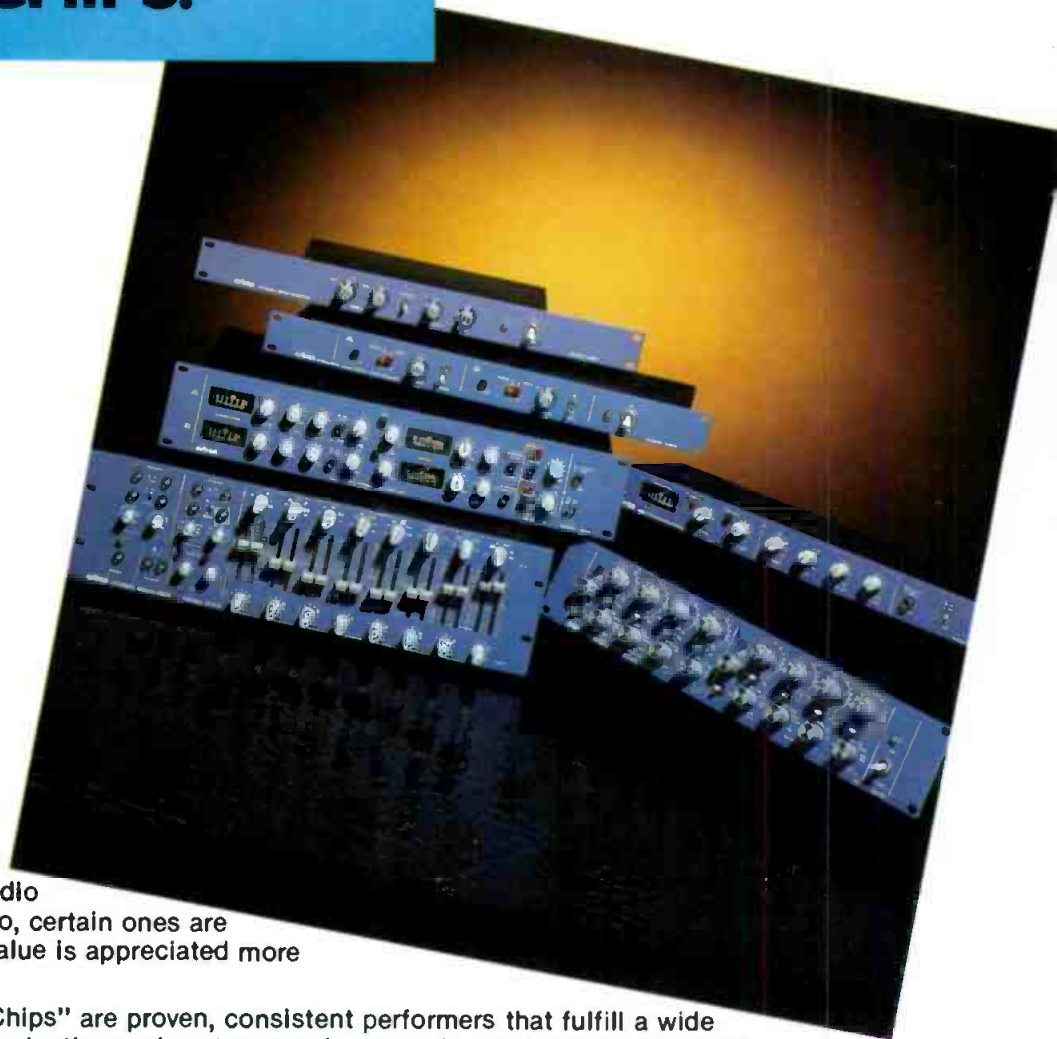
**Jampro Antennas**  
6939 Power Inn Road  
Sacramento, CA 95828  
916-383-1177

**JBL Professional**  
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Box 2200  
Northridge, CA 91329  
818-893-8411

**JemFab**  
574 Sunrise Highway  
Baldwin, NY 11510  
516-867-8510/8511



# THE BLUE CHIPS.



While trendy audio products come and go, certain ones are timeless. Their true value is appreciated more year after year.

Orban's "Blue Chips" are proven, consistent performers that fulfill a wide variety of essential production and system requirements in top facilities worldwide.

**622B Parametric Equalizer:** The standard by which all others are judged. Sonically and musically pleasing. Can be used as combination 4-band EQ and notch filter. A real job saver.

**672A/674A Graphic Parametric Equalizers "The Paracrossallizer":** Combines eight bands of parametric EQ with tunable high and lowpass filters. A uniquely versatile production tool. Also quickly becoming the smart choice for room and system tuning because it eliminates ringing and phase shift problems. Can be used as full electronic crossover plus EQ in one cost-effective package.

**536A Dynamic Sibilance Controller:** Around the world, Orban de-essers are the salvation of vocal sessions. Quick set up and easy operation.

**422A/424A Gated Compressor/Limiter/De-Esser "The Studio Optimod":** The most flexible, cost-effective level control system available. Orban compressors are known and appreciated for their smoothness. No pumping, no breathing; they work for you, not against you in tough applications.

**412A/414A Compressor/Limiter:** Transparent level control delivers the punch without the bruise. Very cost-effective. Ideal for installations and reinforcement work.

**245F Stereo Synthesizer:** Magical stereo effects from mono synths, drum machines, or any mono source. Perfect for extending capability of smaller format multi-track systems—the 5th, 9th, 17th, or 25th track. Inexpensive.

Orban also manufactures the reliable 111B Dual Spring Reverb as well as attractive acrylic security covers which fit all standard 19" rack mount products.

**Orban Associates Inc.**  
645 Bryant St. San Francisco, CA 94107  
(415) 957-1067 Telex: 17-1480



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[www.americanradiohistory.com](http://www.americanradiohistory.com)

# Service/Parts Centers

JVC Company  
41 Slater Drive  
Elmwood, NJ 07407  
201-794-3900  
800-582-5825 Information  
(Compton, CA)  
213-537-6020  
(Norcross, GA)  
404-447-0877  
(Elk Grove Village, IL)  
312-364-9300  
(Houston, TX)  
713-694-0666

Kaltronics  
1540 Gilbreth Road  
Burlingame, CA 94010  
415-697-9102

Klark-Teknik  
30-B Banfl Plaza N.  
Farmingdale, NY 11735  
516-249-3660

Laird Telemedia  
2424 South 2570 West  
Salt Lake City, UT 84119  
801-972-5900

Lamp Technology  
141A Central Ave.  
Farmingdale, NY 11735  
516-454-6464

Leitch Video  
825K Greenbrier Circle  
Chesapeake, VA 23320  
804-424-7920  
(Don Mills, Ontario, Canada)  
416-445-9640

Lenco Electronics  
300 N. Maryland St.  
Jackson, MO 63755  
314-243-3147

Magna-Tech Electronics  
630 Ninth Ave.  
New York, NY 10036  
212-586-7240

MCG Electronics  
12 Burt Drive  
Deer Park, NY 11729  
516-586-5125

Magni Systems  
9500 S.W. Gemini Drive  
Beaverton, OR 97005  
503-244-9980

Microtime  
1280 Blue Hills Ave.  
Bloomfield, CT 02188-3336  
203-242-4242

Midwest Communications  
One Sperti Drive  
Edgewood, KY 41017  
606-331-8990  
(Nashville, TN)  
615-331-5791  
(St. Louis, MO)  
314-225-4655  
(Miami, FL)  
305-592-5355  
(Cleveland, OH)  
216-447-9745  
(Virginia Beach, VA)  
804-464-6256

Mikrolab  
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Los Angeles, CA 90066  
213-306-0120

Moseley Associates  
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Santa Barbara Research Park  
Goleta, CA 93117  
805-968-9621

Nakamichi USA  
19701 S. Vermont Ave.

Torrance, CA 90502  
213-538-8150  
(Atlanta, GA)  
404-325-7676  
(New York, NY)  
212-989-4240  
(San Diego, CA)  
619-281-1292  
(Denver, CO)  
303-778-0780  
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(Hollywood, CA)  
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(Royston, Herts, England)  
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Telex: 81381

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206-885-4730

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8101 10th Ave. N.  
Minneapolis, MN 55427  
612-540-8671

Nova Systems  
50 Albany Turnpike  
Canton, CT 06019  
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Odetics  
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Anaheim, CA 92802  
714-772-1000

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Canoga Park, CA 91304  
818-700-0742

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Los Angeles, CA 90038  
213-934-3566

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San Francisco, CA 94107  
415-957-1067

Alan Osborne Associates  
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Westlake Village, CA 91361  
805-495-8420

Paco Electronics  
714 West Olympic Blvd. #1439  
Los Angeles, CA 90015-1439  
213-747-6540

PESA/PIher Electronica SA  
Albala, 12  
28037 Madrid, Spain  
754-0078  
(Miami, FL)  
305-556-9638

Polyline  
1233 Rand Road  
Des Plaines, IL 60016  
312-298-5300

PolyPhaser  
1425 Industrial Way, PO Box 1237  
Gardnerville, NV 89410  
702-782-2511

QEI Corporation  
Box D  
Williamstown, NJ 08094  
609-728-2020

RAMSA/Panasonic Audio  
6550 Katella Ave.  
Cypress, CA 90630  
714-895-7200

Rank Cintel  
704 Executive Blvd.  
Valley Cottage, NY 10989  
914-268-5106  
(North Hollywood, CA)  
818-765-7285  
(Ware, England)  
Phone: (0920) 3939  
Telex: 81415

Richardson Electronics  
One Branca  
East Rutherford, NJ 07073  
800-323-1770

ROH/div. Anchor Audio  
913 W. 223 St.  
Torrance, CA 90502  
213-533-1498

Scip Electronics Systems  
16169 Sunset Blvd., #304  
Pacific Palisades, CA 90272

Skotel  
1445 Provencher  
Brossard, Quebec, Canada  
J4W 1Z3  
514-465-8990

Solid State Logic  
Begbroke, Oxford  
England OX5 1RU  
Phone: 44-8675-4353  
Telex: 837400 SSL OXG  
(New York, NY)  
212-315-1111  
(Los Angeles, CA)  
213-463-4444

Sound Technology  
1400 Dell Ave.  
Campbell, CA 95008  
408-378-6540

Spectrum Communications  
1055 W. Germantown Pike  
Norristown, PA 10943  
215-631-1710

Standard Tape Laboratory  
26120 Eden Landing Road #5  
Hayward, CA 94545  
415-786-3546

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1425 Elm Hill Pike  
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(Barrington, IL)  
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(New York, NY)  
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(Dallas, TX)  
214-943-2239  
(Regensdorf, Switzerland)  
Phone: 01-840-2960

Surcom Associates  
305 Wisconsin Ave.  
Oceanside, CA 92054  
619-722-6162

Swintek Telecommunications  
587 Division St.  
Campbell, CA 95008  
408-378-8091

Tamron Industries  
24 Valley Road  
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516-883-8800

TASCAM/Teac Pro Products  
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Montebello, CA 90640  
213-726-0303  
(Arlington Heights, IL)  
312-640-6181  
(Little Ferry, NJ)  
201-641-5600  
(Aiea, HI)  
808-487-3588  
(Atlanta, GA)  
404-458-2880

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Beaverton, OR 97077  
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(Los Angeles, CA)  
818-999-1711  
(Santa Clara, CA)  
408-496-0800  
(Denver, CO)  
303-799-1000  
(Atlanta, GA)  
404-449-4770  
(Chicago, IL)  
312-259-7580  
(Boston, MA)  
617-861-6800  
(Long Island, NY)  
718-895-8010  
(Dallas, TX)  
214-550-0525  
(Washington, DC)  
301-948-7151

Tentel  
1506 Dell Ave.  
Campbell, CA 95008  
408-379-1881

Thomson Video Equipment  
17, rue du Petit Albi  
F-95000 Cergy  
St. Christophe, France  
Phone: (1) 34.20.70.00  
Telex: 204780 F

Total Spectrum Manufacturing  
20 Virginia Ave.  
West Nyack, NY 10994  
914-358-8820

Ultimate  
18607 Topham St.  
Reseda, CA 91335  
818-345-5525

United Ropeworks (USA)  
PO Box 306  
Montgomeryville, PA 18936  
215-368-6611

Utah Scientific  
1685 West 2200 South  
Salt Lake City, UT 84119  
801-973-6840

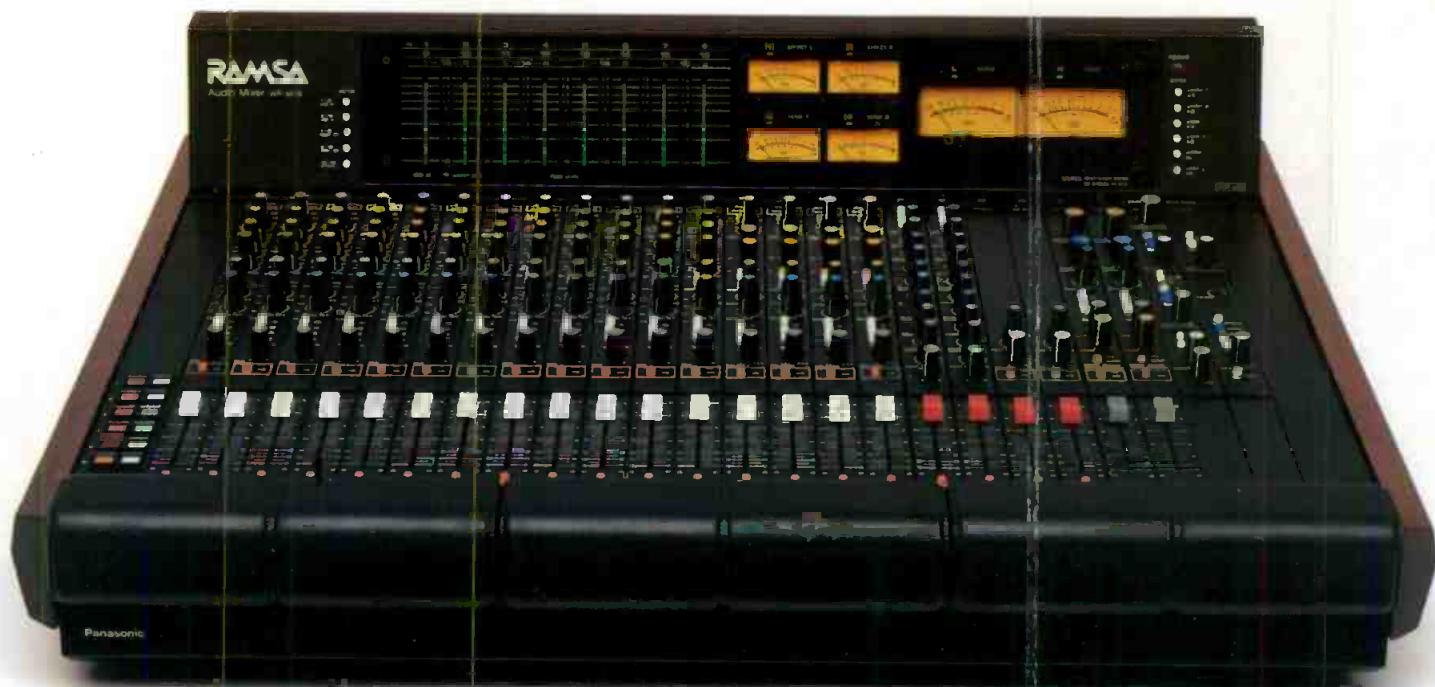
Varian/Continental/TVT  
Box 270879  
Dallas, TX 75227  
214-327-4532 parts  
214-327-4533 service

Videotek  
243 Shoemaker Road  
Pottstown, PA 19464  
215-327-2292

Ward-Beck Systems  
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Scarborough, Ontario  
Canada M1H 2X4  
Phone: 416-438-6550  
Telex: 065-25399

Western Electronics Products  
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**AUDIO FADERS**

Audio Export Georg Neumann & Co.  
GmbH  
Audio Kinetics Ltd.  
BC Engineering  
Benchmark Media Systems, Inc.  
Calrec Audio (Calrec By AMS)  
Gotham Audio Corp.  
Penny & Giles  
Pro-Bel Ltd.  
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VCL Audio SA

**AUDIO PROCESSING SYSTEMS  
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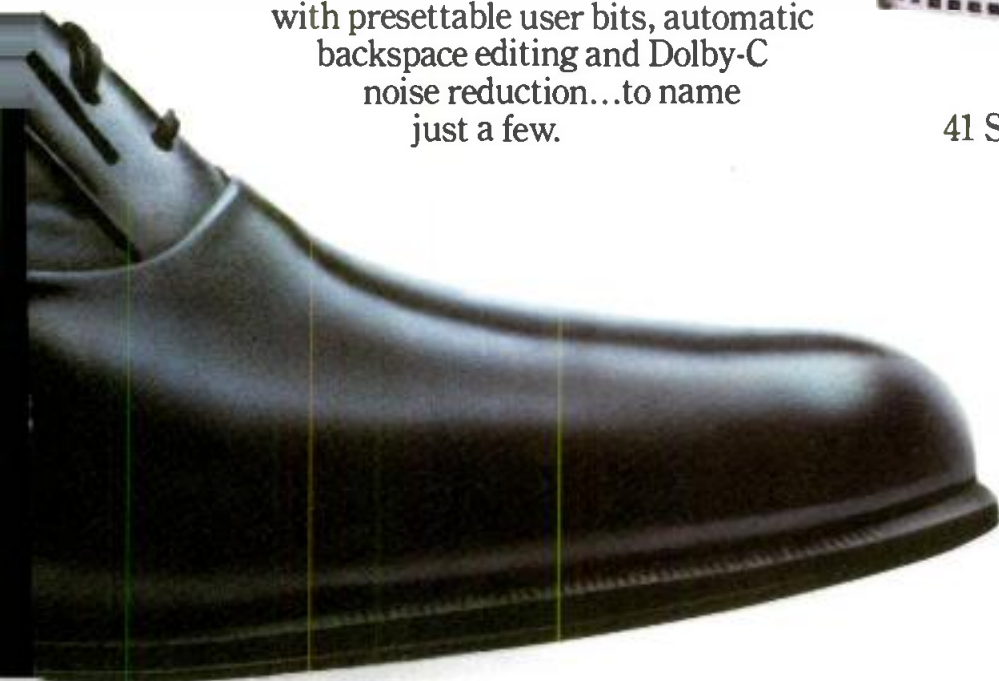
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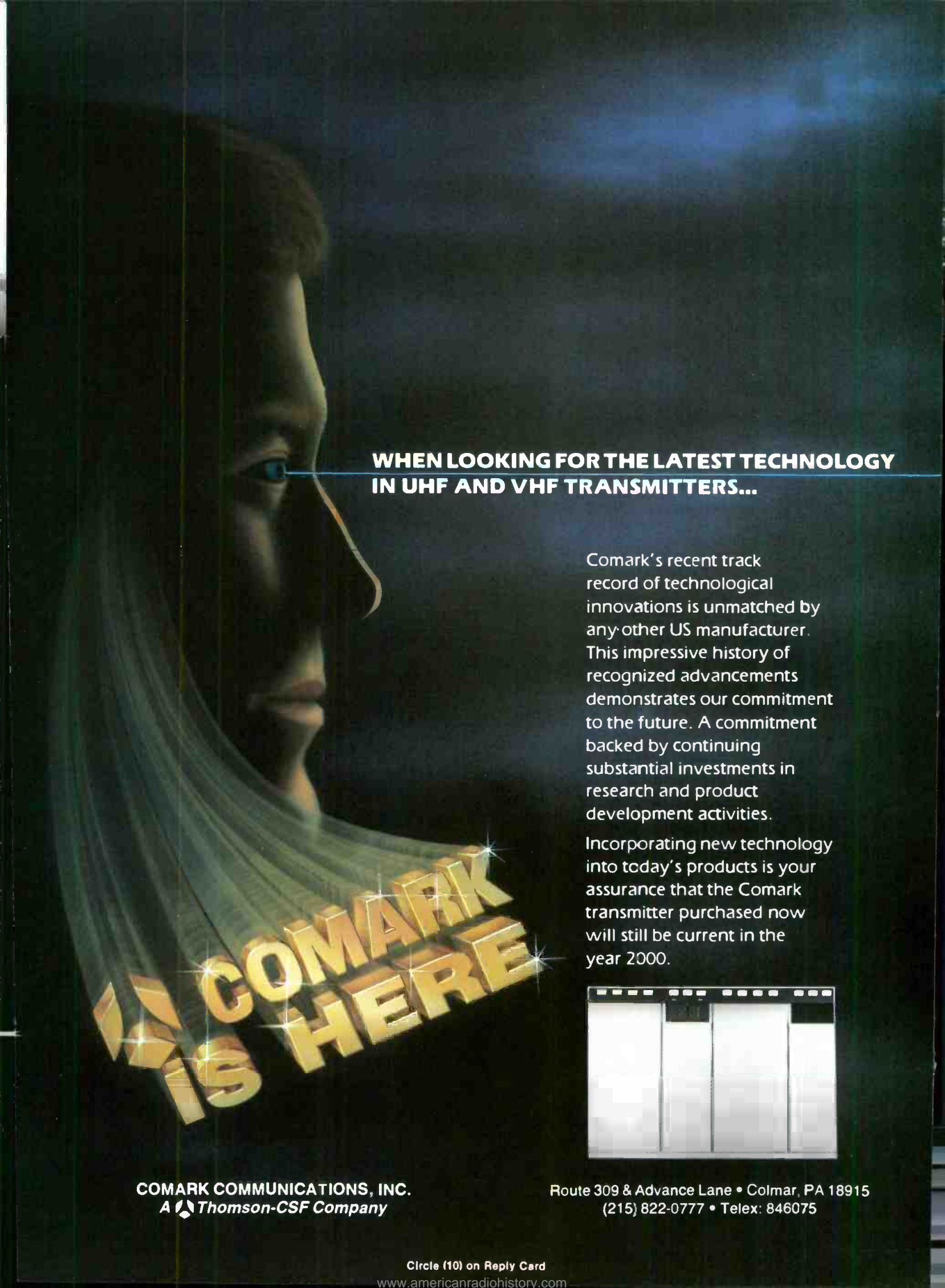
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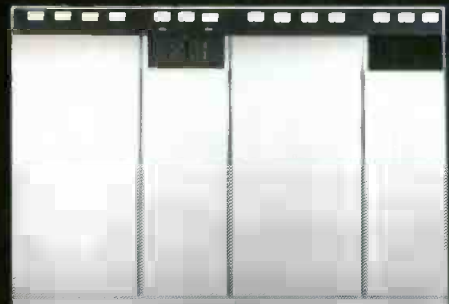


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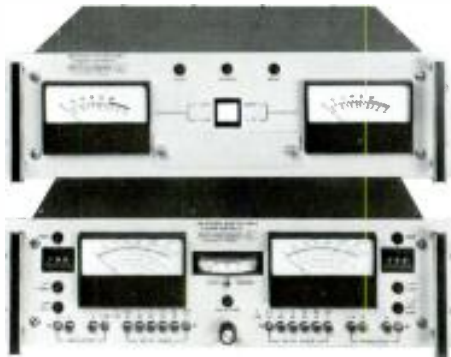
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# DELTA BROADCAST PRODUCTS



## ASE-1/ASM-1

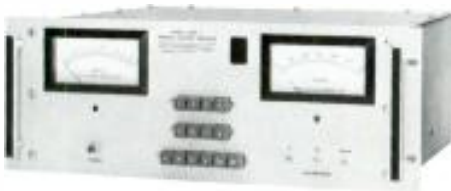
AM Stereo without compromise. The AM Stereo Exciter and Modulation Monitor provides a C-QUAM™ quadrature modulated stereo signal featuring low distortion and channel separation greater than 35 dB throughout the audio spectrum. The ASE-1 generates a signal to produce a phase modulated transmitter carrier. An L + R audio signal AM's this carrier to produce the C-QUAM signal, the only signal completely compatible with all C-QUAM, multimode and envelope detector receivers.

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## RCS-1V

**This Remote Control System calls you when it needs help!** The RCS-1 combines microprocessor technology with easy operation. Features include direct interface boards for antenna monitors, patented remote modulation bargraphs, automatic logging, and synthesized speech telephone interface. Additional input and control boards to expand remote control capabilities can be added at any time.



## AAM-1

The Analog Antenna Monitor measures the parameters of directional antenna systems. Readings are: relative current; and current ratio and current phase to a reference antenna. The AAM-1 can monitor up to 8 antennas with ratio and phase measurements displayed on front panel meters.



## AMC-1/FMC-1

The only modulation control systems which provide a completely closed loop around the transmitter. The Amplitude and Digital Modulation Controllers sample actual modulation levels after the PA output network assures precise adjustment for optimum modulation levels. Both the AMC-1 and FMC-1 keep count of over-modulation bursts for signal control through a linear attenuator.



## RG-4

High output Receiver/Generator. The Receiver/Generator combines a two-watt RF output and a correlation detector circuit that virtually eliminates interference problems. The RG-4 operates in the 100 kHz to 30 MHz range. It is designed as the ideal companion instrument for Delta's OIB-1, OIB-2, and OIB-3 impedance bridges.



## APC-1

Your insurance against over- and under-power operation. The Automatic Power Controller continuously monitors the transmitter output power, making automatic power adjustments via the transmitter loading control. The APC assures proper power levels at all times.



## OIB-1/OIB-3/CPB-1

Full power Impedance measuring. The Operating Impedance Bridges measure the impedance of radiators, networks and the like while operating under normal power. The OIB-1 measures VSWR and impedance up to  $400 \pm j300$  ohms. The OIB-3 extends the range to  $1000 \pm j900$  ohms, and has an RF amplifier for improved nulling. The Common Point Impedance Bridge is permanently installed for continuous monitoring of the common point during network adjustment. An optional TCA ammeter can be installed in its front panel.



## 6730E/6740B

Fast, efficient coaxial transfer switches. The coaxial transfer switches are designed to switch transmitters, transmission lines, antennas, dummy loads and auxiliary equipment quickly and easily. Either manually or remotely controlled, the switches are fully interlocked to prevent switching with RF power applied. The 6730E switch uses 1-5/8 inch connectors, the 6740B switch uses 3-1/8 inch connectors.



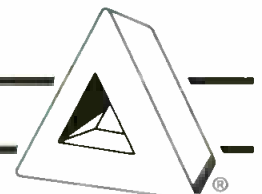
## TCA/TCT

Simplifies antenna current and phase sampling. TCA Ammeter Systems provide accurate, modulation-free current readings on a variety of meter types. Toroidal Current Transformers provide current and phase samples, and are available with three output voltage ranges, as well as high voltage models.

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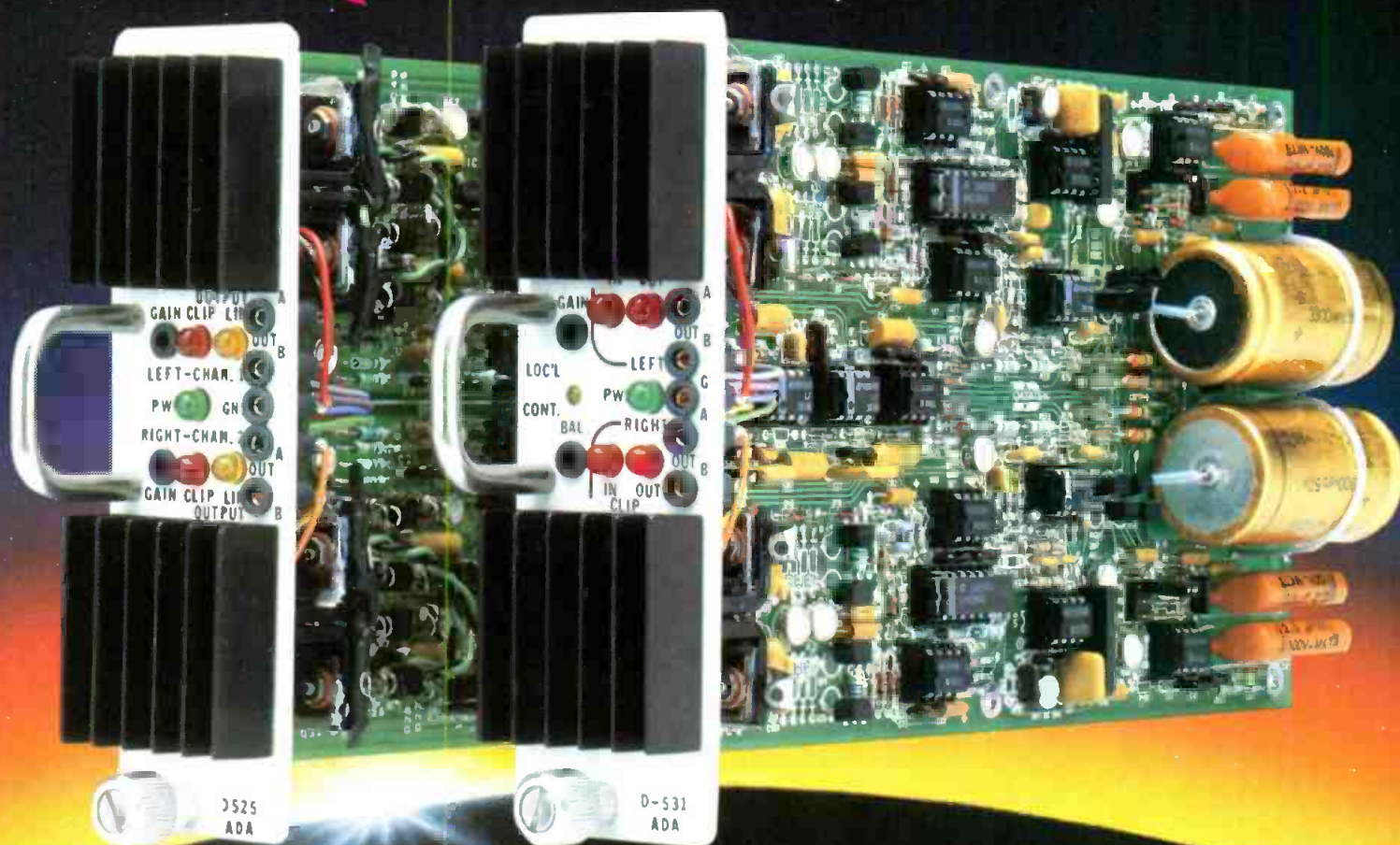
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# Machine Control from a Machine Maker



SC 4008



SC 4016

STUDER SMPTE BUS CONTROLLERS



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Kavouras Inc.  
R/SCAN Corp.  
Texas Electronics, Inc.

### WEATHER RADAR

Advanced Designs Corp.  
Alden Electronics, Inc.  
ESD, Inc.  
Kavouras Inc.  
Precision Echo  
R/SCAN Corp.  
Toshiba Corp.

## RF PRODUCTS

### ALARMS, FAULT/CARRIER

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Kintronic Labs, Inc.  
LBA Technology, Inc.  
Marconi Communication Systems Ltd.  
Pinzone Communications Products Inc.  
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## RF PRODUCTS

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ITELCO  
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MCL, Inc.  
Nexus Engineering Corp.  
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### ANTENNA ALIGNMENT/POSITIONING SYSTEMS

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Johnson Electronics Inc.  
Microdyne Corp.  
Mobile Cam Products  
The Narda Microwave Corp.  
Nurad, Inc.  
Precision Specialties, Inc.

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Dielectric Communications A Unit of General Signal  
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### ANTENNA REMOTE INDICATORS

Broadcast Microwave Services, Inc.  
Comtech Antenna Div. Comtech Systems, Inc.  
Kintronic Labs, Inc.  
Nurad, Inc.  
Precision Specialties, Inc.  
Vector Technology

### ANTENNA SAMPLING EQUIPMENT

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Vector Technology

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Express Tower Co.  
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Kline Iron & Steel Co.  
LDL Communications, Inc.  
Marconi Communication Systems Ltd.  
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Television Technology Corp. Wilkinson Electronics Div. .... 63  
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Andrew Corp.  
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Cablewave Systems  
Comtech Antenna Div. Comtech Systems, Inc.  
Conifer Corp.  
Dalsat Inc.  
DX Communications  
Harris Corp. Broadcast Div.  
ISS-International Satellite Systems  
Kathrein-Werke KG  
Mark Antenna Products, Inc.  
McCullough Satellite Equip., Inc.  
Microdyne Corp.  
North Hills Electronics, Inc.  
Nurad, Inc.  
Pinzone Communications Products Inc.  
Radiation Systems, Inc.  
Rohde & Schwarz  
SatCom Technologies, Inc. An RSI Co.  
Scientific-Atlanta  
Vizcom

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Conifer Corp.  
Mark Antenna Products, Inc.  
Micro Communications, Inc.  
Nurad, Inc.

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Kathrein-Werke KG  
Kintronic Labs, Inc.  
Potomac Instruments, Inc.  
Rohde & Schwarz

## ANTENNAS, RECEIVING FM/TV

Bext Inc.  
Blonder-Tongue Labs, Inc.  
Dielectric Communications A Unit of General Signal  
Gorman-Redlich Mfg. Co.  
ITAME, S.A.

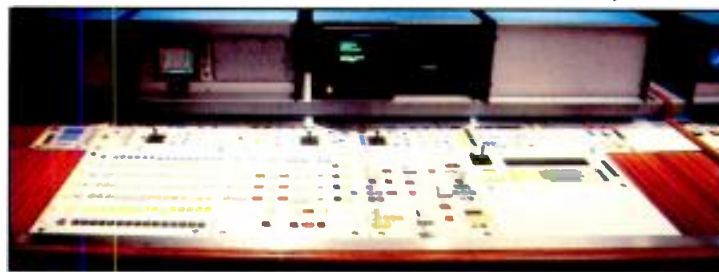
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Potomac Instruments, Inc.  
Rohde & Schwarz  
Scala Electronic Corp.  
Tennaplex Systems Ltd.

**ANTENNAS, REMOTE PICKUP**

Andrew Corp.  
Broadcast Microwave Services, Inc.  
Celwave  
Gorman-Redlich Mfg. Co.  
ITAME, S.A.  
Marti Electronics  
Motorola Communications and Electronics Inc.  
North Hills Electronics, Inc.  
Nurad, Inc.  
Precision Specialties, Inc.  
RF Technology, Inc.  
Rohde & Schwarz  
Scala Electronic Corp.  
Vizcom

**ANTENNAS, STL/MICROWAVE**

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Harris Corp. Broadcast Div.  
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Racon  
Radiation Systems, Inc.  
RF Technology, Inc.  
Scala Electronic Corp.

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Antenna Technology Corp.  
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Cablewave Systems  
Celwave  
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Micro Communications, Inc.  
Racon  
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Sonar Radio Corp.  
SWR, Inc.  
Tennaplex Systems Ltd.

**ANTENNAS, TRANSMITTING UHF/VHF TV**

AEG Communications Div. Transmitter Department  
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ITAME, S.A.  
ITELCO

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Kintronic Labs, Inc.  
LDL Communications, Inc.  
Marconi Communication Systems Ltd.  
Micro Communications, Inc.  
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SWR, Inc.  
Tennaplex Systems Ltd.  
Thomson-LGT

**ATTENUATORS, RF**

Acrian Inc.  
Allen Avionics, Inc.  
Augat/LRC-Vitek  
AVA Electronics  
Bird Electronic Corp.  
Blonder-Tongue Labs, Inc.  
Cablewave Systems  
Coaxial Dynamics  
Comark Communications, Inc.  
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Electro Impulse Lab, Inc.  
General Microwave Corp.  
ITAME, S.A.  
ITELCO  
Kay Elemetrics Corp.  
Mu-Del Electronics, Inc.  
The Narda Microwave Corp.  
Nemal Electronics Int'l.  
Penstock, Inc.  
RMS Electronics, Inc.  
Tech Laboratories Inc.  
Trompeter Electronics, Inc.  
VIZ Test Equipment Div. of VIZ Mfg. Co.  
Weinschel Engineering

**COMBINERS, POWER**

Acrian Inc.  
AEG Bayly Inc.  
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Tennaplex Systems Ltd.  
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Vector Technology  
Watco Inc.  
Weinschel Engineering  
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AEG Communications Div. Transmitter Department  
Celwave  
Harris Farinon  
International Microwave Corp.  
ITAME, S.A.  
Marconi Communication Systems Ltd.  
Mark Antenna Products, Inc.  
Marti Electronics  
MERET, Inc.  
Micro Controls, Inc.  
Microwave Communications Ltd.  
Nurad, Inc.  
OKI Telecom Cellular Telephone Div.  
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Toshiba Corp.

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Toshiba Corp.  
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Vector Technology  
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Townsend Broadcast Systems Inc.  
Trompeter Electronics, Inc.  
Vector Technology  
Weinschel Engineering  
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**EBS AND WEATHER ALERT EQUIPMENT**

Advanced Micro-Dynamics, Inc.  
Emergency Alert Receiver Inc. Also known as EAR Inc.  
Gorman-Redlich Mfg. Co.  
International Nuclear Corp.  
Johnson Electronics Inc.  
TFT Inc.

**ENG EQUIPMENT**

Andrew Corp.  
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Broadcast Microwave Services, Inc.  
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Philip Drake Electronics Ltd.  
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Ikegami Electronics (USA), Inc.  
Kahn Communications, Inc.  
Lang Video Communication Inc.  
Marti Electronics  
Micro Communications, Inc.  
Microwave Communications Ltd.  
Microwave Radio Corp.  
Midwest Communications Corp. .. 1  
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Micro Controls, Inc.  
Motorola Inc. AM Stereo  
Rohde & Schwarz  
TFT Inc.  
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Comark Communications, Inc.  
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Townsend Broadcast Systems Inc.  
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**FILTERS, ANTENNA**

Augat/LRC-Vitek  
Bird Electronic Corp.  
Celwave  
Dielectric Communications A Unit of  
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Penstock, Inc.  
Rohde & Schwarz  
TEKO Telecom S.R.L.  
Television Equipment Associates  
Toko America Inc.  
UTE Microwave, Inc.

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Marcom  
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RE Instruments Corp.  
Rohde & Schwarz  
Rood Megatronics B.V.

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AEG Bayly Inc.  
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QEI Corp. ....237  
Rohde & Schwarz  
Rood Megatronics B.V.  
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Broadcast Electronics, Inc.

CRL Systems Circuit Research  
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Delta-Benco-Cascade A Sub. of Triple  
Crown Elec. Inc.  
ISS-International Satellite Systems  
ITELCO  
Modulation Sciences, Inc.  
Nexus Engineering Corp.  
Orban Associates Inc. ....7  
Rohde & Schwarz  
Townsend Broadcast Systems Inc.  
Triple Crown Electronics

**HEAT EXCHANGERS**

Bird Electronic Corp.  
Dielectric Communications A Unit of  
General Signal  
Electro Impulse Lab, Inc.  
ITELCO  
Rohde & Schwarz  
Townsend Broadcast Systems Inc.

**INSULATORS, ANTENNA  
BASE/GUY STRAIN**

Allied Tower Co., Inc.  
Dielectric Communications A Unit of  
General Signal  
Racal-Decca Canada Inc.  
Insulators Div. ....167

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Dielectric Communications A Unit of  
General Signal  
Kintronic Labs, Inc.  
MERET, Inc.  
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Abroyd Communications Ltd.  
Andrew Corp.  
Control Concepts Corp.  
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SL Waber, Inc. Subsidiary of SL  
Industries  
SWR, Inc.  
XIT Grounding Systems Div. of  
Lyncole Industries, Inc.

**LOW NOISE AMPS, LNA/LNC**

Antenna Technology Corp.  
Broadcast Microwave Services, Inc.  
International Microwave Corp.  
LNR Communications, Inc.  
Marti Electronics  
McCullough Satellite Equip., Inc.  
Microdyne Corp.  
Penstock, Inc.  
Pinzone Communications Products Inc.  
RF Technology, Inc.  
SatCom Technologies, Inc. An RSi Co.  
Scientific-Atlanta  
Standard Communications  
Toshiba Corp.  
Vizcom

**MICROWAVE COMPONENTS**

Acrian Inc.  
Andersen Labs, Inc.  
Andrew Corp.  
AVCOM of Virginia, Inc.  
Broadcast Microwave Services, Inc.  
Cablewave Systems

Comwave Div. of Communication  
Microwave Corp.  
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General Microwave Corp.  
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International Microwave Corp.  
FL Jennings A Div. of FL Industries  
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Marshall Electronics  
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Microwave Communications Ltd.  
Motorola Communications and  
Electronics Inc.  
The Narda Microwave Corp.  
North Hills Electronics, Inc.  
Nurad, Inc.  
Penstock, Inc.  
Standard Telephone und Radio AG  
TFT Inc.  
Toshiba Corp.  
UTE Microwave, Inc.  
Varian Associates, Inc. Electron  
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Weinschel Engineering

**MODULATORS, TV**

Antenna Technology Corp.  
Asaco/Shibasoku Corp.  
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Comark Communications, Inc.  
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**PRESSURIZATION EQUIPMENT**

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Cablewave Systems  
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General Signal  
Environmental Technology, Inc.  
Gabriel Electronics, Inc.  
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**RADOMES, ANTENNA  
PROTECTION**

Andrew Corp.  
Antenna Technology Corp.  
Antennas For Communications, Inc.  
Cablewave Systems  
Dielectric Communications A Unit of  
General Signal  
Gabriel Electronics, Inc.  
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SWR, Inc.

**RECEIVERS, AM**

Antenna Technology Corp.  
Bogen Communications, Inc.  
Cetec Raymer  
Heynen International  
International Microwave Corp.

Kahn Communications, Inc.  
Pioneer Electronics  
Potomac Instruments, Inc.  
Toshiba Corp.

**RECEIVERS, COMMUNICATION**

International Microwave Corp.  
LNR Communications, Inc.  
Marti Electronics  
McCullough Satellite Equip., Inc.  
Microdyne Corp.  
Nurad, Inc.  
Spectrum Communications  
Corp. ....213  
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**RECEIVERS, EARTH STATION**

Andrew Corp.  
Antenna Technology Corp.  
AVCOM of Virginia, Inc.  
Blonder-Tongue Labs, Inc.  
Delta-Benco-Cascade A Sub. of Triple  
Crown Elec. Inc.  
R.L. Drake Co.  
DX Communications  
LNR Communications, Inc.  
McCullough Satellite Equip., Inc.  
Micro Phase Communications, Inc.  
Microdyne Corp.  
Modulation Associates Inc.  
Nexus Engineering Corp.  
Pinzone Communications Products Inc.  
Rohde & Schwarz  
SatCom Technologies, Inc. An RSi Co.  
Scientific-Atlanta  
Standard Communications  
Tectan, Inc.  
Thomson-LGT  
Toshiba Corp.  
Vizcom  
Wegener Communications Inc.

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AEG Bayly Inc.  
AEG Communications Div. Transmitter  
Department  
Antenna Technology Corp.  
Bogen Communications, Inc.  
Cetec Raymer  
Emergency Alert Receiver Inc. Also  
known as EAR Inc.  
Heynen International  
International Microwave Corp.  
ITAME, S.A.  
Johnson Electronics Inc.  
LNR Communications, Inc.  
Marti Electronics  
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International Microwave Corp.  
ITELCO  
Marti Electronics  
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Microwave Communications Ltd.  
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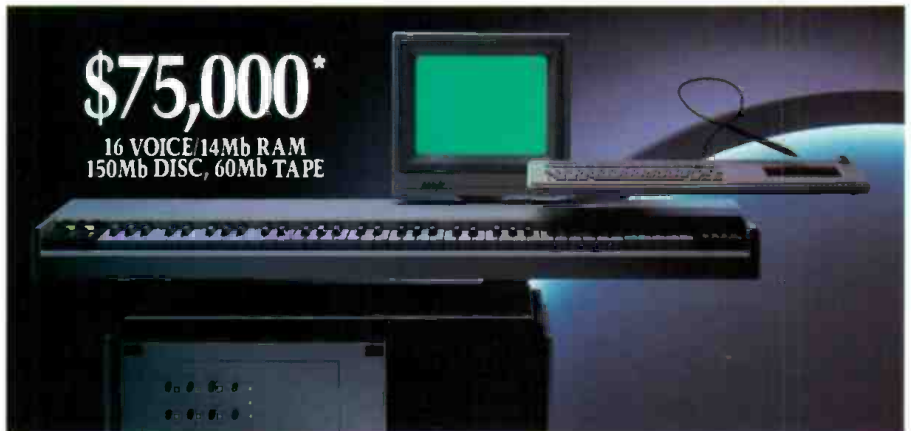
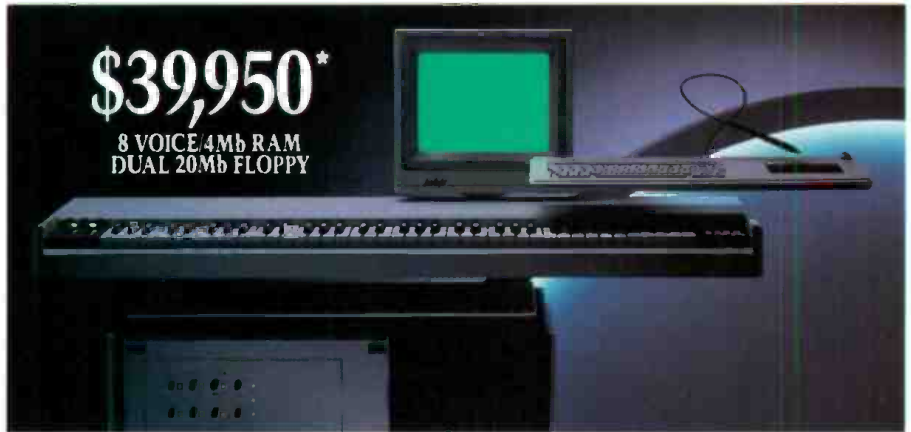
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Marti Electronics  
McCullough Satellite Equip., Inc.  
Micro Controls, Inc.  
Reach Electronics, Inc.  
Rohde & Schwarz  
TOA Electronics, Inc.  
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Kinometrics/Truetime

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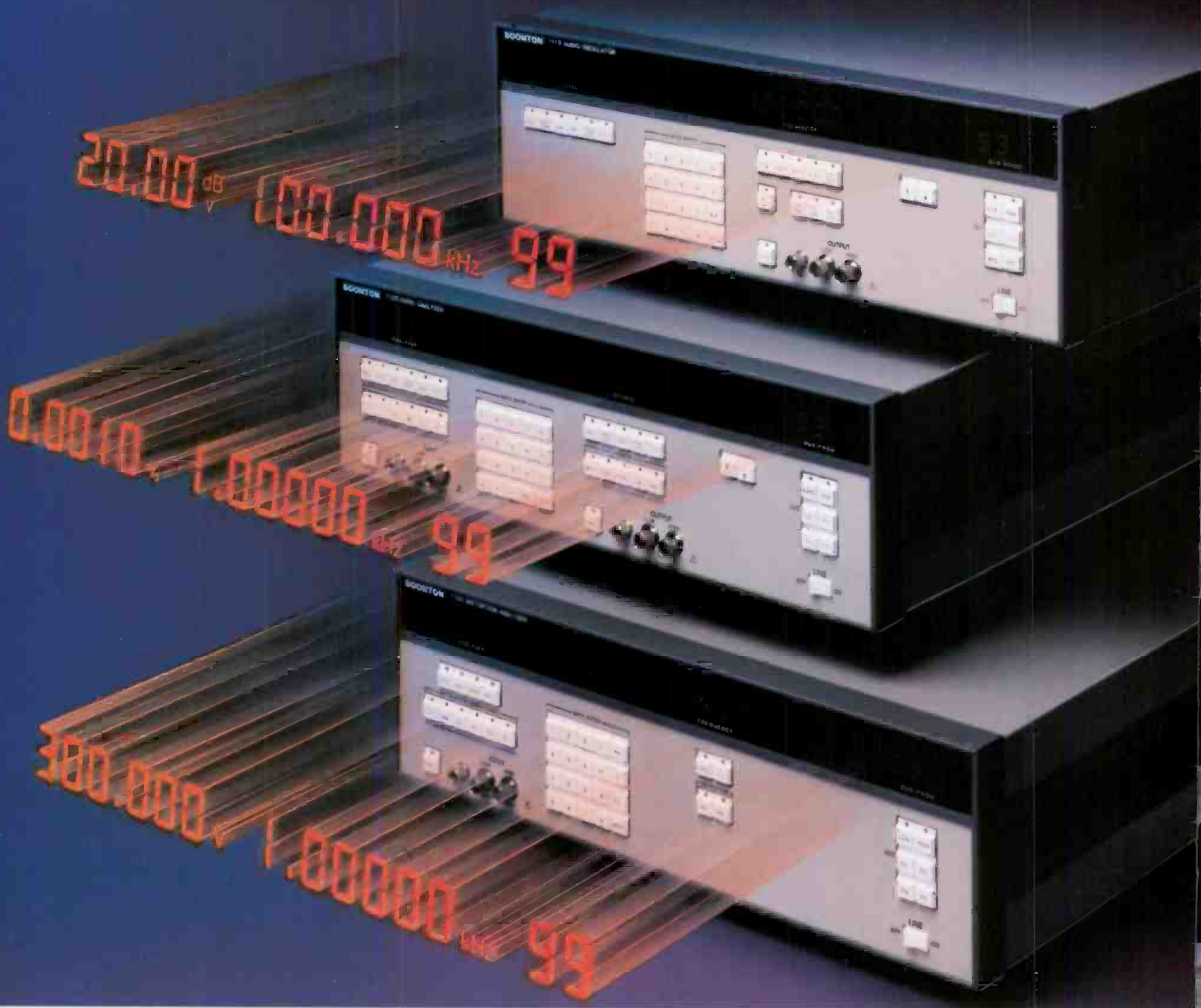
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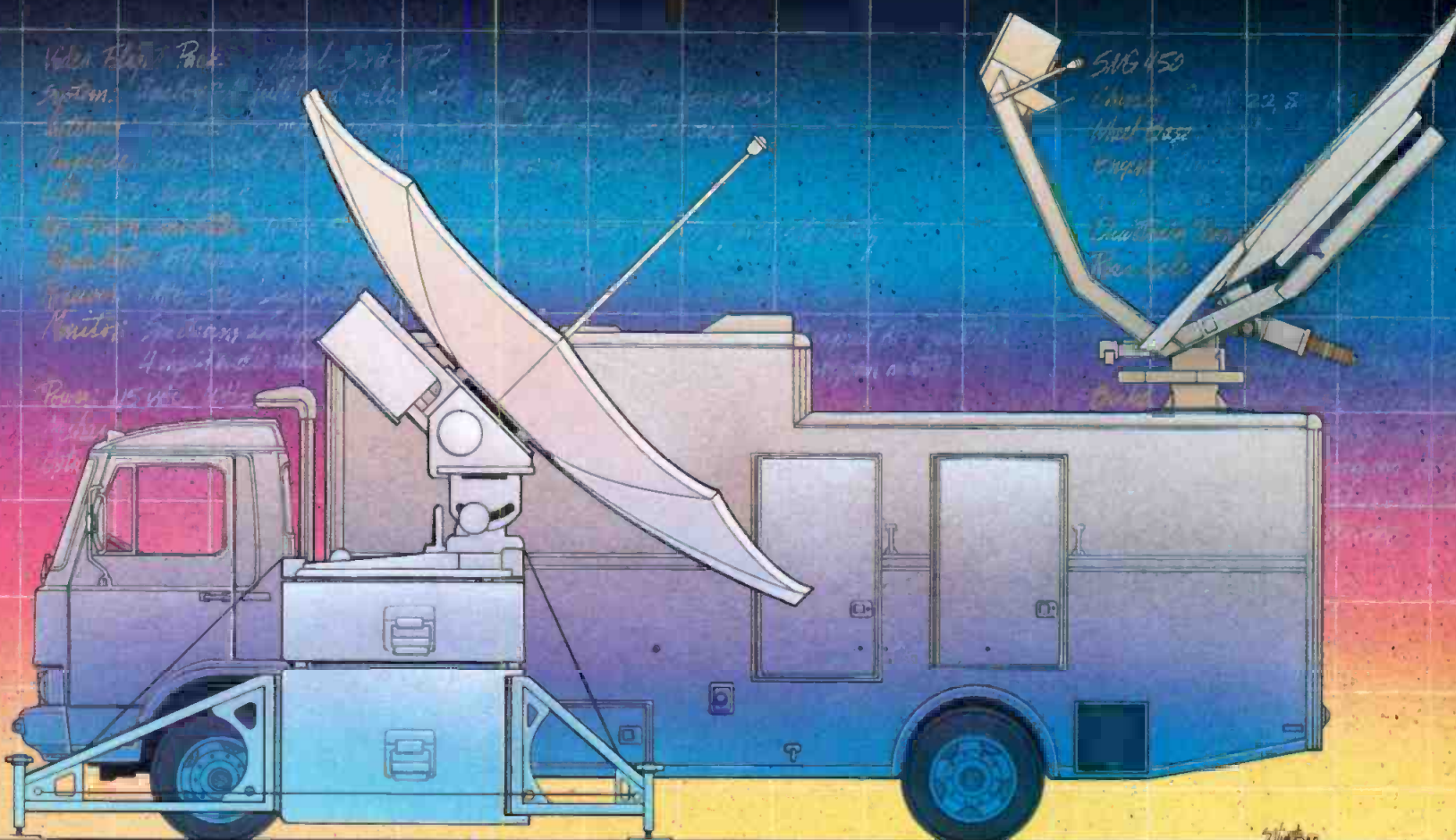
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1:2.8 en 540 mm

\*formato de 25 mm



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Apertura relativa máxima\*: 1:1.6 para todas las distancias focales

\*formato de 25 mm



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Apertura relativa máxima: 1:1.7 hasta 116 mm  
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**J14x8B1E** Lente de alta resolución para cámaras de 2/3". Super angular (60°) y extra nitida en toda su extensión. Esta lente compacta tiene también un objetivo regulable de 14X y un extensor de 2X incorporado.

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Apertura relativa máxima: 1:1.7 hasta 201 mm  
1:3.0 en 430 mm



**J25x11.5B1E** para cámaras de 2/3".  
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Distancia focal: 11.5-288 mm (23-576 mm con extensor de 2X)  
Apertura relativa máxima: 1:1.6 hasta 220 mm  
1:2.1 en 288 mm



**J20x8.5B1E** para cámaras de 2/3".  
Doble función — use una lente de 13X con enfoque ajustable para la recolección electrónica de noticias (ENG) y la J20x8.5B1E para transmisiones en estudio o al aire libre... ¡con la misma cámara de 2/3"!  
Distancia focal: 8.5-170 mm (17-340 mm con extensor de 2X)  
Apertura relativa máxima: 1:1.6 hasta 130 mm  
1:2.1 en 170 mm



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1:1.9 en 118 mm



**J15x9.5** para cámaras de 2/3".  
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 Western Wireless Works  
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 Bi-Tronics, Inc.  
 Blonder-Tongue Labs, Inc.  
 Canford Audio Ltd.  
 Comprehensive Video Supply Corp.  
 CSE Technologies  
 Nermal Electronics Int'l.  
 Paladin Corp.  
 Penstock, Inc.  
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Thermodyne International  
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 DATEL  
 Delta-Benco-Cascade A Sub. of Triple  
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 Dukane Corp.  
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 The Superior Electric Co.  
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**RECORDER REPLACEMENT  
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International Tapetronics/3M  
 Broadcasting & Related Products  
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**REGULATORS, VOLTAGE**

Hipotronics Inc.  
 Kayglo Electronics  
 Lightning Eliminators & Consultants  
 Perma Power Electronics, Inc.  
 Professional Sound Corp.  
 Sola/General Signal  
 Topaz, Inc.

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 Equipto Electronics Corp.  
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 Scientific-Atlanta Optima Div.  
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 Div.  
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 The Geneva Group of Companies  
 Nu-Concept Systems, Inc.  
 SL Waber, Inc. Subsidiary of SL  
 Industries  
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To learn more about Fujinon's new generation of 2/3" studio/field lenses, you'll get more information or a demonstration by calling the Fujinon location nearest you.

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Vistek Electronics Ltd.  
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Ethereum Scientific Corp.  
Alan Gordon Enterprises Inc.  
Harris Corp. Broadcast Div.  
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Lighting & Shadows A Div. of Phoebus  
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Lerro Electrical Corp.  
Lighting & Shadows A Div. of Phoebus  
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Maze Broadcast, Inc.  
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Midwest Communications Corp. ..1  
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Allied Film & Video/IL  
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Allied Film & Video/FL  
Allied Film & Video/IL  
Arnold & Richter  
Center Video Industrial Co., Inc.  
Devlin Productions, Inc.  
Image Transform, Inc.  
Johnson-Nyquist Production Inc.  
Media Concepts, Inc.  
Multi-Video Productions, Inc.  
RADMAR, Inc.  
T & G Optics

**FREQUENCY MEASUREMENTS**

Apple Frequency Measuring Service  
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Data Check Corp.  
Discrete Technology Labs, Inc.  
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Newman-Kees Measurements Engineering & Installations  
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R&D Station Service  
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**MAINTENANCE, AM/FM RADIO**

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Western Union Video Services  
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**SATELLITE TRANSPONDER TIME BROKERS**

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Comsat Video Enterprises  
Conus Communications Satellite Services Div.  
NETCOM  
**Northstar Satellite Systems Inc. ....214**  
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Allied Film & Video/IL  
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Devlin Productions, Inc.  
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NETCOM  
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Creative Video Services  
Devlin Productions, Inc.  
Image Transform, Inc.  
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**Broadcast Communications**  
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**Broadcast Developments Ltd.**  
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01-987-5135

**Broadcast Devices Inc.**  
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914-737-5032

**Broadcast Electronics, Inc.**  
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**Broadcast Microwave Services, Inc.**  
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**CBS Special Products**  
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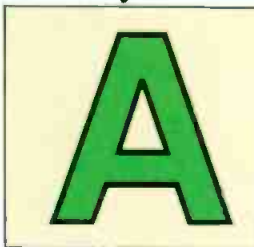
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That's a lot of hardware for a character generator which already costs less than most.

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With Pesa you get variable edge width, 4 directions of shadow. 3 levels of italic slope (in both directions). Variable width underline. Horizontal and vertical expansion or compression, by page, row or character.

selectable by character, row or page. Colours and all other attributes can be transferred to rows and characters.



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Contact Pesa America for further details.

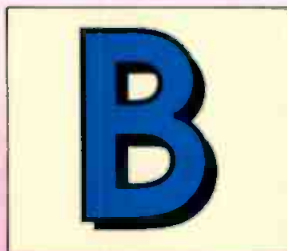
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Most of the CG's excellent facilities can be accessed directly from dedicated keys, eliminating the sort of unnecessary menus that clutter other systems in the name of 'user-friendliness'.

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## Manufacturers' Addresses

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717-474-6751

**Concept Productions**  
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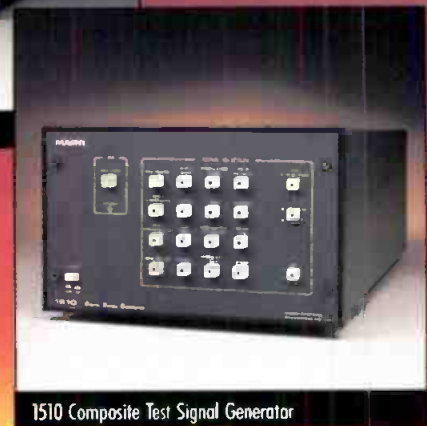
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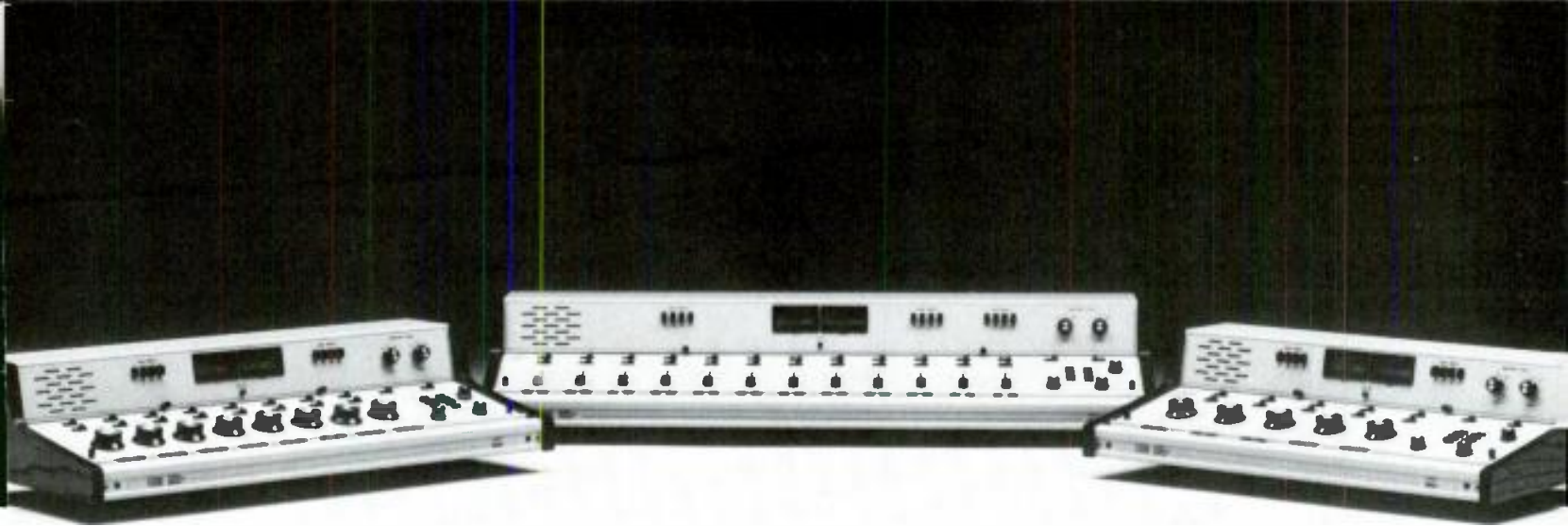
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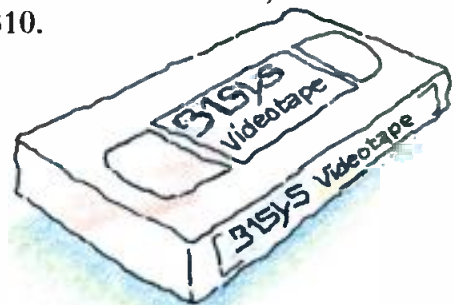
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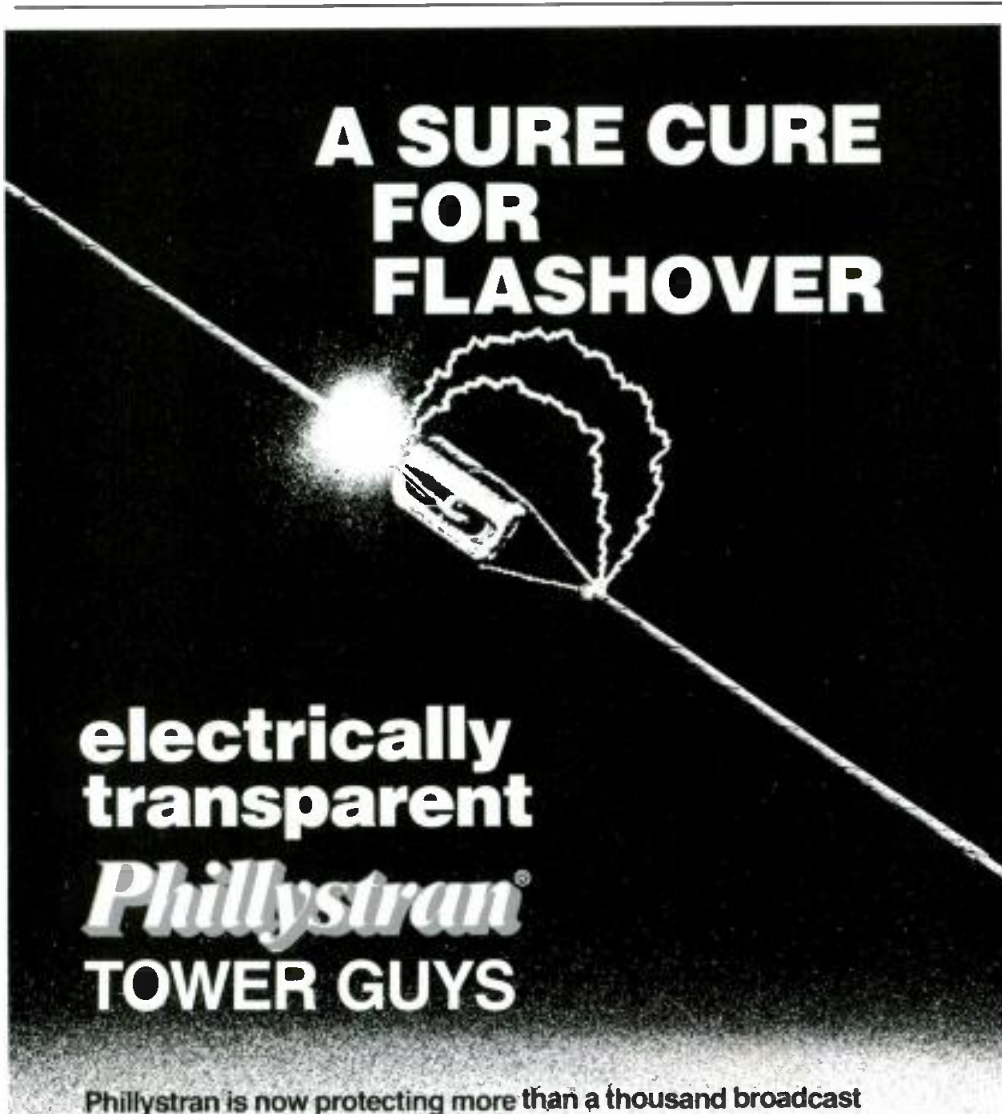
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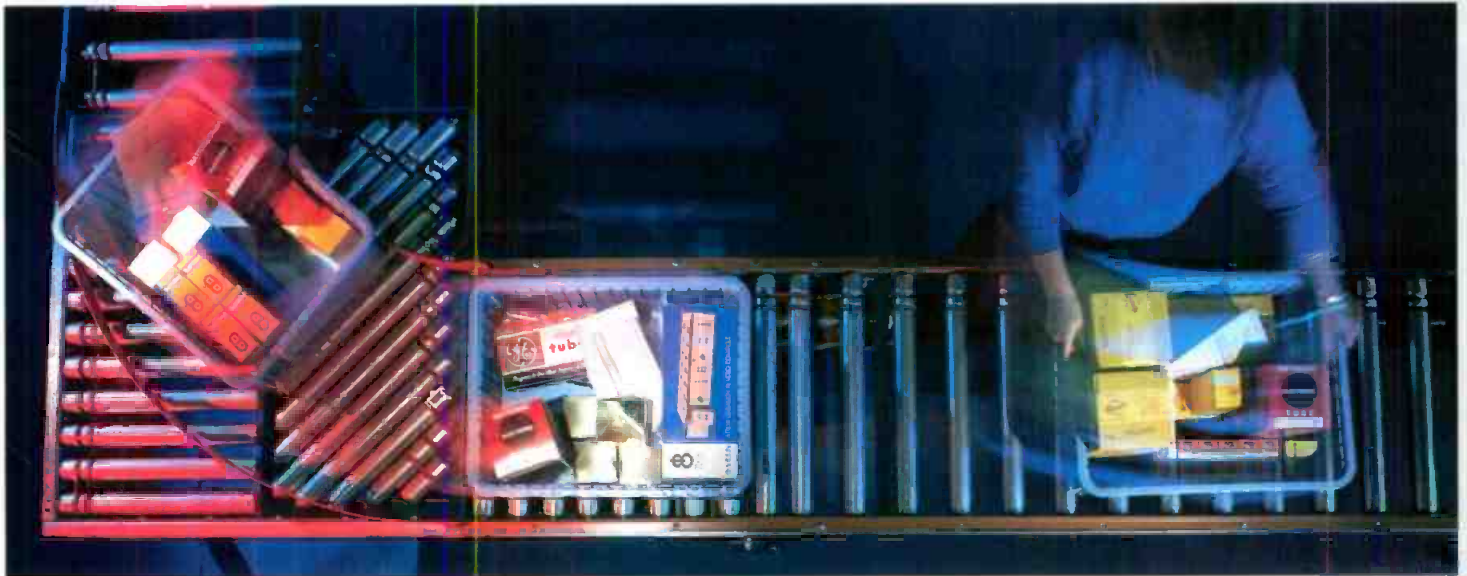
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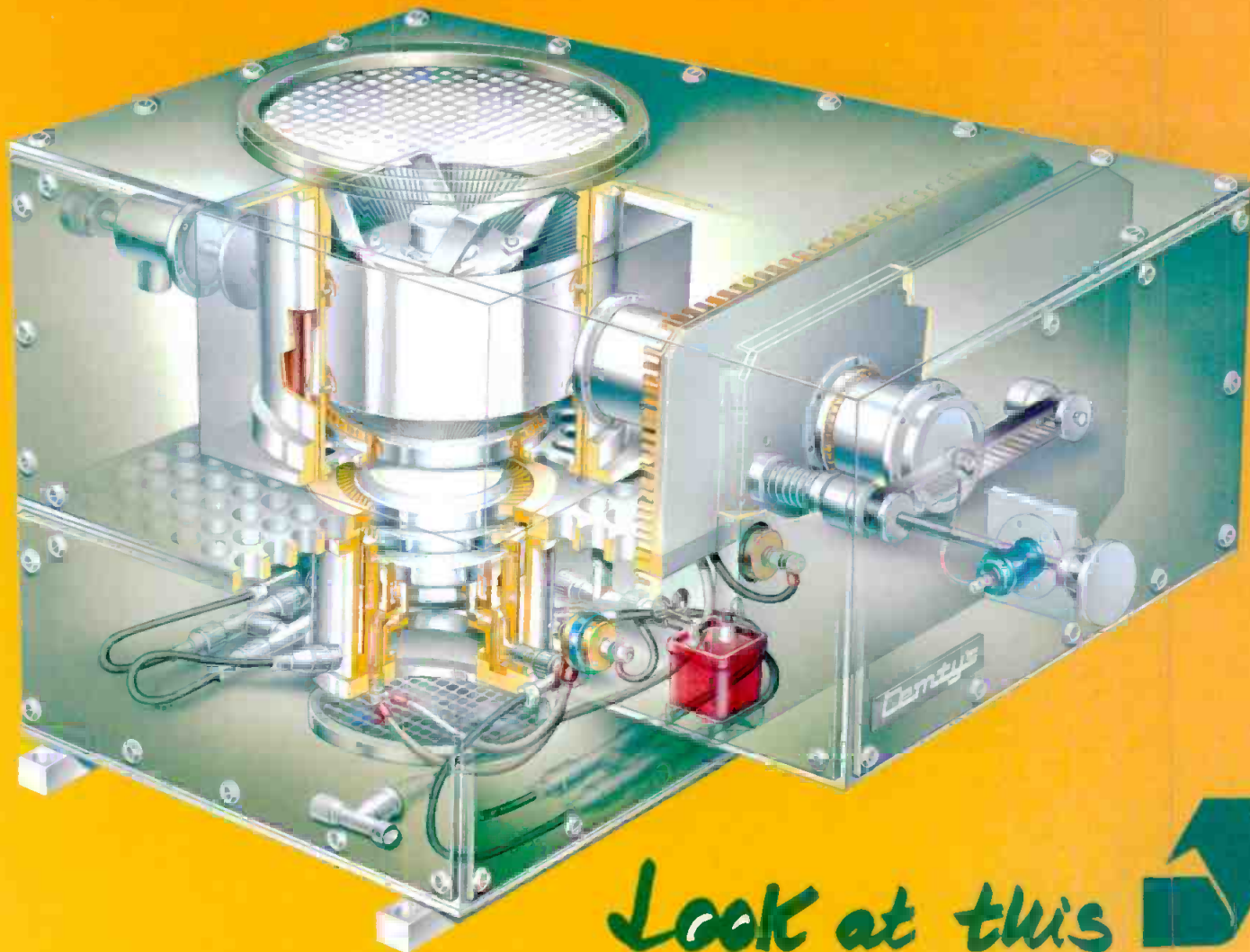
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\* Built under license (N. V. PHILIPS, pat. 8200633)

#### POWER AMPLIFIER CONFIGURATION

The resonant cavity of the output stage contains the power amplifier in a grounded-grid and grounded-screen configuration. This unique design eliminates neutralization as it provides dual internal shielding between the input and output circuits of the tube stage.

The broadband tube input circuit uses a rugged complex coaxial structure that converts the low operating impedance of the cathode-grid circuit to 12 1/2 Ohms. Final matching is then obtained by means of a 4:1 transformer built with 50 Ohm coaxial cables that provide WIDEBAND coupling over the entire FM Band without grid tuning.

The design is so efficient that a VSWR of less than 1.3:1 is obtained throughout the entire operating range in Band II.

The cavity output circuit is tuned to the required frequency in a  $\lambda/4$  mode by means of a moveable shorting plunger which is the only frequency dependent adjustment in the transmitter.

The mechanical design places the adjustable element out of the cooling airflow, eliminating both thermal detuning and the problems associated with high temperatures on the sliding RF contacts.

CEMTYS manufactures the resonant cavity with meticulous care so as to achieve the rigid tolerances that are necessary for continuous operation in Band II.

In the construction of the cavity we use special materials: KAPTON, ECCOSORB, NORYL, BERYLLIUM-COPPER, etc. along with sophisticated cryogenic assembly techniques to provide the reliability and durability which are part of the basic design criteria.

CEMTYS BROADCASTING. Explanada 4 y 6 - Tel. 233 25 08\* - Fax 253 78 88 - Télex 22230 - 28040 MADRID SPAIN

The constant evolution of technology allows us to incorporate improvements in the design and production of our products. For this reason, CEMTYS reserves the right to modify without prior notice the technical characteristics and specifications related to the product described in this publication

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**Manufacturers' Addresses**

**SatCom Technologies, Inc.**  
An RSi Co.  
2912 Pacific Drive  
Norcross, GA 30071  
404-448-2116

**SATT Communications AB**  
P.O. Box 32701  
S-12611 Stockholm, Sweden  
468-81-0100

**Sauppe Media, Inc.**  
1625 Pegfair Drive  
Pasadena, CA 91103  
818-792-9840

**Scala Electronic Corp.**  
P.O. Box 4580  
Medford, OR 97501  
503-779-6500

**Scantex Labs Inc.**  
P.O. Box 338  
Pierrefonds, Que., Canada H9H 4L1  
514-626-8943

**Schafer World Communications Corp.**  
P.O. Box 31  
Marion, VA 24354  
703-783-2001

**Schmid Telecommunication**  
Rieterstrasse 6  
CH-8002 Zuerich, Switzerland  
1 206 11 11

**Schneider Corp. of America**  
400 Crossways Park Drive  
Woodbury, NY 11797  
516-496-8500

**Jos. Schneider Optische Werke**  
Kreuznach GmbH & Co. KG  
Ringstrasse 132, P.O. Box 2463  
D-6550 Bad Kreuznach  
West Germany  
067-601289

**Edward A. Schober, P.E.**  
Radio Consulting Engineer  
402 Tenth Ave.  
Haddon Heights, NJ 08035-1838  
609-546-0472

**Schoeps/Posthorn Recordings**  
142 West 26th St., 10th Floor  
New York, NY 10001  
212-242-3737

**Schoeps Schalltechnik**  
Spitalstrass 20  
D-7500 Karlsruhe 41, West  
Germany  
0721-42016

**Schuessler Case Co., Inc.**  
P.O. Box 39066  
Chicago, IL 60639  
312-227-0027

**Schwem Technology, Inc.**  
3305 Vincent Road  
Pleasant Hill, CA 94523  
415-937-3257

**Scientific-Atlanta**  
P.O. Box 105600  
Atlanta, GA 30348  
404-441-4618

**Scientific-Atlanta**  
Digital Video Systems Div.  
120 Middlefield Road  
Scarborough, Ont., Canada M1S 4M6  
416-299-6888  
*John Fazackerley*

**Scientific-Atlanta**  
Optima Div.  
2166 Mtn. Industrial Blvd.  
Tucker, GA 30084  
404-496-4023

**Scientific Systems, Inc.**  
92 Westwood Drive  
Toms River, NJ 08753  
201-255-2230

**Scip Electronic Systems**  
16169 Sunset Blvd., Suite 304  
Pacific Palisades, CA 90272  
213-454-1889  
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**The L.J. Scully Mfg. Corp.**  
138 Hurd Ave.  
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203-368-2332

**SCV/Portland Instrument**  
1101-A Air Way  
Glendale, CA 91201  
818-500-0137

**Seem Audio A.S.**  
P.O. Box 115  
N-1380 Heggedal, Norway  
47-2-797730

**Selco Products Co.**  
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213-921-0681

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Mckinney, TX 75069  
214-542-2056

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605-339-0100

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New York, NY 10018  
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**Sentry Systems**  
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Seattle, WA 98121  
206-728-8651

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Henderson, NV 89015  
702-565-3400

**Setcom Corp.**  
1400 Stierlin Road, Dept. BE  
Mountain View, CA 94043  
415-965-8020

**S.G. Communications West Inc.**  
3444 N. Dodge, Suite A  
Tucson, AZ 85716  
800-824-7865

**Shallco, Inc.**  
P.O. Box 1089  
Smithfield, NC 27577  
919-934-3135

**Sharp Electronics Corp.**  
Broadcast Group  
Sharp Plaza  
Mahwah, NJ 07430  
201-529-8731

**Jack Shearer & Associates, Inc.**  
3059 Beechwood Blvd.  
Pittsburgh, PA 15217  
412-421-1378

**Shintron Co. Inc.**  
144 Rogers St.  
Cambridge, MA 02142  
617-491-8700

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San Antonio, TX 78233  
512-653-6761

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222 Hartrey Ave.  
Evanston, IL 60202-3696  
312-866-2573

**Siecor Corp.**  
489 Siecor Park  
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704-327-5189

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Balanstrasse 73  
D-8000 Muechen, West Germany

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1173 Borregas Ave.  
Sunnyvale, CA 94089  
408-745-1500

**Sierra Video Systems**  
P.O. Box 2462  
Grass Valley, CA 95945  
916-273-9331

**Sigma Consultants**  
8765 Aero Drive, Suite 221  
San Diego, CA 92123  
619-279-6766

**Sigma Electronics, Inc.**  
P.O. Box 448  
East Petersburg, PA 17520  
717-569-2681

**Simpson Electric**  
853 Dundee Ave.  
Elgin, IL 60120  
312-697-2260

**Sims Vibration Dynamics**  
17724 15th Ave. N.E.  
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206-362-0700

**Skantronics Inc.**  
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Port Washington, PA 11050  
516-944-6244

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300 Harvard Ave.  
Westville, NJ 08093  
609-456-5400

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Arlington, VA 22201  
703-525-7272

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2033 M St. N.W., Suite 600  
Washington, DC 20036  
202-293-7742

**Snell & Wilcox**  
Electronic Consultants  
57 Jubilee Road  
Waterlooville, Hants  
England PO7 7RF  
0705-268827

**SoftPedal Inc.**  
Microsoftware for TV Sales  
2690 Cumberland Parkway  
Suite 350  
Atlanta, GA 30339  
404-435-4880

**Sola/General Signal**  
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Elk Grove Village, IL 60007  
312-439-2800

**Solder Absorbing Technology**  
144 Oakland St.  
Springfield, MA 01108  
413-788-6191

**Solid Electronics Labs**  
220 Brookthorpe Circle  
Broomall, PA 19008  
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**Solid State Logic**  
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44-8675-4353

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212-988-0290

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514-522-8960

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Hollywood, FL 33021  
305-981-8800

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Im Gewerbezentrum  
CH-8702 Zollikon-Zurich, Switzerland  
1-397-8090

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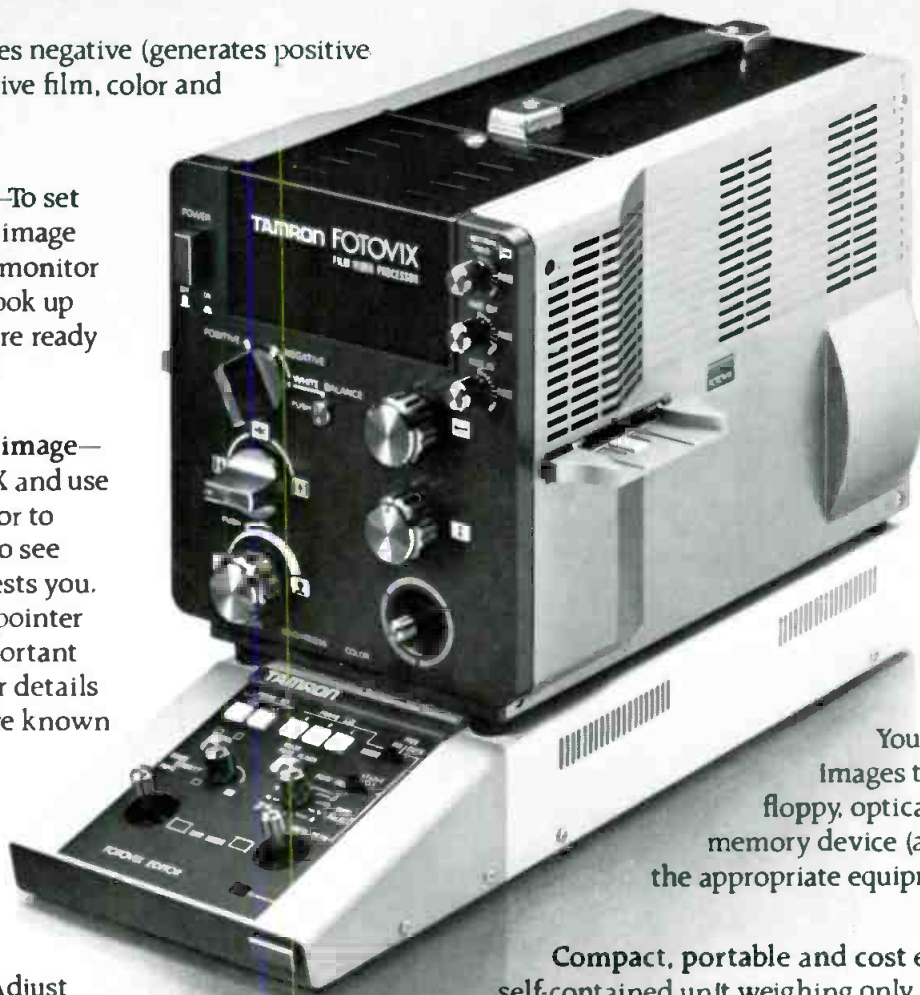
The perfect film video processor for video and broadcast production, law enforcement and security work, fire departments, laboratories, medical, publishing, newspapers, advertising and public relations, education, sales training, real estate, used car and boat sales, etc.

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**Genlock**—Fotovix Pro's Genlock capability lets you integrate and review multiple images on a single monitor by use of an SEG (Special Effect Generator) or a switcher.

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**Sonosax SA**  
Rte Cantonale 116  
CH-1025 St-Sulpice, Switzerland  
021-35.35.01

**Sony Communications Products Co.**  
1600 Queen Anne Road  
Teaneck, NJ 07666  
201-833-5200

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One Sony Drive  
Park Ridge, NJ 07656  
201-930-7266

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50 Werman Court  
Plainview, NY 11803  
516-433-2202

**Soundcraft Electronics Ltd.**  
Unit 2, Borehamwood Industrial Park  
Rowley Lane, Borehamwood  
Hertfordshire, England WD6 5PZ  
01-207-5050

**Soundcraft USA**  
8500 Balboa Blvd.  
Northridge, CA 91329  
818-893-4351

**Soundmaster Int'l.**  
306 Rexdale Blvd., Suite 5  
Toronto, Ont., Canada M9W 1R6

**Soundtracs**  
77 Selleck St.  
Stamford, CT 06902  
203-348-2121

**Soundtracs PLC**  
91 Ewell Road  
Surbiton, Surrey, England KT6 6AH  
01-399-3392

**Southern Broadcasting Systems Ltd.**  
Unit 1/375, 11 Brodie Hall Drive  
Bentley 6102, Western Australia  
09-470-2343

**Spectra Sonics**  
3750 Airport Road  
Ogden, UT 84405  
801-392-7531

**Spectra Systems, Inc.**  
2040 N. Lincoln St.  
Burbank, CA 91504  
818-842-1111

**Spectrum Communications Corp.**  
1055 W. Germantown Pike  
Norristown, PA 19403  
215-631-1710  
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**Spectrum Planning, Inc.**  
P.O. Box 831360  
Richardson, TX 75083-1360  
214-680-1000

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Hauppauge, NY 11788  
516-231-7050

**SSAC Inc.**  
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215-699-4871

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213-532-5300

**Standard Frequency Measuring Service**  
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Cincinnati, OH 45231  
513-851-4964

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603-529-2500

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Seattle, WA 98199  
206-282-2555

**Symtec Inc.**  
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Dunwoody Toronto, Ont., Canada M5J  
2J9  
813-961-4771

**Synchronous Communications, Inc.**  
1885 Lundy Ave., Suite 102  
San Jose, CA 95131  
408-943-0222

**System Video Ltd.**  
120 Oyster Lane  
Byfleet, Surrey, England KT14 7LJ

**Systemation Corp.**  
337 N. Water  
Decatur, IL 62523  
217-428-7101

**Systems Wireless Ltd.**  
465 Herndon Parkway  
Herndon, VA 22070  
703-471-7887

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1880 Embarcadero Road  
Palo Alto, CA 94303  
415-493-3811

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24 Valley Road  
Port Washington, NY 11050  
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Bogner's slot broadcast antennas have long been known for their outstanding performance and ability to custom tailor vertical and horizontal radiation patterns to fit the specific needs of each location. A patented director system with radiating elements is largely responsible for this impressive performance. So impressive that over 1,000 Bogner TV Broadcast antennas employing this technique are now in use.

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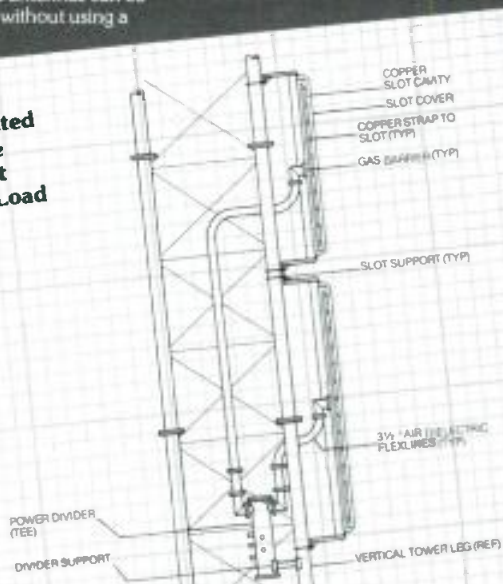
support pipe at all. Instead, the slot cavities and the power divider are bolted directly to a tower leg and are interconnected with 3 1/2" pressurized semi-flexible coaxial cables. Weight, wind load, and cost are markedly reduced. But performance is virtually unchanged with power gains to 16 dB and VSWRs of under 1.08:1 over an entire channel (better than 1.05:1 at visual). In fact, the side-mounted array has precisely the same gain, VSWR and horizontal and vertical radiation patterns as our top-mounted version.

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- Tower Leg Mounted
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- Full Bogner Performance



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High Wycombe, Bucks  
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0494-450606

**Tape-Athon Corp.**  
**Cavox Stereo Productions**  
13633 Crenshaw Blvd.  
Hawthorn, CA 90250  
213-676-6752

**TASCAM**  
7733 Telegraph Road  
Montebello, CA 90640  
213-726-0303

*Bill Mohrhoff*

**TDV S.A.**  
Parc Industrial Hauts Sarts  
B-4400 Herstal, Belgium

**Teatronics Inc.**  
3100 McMillan Road  
San Luis Obispo, CA 93401  
805-544-3555

**Tech Laboratories Inc.**  
500 Tenth St.  
Palisades Park, NJ 07650  
201-944-2221

**Technical Projects Inc.**  
P.O. Box 1449  
Barrington, IL 60011  
312-381-5350

**Tectan, Inc.**  
P.O. Box 27 1872  
Concord, CA 94527  
415-798-2222

**Tekno Inc.**  
100 W. Erie St.  
Chicago, IL 60610  
312-787-8922

**TEKO Telecom S.R.L.**  
Via Dell'Industria, 5  
I-40068 San Lazzaro di Savena  
BO, Italy  
051-456148

**Tekskil Industries**  
# 108-15290 103A Ave.  
Surrey, B.C., Canada V3R 7A2  
604-589-1100

**Tektronix Inc.**  
P.O. Box 500 D/S 58-699  
Beaverton, OR 97077  
503-627-2230

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PA, Philadelphia, (215) 825-6400  
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**Telcom Research**  
1163 King Road  
Burlington, Ont., Canada L7R 3X5  
416-681-2450

**Telecommunication Products Corp.**  
P.O. Box 476  
Chamberburg, PA 17201  
717-267-3939

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96-18 43rd Ave.  
Corona, NY 11368  
718-651-8900

**Teledac Inc.**  
661 Pine  
St. Lambert, Que., Canada J4P 2P4  
514-671-7762

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Timonium, MD 21093  
301-252-8220

**Telemet Div.**  
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185 Dixon Ave.  
Amityville, NY 11701  
516-842-2300

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7 Valley St.  
Hawthorne, NJ 07506  
201-423-0347

**Telescript, Inc.**  
445 Livingston St.  
Norwood, NJ 07648  
201-767-6733

**Teletech, Inc.**  
23400 Michigan Ave.  
Dearborn, MI 48124  
313-562-6873

**Television Equipment Associates**  
P.O. Box 393  
South Salem, NY 10590  
914-763-8893

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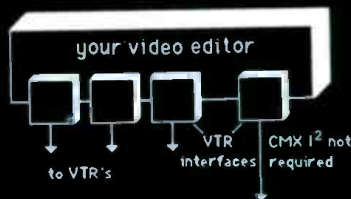
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**NVS Systems, Inc.**, 8300 King St., Anchorage, AK 99518 (907-349-3523) AK, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design

## ARIZONA

**E.A.R. Professional Audio**, 2641 E. McDowell, Phoenix, AZ 85008 (602-267-0600) AZ, CA, CO, MT, NV, NM, Audio & Video Equip.; Tape; Systems Design; Used Equip.

**Jensen Tools Inc.**, 7815 South 46th St., Phoenix, AZ 85044 (602-968-6241) Worldwide, Tools; Tool Kits; Tool Cases; Test Equip.; Shipping Containers

**ROH'S Inc.**, 4553 E. Broadway, Tucson, AZ 85711 (602-795-8573) AZ, NM, Audio & Video Equip.; Tape; System Design

**Spencer Broadcast, Inc.**, 8642 North 78th Ave., Suite 2, Peoria, AZ 85345 (602-242-2211; 800-221-6941) 50 State '800' Service, Worldwide, Over 150 Lines; Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design; Towers, Station Turnkey Services; Consulting Services Div.

**Western Wireless Works, P.O. Box 999**, Apache Junction, AZ 85217 (602-890-1200) AZ, CA, NV, NM, Audio Equip., Transmitters, Antennas & Transmission Systems Service & Repair; System Design; Used Equip.

## ARKANSAS

**Gray Communications Consultants, Inc.**, 5105 McClanahan Drive, Suite J-1, North Little Rock, AR 72116 (501-758-3234) AR, TN, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Vans & Accessories; Service & Repair; System Design; Tape

**Radcom, Inc.**, P.O. Box 191, Eureka Springs, AR 72632 (501-253-8556) Worldwide, Audio Equip.; Transmitters, Antennas & Transmission Systems; System Design

## CALIFORNIA

**Accurate Sound Corp.**, 3515 Edison Way, Menlo Park, CA 94025 (415-365-2843) U.S.A., Canada, GU, PR, VI, Audio Equip.; Tape; System Design

**Advanced Marketing, P.O. Box 97**, Redwood City, CA 94064 (415-365-3944) CA, NV, Audio & Video Equip.; Test & Measurement Equip.

**Audio Engineering Associates**, 1029 N. Allen Ave., Pasadena, CA 91104 (818-798-9127; 213-684-4461) Southern-CA, Audio Equip.

**Audio L A**, 11349 Santa Monica Blvd., Los Angeles, CA 90025 (213-477-1516) AK, AZ, CA, CO, GU, HI, ID, NV, NM, OR, UT, WA, WY, BC, Argentina, Australia, Brazil, Columbia, Mexico, Philippines, A full line service organization specializing in Music & Audio Production Systems for recording, video & film-scoring applications. System Design & Installation

**Audio Services Corp.**, 4210 Lander-shim Blvd., North Hollywood, CA 91602 (818-980-9891) U.S.A. and Canada, Audio-Equip.-Film, Video, Live Entertainment, News; Test & Measurement Equip.; Tape; Service & Repair; Used Equip.

**AVSC, Inc.**, 140 University Ave., Suite 113, Palo Alto, CA 94301 (415-493-3814) Worldwide, Audio & Video Degaussers; Teleconfer-ence Systems; Audio/VHS Tape

**Barrett Associates Inc.**, 3205 Production Ave., Oceanside, CA 92054 (619-433-5600) Worldwide, Full Line Audio Equip.; Transmitters, Antennas, & Transmission Systems, Tape, Cartridges, Reconditioned and Warranted Broadcast Equip.

**BERC**, 4545 Chermak, Burbank, CA 91505 (818-841-3000) Worldwide, Audio, Video & Test & Measurement Equip.; Vans & Accessories; Used Equip.

*See advertisement on page 153*

**Bexel Corp.**, 801 S. Main St., Burbank, CA 91506 (818-841-5051) USA, TV Production & Post Production Equip.; Video Equip.; Used Equip.

**Birns & Sawyer, Inc.**, 1026 N. Highland Ave., Hollywood, CA 90038 (213-466-8211) Worldwide, Film Equip.; 16mm & 35mm; Service & Repair; Used Equip.

**Broadcast Cartridge Service**, 15131 Triton Lane, Suite 108, Huntington Beach, CA 92649 (714-898-7224) U.S.A., Tape; Broadcast Cartridges Reel-to-Reel; Alignment

Tools, Storage Systems; Reloading Service; Fone Box

**C.A.E.**, 11552 Knott St., Unit 1, Garden Grove, CA 92641 (714-895-1887) CA, NV, Audio & Video Equip.; Service and Repair

**Cinemills Corp.**, 3500 W. Magnolia Blvd., Burbank, CA 91505 (818-843-4560) USA, Lighting Equip.; Filters

**COMWEST, P.O. Box 420992**, Sacramento, CA 95842 (916-332-8700) AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY, Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Vacuum Tubes

**Cottonwood Communications, Inc.**, P.O. Box 526, Los Alamos, CA 93440 (805-344-3335; CA only-800-826-7025; Outside CA-800-331-8333) U.S.A., Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design; Used Equip.

*See advertisement on page 127 and this page*

**Electro Rent Corp.**, 4209 Vanowen Place, Burbank, CA 91505 (818-843-1221) CA only-LA, San D, San Fran; GA only-Norcross; IL only-Elk Grove; MD only-Columbia; MA only-Wilmington; MI only-Livonia; NJ only-Cedar Grove; TX only-Dallas, Test & Measurement Equip.; Used Equip.

**Alan Gordon Enterprises Inc.**, 1430 Cahuenga Blvd., Hollywood, CA 90078 (213-466-3561; 818-985-5500) U.S.A., AK, HI, Canada, Central & So. America, Far East, India, Europe, Audio Equip.; Video Lighting & Camera Supports; Film Equip.; Service & Repair; Used Equip.

**JP Associates, Inc.**, 3115 Kashiwa St., Torrance, CA 90505 (213-539-8533) AK, AZ, CA, CO, GU, HI, ID, NV, NM, OR, PR, TX, WA, Video Equip.; Transmitters & Antennas & Transmission Systems; System Design

**J&R Film**, 6820 Romaine, Los Angeles, CA 90038 (213-467-3107) USA, Film Handling, Editing; Video Reels; Film-to-Tape Machines; Film & Tape Supplies & Equip.

**Magnetic Communications Systems, Inc.**, 14731 Franklin Ave., Suite C, Tustin, CA 92680 (714-730-5021) AK, AZ, CA, HI, ID, NV, OR, WA, Western-Canada, Audio & Video Cassette Products; High Speed Cassette Duplicators; Slide Mounting & Mounts; Head Cleaning Equip.; Accessories for A/V Duplication; Tape

**MARCOM, P.O. Box 66507**, Scotts Valley, CA 95066 (408-438-4273) Nationwide, Audio & Video Equip.; Transmitters, Antennas & Transmission Systems; System Design, Telephone Bandwidth Extender; 5KHZ 2-line

**Martel Electronics, Inc.**, 920 E. Orangethorpe, Suite A, Anaheim, CA 92801 (714-871-7102) U.S.A.,

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- Meyer, Ross & Fleming, Inc.**, 1485 Rollins Road, Burlingame, CA 94010 (415-348-6800) CA, HI, NV, Audio & Video Equip.; Test & Measurement Equip.
- Moseley Associates, Inc.**, 11 Castilian Drive, Santa Barbara, CA 93101 Worldwide, Transmitters, Antennas & Transmission Systems
- Pacific Coast Marketing**, 14125 Capri Drive, Los Gatos, CA 95030 (408-370-3505) CA, NV, Test & Measurement Equip.; Audio Equip.
- Penstock Inc.**, 105 Fremont Ave., Los Altos, CA 94022 (415-948-6552) AK, CA, ID, IL, IN, IA, KS, MI, MN, MO, MT, NE, NV, ND, OH, OR, PA, SD, WA, WI, WY, BC, Alta., Yuk., Electronic Active & Passive Components; Cable assemblies & Connectors; Transmission Systems; Connectors, Cable & Assemblies
- RF Specialties of California**, 3463 State St., Suite 229, Santa Barbara, CA 93105 (805-682-9429) AZ, CA, NV, Transmitters, Antennas & Transmission Systems
- RTS Systems, Inc.**, 1100 W. Chestnut St., Burbank, CA 91506 (818-840-7119) U.S.A. and Canada, Audio & Video Equip.; Test & Measurement Equip.
- Skyline, Inc.**, 6309 Eleanor Ave., Hollywood, CA 90038 (213-856-0033) CA, Audio & Video Equip.; Tape; Used Equip.; Rental, Sales, Service
- Sound Investment Enterprises, P.O. Box 4139, Thousand Oaks, CA 91359 (805-499-0539) AL, AZ, AR, CA, CC, FL, HI, IL, IN, IA, KS, LA, MI, MS, MO, NV, NM, NC, OK, OR, SC, TN, TX, UT, WY, Audio Equip.; Systems Design; TEF Acoustical Analysis; Audio Training Classes**
- Sprague Magnetics, Inc.**, 15720 Stagg St., Van Nuys, CA 91406 (818-994-6602) Worldwide, Replacement Tape Heads; Recorder Care Products; Head Refurbishment Services
- SSL Industries Inc.**, P.O. Box 3410, Camarillo, CA 93011 (805-482-9884) AZ, CA, CO, NV, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design
- Studio Film & Tape (LA) Inc.**, 6674 Santa Monica Blvd., Hollywood, CA 90038 (213-466-8101) U.S.A. and Canada, Audio & Video Tape, All Formats, Blank 2' 1' 3/4' 1/2'
- System Associates**, 5801 Uplander Way, Culver City, CA 90230 (213-641-2042) North America, Brokers of Used Broadcast TV Equip.; Video Equip.; Test & Measurement Equip.; Film Equip.; Vans & Accessories
- Televideo San Diego**, 4783 Ruffner St., San Diego, CA 92111 (619-268-1100) USA, Audio, Video & RF Products
- Television Associates, Inc.**, 2410 Charleston Road, Mountain View, CA 94040 (415-967-6040) Northem-CA, Broadcast Professional & Industrial Products; Video Equip. System Design; Video Production & Duplication Facilities
- U.S. Instrument Rentals**, 2988 Campus Drive, San Mateo, CA 94403 (800-824-2873) USA & Canada, Equip. Leasing & Rental
- Video Communications Corp.**, 2514 Ontario St., Burbank, CA 91504 (714-594-2442)
- Video Communications Corp.**, 324 Martin Ave., Santa Clara, CA 95050 (408-988-2968) AZ, CA, NV, Video Equip.
- Videomedia, Inc.**, 211 Weddell Drive, Sunnyvale, CA 94089 408-745-1700 AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY, Editing Systems; Color Cameras; Monitors; Time Base Correctors; Video Tape Recorders, Projectors & Tape; Sync & Character Generators; Lighting; System Design, Fabrication & Training; Sequencing & Station Automation Products
- Videotape Products, Inc.**, 320 N. Madison Ave., Los Angeles, CA 90004 (213-664-1144; 800-422-2444) Worldwide, Video Equip.; Tape; Test & Measurement Equip.
- Western Broadcast Systems Inc.**, 3350 Scott Blvd., Building 5, Santa Clara, CA 95054 (408-727-9898) AK, CA, HI, NV, OR, WA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design
- Whitehouse Audio Visual**, 11511 W. Pico Blvd., Los Angeles, CA 90064 (213-479-8313) AZ, CA, CO, KY, MI, NV, OR, WA, WY, Video Equip.; Test & Measurement Equip.; Film Equip.; Service & Repair; Used Equip.

## COLORADO

- Didier Broadcast Associates**, 9775 W. Cornell Place, Lakewood, CO 80227 (303-987-0256) CO, ID, KS, MT, NE, NM, UT, WY, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Equip.
- Film/Video Equipment Service Co.**, 1875 S. Pearl St., Denver, CO 80210 (303-778-8616) AK, AZ, CA, CO, DC, FL, KS, LA, MN, MS, MO, MT, NE, NV, NM, ND, SD, TN, TX, UT, WY, Audio & Video & Film Equip.; Service & Accessories
- 2001 Enterprises, Inc.**, 180 Cook St., Suite 209, Denver, CO 80206 (303-333-4477) AZ, CO, ID, MT, NM, EL Paso-TX, UT, WY, Audio & Video Equip.; Tape

## CONNECTICUT

- National Video Services**, Commerce Park, Finance Drive, Danbury, CT 06810 (203-792-3862) CT, DC, ME, MA, NH, NJ, NY, PA, RI, VT, Video Equip.; Camera Tubes; Service & Repair; System Design; Manufacture a Wide Band Video Recorder for Medical Use

## DISTRICT OF COLUMBIA

- Instrucom, Inc.**, 655 15th St. N.W., Suite 310, Washington, DC 20005 (202-223-1759) DE, DC, MD, NC, VA, WV, Customized Control; Telemetering & Alarm Systems; Telecommunications Systems & Test Equip.;

Telephone Radio Surge Protection Systems

## FLORIDA

- Barbizon Delta Corp.**, 1125 N. 53rd Court, Australian Business Park, West Palm Beach, FL 33407 (305-844-5973) FL, GA, SC, PR, Lighting Equip. for Motion Picture, Television & Theatre; Lamps; Color Media; Sockets; Lighting Heads & Accessories; Complete Range of expendible supplies
- Beattie & Associates, Inc.**, 3317 Barrow Hill Trail, Tallahassee, FL 32312 (904-893-1382) AL, FL, GA, Audio & Video Equip.; Transmitters, Antennas & Transmission Systems; Sales, Service & Installation. Turnkey LPTV Systems; All Solid State FM Transmitters up to 5 KW.
- Bencisk Associates Inc.**, 3730 N.E. 42nd Ave., Ocala, FL 32670 (904-732-9775) FL, PR, Pro Audio Equip.; CCTV
- Comex Corp.**, 1645 N.W. 79th Ave., Miami, FL 33126 (305-594-0850) Worldwide, MMDS/ITFS Systems; Satellite Earth Stations & Associated Origination Equip.; Engineer, Furnish & Install
- Control Technology, Inc.**, 2950 S.W. 2nd Ave., Fort Lauderdale, FL 33315 (305-761-1106; Outside FL 800-327-4121) U.S.A., Audio Tape Recorders; Consoles, Mixers; Turntables, Preamps; Mics & Accessories; Power Amps; Speakers, Audio Processing & Loggers; Heads & Accessories; Studio Furniture; STL Systems; Transmitters, Transmission & Antennas; Automation Sys./Equip.
- Electrex Co.**, 18620 N.E. Second Ave., Miami, FL 33179 (305-651-5752) U.S.A. and Latin America, Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape, Vacuum Tubes; System Design
- Gendra International Inc., Broadcast & Communications Div.**, P.O. Box 371067, Miami, FL 33137 (305-372-8845) Fl, Caribbean, So. America, Audio, Video & Test Equip.; Transmissions; Microwave
- Gray Communications Consultants, Inc.**, P.O. Box 1706, Fort Walton Beach, FL 32549-1706 (904-651-8546)
- Gray Communications Consultants, Inc.**, 1031 N.W. 91st Terrace, Gainesville, FL 32601 (904-332-2435)
- Gray Communications Consultants, Inc.**, 1657 N.W. 79th Ave., Miami, FL 33126 (305-591-3637)
- Gray Communications Consultants, Inc.**, 1605 S. Bumby Ave., Orlando, FL 32806 (305-896-7414)
- Gray Communications Consultants, Inc.**, 5401 Southern Comfort Blvd., Tampa, FL 33614 (813-885-1411) FL, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Vans & Accessories; Service & Repair; System Design; Tape
- Lauderdale Electronic Labs**, 16 S.W. 13th St., Fort Lauderdale, FL 33315 (305-764-7755) U.S.A. and Canada, Audio, Test & Measurement Equip.; Tape
- Media Concepts, Inc.**, 559 49th St. S., St. Petersburg, FL 33707 (813-321-2122) Worldwide, Audio & Video Equip.; Tape; Service & Repair; System Design; VHS Tape Duplication
- Midwest Communications Corp.**, 5450 N.W. 33rd Ave., Fort Lauderdale, FL 33309 (305-735-8333)
- Midwest Communications Corp.**, 8917 Western Way, Suite 120, Jacksonville, FL 32216 (904-363-0001)
- Midwest Communications Corp.**, 8875 N.W. 23rd St., Miami, FL 33172 (305-592-5355)
- Midwest Communications Corp.**, 3305 Bartlett Blvd., Orlando, FL 32809 (305-841-0602)
- Midwest Communications Corp.**, 6302 Benjamin Road, Suite 403, Tampa, FL 33634 (813-885-9308) FL, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design
- MPCS Video South**, 4100 North 28th Terrace, Hollywood, FL 33021 (305-923-3446; 947-3340) U.S.A., Full service distributor of industrial & broadcast video equip. Rental; Production, post-production & duplication. System Design & Installation. Specializers in network, call letter, cable stations, educational & medical institutions.
- Nemal Electronics Int'l. Inc.**, 12240 N.E. 14th Ave., North Miami, FL 33161 (305-893-3924) Worldwide, Audio & Video Wire, Cables, Connectors; Transmitters, Antennas Wire, Cables, Connectors and Accessories
- Omni Technology, Inc.**, 120 S.W. 21st Terr., Suite C-104, Fort Lauderdale, FL 33312 (305-583-0626) USA, Pro Audio Products; Pro Television Products & Services
- Recording Studio Equip. Co.**, 229 Sunny Isles Blvd., North Miami, FL 33160 (305-945-9774) U.S.A.; Export to So. America, Europe, Caribbean, Professional Audio Equip.; Studio Design & Interface
- RF Specialties of Florida, P.O. Box 397, Niceville, FL 32580 (904-678-8943) AL, FL, GA, SC, Transmitters, Antennas & Transmission Systems**
- Southeast Electronics, Inc.**, 1125 Roselle St., Jacksonville, FL 32203 (904-356-3007) AL, FL, GA, Audio & Video Equip.; Transmitters; Tape; Service & Repair; System Design; Used Equip.
- Stage Equipment & Lighting, Inc.**, 124 Candace Drive, Maitland, FL 32751 (305-339-1772) AL, FL, GA, Video & Film Lighting
- Stage Equipment & Lighting, Inc.**, 12231 N.E. 13th Court; P.O. Box 61000F, Miami, FL 33161 (305-891-2010) AL, FL, GA, Caribbean, Central & South America, Video Equip.; Lamps; Ser-

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**Broadcasters General Store, Inc.,** 1805 Kimberly Drive, Marietta, GA 30060 (404-425-0630) U.S.A., Audio & Test & Measurement Equip.; Antennas & Transmission Systems; Tape

**Victor Duncan, Inc.-Atlanta, 1575** Northside Drive N.W., Suite 355, Atlanta, GA 30318 (404-355-3001) U.S.A. and Canada, Audio, Film, & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip.; Over 300 Line of Pro Equip.

**Gray Communications Consultants, Inc. (Corporate Office), P.O. Box** 3229, Albany, GA 31708 (912-883-2121) AL, AR, FL, GA, LA, MS, PR, SC, TN, North & South America, Caribbean, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; Systems Design; Transmitters, Antennas & Transmission Lines

**Midwest Communications Corp., 522** Armour Circle, Atlanta, GA 30324 (404-875-3753) U.S.A., GU, PR, VI, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design

**Radford Associates, 3203 Lanier** Drive, Atlanta, GA 30319 (404-237-6097) AL, FL, GA, KY, MS, NC, SC, TN, WV, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Transmission, Antennas Systems

**Technical Industries Inc. of Georgia,** 6000 Peachtree Road, N.E., Atlanta, GA 30341 (404-455-7610; 800-554-5440) GA, SC, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design

**Vica Associates, Inc., 4296-A** Memorial Drive, Decatur, GA 30032 (404-292-7506) AL, FL, GA, MS, NC, SC, TN, Audio & Video Equip.; Test & Measurement Equip.

**Video Display Corp., 5530 E. Ponce de** Leon Ave., Stone Mountain, GA 30086 (404-938-2080; 800-241-5005) U.S.A. & Europe, Replacement CRT's for broadcast quality monitors & computers.

**WJR Distributors, 4451 N. Log Cabin** Drive, Suite 132, Smyrna, GA 30080 (404-436-7605/800-423-8859) AL, GA, MS, NC, SC, TN, Audio & Video Equip.

### HAWAII

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Omega Pacific, 222 Kaelepu Drive, Kailua, HI 96734 (808-263-4212) HI, Video Equip.; Transmitters, Antennas & Transmission Systems

**IDAHO**

Hall Electronics, P.O. Box 5031, Boise, ID 83705 (208-343-3088) CO, ID, MT, UT, WY, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design; Used Equip.

**ILLINOIS**

Allied Broadcast Equipment, 5215 Old Orchard Road, Suite 970, Skokie, IL 60077 (312-470-0303) IL, IA, MI, MN, MO, NE, ND, SD, WI, Audio Equip.; Test & Meas-

urement Equip.; Transmitters & Antennas; Tape; Service & Repair; System Design

Broadcasters General Store, Inc., 746 Cypress Lane, Carol Stream, IL 60188 (312-231-7120) AL, AZ, AR, CO, DC, FL, GA, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, MT, NE, NY, NC, ND, OH, OK, SC, SD, TN, TX, UT, VA, WV, WI, Audio Equip.; Transmitters, Antennas & Transmission Systems; Service & Repair; System Design; Tape

Center Video Industrial Co., Inc., 5615 W. Howard St., Chicago, IL 60648 (312-647-8700; Outside IL-800-621-4354) U.S.A., Audio

& Video Equip.; Test & Measurement Equip.; Tape; Service Repair; Used Equip.; System Design

Columbia Audio/Video, The Columbia Building, 1741 Second St., Highland Park, IL 60035-3599 (312-433-6010) IL, IN, IA, MI, WI, Video Equip.; Tape

Victor Duncan, Inc., 661 N. LaSalle St., Chicago, IL 60610-3770 (312-943-7300) U.S.A. and Canada, Audio, Film & Video Equip.; Test Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip. Over 300 Lines of Pro Equip.

ESV, Inc., 525 Court St., Pekin, IL 61554 (309-347-6685; 800-423-6411) U.S.A., PR, Projection, Stage, Studio & Miniature Lamps; Studio Fixtures; Sockets & Connectors; Tape; Gels; Gaffers Tape; Batteries; Retrofits for PL, Quads & MR16 Lamps

GO Video Sales, Inc., 1195 S. Wilson Drive, Lake Forest, IL 60045 (312-295-6726) IL, Davenport-IA, MN, ND, SD, WI, Video Equip.

Joseph Electronics, 8830 N. Milwaukee Ave., Niles, IL 60648 (312-297-4200; 800-323-5925) IL, IN, WI, National by Mail Order, Test Equip.; Tools; Cases; Wire; Connectors; Batteries; Camera Tubes; Hardware; Components; Chemicals; Cabinets; Solder & Equip.; Audio & Video Products

Richardson Electronics, Ltd., 40W267 Keslinger Road, Lafox, IL 60147 (800-323-1770; 312-232-6400) Worldwide, Vacuum Tubes  
*See advertisement on page 83*

Roscor Corp., 1061 Feehanville Drive, Mount Prospect, IL 60056 (312-539-7700) IL, IN, IA, KY, MI, OH, WI, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Film Equip.; Service & Repair; System Design; Used Equip.


Swiderski Electronics, Inc., 1200 Greenleaf Ave., Elk Grove Village, IL 60007 (312-364-1900) IL, IN, IA, MI, MO, WI, Complete line of Audio & Video Equip.; Service & Repair; System Design; Rent & Leasing; Computerized Editing Systems; Vans & Accessories

Video Images, 890 Cambridge Drive, Elk Grove Village, IL 60007 (312-640-7111) IL, Audio, Video, Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Vans & Accessories; System Design; Used Equip.; Service & Repair


**INDIANA**

Allied Broadcast Equipment, 3712 National Road W., Richmond, IN 47375 (317-962-8596) U.S.A., Worlds largest independent distributor of Audio & RF Broadcast & Professional Equipment

Allied International, P.O. Box 1487, Richmond, IN 47375 (317-935-1704) Worldwide, Worlds largest independent distributor of audio, RF broadcast & professional equip.



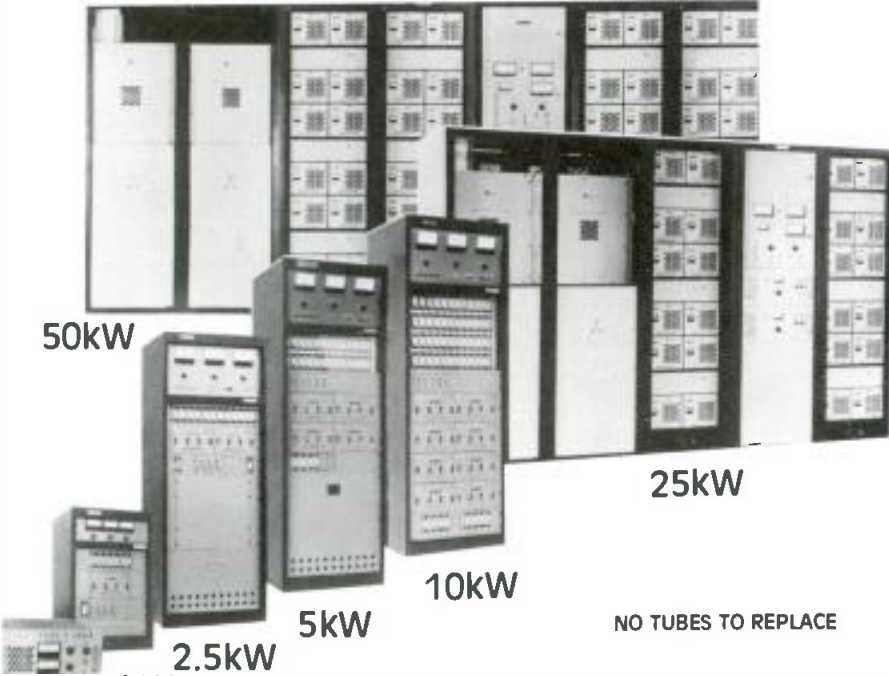
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**AMPFET** SERIES **MODULAR**

TOTALLY SOLID STATE      ALL POWERS



50kW      25kW

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5kW

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201 Target Industrial Circle  
Bangor, Maine 04401 U.S.A.

Phone (207) 947-8200  
Telex: 944466



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**Allied Satellite Equipment**, P.O. Box 1487, Richmond, IN 47375 (317-962-8596) USA, Independent distributor of satellite communication equip. to broadcast industry for state-of-the-art commercial up & down link gear.

## IOWA

**Audiovisual Inc.**, 415 S.W. Eighth St., Des Moines, IA 50309 (515-278-2929) IA, Broadcast & Professional Audio & Video Equip.; Microwave Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; Systems Design; Used Equip.

**Sitler's Supplies, Inc.**, 702 E. Washington, Washington, IA 52353 (IA 800-272-6459; Outside IA 800-426-3938) U.S.A., Lamps; Batteries

**Vaughn Broadcast Rentals/Vaughn Duplication Services**, 2906 Brady St., Davenport, IA 52803 (319-322-1525) IL, IA, Audio & Video Equip.; Test & Measurement Equip.; Audio & Video Tape; Vacuum Tubes; Service & Repair; System Design; Used & Rental Equip.; Duplications

## KANSAS

**Professional Studio Distributors**, 1059 Porter, Wichita, KS 67203 (316-267-1573) AR, CO, IA, KS, MO, NE, OK, TX, Audio & Video Equip.; Video & Audio Tape; Floppy Discs; Wind Audio Cassettes

**RSC Electronics, Inc.**, 131 Laura, Wichita, KS 67201 (316-267-5213) KS, OK, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vacuum Tubes

**Smith Audio-Visual, Inc.**, 2615 S.W. 21st St., Topeka, KS 66604 (913-235-3481) KS, Western-MO including St. Joseph and K.C., Audio & Video Equip.; Transmitters, Antennas & Transmission Systems; Tape; Service & Repair; System Design; Used Equip.

## KENTUCKY

**Bruce L. Dawson & Associates**, Central American Terminal-Bowman Field, Louisville, KY 40205 (502-456-6666, 6693) IN, KY, OH, West-PA, WV, Audio & Video Equip.; Transmitters, Antennas & Transmission Systems

**Midwest Communications Corp.**, Headquarters, One Sperti Drive, Edgewood, KY 41017 (606-331-8990) U.S.A., GU, PR, VI, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design

See advertisement on page 1

## LOUISIANA

**Audiomedia Associates**, P.O. Box 29264, New Orleans, LA 70189 (504-586-0140) AL, AR, FL, GA, LA, MS, TN, TX, Audio Equip.; Test & Measurement Equip.; Transmitters,

Antennas & Transmission Systems; Tape; Service & Repair; System Design

**Gray Communications Consultants, Inc.**, 550 Wholesalers Parkway, Suite G, New Orleans, LA 70123 (504-733-7265) AL, FL-Panhandle, LA, MS, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Film Equip.; Vans & Accessories; Service & Repair; System Design; Used Equip.; Tape

## MARYLAND

**ASR Enterprises, Ltd.**, P.O. Box 10,

Benson, MD 21018 (301-574-0550) DE, DC, MD, NJ, PA, VA, Audio & Video Equip.; Test & Measurement Equip.; Tape

**Bradley Broadcast Sales Inc.**, 8101 Cessna Ave., Gaithersburg, MD 20879 (800-732-7665; 301-948-0650) Nationwide, Audio Equip.; Transmitters, Antennas & Transmission Systems; Tape; Test & Measurement Equip.

**David H. Brothers Co., Inc.**, 2893 Baltimore Blvd., Finksburg, MD 21048 (301-833-0920) DC, MD, VA, Audio & Video Equip.; Tape; Vacuum Tubes; Microphones

**Midwest Communications Corp.**, 4720-D Boston Way, Lanham, MD

20706 (301-577-4903) North America, Audio & Video Equip.; Test & Measurement Equip.; Tape; Transmitters & Antennas; Vacuum Tubes; Vans & Accessories; Service & Repair; System Design; Used Equip.

**Print Products International**, 8931 Brookville Road, Silver Spring, MD 20910 (301-587-7824; 800-638-2020) U.S.A. and Canada, Equip., Tools, Supplies, Training for Electronic PC Boards Maintenance & Repair

**Radio Resources**, P.O. Box 8782, BWI Airport, MD 21240 (301-859-1500) U.S.A., Radio Broadcast Equip. & Supplies

# THERE'S A VIDEO PATCHING SYSTEM THAT'S BETTER.

# HERE IT IS.

# HERE'S WHY.

Only THE DYNATECH COAXIAL PATCH Gives You All These Features: normal-thru connection, cross-patching, non-interrupting on-line monitoring of live circuits AND Coterm's automatic termination of patched-off circuits *within the jack*.

All These DYNATECH Features Mean you get the least amount of noise pick-up, signal degradation and signal loss. This patented, shielded jack helps reduce interference due to EMI, RFI, hum, noise and cross-talk. Unbalanced line, coaxial equipment will transmit signals in excess of 400 MHz with negligible insertion loss, cross-talk or VSWR.

Normal-Thru Connection eliminates patch cords or normalling plugs for dedicated circuits — you get less signal degradation and you get a clean, uncluttered patchfield — reducing the possibility of errors when a patch must be made.

To Break The Normal-Thru Connection, you insert a patch cord that allows cross connections to be made. Sources that are patched out are automatically terminated *within the jack in the proper impedance*. Test probes may be inserted in the jack to sample a signal *without interrupting the live circuit*.

TO FIND OUT HOW Dynatech's coaxial patching/switching system can assist your requirements, CALL OR WRITE TODAY.

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1988 BG/SB Broadcast Engineering 101

## Dealer/distributors...continued

**RCI (Recording Consultants Inc.),** 8550 Second Ave., Silver Spring, MD 20910 (301-587-1800) DE, DC, MD, PA, VA, WV, Audio Equip.; Tape; Service & Repair; System Design; Used & Rental Equip.

**Sel-Tronics, Inc.,** 9311 Annapolis Road, Lanham, MD 20706 (301-731-8080) DC, MD, VA, Audio & Video Equip.; Test & Measurement Equip.

**Wiltronix, Inc.,** 16850 Oakmont Ave., Washington Grove, MD 20880 (301-258-7676) DE, DC, FL, GA, KY, MD, NC, PA, SC, VA, WV, Audio & Video Equip.; Test & Measurement Equip.; Transmission Systems

## MASSACHUSETTS

**BAF Communications Corp.,** 17 Everberg Road, Woburn, MA 01801 (617-932-3232) USA, Audio, Video & RF Equip.; Earth Stations; Microwave Equip.

**Barbizon Light,** 3 Draper St., Woburn, MA 01801 (617-935-3920) CT, DC, FL, GA, ME, MD, MA, NH, NY, RI, VT, Video & Film Lighting Equip. & Supplies

**Contact East,** 335 Willow St. S., P.O. Box 786, North Andover, MA 01845 (617-682-2000) U.S.A., Precision hand tools, test instruments, tool kits, soldering supplies

**Lake Systems Corp.,** 287 Grove St., Newton, MA 02166 (617-244-6881) Worldwide, Turnkey Communications Systems; TV Station Automation Featuring La-Kart; Automated Library System

**Landy Associates, Inc.,** 330 Bear Hill Road, Waltham, MA 02154 (617-890-6325) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, Audio & Video Equip.; Test & Measurement Equip.; Film Equip.; Tape; Vacuum Tubes; Service & Repair; System Design

**MPCS Boston,** 303 Congress St., Boston, MA 02210 (617-439-7620/7621) U.S.A., Full service distributor of industrial & broadcast video equip. Rental; Production, post-production & duplication. Systems Design & Installation. Specializers in network, call letter, cable stations, educational & medical institutions.

**QSI Systems, Inc.,** 12 Linscott Road, Woburn, MA 01801 (617-938-1403) CT, ME, MA, NH, RI, VT, Video Equip.; Tape; Service & Repair; System Design

**Townsend Broadcast Systems Inc.,** 79 Mainline Drive, Westfield, MA 01085 (413-568-9581) U.S.A. & Canada, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design

## MICHIGAN

**Audio Broadcast Group, Inc.,** 2342 S. Division Ave., Grand Rapids, MI 49507 (616-452-1596) U.S.A., Studio Systems for AM-FM-TV Audio; Over 100 Equip. Lines; Studio Cabinetry - Turnkey Systems

**CM Sales,** 31700 W. 12 Mile Road, Suite 206, Farmington Hills, MI 48018 (313-553-8070) MI, Au-

dio & Video Equip.; Test & Measurement Equip.

**Cruse Communications Co.,** 4903 Dawn Ave., East Lansing, MI 48823 (517-332-3579/792-8800; 313-961-3579; 616-454-3257) IN, MI, OH, Audio, Video, Test & Measurement Equip.; Tape; Service & Repair; System Design

**Victor Duncan, Inc.,** 32380 Howard St., Detroit, MI 48071-1429 (313-589-1900) U.S.A. and Canada, Audio, Film & Video Equip.; Test Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip. Over 300 Lines of Pro Equip.

**H. M. Dyer Electronics, Inc.,** 48647 Twelve Mile Road, Novi, MI 48050 (313-349-7910) IL, IN, IA, MI, MN, MO, OH, WI, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Used Equip.

**General TV Network,** 13201 Capital Ave., Oak Park, MI 48237 (313-399-2000) MI, Northwest-OH, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Vans & Accessories; Service & Repair; System Design; Used Equip.

**Midwest Communications Corp.,** 21683 Melrose Ave., Southfield, MI 48075 (313-350-3038) U.S.A., GU, PR, VI, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Film Equip.; Vans & Accessories; Service & Repair; System Design; Satellite Up-links, Mobile & Fixed

**Sound Solutions Inc.,** 5701 Canton Center Road, Canton, MI 48187 (313-455-5557) IL, IN, MI, OH, Audio Equip.; Tape; System Design; Test & Measurement Equip.; Used Equip.

**Thalner Electronic Labs, Inc.,** 7235 Jackson Road, Ann Arbor, MI 48103 (313-761-4506; Area 313 Only 800-552-5275) MI, OH, Audio & Video Equip.; Tape; Test & Measurement Equip.; Service & Repair; System Design; Used Equip.

## MINNESOTA

**Emmons Associates, Inc.,** 1121 Riverwood Drive, Burnsville, MN 55337 (612-890-8920) IA, MN, ND, SD, WI, Audio & Video Equip.; Test & Measurement Equip.; STL Transmission Systems; Service & Repair

**Northern Magnetics, Inc.,** P.O. Box 16409, Minneapolis, MN 55416 (612-333-3071) U.S.A., Audio Equip. (Recording Heads.); Film Equip. (Film Heads. Audio); Service & Repair (Audio Heads. & Head Nest)

**T. R. Pitts Co.,** 501 W. Fifth St., Winona, MN 55987 (507-452-2629; Outside MN: 800-533-8092; MN Only: 800-642-2384) U.S.A., Complete equip. & supplies for the cable TV industry including some services. Satellite Equip.

**Vaughn Communications, Video Midwest,** 7951 Computer Ave. S., Minneapolis, MN 55435 (612-831-2248) MN, ND, SD, Audio & Video Equip.; Test & Meas-

urement Equip.; Video & Audio Tape; Vacuum Tubes; Service & Repair; System Design; Used & Rental Equip.; Duplications

## MISSISSIPPI

**Broadcast Equipment Sales & Engineering Inc.,** P.O. Box 20331, Jackson, MS 39209 (601-857-8573; 85-RADIO) AL, AR, FL, LA, MS, TN, Audio Equip.; Transmitters, Antennas & Transmission Systems; Tape; Service & Repair; System Design

## MISSOURI

**Centurian Marketing Associates, P.O. Box 1011, Ballwin, MO 63022-1011 (314-227-7229) Southern-IL, IA, KS, MO, NE, Audio Professional Products**

**Delcom Corp. of St. Louis,** 2349 Grisom, St. Louis, MO 63146 (314-432-1164; 800-331-5461) Continental U.S., Total Video Systems, Featuring Custom System Design; Installation; Computerized Wiring & Tracing Documentation; Custom & Standardized Cabinetry

**Electronic Video Systems,** 1856 S. Stewart, Springfield, MO 65804 (417-881-4677; 800-334-6110) AR, KS, LA, MO, NE, OK, Audio, Video & Test Equip.; Tape; Transmitters including towers ATS, STL, MDS, etc.; Vacuum Tubes; Film Equip.; Service & Repair; Used Equip.; System Design, including studio installation digital effects systems, broadcast cameras, synchronizers.

**Lines Video Systems,** 219 S. Jefferson, Springfield, MO 65806 (417-862-5533; Outside MO-800-641-4674) AR, IL, IA, KS, KY, LA, MO, NE, OK, TN, TX, Audio, Video, Test & Measurement Equip.; Transmitters, Antennas & Transmissions; Tape; Vans; Service Repair; System Design; Used Equip.

**Television Engineering Corp.,** 580 Goddard Ave., Chesterfield, MO 63017 (314-532-4700) U.S.A. and Canada, Audio & Video Equip.; Test & Measurement Equip.; Tape; System Design; Used Equip.; Vans & Accessories

**Video Masters, Inc.,** P.O. Box 419963, Kansas City, MO 64141 (816-474-8530) AR, IL, IA, KS, MO, NE, Audio & Video Equip.; Test Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Service & Repair; System Design

## MONTANA

**Audiovisual Inc.,** 1422 W. Ramshorn, Laurel, MT 59044 (406-628-2116) MT, WY, Broadcast & Professional Audio & Video Equip.; Test & Measurement Equip.; Film Equip.; Service & Repair; System Design; Used Equip.

**The Source Inc.,** 320 Sixth St. S.; P.O. Box 2487, Great Falls, MT 59403 (406/761-2420) MT, North-ern-WY, Audio & Video Equip.; Test

& Measurement Equip.; Tape; Antennas

**Video International Publishers,** 118 Sixth St. S., Great Falls, MT 59405 (406-727-7133) ID, MT, ND, SD, WA, WY, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; System Design; Used Equip.

## NEBRASKA

**Audiovisual Inc.,** 8025 Maple St., Omaha, NE 68134 (402-393-9911) KS, NE, Broadcast & Professional Video Equip.; Microwave Equip.; Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design; Used Equip.

**RF Specialties of Nebraska,** 2003 Brewster Road, Bellevue, NE 68005 (402-734-5521) IA, KS, MO, NE, Transmitters, Antennas & Transmission Systems

## NEVADA

**Cinema Services,** 4445 S. Valley View Blvd., Suite 7, Las Vegas, NV 89103 (702-876-4667) AZ, NV, NM, UT, Video Equip.; Film Equip.; Used Equip.

## NEW HAMPSHIRE

**Associated Systems, P.O. Box 5211, Manchester, NH 03108 (603-472-2297) CT, ME, MA, NH, RI, VT, Video & Test Equip.**

## NEW JERSEY

**A.F. Associates,** 100 Stonehurst Court, Northvale, NJ 07647 (201-767-1000) Worldwide, Audio & Video Equip.; Test & Measurement Equip.; Telecine Equip.; Vans & Accessories; System Design

**Avtec Industries, Inc.,** 5 Audrey Place, Fairfield, NJ 07006 (201-882-9460) International, Audio & Video Equip.; Test Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Film Equip.; Service & Repair; Used Equip.

**Broadcast Video Marketing Corp.,** 275 Route 18, East Brunswick, NJ 08816 (201-390-0770) CT, DE, DC, MD, NJ, NY, PA, VA, Video Equip.; Cases; Test & Measurement Equip.; Audio Time Compression; Audio Delay Synchronizer; Character generators, graphics systems; Broadcast Cameras

**Calvert Electronics Inc.,** A Richardson Co., 1 Branca Road, East Rutherford, NJ 07073 (Outside NJ 800-526-6362; NJ 201-460-8800) Worldwide, Camera Pickup Tubes & CCDs; Capacitors, Transmitting, Mica & Vacuum; Microwave Components; Semiconductors; Vacuum Tubes



CLASSIC

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New goals and higher standards in audio production for broadcast require new and higher standards in console technology. Using our fourteen years of manufacturing experience and technical insight, we set ourselves the objective of producing a broadcast-specific console system equal to the challenge. That system became the AMEK CLASSIC.

We call it CLASSIC because within one system we've incorporated all the facilities you would expect to find in a console of this calibre, and all the facilities you can't find in any competing product. By adding to this the unmistakable touch of AMEK build quality and sonic performance, we believe we've made an audio CLASSIC of its kind.

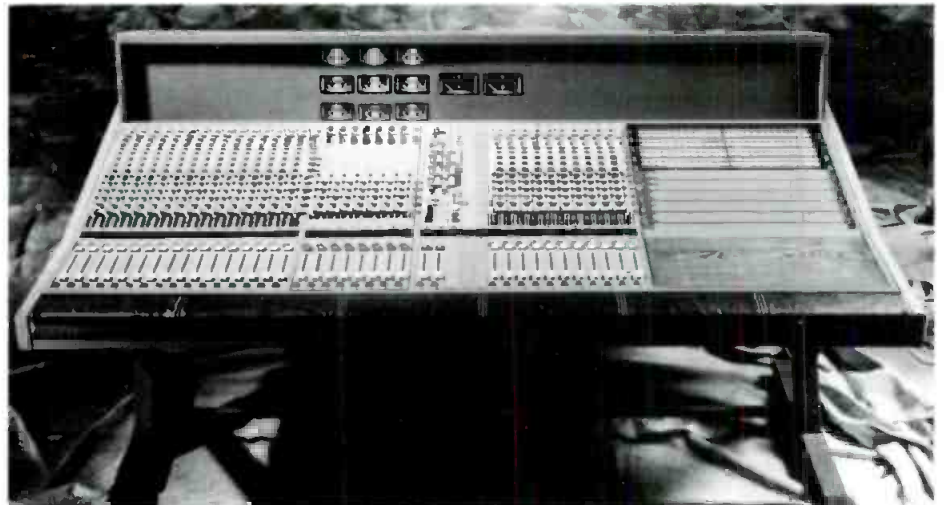
In the new world of stereo broadcast, we had to consider stereo a priority. So we gave you not only mono but also stereo inputs; eight mono or eight stereo subgroups; and two independent stereo master buss routes. And because we like things in twos, all the busses, including the eight auxiliaries, are balanced to give the necessary calibre of performance.

Because many configurations and interfaces may be needed, the CLASSIC had to be truly flexible. Thus, we've allowed for three standard chassis sizes — 32, 48 or 64 inputs, with or without Dynamics on each input; the option of monitor facilities for multitrack work; and a variety of panning options, including systems suitable for film post. The CLASSIC is balanced at all inputs and outputs, and has Penny & Giles faders and Remote Start switching as standard equipment. Because space is often at a premium, we've used a 30 mm (1.25 inch) module width.

The AFV port allows either remote muting or remote DC control, if VCAs are fitted; and there are a number of fader automation options, including Audio Kinetics Mastermix and the GML Moving Fader System.

The CLASSIC has far more to offer than can be described here. We've had to consider what you might want to do 10 years down the line. By that time, we think your CLASSIC will still be the contemporary it is now.

AMEK CLASSIC IN 32/8/2 VERSION



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Telex: 668127 AMEK G E-MAIL: AMEK-UK. Fax: 061-834 0593.

In the USA: AMEK Controls Inc. 10815 Burbank Blvd, North Hollywood, CA 91601.  
Tel: 818/508 9788. Telex: 662526 AMEK USA E-MAIL: AMEK US. Fax: 818/508 8619.



# AMEK



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Dealer/distributors...continued

**Comprehensive Video Supply Corp.**, 148 Veterans Drive, Northvale, NJ 07647 (201-767-7990) World-wide, Audio & Video Equip.; Test & Measurement Equip.; Tape; Custom Cases & Accessories; Computer Software for Video & Film

**Holzberg Inc.**, P.O. Box 323, Sea Bright, NJ 07760 (201-530-8555; 800-242-7298) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, Audio & Video Equip.; Test & Measuring Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Film Equip.; Vans & Accessories, System Design;

**Turnkey Systems Installed**

**Landy Associates, Inc.**, 1890 E. Marlton Pike, Cherry Hill, NJ 08003 (609-424-4660) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, Cameras; Prompters; Batteries; Audio Equip.; Test & Measuring Equip.; Film Equip.; Tape; & Accessories; Service & Repair; System Design Transmitters, Antennas & Transmission Systems; VTR's

**Quality Video Supply**, 76 Frederick St., Hackensack, NJ 07602 (201-488-8336) Nationwide, Audio & Video Equip.; Test & Measurement Equip.; Tape

**Tape City Int'l. Inc.**, 300-1 Route 17 S., Lodi, NJ 07644 (800-223-1586; 201-777-4700) CT, NJ, NY, Mail Order in U.S.A., Professional Video Equip.; Tape; Service & Repair; Used Equip.

**Tele-Measurements, Inc.**, 145 Main Ave., Clifton, NJ 07014 (201-473-8822) CT, DE, DC, NJ, NY, PA, VA, Audio & Video Equip.; Test & Measurmnt Equip.; Satellite Communications; Tele-Conferencing; Service & Repair; System Design

**Thor Electronics Corp.**, 321 Pennsylvania Ave., Linden, NJ 07036 (201-486-3300) Worldwide,

**Vacuum Tubes**

**Turner Engineering**, 325 Division St., Boonton, NJ 07005 (201-263-1000) CT, FL, GA, MD, MA, NH, NJ, NY, NC, PA, RI, SC, VT, VA, Audio & Video Equip.; RF Products; Meters, Monitors & Test Equip.; Automation/Computer Products; Miscellaneous Products; Services

**NEW MEXICO**

**DYMA Engineering, Inc.**, P.O. Box 1535, Los Lunas, NM 87031 (505-865-6700) AZ, CA, CO, KS, NV, NM, OK, TX, UT, Audio & Video Equip.; Test Equip.; Transmitters, Antennas & Transmission Systems; Tape; Film Equip.; Vans & Accessories; System Design; Some Used Equip. as well as documentation and installation

See advertisement on page 214

**NEW YORK**

**Acoustilog, Inc.**, 19 Mercer St., New York, NY 10013 (212-925-1365) CT, NJ, NY, Audio Equip.; Test & Measurement Equip.; Service & Repair; Used Equip.; System Design

**Adcom Communications Inc.**, 555 West 57th St., New York, NY 10019 (212-265-1760) CT, NJ, NY, Video Equip.; Test & Measurement Equip.; Service & Repair; System Design; Used Equip.; Rental Equip.

**Alpha Electronics, Inc.**, 1365 39th St., Brooklyn, NY 11218 (718-633-2800; 800-221-5802) U.S.A., Camera, Transmitting & Vacuum Tubes; Vidicons

**Audiotechniques Inc.**, 1619 Broadway, 4th Floor, New York, NY 10019 (212-586-5989) CT, DE, DC, ME, MD, MA, NJ, NY, PA, RI, VT, VA, Audio Recording Equip.; Consoles Test & Measurement Equip.; Tape; MCI, Sony, Studer Service & Repair; System Design; Used Equip.

**Auteri Associates, Inc.**, 9 Henearty Drive, Miller Place, NY 11764 (516-331-5022) Worldwide, Audio & Film Equip.; Service & Repair

**Avtech Electronics Inc.**, 22-60 46th St., Astoria, NY 11105 (718-956-1200; 800-221-1300) Worldwide, Audio & Video Equip.; Tape; Vacuum Tubes

**Barbizon Electric Co., Inc.**, 426 West 55th St., New York, NY 10019 (212-586-1620) AL, CT, DE, DC, FL, GA, IL, IN, KY, ME, MD, MA, MI, MS NH, NJ, NY, NC, OH, PA, RI, SC, TN, VT, VA, WV, WI, All Types of Lamps and Sockets; Gaffer's Tape; Hot Mill Gloves; Light Control & Diffusion Media; Color Media; Dimming Equip.

**Beaveronics, Inc.**, 8 Haven Ave., Port Washington, NY 11050 (516-883-4414) USA, Video Equip.

**Bi-Tronics, Inc.**, 76 Main St., Tuckahoe, NY 10707 (914-793-3221; Outside NY: 800-522-7377) U.S.A. and Canada, Cable and Assemblies; Audio & Video Connectors For Japanese Equip.

Introducing **TELEMET'S STEREO BROADCAST DEMODULATOR** WITH QUADRATURE OUTPUT

When choosing Telemet's Broadcast Demodulator with multichannel stereo sound capability, you don't have to trade quality for a competitive price. Let's Compare.

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Quadrature output adjustable to exactly 90° with no plus or minus factor	✓	—
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Four function digital display	✓	✓
User friendly ICPM measurement	✓	—
Built-in low pass quadrature filtered output	✓	✓
Used with any oscilloscope that has an external horizontal output	✓	✓

**\$11,990\*** total price  
\*Model No. 3713-A1

**Telemet**

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Eastern Area office — (914) 279-3231

**Contact us and make your own comparison**

A GEOTEL COMPANY



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**Burlington Audio/Video Tapes, Inc.**, 106 Mott St., Oceanside, NY 11572 (516-678-4414/800-331-3191) Nationwide, Audio/Video Tapes & Related Accessories  
**The Camera Mart, Inc.**, 456 West 55th St., New York, NY 10019 (212-757-6977) AZ, CA, CT, DE, DC, MA, NH, NJ, NY, PA, VT, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; System Design; Used Equip.

See advertisement on page 58

**CeCo Communications Broadcast Div.**, 2115 Avenue X, Brooklyn, NY 11235 (718-646-6300; 800-221-0860) Worldwide, Broadcast Tubes; Electron Tubes-Semiconductors; Broadcast Types, High Power Transmitting Tubes; Receiving Tubes; Industrial Tubes; Vacuum Tubes; Video Equip. Eimac, RCA, Ampere, GE

**R F Gain, Ltd.**, 116 S. Long Beach Road, Rockville Centre, NY 11570 (516-536-8868; 800-645-2322) Worldwide, CCTV Equip.; Vacuum Tubes; RF Amplifiers & Transistors; Vacuum Capacitors

**Henry Grossman Associates**, 519 S. Fifth Ave., Mount Vernon, NY 10550 (914-664-5393) CT, DE, DC, FL, ME, MD, MA, NH, NJ, NY, PA, VT, VA, Audio & Video Equip.; Film Equip.; Tape Equip.; Optics; TV Equip.; Transmitters (AM-FM-TV-STL), Antennas (AM-FM-TV); System Design

**Hudson Audio Video Enterprises, Inc.**, 309 Power Ave., Hudson, NY 12534 (518-828-2000) Nationwide, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design; Used Equip.

**Laumic Co., Inc.**, 306 East 39th St., New York, NY 10016 (212-889-3300) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vacuum Tubes; Film Equip.; Vans & Accessories; Service & Repair; System Design; Used Equip.

**LCA Sales Co.**, 76 Main St., Tuckahoe, NY 10707 (212-402-6600; 914-961-4700; 800-522-7377) DE, DC, MD, NJ, Metro-NY, East-PA, VA, Audio & Video Equip.; Transmission Systems; System Design

**Lee Dan Communications, Inc.**, 155 Adams Ave., Hauppauge, NY 11788-3699 (516-231-1414; NY: 800-231-1414; USA: 800-Lee-Dan-1) U.S.A., Intercom Systems; Speakers & Enclosures; Wire & Cable, Annunciators; Sony Video Equip. Authorized Distributor

**Lunar Video Ltd.**, 138 East 26th St., New York, NY 10010 (212-686-4802) CT, MA, NJ, NY, Service & Repair on Video & Test Equip.

**Martin Audio/Video Corp.**, 423 West 55th St., New York, NY 10019 (212-541-5900) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, PR, RI, VT, VI, NB, NF, NS, Ont, PEI, Que, Audio & Video Equip.; Test & Measurement; Tape; System Design; Rentals; Service & Repair

**Miller Associates Ltd., L. Matthew**, 48 West 21st St., 11th Floor, New York, NY 10010 (212-741-8011;

800-221-9328) U.S.A., PR, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design; Rental; Used Equip.

**MPCS Video Industries, Inc.**, 514 West 57th St., New York, NY 10019 (212-586-3690) U.S.A., Full service distributor of industrial & broadcast video equip. Rental; Production, post-production & duplication. Systems Design and Installation. Specializers in network, call letter, cable stations, educational & medical institutions.

**Northeast Broadcast Lab, Inc.**, 10373 Saratoga Road, South Glens Falls, NY 12801 (518-793-2181) Continental USA, Complete AM & FM systems including audio, trans-

mitting & antenna equip.

**Richardson Electronics-East**, 116 S. Long Beach Road, Rockville Centre, NY 11570 (800-645-2322; 516-536-8868) Worldwide, Vacuum Tubes & Capacitors; Camera Tubes; Semiconductors; CC TV Equip.; RF Amplifiers; SCR's

**Sharp Electronics**, 192-08 90th Ave., Hollis, NY 11423 (718-479-3011) Worldwide, Electron Tubes; Complete line of CCTV Products; Cameras, Monitors & Accessories; Transmitters AM-FM-TV

**Stage Lighting Distributors**, Industrial Park, Route 9 W., Stony Point, NY 10980 (914-947-3034) U.S.A. and Canada, Video Equip.; Lighting & Controls; System Design

**Temtron Electronics Ltd.**, 15 Main St., East Rockaway, NY 11518-0170 (516-599-6400; 800-645-2300) U.S.A., Audio & Video Equip.; Test & Measurement Equip.; Vacuum Tubes

## NORTH CAROLINA

**Broadcast Services Co.**, Route 3 Box 45-E, Four Oaks, NC 27524 (919-934-6869; VA 703-635-1413; Service Center 919-276-1306) DC, MD, NC, PA, SC, VA, WV, Full Line of Broadcast Audio & Radio RF Equip.

See advertisement on page 106

# You can stake your reputation on the Power Siftor.<sup>®</sup>

Gerald Dalton did. "We have four Power Siftors on line here at KKDA AM/FM," says Dalton, Director of Engineering for the Dallas radio station. "Since we installed one in our production room two years ago, we've had no more damage from line glitches or surges. But the real life saver has been the one on the studio mains. It's prevented damage at least twice — in a direct lightning hit to electric lines within 900 feet of the studio, and

when a downed utility pole 200 yards from the studio caused arcing between severed lines..... I recommend Power Siftor highly..... Every radio and television station should have at least one, protecting its microprocessor-based audio and video machines."

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Get your sensors, antennas or illumination systems up to where they can work best with

an Allen Osborne Associates

telescopic hilomasts

If you need to elevate your communications, jamming, or surveillance antenna or other type of sensor, the convenient, compact and portable family of Allen Osborne Associates telescopic masts is the answer. Osborne masts come in a variety of configurations with pneumatic, electric or manual drives. Adaptable for easy installation on vehicles or in fixed facilities, Osborne masts are also available as a self contained trailer system that can be towed behind your vehicles.

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**With retracted sizes from three to fifteen feet, Osborne masts can extend to over 90 feet above intervening terrain.**

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California 91361  
(805) 495-8420  
TWX: 910-494-1710



## Dealer/distributors...continued

**Electronic Merchandising Enterprises, Inc.**, 112 Buena Vista, High Point, NC 27260 (919-869-3335) East-KY, NC, SC, East-TN, VA, WV, Mixers, Mlcs, Amps; Video Production Switchers, Monitors, Cameras, DA's; Analyzers; Frequency Counters; Power Meters, Voltmeters; Test & Measurement Equip.; Distortion Analyzers; STL DVES, CCD Cameras

**Midwest Communications Corp.**, 2848 Interstate 85 S., Suite E, Charlotte, NC 28208 (704-399-6336) NC, SC, Audio, Video & Test Equip.; Tape; Vans, System Design; Service & Repair

**Midwest Communications Corp.**, 3033-2 Stoney Brook Drive, Raleigh, NC 27604 (919-850-9811)

**S.C.M.S., Inc.**, 10201 Rodney Blvd., Pineville, NC 28134 (704-889-4508; NC-800-221-SCMS; Outside NC-800-438-6040) National, Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Service & Repair; System Design; Used Equip., Studio Design; Acoustics

**Technical Video Systems, Inc.**, 215 N. Broad St., Winston-Salem, NC 27101 (919-748-0916) NC, SC, TN, Video Equip.

**Midwest Communications Corp.**, 7500 Wall St., Cleveland, OH 44125 (216-447-9745) NY, OH, PA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Transmitters & Antennas

**Vincent Lighting Systems Co.**, 20810 Miles Parkway, Cleveland, OH 44128 (216-475-7600) IN, KY, OH, Install, Design & Service Lighting Systems & Related Equip.; Rentals are available. Expendable lighting Supplies i.e. color media, connectors, lamps, patterns

## OKLAHOMA

**Walter S. Brewer Co., Inc.**, P.O. Box 35746, Tulsa, OK 74153-0746 (918-493-7323) Worldwide, Lighting for Video; System Design

**Delcom Corp.**, 6019 S. 66th E. Ave., Tulsa, OK 74145 (918-494-9500; Outside OK 800-331-5461) Continental U.S., Total Video Systems Featuring Custom System Design; Professional & Broadcast Equip. Installation; Computerized Wiring & Tracing Documentation; Custom & Standard Cabinetry

## NORTH DAKOTA

**Audiovisual Inc.**, 1818 E. Broadway, Bismarck, ND 58502 (701-258-6360) CO, ID, IA, KS, MN, MT, NE, ND, SD, WY, Audio & Video Equip.; Test & Measuring Equip.; Transmitters; Tape; Vacuum Tubes; Film Equip.; Service & Repair; System Design; Used Equip.; Rentals

## OHIO

**Audio Marketing Association**, 9470 Whitewood Road, Brecksville, OH 44141 (216-526-2426) IN, KY, OH, PA, WV, Audio Equip.; Test & Measurement Equip.

**Cartwright Communications Co.**, 7812 Red Sky Drive, Cincinnati, OH 45249 (513-489-1755; Outside OH-800-543-8614; OH-800-582-2641) U.S.A., AK, HI, Antennas; Batteries; Duplexers; Power Suppliers; Remotes; RF Amps; Elec. Sirens & Lights; Tone Equip.; Transmission Line; Two-Way Warning Radios & Accessories; Wattmeters; Isolators; Receiver & Transmitter Multicouplers

## OREGON

**Custom Video Systems of Oregon, Inc.**, 1963 N.W. Kearney St., Portland, OR 97209 (503-295-6963) OR, Audio & Video Equip.; Test Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip.

**Frontier Communications Corp.**, P.O. Box 750, Portland, OR 97207 (503-246-8080) AK, AZ, CA, CO, HI, ID, MT, NV, OR, UT, VI, WA, WY, Audio Equip.; Transmitters, Antennas & Transmission Systems; Service & Repair; Systems Design

**URS Electronics, Formerly United Radio Supply Inc.**, 123 N.E. Seventh Ave., Portland, OR 97232 (503-233-5341; 800-547-4557) AK, CA, GU, ID, MT, OR, PR, WA, Alta., BC, Sask., Cable, Connectors & Fiber Optics; Electro Mechanical Products; Motion Control & Video Systems; Power Conditioning Lab Bench/Test Equip. Products; Passive & Discrete Products

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## PENNSYLVANIA

**Alpha Video & Electronics Co.**, 28 E. Mall Plaza, Carnegie, PA 15106 (412-923-2070) MD, NY, OH, PA, WV, Audio & Video Equip.; Test & Measurement Equip.; Transmitters; Tape; Vans & Accessories; Service & Repair; System Design

**Audio Associates**, 814 W. Broad St., Bethlehem, PA 18018 (215-865-6013) U.S.A., Audio Equip.; Test & Measuring Equip.; Transmitters, Antennas & Transmission Lines; Tone Arms & Cartridges; Processing Equip.; Power Distribution & Preamps; Studio Furniture & Accessories; Used Equip. & Trade-Ins

**Comark Communications, Inc.**, P.O. Box 506, Colmar, PA 18915 (215-822-0777) Worldwide, Transmitters, Antennas and Transmission Systems

**Jerry Conn Associates, Inc.**, P.O. Box 444, Chambersburg, PA 17201 (717-263-8258) U.S.A., Regional sales rep for top quality products and national distributor for all your distribution needs from drop materials to standby 63 channel tuneable modulators.

**Lerro Electrical Corp.**, 3125 N. Broad St., Philadelphia, PA 19132 (215-223-8200) DE, DC, MD, NJ, PA, VA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vacuum Tubes; Film Equip.; Vans & Accessories; Service & Repair; System Design; Used Equip.

**Maxima Magnetics, Inc.**, 300 Bonair Ave., Hatboro, PA 19040 (215-443-0700) AL, CT, DE, DC, FL, GA, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, NE, NH, NJ, NY, NC, ND, OH, OK, PA, PR, RI, SC, SD, TN, TX, VT, VA, WV, WI, Audio & Video Tape; Reprocessed Tape all formats; Custom Loaded 1/2" Video Cassettes & Audio; Re-loaded 3/4" Cassettes

**Northeast Broadcast Lab, Inc.**, 517 Hollyknoll Drive, Southampton, PA 12803 (213-322-2227) USA, Complete AM & FM systems including audio, transmitting & antenna equip.

**Peirce-Phelps, Inc.**, 2000 North 59th St., Philadelphia, PA 19131 (215-879-7171) U.S.A., GU, PR, VI, Audio & Video Equip.; Tape; Vans & Accessories; Service & Repair; System Design

**Performance Lighting Products Co., Inc.**, 2741 Noblestown Road, Pittsburgh, PA 15205 (412-922-0900) DE, KY, NJ, OH, WV (TV only), Studio & Remote Lighting Products & Accessories; Design, Supply & Installation of Same

**Radio Systems Inc.**, 5113 W. Chester Pike, Edgemont, PA 19028 (215-356-4700) U.S.A., Audio Equip.; Tape; Transmitters, Antennas & Transmission Systems; System Design; Service & Repair; Turnkey Installation; Studio Furniture; SCA Receivers

**RF Specialties of Pennsylvania**, 121 Conneaut Drive, Pittsburgh, PA 15239 (412-733-1994) CT, DE, DC, IL, IN, KY, ME, MD, MA, MI, MN, MO, NH, NJ, NY, NC, OH, PA, RI, TN, VT, VA, Transmitters, Antennas & Transmission Systems; Audio Equip.; System Design

**Steinberg Electronics Inc.**, 2520-22 N. Broad St., Philadelphia, PA 19132 (215-223-9400; 800-523-0894; PA Only-800-245-3105) Worldwide, Audio & Video Equip.; Tape; Vacuum Tubes

**Tape World**, 220 Spring St., Butler, PA 16001 (800-245-6000; 412-283-8621) OH, PA, WV, Tape

**Val-Tronics, Inc.**, Penn Park Building, Pittston, PA 18640 (717-655-5937) U.S.A., Cart Machines; Consoles; Transmitters; Audio Carts; Tape Recorders & Turntables; Microphones; Optimods; Antennas; Transmission Lines; Cabinets; Phono Cartridges; Replacement Heads; Amplifiers; Dummy Loads

## SOUTH DAKOTA

**Audiovisual Inc.**, 1809 Cambridge, Sioux Falls, SD 57106 (605-361-7460) IA, SD, Broadcast & Professional Audio & Video Equip.; Microwave Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design; Used Equip.

## TENNESSEE

**Broadcast Equipment & Supply Co., Inc.**, P.O. Box 3141, Bristol, TN 37625 (615-878-2531) U.S.A., Audio & Video Equip.; Tape

**Gray Communications Consultants, Inc.**, 1838 Elm Hill Pike, Apcom Place Suite 101, Nashville, TN 37210 (615-883-9175) AL, AR, FL, GA, LA, MS, PR, SC, TN, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Transmitters, Antennas & Transmission Systems

**Imageering Laser Disk Systems, Inc.**, 3314 Poplar Ave., Suite 1, Memphis, TN 38111 (901-323-4762; 800-922-ICMS) USA & Canada, Video equip. relating to optical disc technology

**Wilson Audio Sales**, 5972 Asberry Court, Nashville, TN 37221 (615-646-4477) AL, GA, MS, NC, SC, TN, Audio Equip.

## TEXAS

**Allied Broadcast Systems**, P.O. Box 4551, Bryan, TX 77805-4551 (409-846-8244) Worldwide, Systems engineering for clients of four Allied Divisions.

**Alpha Tower Design, Inc.**, 901 Waterfall Way, Suite 203, Richardson, TX 75080 (214-783-2578) Continental USA, Transmitters, Antennas & Transmission Systems; Tower Design & Analysis; Tower Survey & Repair

**Crouse-Kimzey Co.**, 3507 W. Vickery, Ft. Worth, TX 76107 (817-737-9911) U.S.A., Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape

**Victor Duncan, Inc.**, 6305 N. O'Connor, Irving, TX 75039 (214-869-0200) U.S.A. and Canada, Audio, Film & Video Equip.; Test &

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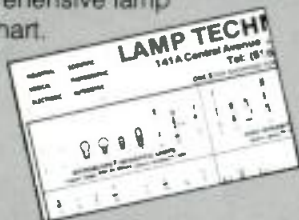
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**Use our  
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again for  
the next  
12 years.**



Relamp your incandescent sockets. Our based multi LED miniature lamps are exact replacements for T 1 $\frac{3}{4}$  and T 3 $\frac{3}{4}$  incandescent miniature lamps. Shock and vibration proof, they keep your lighted panel and switches going "on" for 100,000 hours.

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  - Low power & heat consumption.
  - Shock & vibration proof.
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## Dealer/distributors...continued

Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip. Over 300 Lines of Pro Equip.

**Ethereum Scientific Corp.**, 7641 Clarewood, Suite 336, Houston, TX 77036 (713-784-2630) U.S.A., Service & Repair; System Design-including studio installation, etc.; Used Equip.-including leasing, rent, etc.; Vans & Accessories

**G.P. Enterprises, Inc.**, P.O. Box 912, Arlington, TX 76004-0912 (817-572-0132; 478-0050) AL, AZ, AR, CO, IA, KS, LA, MN, MS, MO, MT, NE, NM, ND, OK, SD, TN, TX, WI, WY, Audio, Video, Test & Measurement, Film & Used Equip.; Monitors; Audio Lip Sync & Time Compression/Expansion; 3D Graphics/Animation; Routing Switchers; Master Clock Systems; (SMPTE) Generators/Readers; Racks/Consoles; CCD Cameras; Digital Video Effects

**International Music Co.**, 1316 E. Lancaster, Fort Worth, TX 76102 (817-336-5114) Worldwide, AKAI Professional; Studiomaster Mixing Consoles; Ross Systems Fane Loudspeakers

**Linrose Broadcast Equipment**, 442 Breesport, San Antonio, TX 78216 (512-342-8849; TX only-800-221-3063; Outside TX-800-523-7360) Worldwide, Complete line of audio equip. & supplies

**The Management**, P.O. Box T, Aledo, TX 76008 (800-334-7823; 817-441-8532) U.S.A. & Canada, Computer Software: Music For Radio, Logging & Billing Affiliates

**MZB & Associates** 4203 Beltway, Dallas, TX 75234 (214-233-5535) AR, KS, LA, MO, NE, NM, OK, TX, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip.

**MZB & Associates**, 11231 Richmond Ave., Suite 102, Houston, TX 77082 (713-497-0611)

**MZB & Associates**, 837 Isom Road, San Antonio, TX 78216 (512-525-1628)

**Professional Audio Supply**, 5700 East Loop 820 South, Fort Worth, TX 76119-7050 (817-483-7474; 800-433-7668) Worldwide, Complete Line of Broadcast & Recording Equip. & Supplies

**RF Specialties of Texas**, P.O. Box 8316, Amarillo, TX 79114 (806-372-4518) CO, NM, OK, TX, Transmitters, Antennas & Transmission Systems; System Design; Audio Equip.; Test & Measurement RQ

**SAVCO Broadcast Equipment, Inc.**, P.O. Box 850427, Richardson, TX 75085 (214-783-1438) AL, AR, KS, LA, MI, MO, OK, TX, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design

**The Gene Sudduth Co., Inc.**, P.O. Box 293, Flint, TX 75762 (214-894-6303) AR, LA, OK, TX, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems

**The Gene Sudduth Co., Inc.**, P.O. Box 518, Paris, TX 75460 (214-785-5764) AR, LA, OK, TX, Video Equip.; System Design; Service & Repair

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A good antenna is crucial to quality broadcasting. An antenna that is merely adequate will compromise the performance of even the best studio equipment and transmitter.

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### SHUTTLE I

- Adds shuttle knob to VP-5000/VO-5600, VP-5030/VO-5630P
- Variable speed—0 to 5x in forward and reverse
- Control track readout
- Preroll

### INTRODUCING SHUTTLE II

- All the features of the Shuttle I Plus
- A/B roll editing capability with Sony RM-440
- GPI programmable switch triggers PYXIS special effects
- No additional interface cables required



### SHUTTLE II

- A new interface
- Use VP-5000/5600 with: RM-440, ECS-90, ECS-204, PALTEX ABNER
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**Contact: Russell W. Glenn  
President**

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Burbank, CA 91505  
(800) 826-2035.

In California (818) 845-1515

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Dealer/distributors...continued

## UTAH

RIA Corp., 50 E. Malvern, Salt Lake City, UT 84115 (801-486-8822 or 484-1701) AZ, CA, CO, ID, LA, MS, MO, MT, NV, OK, TX, UT, WY, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Film Equip.; Tape; Service & Repair; System Design

## VIRGINIA

Broadcast Services Co., 408 E. Sixth St., Front Royal, VA 22630 (703-635-1413; 919-934-6869) DC, MD, NC, PA, SC, VA, WV, Full line of Broadcast Audio & Radio RF Equip.

Midwest Communications Corp., 2730 Ayliff Road, Norfolk, VA 23513 (804-262-5788) U.S.A., Audio & Video Equip.; Test & Measurement Equip.; Transmitters & Antennas; Tape; Vans & Accessories; Service & Repair; System Design

Old Dominion Broadcast Eng. Service, 1101 Front St., Richmond, VA 23222 (804-321-4506) Worldwide, Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Service & Repair; System Design; Used Equip.

Robert Slye Electronics, 3415 N. Washington Blvd., Arlington, VA 22201 (703-525-7272) DC, MD, VA, Audio & Video Equip.; Test & Measurement Equip.; System Design

Straight Wire Audio, Inc., 4611 Columbia Pike, Arlington, VA 22204 (703-979-1990, 800-368-2081) U.S.A., Alta, BC, Ont., Que, Audio Equip.

## WASHINGTON

Bennett Engineering Associates, A Div. of Midwest Communications, 1331 118th Ave. S.E., Bellevue, WA 98005 (206-455-2331) AK, CA, ID, MT, OR, WA, Engineering Consultants-Electronic & Communication Systems; Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design

Broadcast Supply West, 7012 27th St. W., Tacoma, WA 98466 (206-565-2301; 800-426-8434) Worldwide, Audio Equip.; Test & Measurement Equip.; Tape; Transmitters, Antennas & Transmission Systems

**NORTHSTAR**

4030 148th Ave N E Bldg N Redmond WA 98052 U.S.A

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Inc

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- Special package quotes available
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Division of Cam-Net Communications Networks Inc

# The Two Sides Of The Jem-Fab Group:

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## CONSTRUCTION

*The Jem-Fab Corporation has the necessary in-house facilities and personnel to build, install and test your turn-key facility. Our custom manufactured equipment enables your company to operate to its maximum potential and realize its greatest profits.*

*Whether the Jem-Fab Group designs, constructs or retrofits your studio, there are two things you can count on: A) our uncompromising commitment to quality, and B) our dedication to service for our clients in every aspect of our business.*

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**Franklyn R. Beemish & Co.**

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(516) 867-8510 • (516) 867-8511

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## Dealer/distributors...continued

**Continental Video Brokers**, 177 Telegraph Road, Suite 79, Bellingham, WA 98226 (604-858-8335; 800-663-6211) USA, Used Audio & Video Equip.

See advertisement on page 168

**Custom Video Systems, Inc.**, 17521 15th Ave. N.E., Seattle, WA 98155 (206-365-5400) AK, OR, WA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Rentals

**Northshore Marketing**, 16 W. Harrison St., Suite 205, Seattle, WA 98119 (206-284-9699) AK, ID, MT, OR, WA, Audio, Test & Measurement Equip.; Projection Video Equip.

**Northstar Satellite System Inc.**, 4030 148th Ave., Building N, Redmond, WA 98052 (206-885-4730) Worldwide, Ku Band Uplinking & Downlinking; Portable Video Production Studio; Microwave Equip.

See advertisement on pages 109 and 214

**RF Specialties of Washington, Inc.**, 11721 15th Ave. N.E., Seattle, WA 98125 (206-363-7730) AK, ID, MT, OR, WA, Transmitters, Antennas & Transmission Systems; Complete line of RF & audio products.

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**M.S.C. Electronics Ltd.**, 147 W. Beaver Creek Road, Richmond Hill, Ont., Canada L4B 1C6 (416-731-9500) Canada, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Vacuum Tubes; System Design

**Multi Electronic Services Ltd.**, 190 Don Park Road, Unit 5, Markham, Ont., Canada L3R 2V8 (416-475-5068) Ont., Que., Audio & Video Equip.; Service & Repair; System & Design

**Nortec West Ltd.**, 7056-B Farrell Road S.E., Calgary, Alta., Canada T2H 0T2 (403-252-8141) Alta, B.C., Man., Sask., Audio & Video Equip.; Film Equip.; Service & Repair

**Pineway Electronics Ltd.**, 1875 Leslie St., Unit 7, Don Mills, Ont., Canada M3B 2M5 (416-449-1343; Canada 800-269-7839) Canada, Audio & Video Equip.; Test & Measurement Equip.; AM-FM-TV Transmitters; Tape; Service & Repair

**Precision Camera, Inc.**, 181 Carlaw Ave., Toronto, Ont., Canada M4M 2S1 (416-461-3411) Ont., Video & Film Equip.; Service & Repair; System Design

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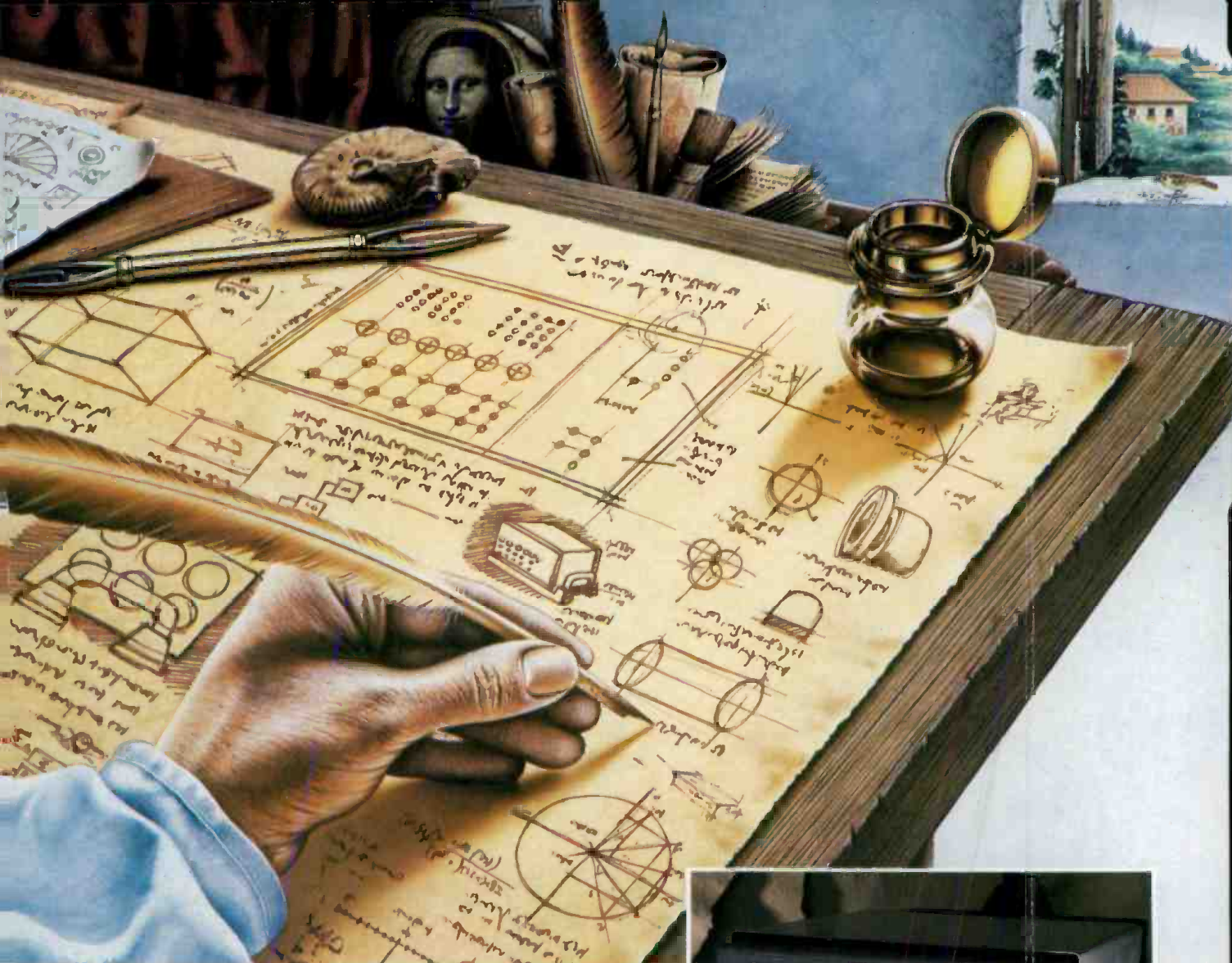
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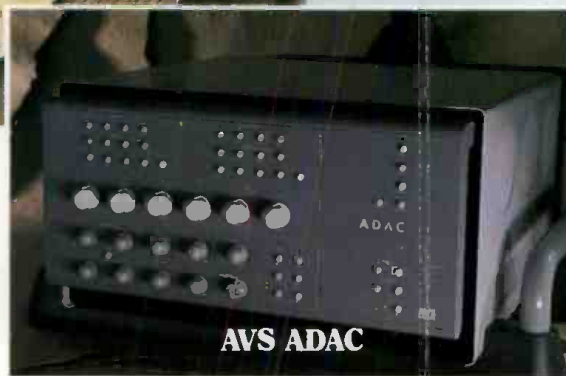
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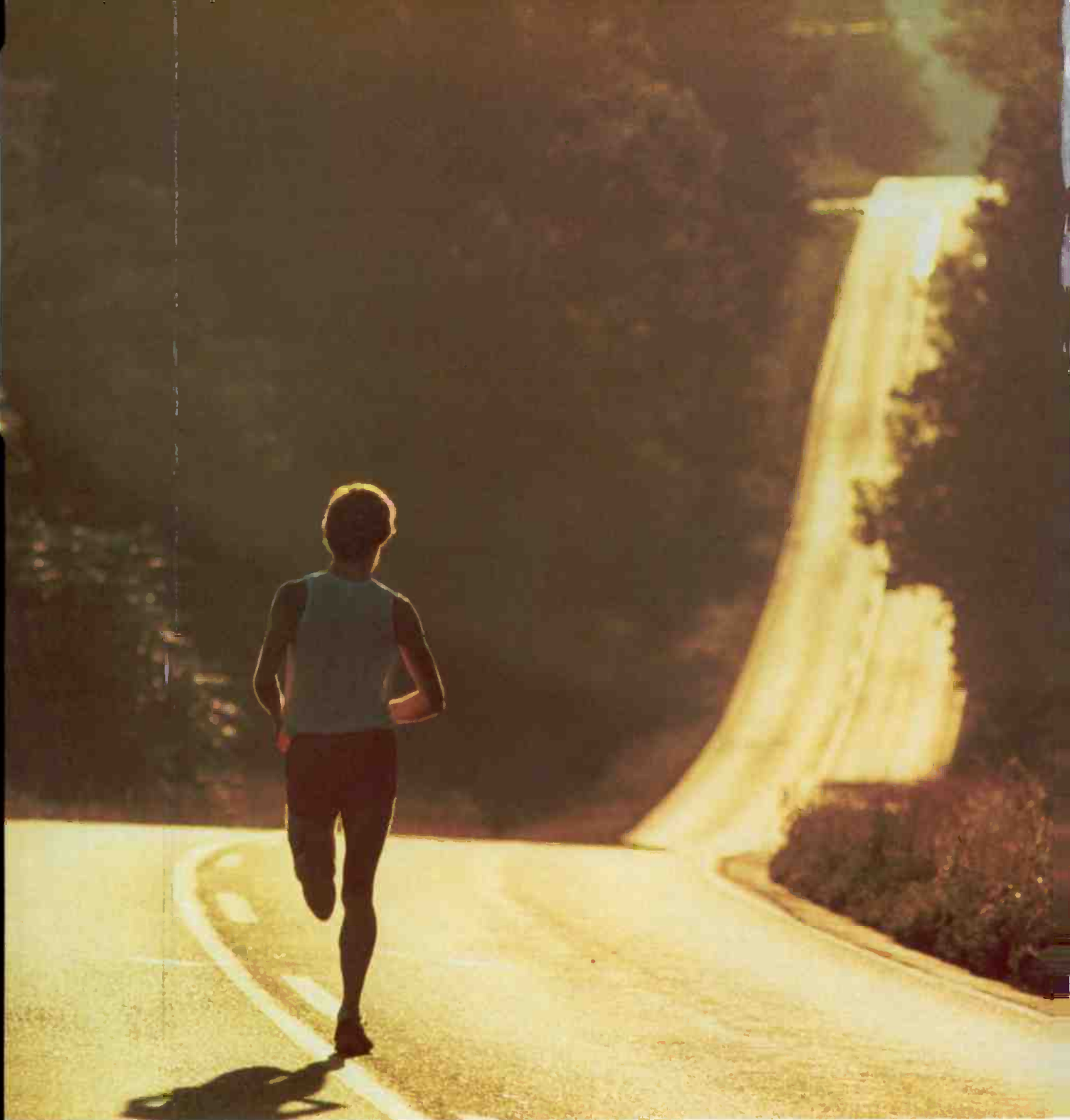
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# Video equipment specs

## Color Television Cameras

These cameras are based on a 3-pickup device design. Those marked with diamond (◆) include a shutter system. All models have noise reduction processing. All include an integral, genlocking sync generator. Enhancements are generally applied to all color channels. The optical system prisms are rated at f/1.4 aperture and that value is considered in the Maximum Sensitivity value, unless otherwise noted. All models include automatic B/W balance features. Component video systems using equi-band R-Y and B-Y differences are designated as YCrCb. Under Cable Types, multicore is designated as 'multi/c'; fiber optic material is abbreviated 'FO'.

Manufacturer Model/Series Number	Ampex AVSD		BFE/Toshiba	BTS Broadcast TV Systems	
	CVC52	CVC3A [30]	PK-7025	◆LDK 90 [KCB590 SP]	KCP 60 [KCA 110]
Application	ENG, EFP	ENG, EFP	ENG	ENG	Studio, OB [& ENG]
Pickup devices	CCD 510x492 pixel N	MF SAT [DG PbO]	LOC DG PbO	CCD Frame Transfer	PbO [LOC DP PbO]
Optical format	⅔" 500x582 pixel P/S	⅔"	⅓" f/1.5	610x492-pix NTSC	⅔"
Sensitivity 89.9%R	2000 lux, f/5.6	2000 lux f/4 [4.5]	2000 lux, f/4	160fc, f/4	1250 lux, f/2.8, 60%[70]
Max sensitivity	15 lux, +18dB	30[25]lux, +18dB	30 lux, +18dB	2.5fc, +18dB	40 lux, +18dB
Resolution TVL, % mod	550	650 typical	650 >40% mod	40% mod, 5MHz, RGB	45% mod, 5MHz [>750]
Registration Z1,2,3	0.05% fixed	0.1, 0.15, 0.3%	0.1, 0.15, 0.3%	<25ns [0.05%] overall	0.1/0.2% [<40/80/120ns]
S/N ratio	58dB N, 55dB P5	59dB N, 57dB P/S	56dB N, 56dB P/S	58dB N, 56dB P	52dB N, 50dB P [57/55]
Contours out of	Spatial offset/green	Green	Green dependent	Edge of band, RG	Green
ND filters	2 positions	2 positions	1/8 optic	Electronic	Optic
Color correction	4 position optic	4 position optic	3 position	Electronic	Optic [3 position]
Color standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	PAL	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM
Output signal forms	Composite, YCrCb	Composite, YCrCb	Composite, YCrCb	RGB	Encoded, RGB [& VTR]
CCU required/option	W/CA3 adapter opt	CCU-300 options	W/DO-7744B adapter	Opt RCU, EFP adapter	Suggested [in system]
μP control	No	Single	Single	For automatics	..... [Yes]
Setup memories	Balance, filters	Color, black, center	Color	W/menus	Color balance
Auto centering	Fixed	Yes	Yes	Fixed	Yes [Option]
Auto registration	Fixed	No	.....	Fixed	.....
Auto cable compensation	.....	No	.....	.....	Yes
Computer setup system	.....	No	No	.....	No
Diagnostic display	.....	.....	Yes	Yes	Limited, CCU & [VF]
Cable types	Coax	Per adapter	.....	19p multi/c	Multi Ka64 [multi/tri/FO]
Portable unit	Yes	Yes	Yes	Yes	No [Yes]
Camera head weight lbs	7 w/VF	9.5 w/lens, VF	6.1 [17.6]	9 [15]	50 w/o lens [<15]
Docking VCR	CVR1-A Betacam	Betacam CVR-1A adapter	VTR-1PS Betacam	Betacam [SP BCB5]	No
Reader Service Number	501	502 [503]	504	505 [506]	507 [508]

Manufacturer Model/Series Number	BTS Broadcast TV Systems		BTS Broadcast TV Systems		
	LDK 12	KCF-1/KCB-1	KCM-125 [KCM-318]	LDK 54A	LDK 6A [26A]
Application	ENG, EFP	ENG	Studio, field, OB	ENG	Studio, field
Pickup devices	MF LOC DG SAT	LOC PbO	LOC DG PbO	High Stability PbO	PbO
Optical format	⅔"	⅓"	1" f/1.5 [⅔" HS PbO]	⅔"	1, 1¼ [⅔]"
Sensitivity 89.9%R	2000 lux, f/4	700 lux, f/2	630 lux, f/2.8 [800]	900 lux, f/3	70fc, f/2.8, 60%R, 1"
Max sensitivity	.....	85 lux, +12dB	30[25] lux, f/1.6 18dB	24 lux, +18dB	4.6fc, f/1.6, +12dB
Resolution TVL, % mod	750	40% mod, 4MHz	>700 [60% mod, 5MHz]	>650	Adj to 400, 100% mod
Registration Z1,2,3	<0.1, <0.1, <1.5%	<40, <80, <120ns	μP corrected	<30, <60, <100ns	<25, <40, <40ns
S/N ratio	55dB CCIR 625/50	54dB N, 52dB P/S	58dB N, 56dB P/S	59dB N, 57dB P	58dB N, 56dB P
Contours out of	Green	Green	Green	lb-eob, green	Green, ib-eob [red opt]
ND filters	12% ND optic	25% ND optic	3 position optic	2 position	5 [3] position
Color correction	3 position optic	3 position optic	3 optic, electronic	#85B optic	#85B, clear, 3 blank
Color standards	CCIR 625/50 2:1	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM
Output signal forms	Encoded, RGB	Encoded or component	Encoded, RGB	Y/U/V, encoded	RGB, composite
CCU required/option	LDK1206	CCU, RCU options	CCU suggested	Optional	Required
μP control	Yes	No	Yes	.....	4 [3] distributed
Setup memories	Color balance	Color balance	Multifunction	Color balance	2, 4 [2] lens, 6 ops
Auto centering	Yes	No	Yes	.....	Yes
Auto registration	No	No	Yes	Yes	49-point
Auto cable compensation	No	No	Yes	Yes	Yes
Computer setup system	No	No	Yes	.....	Yes
Diagnostic display	In viewfinder	No	Yes	.....	2 system & COACH
Cable types	26-pin, 14/10-pin VTR	Multi/c	Multi/c, triax	Multi/c, triax	Triax to 6,560 ft
Portable unit	Yes	Yes	No	Yes	No
Camera head weight lbs	10 w/VF	<15 w/lens, VF	73 [17.6]	9.35	94.6 [79]
Docking VCR	No	BCB-1 Betacam on KCB-1	No	BCB-1 Betacam	No
Reader Service Number	509	510	511 [512]	513	514 [515]

## Color Television Cameras

Manufacturer	Hitachi Denshi			Ikegami Electronics	
Model/Series Number	FP-Z31A [FP-Z31P]	SK-970D	SK-110D	SK-97 [SK-97D]	HL-791S
Application	ENG, EFP	Studio, OB	Studio, OB	ENG, EFP	ENG, low light
Pickup devices	MS SAT [DG-LOC PbO]	DG LOC PbO	DG LOC PbO	MS DG SAT or PbO	Si intensifier
Optical format	3/4" w/bias	3/4" f/1.2 w/bias	1 1/4" f/1.8	3/4" w/bias	1"
Sensitivity 89.9%R	2000 lux, f/4[4.5]	2000 lux, f/4.5	2000 lux, f/5.6	2000 lux f/4[4.5]	.....
Max sensitivity	40[30]lux f/1.6, 18dB	2fc, f/1.2, +21dB	.....	+18dB	2 lux f/2.8 +0dB
Resolution TVL, % mod	800 [660]	650	400 60% mod	700 SAT, [650] PbO	500
Registration Z1,2,3	0.1, 0.2, 0.4%	0.05, 0.1, 0.2%	0.05% overall	0.05, 0.1, 0.2%	0.1, 0.3, 0.5%
S/N ratio	60dB N, 57dB P [57dB N]	60dB N, 57dB P-B	56dB N, 54dB P	59dB N, 56dB P	58dB
Contours out of	Green	Green	RGB	Green	RGB
ND filters	Internal 1/8ND	6.3%, 25%, 100% int	5 position filter	6.3%, 25%, 100% int	5%
Color correction	3 position optic	3 position	6 position	3 position int	3 position optic
Color standards	NTSC, PAL-B [NTSC]	NTSC, PAL-B	NTSC, PAL	NTSC, PAL (NTSC/PAL-B)	NTSC
Output signal forms	Composite	Composite, RGB	Composite, RGB, key	Composite, RGB/YIQ/YUV	Composite, RGB
CCU required/option	RCU opt	BU-97D, CCU-110D opt	CCU-110D required	BSU97[D]/CCU110[D]	MA/TA-79E, dig RCU
μP control	Yes	Multiple	Multiple	Multiple	Yes
Setup memories	Color balance	Color/lens/scene/temp	Full setup	Color balance, lens	Color balance
Auto centering	Yes	Yes	Yes	Yes	.....
Auto registration	Yes	Yes	Yes	Yes	.....
Auto cable compensation	Yes	Yes	Yes	Yes	.....
Computer setup system	From opt CCU	BU-97D to 6 cameras	SU-110D	BSU-79[D] to 6 cameras	Yes
Diagnostic display	In viewfinder	CCU and viewfinder	CCU, VF	Viewfinder, CCU	VF
Cable types	Multi/c, coax, triax	Multi/c, triax, coax	24-core	Multi/c, triax, coax	Multi/c, triax
Portable unit	Yes	No	No	Yes	Yes
Camera head weight lbs	10.8 w/o lens, vf	55	88	15	24.2
Docking VCR	No	No	No	HR-50, -100 adapter	No
Reader Service Number	516 [516]	518	519	520 [521]	522

Manufacturer	Ikegami Electronics				
Model/Series Number	HK-323 [HK-323P]	HDK-1125P	HL-79E [79PC]	HL-95B Unicam	SC-500
Application	Studio, OB, ENG, EFP	HDTV	ENG, EFP	ENG, EFP	Studio
Pickup devices	DG PbO	MS high resolution	DG/LOC PbO or SAT	PbO StaMag DG	PbO or SAT



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## Color Television Cameras

Manufacturer	Ikegami Electronics					
Model/Series Number	HK-323 [HK-323P]	HDK-1125P	HL-79E [79PC]	HL-95B Unicam	SC-500	
Optical format	1" or [3/4"]	1"	3/4"	3/4"	3/4"	
Sensitivity 89.9%R	2000 lux, f/5.6 [4.5]	150fc, f/2.8	2000 lux, f/5	2000 lux, f/4.5	200fc, f/4	
Max sensitivity	10fc, +6dB	.....	≤20 lux, +18dB	≤15 lux, f/1.6, 24dB	8fc, f/1.6, +12dB	
Resolution TVL, % mod	700 [650]	1125	650	650 center	700 center, SAT	
Registration Z1,2,3	0.05, 0.1, 0.2%	.....	0.05, 0.1, 0.3%	0.05, 0.1, 0.2%	0.1, 0.2, 0.4%	
S/N ratio	59dB, 4.2MHz [60dB]	44dB Y-channel	57dB, 59dB/LOC [61dB]	60dB	57dB N	
Contours out of	RGB	Green	RGB	RGB	RGB	
ND filters	4 [3] internal	6 position internal	3 [4] position	25%	ND8 [12.5%]	
Color correction	4 [3] pos optic	6 position optic	3 [4] position optic	3 position optic	3 position optic	
Color standards	NTSC	2:1 interlace, 5:3	NTSC	NTSC	NTSC	
Output signal forms	Composite, RGB	Y/Cw/Cn, RGB	Composite, RGB	Composite, RGB	RGB, composite	
CCU required/option	Yes [Opt]	Yes	TA/MA-79E opt	Base station opt	Yes	
μP control	Multiple	Multiple, distributed	Yes	Yes	Single	
Setup memories	Color bal, lens	Color, lens, others	Lens, color bal	Color balance	Color balance	
Auto centering	Yes	Yes	Yes	Yes	Yes	
Auto registration	Yes	Yes	Yes	Yes	Yes	
Auto cable compensation	Yes	Yes	Yes	.....	Yes	
Computer setup system	Yes, to 40 cameras	Yes	w/ADC-79 setup control	Base station opt	No	
Diagnostic display	Yes, hardcopy opt	Yes	VF, CCU, hardcopy	Viewfinder	Viewfinder	
Cable types	Triax, multi, fbr op	F-7 28-core, fbr op	Multi, triax [fbr op]	Multi/c, triax, coax	Multi/c, coax	
Portable unit	HK-323P	No	Yes	Yes	No	
Camera head weight lbs	57.2 -1" [15.4]	94	13.2 [11] w/VF	7 w/o lens, bat	30.9 w/o VF	
Docking VCR	No	No	[w/adapters]	Adapts M-II, Betacam	No	
Reader Service Number	523 [524]	525	526 [527]	528	529	

Manufacturer	Ikegami Electronics			JVC Company	
Model/Series Number	ITC-730A [730AP]	HK-322	◆CCD-770 [HL-379]	KY-950BU [900BU]	BY-110U
Application	ENG, EFP	Studio	ENG	ENG, EFP, studio	ENG
Pickup devices	SAT [PbO]	PbO ACT, LOC, DG	CCD [649x491 pixel]	PbO [SAT] LOC DG	ES focus EM defl SAT
Optical format	3/4"	30mm std or 25mm opt	3/4"	3/4"	1/2"

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## Color Television Cameras

Manufacturer	Ikegami Electronics			JVC Company	
Model/Series Number	ITC-730A [730AP]	HK-322	◆CCD-770 [HL-379]	KY-950BU [900BU]	BY-110U
Sensitivity 89.9%R	2000 lux, f/4	1200 lux, f/4	2000 lux, f/4	2000 lux, f/4.5	2000 lux, f/2.8
Max sensitivity	40 lux, f/1.6, 18dB	350 lux, f/2.1 [30mm]	40 lux, f/1.6, +18dB	38 lux, f/1.7, +18dB	65 lux, +12dB
Resolution TVL, % mod	>650 [>600]	400, 60% mod 5MHz	480 [650]	700	600
Registration Z1,2,3	0.1, 0.2, 0.4%	0.05% overall	0.05%, fixed	0.05, 0.1, 0.3%	0.1, 0.4, 0.8%
S/N ratio	57dB	56dB [58dB 25mm]	53dB [>58dB]	59dB	54dB
Contours out of	RGB	RGB opt	RGB [Green]	Green	Green
ND filters	25% internal	6 position	..... [25%]	25%	25%
Color correction	3 position optic	6 pos electronic	Electronic [3 optic]	3 position optic	3 position optic
Color standards	NTSC	NTSC	NTSC	NTSC	NTSC
Output signal forms	Composite, RGB at CCU	RGB, composite	Composite [and RGB]	Composite	Composite
CCU required/option	CCU-730A	Yes	No [w/adaptor opt]	RS-500U/-T900U opts	RS-110U opt
μP control	Single	Multiple	.....	Single	Yes
Setup memories	Color balance	Lens, b/w bal	Color balance	Yes	Color balance
Auto centering	Yes	Yes	Fixed	Yes	Yes
Auto registration	No	Yes	Fixed	No	Auto-shift
Auto cable compensation	Yes	Yes	.....	No	No
Computer setup system	No	From CCU	No	No	No
Diagnostic display	No	At CCU, printer	.....	In Viewfinder	No
Cable types	Multi/c, coax	TV24[B1], triax	..... (per adapter)	Multi/c, triax	14-core, triax
Portable unit	Yes	No	Yes	Yes	Yes
Camera head weight lbs	11.4 w/VF	55	8.6	10	8.2
Docking VCR	No	No	No [w/adaptor 1/2, 1/4"]	No	No
<b>Reader Service Number</b>	<b>530 [531]</b>	<b>532</b>	<b>533 [534]</b>	<b>535 [536]</b>	<b>537</b>

Manufacturer	JVC Company		NEC America	Panasonic Broadcast	Panasonic/Industrial
Model/Series Number	KY-320U	KY-210BU	◆SP-3A [SP-3AUW†]	◆AK-400 CCD	WV-555BN [N3](WV-V3)
Application	ENG, EFP, studio	ENG, EFP, studio	ENG, EFP	ENG, EFP	ENG, EFP, studio
Pickup devices	SM PbO	HR EM SAT	CCD interline f/t	Interline f/t	Newvicon [S4701]
Optical format	3/4"	3/4"	3/4" 2-G, 1-R/B	3/4"	3/4" (1/2")
Sensitivity 89.9%R	2000 lux, f/4.5	2000 lux, f/4	130fc, f/4	.....	140fc, f/4
Max sensitivity	38 lux, f/1.7, +18dB	32 lux, +18dB	<5fc, +12dB	...../0/9/+18dB	2(3)fc, +18(12)dB
Resolution TVL, % mod	650	750	550 Hor/350 Ver	580	600 (570)
Registration Z1,2,3	0.1, 0.2, 0.3%	0.1, 0.2, 0.4%	Fixed	Fixed	0.1/.2/.4% (0.1/.3/.6%)
S/N ratio	57dB	58dB	58dB	58dB	55(54)dB N, 53dB P
Contours out of	Green	Green	Green	RGB	Green
ND filters	25%	25%	Internal	4-position	Internal
Color correction	3 position optic	3 position optic	Optic	4-pos optic	Optic(4-pos)
Color standards	NTSC	NTSC	NTSC	NTSC, component	NTSC, PAL (NTSC)
Output signal forms	Composite	Composite	All component formats	Composite, YIQ, RGB	YIQ/M-format
CCU required/option	RS-500U, RS-T900U opts	FS-500U opt	Option	Option	Option
μP control	No	.....	.....	Single	Single
Setup memories	Color balance	Color balance	Color balance	B/W bal	Color balance
Auto centering	Yes	Yes	Fixed	Yes	Yes
Auto registration	Auto-shift	Auto-shift	Fixed	.....	No
Auto cable compensation	No	No	Option	.....	No
Computer setup system	No	No	None	No	No
Diagnostic display	In viewfinder	In viewfinder	.....	In viewfinder	No (in viewfinder)
Cable types	Multi/c, triax	multi/c, coax, triax	Triax, multi [26,41]	Multi/c, coax	Multi/c (& BNC)
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight lbs	9.2	7.8	10.2	7	7.7 (13.9/ENG)
Docking VCR	No	No	8mm/Beta/M-II adapters †4AUW underwater	AU-400 M-II	No
<b>Reader Service Number</b>	<b>538</b>	<b>539</b>	<b>540 [541]</b>	<b>542</b>	<b>543 (607)</b>

Manufacturer	Panasonic/Industrial		Sharp Electronics		
Model/Series Number	WV-888	WV-890 [P3]	XC-B10	XC-B20P	XC-1A
Application	ENG, EFP, studio	ENG, EFP, studio	ENG, EFP	ENG, EFP	ENG, EFP, Studio
Pickup devices	SAT [H4101B]	PbO [S4804]	DG, LOC/MS, SAT	DG LOC MS PbO	MF DG LOC SAT
Optical format	3/4"	3/4"	3/4"	3/4"	3/4"
Sensitivity 89.9%R	190 lux f/4	190 lux, f/4	2000 lux, f/4	2000 lux, f/4.5	2000 lux, f/4
Max sensitivity	6fc, +18dB	4 fc, f/1.6, +18dB	30 lux, +18dB	24 lux, +18dB	30 lux, +18dB
Resolution TVL, % mod	650	650	750 center	660 center	750
Registration Z1,2,3	0.1, 0.2, 0.4%	0.1, 0.2, 0.4%	0.1, 0.2, 0.4%	<0.01, 0.01, 0.02%	0.1, 0.2, 0.4%
S/N ratio	57dB N, 54dB P	59dB N, 56dB P	57dB	57dB	57dB
Contours out of	Green	Green	Green	Green	Green
ND filters	Internal	Internal	+12% internal	+12%	+12% internal

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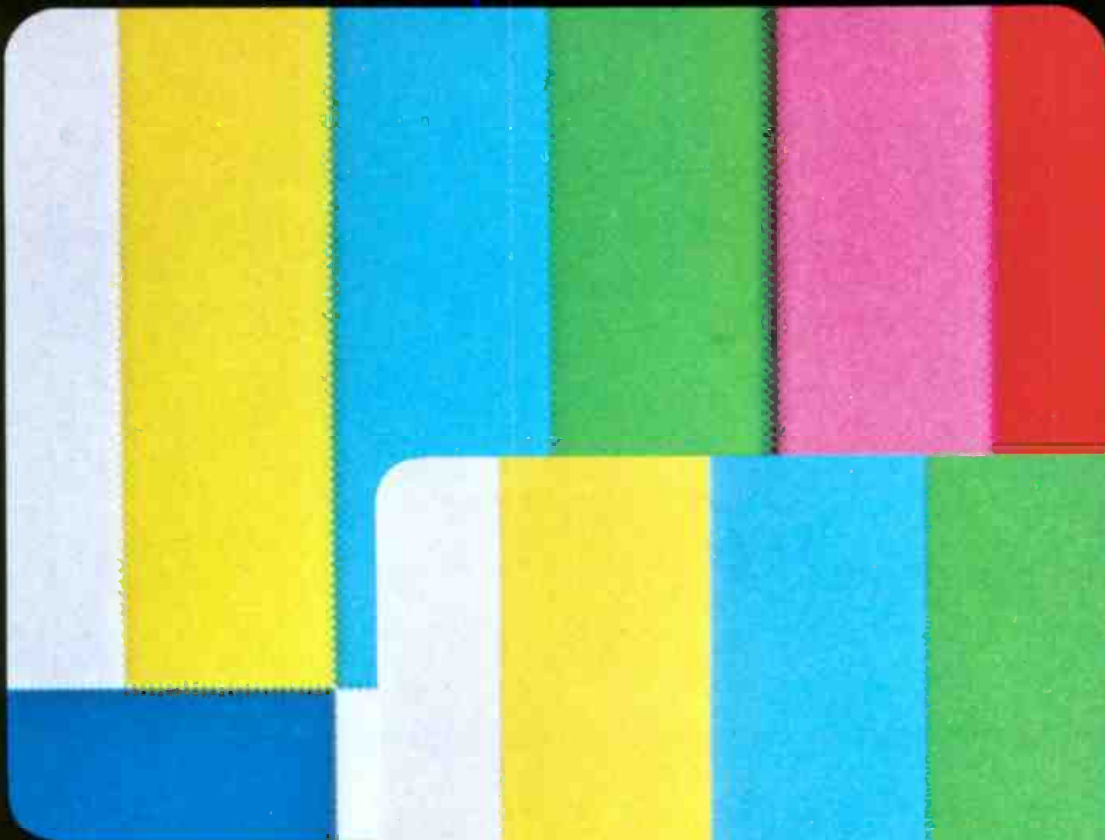
## Color Television Cameras

Manufacturer	Panasonic/Industrial			Sharp Electronics	
	Model/Series Number	WV-888	WV-890 [P3]	XC-B10	XC-B20P
Color correction	Optic	Optic	3 position optic	3 position optic	3 position optic
Color standards	NTSC, PAL	NTSC, PAL	NTSC	NTSC	NTSC
Output signal forms	YIQ/M-format	YIQ/M format	Composite, RGB	Composite, RGB	Composite, RGB
CCU required/option	Option	Option	RCU opt	RCU opt	RCU opt
μP control	Single	Single	Single	Yes	Yes
Setup memories	Color balance	Color balance	Color balance	Color balance	Color balance, clock
Auto centering	Yes	Yes	Yes	Yes	Yes
Auto registration	No	No	No	No	.....
Auto cable compensation	No	No	No	No	.....
Computer setup system	No	No	.....	No	No
Diagnostic display	None	No	VF	VF	VF
Cable types	Multi/c	Multi/c	Multi/c, coax, triax	300m triax opt	Multi/c, coax
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight lbs	12.1	10.3	10.8	10.5	10.5
Docking VCR	No	No	M-II/Betacam adapters	Betacam/M-II adapters	No
Reader Service Number	544	545	546	547	548

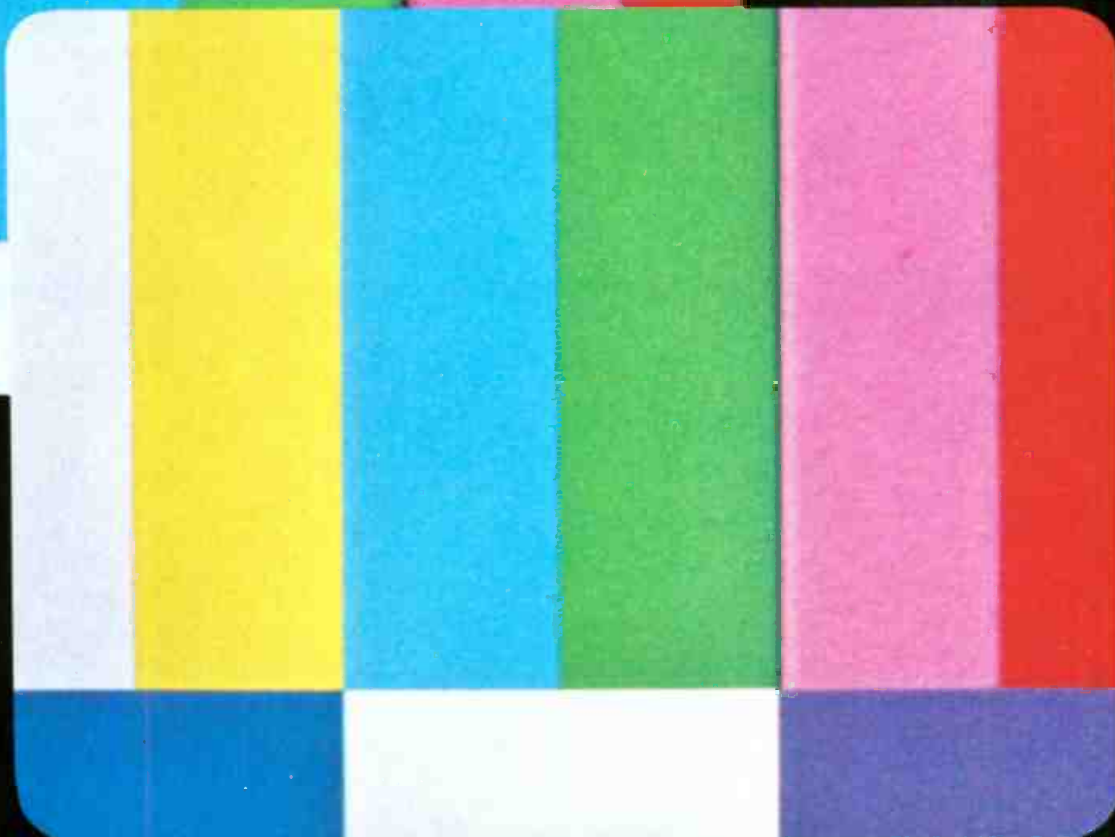
Manufacturer	Sony Broadcast					
	Model/Series Number	BVP-330A	BVP-5	BVP-150, -150P	BVP-350 [BVP-360]	BVP-3A [BVP-30]
Application	ENG, EFP, studio	ENG	ENG	ENG	ENG, EFP [& studio]	ENG, EFP
Pickup devices	DG PbO	Interline f/t CCD	MF SAT	MF SAT	PS PbO [DG PbO]	MF SAT [DG PbO]
Optical format	3/4"	3/4"	3/4"	3/4"	3/4", f/1.2	3/4"
Sensitivity 89.9%R	200fc, f/4.5	200fc, f/5.6	200fc, f/4	200fc, f/4	2000 lux, f/4.5 [200fc]	200fc, f/4.5
Max sensitivity	2.5fc, +18dB	1.5fc +18dB	3fc, +18dB	3fc, +18dB	10 lux f/1.2 24dB [1fc]	3fc, +18dB
Resolution TVL, % mod	650	550 (510x492 array)	650	700	700	650
Registration Z1,2,3	0.1, 0.2, 0.4%	0.05% fixed	0.1, 0.2, 0.4%	Digital [0.05/.1/.15%]	0.1, 0.15, 0.3%	0.1, 0.15, 0.3%
S/N ratio	58dB N	58dB	57dB N, 55dB P	60dB	59dB N, 57dB P	59dB N, 57dB P
Contours out of	Green	Green spatial offset	Green	RGB ob aperture	Green	Green
ND filters	Internal	.....	Internal optic	2 position internal	Internal	Internal
Color correction	Optic, electronic	4 optic	Optic	4 pos optic [& elect]	Optic, electronic	Optic, electronic
Color standards	NTSC, PAL	NTSC	NTSC, PAL	NTSC [& PAL]	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM
Output signal forms	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Composite [RGB/YCrCb]	Composite, YCrCb	Composite, YCrCb
CCU required/option	CCU-300 suggested	No	CCU-M3 suggested	CCU-360 triax opt[360H]	CCU-300 option	CCU-300 option
μP control	Yes	Yes	Single	Single	Single	Single
Setup memories	Color, black, center	Balance, filters	Color, black, center	Color balance [& lens]	Color, black, center	Color, black, center
Auto centering	Yes	Fixed	Yes	Yes	Yes	Yes
Auto registration	No	Fixed	No	Yes	No	No
Auto cable compensation	No	No	No	Yes	No	No
Computer setup system	No	No	No	w/CCU [in head/CCU]	No	No
Diagnostic display	No	.....	In viewfinder	Viewfinder [& CCU]	No	No
Cable types	Multi/c, coax, triax	Coax	Multi/c	Triax, multi [& coax]	Multi/c, coax, triax	Multi/c, coax, triax
Portable unit	Yes	Yes	Yes	Yes [No]	Yes	Yes
Camera head weight lbs	11.9	19.5 operational	9.2	> 13.5 [50 w/VF]	10.1	10.1
Docking VCR	No	BVW-105	No	No	BVW-3A [BVW-30A]	BVW-3A [BVW-30A]
Reader Service Number	549	550	551	552 [553]	554 [555]	554 [555]

Manufacturer	Sony Broadcast			Thomson Video Equipment	
	Model/Series Number	BVP-SuperMotion <sup>1</sup>	HDC-100 <sup>2</sup>	TTV 1530	TTV-1623 [-1624]
Application	EFP, slow motion	HDTV, 1,125/60 only	Studio, OB	ENG, EFP	ENG, EFP
Pickup devices	MS PbO or MS SAT	Mix-field SAT	LOC DG PbO	SAT [LOC PbO]	Interline f/t CCD
Optical format	3/4"	1"	3/4"	3/4"	3/4" 510x493-pix
Sensitivity 89.9%R	200fc, f/4.5	200fc, f/3	130 fc, f/4	.....	1100 lux, f/4
Max sensitivity	10fc, +6dB	25fc, f/1.6, +6dB	2 fc, +18dB	3 fc, +18dB	12 lux, +21dB
Resolution TVL, % mod	500	1200	400 @ 50% mod	650	550
Registration Z1,2,3	0.1, 0.2, 0.4%	0.025, 0.05, 0.1%	0.05, 0.1, 0.1%	0.1, 0.2, 0.4%	0.05% overall fixed
S/N ratio	51dB for system	.....	58dB N, 57dB P	57dB [58dB] N	59dB N, 57dB P/S
Contours out of	Green	Green	Green	Green	RGB
ND filters	Int optic	Int optic	Internal	Internal	Internal
Color correction	Int optic	Int optic	Optic	Optic	Electronic
Color standards	NTSC & 90fr/s	HDTV	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Output signal forms	.....	RGB, Y/Cw/Cn	Composite, RGB	Composite, RGB, YCrCb	RGB, adapters
CCU required/option	CCU-3000/DPU-3000	HDCO-100 required	No	Opt	w/CA-83 adapter opt
μP control	Yes	Distributed	Multiple	Distributed	Ops, status
Setup memories	.....	Color, black, gamma	Color, centering	Color, centering	2 B/W bal per color set
Auto centering	Yes	Yes	Yes	Yes	Fixed





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## Color Television Cameras

Manufacturer	Sony Broadcast		Thomson Video Equipment		
Model/Series Number	BVP-SuperMotion <sup>1</sup>	HDC-100 <sup>2</sup>	TTV 1530	TTV-1623 [-1624]	TTV 1640
Auto registration	Yes	Yes	.....	Option	Fixed
Auto cable compensation	Yes	Yes	.....	No	.....
Computer setup system	In CCU	In CCU	External unit opt	From CCU, ext unit	Opt
Diagnostic display	.....	No	Yes	Viewfinder	Status, VF
Cable types	Multi/c, fiber optic	Multi/c, fiber optic	Multi/c, triax	Multi/c, coax, triax	Triax w/CA83 adapter
Portable unit	Yes	No	No	Yes	Yes
Camera head weight lbs	12	22 camera head	62	9.4	7.7
Docking VCR	No	No	No	Betacam format	Betacam adapter
Reader Service Number	556	557	558	559 [560]	561

<sup>1</sup>System requires BVH-2700 VTR & BFT-2700 TBC for implementation.

<sup>2</sup>System requires HDT-1000 TBC & HDV-1000 VTR for implementation.

## TV Camera Zoom Lenses

The following group of lenses use 1/2" optics. All lens systems include a focus zoom servo unless noted. Availability of integral diascope features is designated by a diamond (◆).

Manufacturer	Angenieux		Schneider Optics
Model/Series Number	◆40x14ERM†	◆18x12.5HP†	TV59.02 Apo-varon HM14X
Application	EFP/sports	Studio/OB	ENG/EFP
Zoom range (basic) mm	14-560	12.5-225	6.5-91, 13-182 (4.5)

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## TV Camera Zoom Lenses

Manufacturer	Angenieux		Schneider Optics
Model/Series Number	◆40x14ERM†	◆18x12.5HP†	TV59.02 Apo-varon HM14X
Aperture (wide-tele)	f/1.9-f/32.1	f/1.5-f/1.7	f/1.4-f/3
MOD distance	0" (at front glass)	27.8"/0.6m	31.5"/0.8m
MOD image area (HxVmm)	55x41.5 (8.2'/2.5m)	80x60	53x40
Horiz. angle (wide-tele)	49.75°-1.33°	54°1.3'-5°02'	53°-4°, 27°-2.2°
Back focus distance mm	Manual, electronic	....	35.5
Clear apertures (f/r) mm	....	....	70.5, 30.5
Integral extender(s)	2.1x std, 1.45x opt	1.6x, 2.5x	2x
Macro focus feature	....	....	Yes
Zoom/iris servo	LEDs show position	Belt-drive w/LED	Yes
Weatherized housing	....	....	No
Assembly weight	43 lbs	....	3.95 lbs/1.8 kg
	†μP-control	†HEC coatings	
Reader Service Number	562	563	564

## TV Camera Zoom Lenses

The following group of lenses use  $\frac{2}{3}$ " optics. All lens systems include a focus zoom servo unless noted. Availability of integral diascope features is designated by a diamond (◆).

Manufacturer	Angenieux			Canon		
Model/Series Number	14x6	14x7	J13x9BIE-II	J40x9.5BIE	◆J45x9.5BIE	J18x9BIRS
Application	ENG/EFP w/CCD	ENG/EFP w/CCD	ENG	OB, studio	EFP, OB, sports	ENG, EFP
Zoom range (basic) mm	6-84	7-98	9-117	9.5-380	9.5-430	9-126
Aperture (wide-tele)	f/1.4-f/1.6	f/1.4-f/1.6	1.6-1.9	1.4-2	1.7-3	1.7-2.4
MOD distance	31"/0.8m	31"/0.8m non-macro	29.1"/0.8m	8.2'/2.5m	70.9"/1.8m	35"/0.9m
MOD image area (HxVmm)	61x46 non-macro	52x39	56x42	50x38	33x25	45x34

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## TV Camera Zoom Lenses

Manufacturer	Angenieux			Canon		
Model/Series Number	14x6	14x7	J13x9BIE-II	J40x9.5BIE	◆J45x9.5BIE	J18x9BIRS
Horiz. angle (wide-tele)	58°-4.5°	52°-4°	52.1°-4.3°	49.7°-1.3°	49.7°-1.2°	52.1°-3.1°
Back focus distance mm	Adjustable	Adjustable	22.1-48.3*	48.9-41.7*	48.3-42*	40.6-48.6*
Clear apertures (f/r) mm	.....	.....	72.6, 31.7	200, 37	146.8, 33	82.8, 31.2
Integral extender(s)	2x†	2x†	2x available	2x	2x, 1.5x option	2x
Macro focus feature	0 (at front glass)	0	Yes	No	No	Yes
Zoom/iris servo	Yes	Yes	Yes	Yes	Yes	Yes
Weatherized housing	.....	.....	.....	No	.....	.....
Assembly weight	4.2 lbs	3.1 lbs	3.2 lbs	66 lbs	30.8 lbs	3.75 lbs
	†Wide-angle opt	†Wide-angle, retro-zoom, tele opt	-Camera dependent			
Reader Service Number	565	566	567	568	569	570

Manufacturer	Fujinon					
Model/Series Number	A12x9ERM	◆A18x8ESM (A20x7ESM)	◆A15x8ESM	A22x12.5ERM	◆A8.5x5.5ERM	A10x10RM
Application	ENG	EFP	ENG	ENG, EFP	Wide-angle	ENG
Zoom range (basic) mm	9-108	8-144 (7-140)	8-120	12.5-275	5.5-47	10-100
Aperture (wide-tele)	f/1.7-f/1.9	f/1.5-f/1.9 (f/1.4-1.6)	f/1.5-f/1.6	f/2-f/2.8	f/1.7-f/1.9	f/1.6-f/1.7
MOD distance	3'/0.95m	27.5*/0.7m (0.75m)	27.5*/0.7m	6'/1.8m	12*/0.3m	39.36*/1m
MOD image area (HxVmm)	73x55	51x38 (58x44)	61x46	54x41	57.9x43.4	80x60
Horiz. angle (wide-tele)	52°06'x4°40'	57°37'x30°30*	57°37'-4°12'	38°47'x1°50'	77°19'x10°41'	47°30'x5°02'
Back focus distance mm	.....	Adjustable	Adjustable	Adjustable	.....	.....
Clear apertures (f/r) mm	.....	.....	.....	.....	.....	.....
Integral extender(s)	2x	2x	2x	2x	1.7x	No
Macro focus feature	Yes	.....	.....	Yes	No	Yes
Zoom/iris servo	Yes	Yes	Yes	Yes	Yes	Yes
Weatherized housing	.....	No	No	Yes	No	.....
Assembly weight	4 lbs	28.6 lbs (33 lbs) *(64°18x3°36)	28.6 lbs	8 lbs	4.2 lbs	3 lbs
Reader Service Number	571	572 (573)	574	575	576	577

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Manufacturer	Fujinon					Schneider Optic
Model/Series Number	◆A14x8ERM	◆A17x8.5ESM	◆A44x9.5ESM	A16x9.5RM	◆A44x9.5ESM	TV80
Application	ENG, EFP	EFP	EFP	ENG	EFP	Studio, OB
Zoom range (basic) mm	8-112	8.5-145	9.5-420	9.5-152	9.5-420	8.5-150, 17-300
Aperture (wide-tele)	f/1.7-f/2.1	f/1.2-f/1.4	f/1.4-f/2.5	f/1.8-f/2.4	f/1.2-f/2.1	f/1.4-f/4
MOD distance	27.5"/0.7m	29"/0.75m	7.2"/2.2m	37.4"/0.95m	8.2"/2.5m	27.5"/0.7m
MOD image area (HxVmm)	73x55	51x38 (58x44)	61x46	54x41	57.9x43.4	80x60
Horiz. angle (wide-tele)	57°37'-4°30'	54°44'-3°29'	49°42'-1°12'	49°42'-3°29'	49°42'-1°12'	55.5°-3.4°, 27.7°-1.7°
Back focus distance mm	Adjustable	Adjustable	Adjustable	.....	Adjustable	42.4
Clear apertures (f/r) mm	.....	.....	.....	.....	.....	133, 33
Integral extender(s)	2x	2x	2x	No	2x	2x
Macro focus feature	Yes	.....	Yes	Yes	.....	.....
Zoom/iris servo	Yes	Yes	Yes	Yes	Yes	Yes
Weatherized housing	Yes	No	No	.....	No	.....
Assembly weight	5 lbs	44 lbs	32 lbs	4 lbs	55 lbs	33 lbs, 15 kg
Reader Service Number	578	579	580	581	582	583

Manufacturer	Schneider Optics			Schwem Technology	Tamron Industries
Model/Series Number	◆TV 85 Electronic†	TV44	TV66	Gyrozoom 60/300 (FP1)	466H† (H14x9BI)
Application	35x Tele, OB	ENG, EFP	EFP	ENG/EFP	ENG
Zoom range (basic) mm	11-385, 22-770	9-126, 18-252 (6.3-9)	8.8-130, 17.6-260	9-126, 18-252 (6.3)	60-300
Aperture (wide-tele)	f/1.4-f/2.6	f/1.7-f/4.2	f/1.4-f/3.4	f/1.7-f/4.2	f/6.2 (range to f/32)
MOD distance	9.8"/3m	31.5"/0.8m	17.7"/0.45m	31.5"/0.8m	10"/3.048m
MOD image area (HxVmm)	67.9x50.2	54x41	43x32	54x41	.....
Horiz. angle (wide-tele)	42.5°-1.4°	52°-4°, 27°-2.2°	56°-4°, 28°-2°	52°-4°, 27°-2.2°	5.24-1.05 (½-diagonal)
Back focus distance mm	44.12	42.5-47.6 adjustable	43.6	42.5-47.6	Adjustable
Clear apertures (f/r) mm	150, 31.8	72, 29.5	134, 35.8	72, 29.5	.....
Integral extender(s)	2x, 1.5x option	2x	2x	2x	.....
Macro focus feature	.....	.....	.....	.....	.....
Zoom/iris servo	Yes	Yes	Yes	Yes	Yes
Integral diascope	Per camera specs	No	.....	No	No

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## TV Camera Zoom Lenses

Manufacturer	Schneider Optics				Schwem Technology	Tamron Industries
Model/Series Number	◆TV 85 Electronic†	TV44	TV66	TP56 Apo-vàron	Gyrozoom 60/300	466H† (H14x90I)
Weatherized housing	.....	No	.....	Yes	No	No
Assembly weight	50.6 lbs (23kg) †16-bit µP control	3.3 lbs (1.7kg)	41.8 lbs, 19 kg	3.96 lbs, 1.8 kg	7.25 lbs 60/300 pan rate 6°/s FP-1 pan rate 30°/s	3.33 lbs †No focus servo
Reader Service Number	584	585	586	587	588 (607)	589

The following group of lenses use 1" optics. All lens systems include a focus zoom servo unless noted. Availability of integral diascope features is designated by a diamond (◆).

Manufacturer	Angenieux				Canon	
Model/Series Number	14x8	◆40x9.5†	14x9	14x7	PV40x13.5BIE	PV18x11BIE
Application	ENG/EFP	EFP/sports	ENG/EFP	ENG/EFP	OB, studio	OB, studio
Zoom range (basic) mm	8-112	9.5-380	9-126	7-98	13.5-540	11-200
Aperture (wide-tele)	f/1.6-f/2	f/1.3-f/2.1	f/1.6-f/2	f/1.6-f/2	1.7-2.8	1.6-2
MOD distance	31"/0.8m	0" (at front glass)	31"/0.8m	31"/0.8m	8.2'/2.5m	23.6"/0.6m
MOD image area (HxVmm)	61x46	55x41.5 @ 8.2'/2.5m	52x39	72x54	53x40	49x37
Horiz. angle (wide-tele)	58-4.5	49.75-1.3	52-4	64-5	50.7°-1.4°	60.4°-3.7°
Back focus distance mm	Adjustable	Manual, electronic	Adjustable	Adjustable	62.8	62.79
Clear apertures (f/r) mm	.....	.....	.....	.....	200, 38.7	185.2, 42.4
Integral extender(s)	2x†	2.1x std, 1.45x opt	2x†	2x	2x	1.5x or 2x
Macro focus feature	0 (to front glass)	.....	0 (to front glass)	0 (at front glass)	No	No
Zoom/iris servo	Yes	LEDs show position	Yes	Yes	Yes	Yes
Weatherized housing	.....	.....	.....	.....	.....	.....
Assembly weight	3.9 lbs	43 lbs	3.1 lbs	5.5 lb	66 lbs	59 lbs
	†Wide-angle attachment	†µP-control	†Wide-angle, retro-zoom, tele attachments			
Reader Service Number	590	591	592	593	594	595

Manufacturer	Fujinon			Schneider Optics
Model/Series Number	◆R17x12.5ESM	◆R44x13.5ESM	◆R20x10.5ESM	◆TV64
Application	BCTV, studio	BCTV	BCTV, studio	Studio, OB
Zoom range (basic) mm	12.5-215	13.5-600	10.5-210	13-190, 26-380
Aperture (wide-tele)	f/1.6-f/2	f/1.8-f/3	f/1.6-f/2.1	f/1.7-f/3.4
MOD distance	29"/0.75m	8.2'/2.5m	29"/0.75m	15.7"/0.4m
MOD image area (HxVmm)	58x44	50x37	58x44	43.3x32.5
Horiz. angle (wide-tele)	54°13'-3°25'	50°44'-1°13'	62°44'-3°29'	54°-4°, 28°-2°
Back focus distance mm	Adjustable	Adjustable	Adjustable	71.6
Clear apertures (f/r) mm	.....	.....	.....	134, 43
Integral extender(s)	1.5x, 2x	2x	1.5x, 2x	2x
Macro focus feature	.....	.....	.....	.....
Zoom/iris servo	Yes	Yes	Yes	Yes
Weatherized housing	No	No	No	.....
Assembly weight	42 lbs	55 lbs	45 lbs	41.8 lbs, 19 kg
Reader Service Number	596	597	598	599

The following group of lenses use 1 1/4" optics. All lens systems include a focus zoom servo unless noted. Availability of integral diascope features is designated by a diamond (◆).

Manufacturer	Angenieux	Canon		Fujinon		Schneider Optics	
Model/Series Number	◆18x16.5HP	P40x18BIE	◆P18x15BIE	◆P44x18ESM	◆P17x16.5ESM	◆P20x14ESM	◆TV65
Application	Studio/OB	OB, EFP, sports	Studio, OB	EFP, OB	Studio, OB	Studio, OB	Studio, OB
Zoom range (basic) mm	16.5-297	18-720	15-270	18-800	16.5-280	14-280	16.5-240
Aperture (wide-tele)	.....	2.3-3.8	2.1-2.7	f/2.4-f/4	f/2.1-f/2.7	f/2.1-f/2.8	f/2.2-f/6.4
MOD distance	27.8"/0.6m	8.2'/2.5m	23.6"/0.6m	8.2'/2.5m	29"/0.75m	29"/0.75m	15.7"/0.4m
MOD image area (HxVmm)	53x40	49x37	50x37	59x44	58x44	45.3x34	
Horiz. angle (wide-tele)	54-1.3	50.7°-1.4°	60.4°-3.7°	50°44'-1°13'	54°50'-3°30'	62°53'-3°30'	54=0-4.2=0
Back focus distance mm	.....	75	75.3	.....	Adjustable	.....	71.5
Clear apertures (f/r) mm	.....	200, 36	185.2, 39.1	.....	.....	.....	134, 37.5
Integral extender(s)	1.6x, 2.5x	2x	15x or 2x	2x	1.5x, 2x	1.5x, 2x	2x
Macro focus feature	.....	No	No	.....	.....	No	.....
Zoom/iris servo	Belt, LED readout	Yes	Yes	Yes	Yes	Yes	Yes
Weatherized housing	.....	.....	.....	No	No	No	.....
Assembly weight	.....	66 lbs	59 lbs	55 lbs	42 lbs	43 lbs	41.8 lbs, 19 kg
	HEC coatings						
Reader Service Number	600	601	602	603	604	605	606

# Technical Difficulties

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# Color Video Monitors

This equipment includes video monitors suitable for display of standard, HDTV and computer generated video signals. Under component inputs, YCrCb refers to equi-band R-Y/B-Y components, rather than unequal bandwidth I/Q, and YCwCn are HDTV format components. Models marked with a diamond (◆) include a  $\mu$ P-controlled auto setup system. Except for those models marked with a bullet (•), the image aspect ratio is 4:3. H-V delay and cross pulse display is standard except on models marked with (‡). Abbreviations N (NTSC), S (SECAM), P- (PAL).

Manufacturer	ASACA/ShibaSoku				
Model/Series Number	CM44A1 (CM43A1)	CMM7 series	CMM11 series	◆CM22A6 (CM65A)	CM99A
Application	Master, utility	Master, utility	Master control	Master control HDTV	Portable
CRT diagonal	14" (15")	20" (14", 26")	20" (14", 26")	20" (26")	9"
CRT type	Inline dot (flat)	Inline dot (slot-26")	Delta-dot	Inline (delta) dot	Inline dot
Dot/stripe pitch in mm	.....	0.31 (0.38)	0.31 (0.37, 0.43)	0.26 (0.37)	0.30
Beam feedback CRT	Yes	No	No	No	No
Suggested resolution (TVL)	500	600	>600	1000	500
Luma bandwidth	60Hz-7MHz	To 7MHz	>7MHz	To 30MHz	To 7MHz
Chroma bandwidth	500kHz R-Y/B-Y	1.3MHz	I-1.3, Q-0.5	To 7MHz	To 1.3MHz
Aperture correction	0-8dB @ 2.8MHz	-10, 0dB	>10dB range	.....	-10,0dB range
Chroma decoder	Comb filter	Comb filter	Comb filter	.....	Comb filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	I, Q	.....	R-Y, B-Y
X-Y outputs	.....	Yes	Yes	.....	No
Blue gun only test	No	No	No	.....	No
Underscan	Yes	To 95%	To 95%	To 92%	To 95%
Available for	N, RGB	N, P, S, RGB	N, P, S, RGB	RGB	N, P
Multistandard unit	No	Switch selected	Switch selected	No	No
Composite inputs	3 inputs	N, P, S	N, P, S	No	N, P
Component inputs	RGB 8-pin	RGB	RGB, YCrCb forms	RG8, YCrCb, YCwCn	RGB
VCR input/output	No	No	No	No	No
Integral AF amp/speaker	No	No	No	No	No
Reader Service Number	611	612	613	614	615

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## Color Video Monitors

Manufacturer	Barco Industries				Brabury (Grunder & Assoc)
Model/Series Number	CM22 (CM33, CM51)	CTVM 4 series	◆CVS series†	-HDTV series‡	MCM37B (MCM series)†
Application	Master, utility	Master control	Master control	.....	Utility
CRT diagonal	9" (14" 19")	14" (20", 26")	14" (20")	20", 26", 30", 40"	14" (9", 20")
CRT type	Inline dot	Delta or inline dot	Inline dot	Delta dot	In-line, black matrix dot
Dot/stripe pitch in mm	0.30 (0.43)	0.31	0.31	0.34	0.31
Beam feedback CRT	Yes	Yes	Yes	.....	No
Resolution (TVL)	320 -12dB (340)	710 (770)	550	Unspecified	> 600
Luma bandwidth	To 7MHz	± 0.5dB to 10MHz	± 1dB to 8MHz	± 0.5dB, 15kHz-30MHz	± 0.5dB to 4MHz
Chroma bandwidth	.....	0.6 equiband N	0.6 equiband	-based on RGB	1.2MHz
Aperture correction	No	.....	+6dB, 3MHz, switched	No	.....
Chroma decoder	Comb filter	Comb filter	Comb filter	.....	Passive filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y	.....	U/V, I/Q
X-Y outputs	No	Yes	No	No	No
Blue gun only test	Yes	Yes	Yes	No	No
Underscan	Yes	Yes	Corners in	.....	To 10%
Available for	N, P, RGB	N, PAL/-B/M/N, S	N, P, S, RGB	HDTV only	P, S, NTSC-M/-N
Multistandard unit	.....	Auto selection	Auto selection	No	Auto selection
Composite inputs	N, P	N, S, PAL/-B/N/M	N, P, S	No	2 encoded
Component inputs	RGB	RGB & Y/Cr/Cb forms	RGB & Y/Cr/Cb forms	RGB	Analog RGB, YUV
VCR input/output	No	No	No	No	On -A version only
Integral AF amp/speaker	Yes	No	Yes	No	No
			†Color analyzer opt		†Provides split-screen display of inputs 1, 2.
Reader Service Number	616	617	618	619	620

Manufacturer	BTS Broadcast TV Systems	Conrac/Display Products	Croma Research	Curtis & Green	
Model/Series Number	LDH6200/-20‡(LDK7020‡)	MC37BA (51BA, 22BA)	◆6545/6550 Micromatch	CM137 (CM142/151)	CG23400 series‡
Application	Master, utility	Master control	Master control	Master control	Mobile monitoring
CRT diagonal	14"/20"(20")	14" (20", 9")	13" (19")	14" (16", 20")	14", 16", 22", 27"
CRT type	Inline self converging†	Inline dot EBU/US phos	PL, dot mask	Inline, self-converged	.....

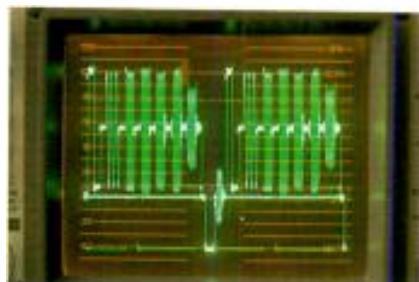
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## Color Video Monitors

Manufacturer	BTS Broadcast TV Systems		Conrac/Display Products	Croma Research	Curtis & Green
<b>Model/Series Number</b>	LDH6200/-20†(LDK7020‡)	MC37BA (51BA, 22BA)	◆6545/6550 Micromatch	CM137 (CM142/151)	CG23400 series‡
Dot/stripe pitch in mm	0.65(0.40)	0.31 (0.43, 0.30)	0.31 (0.44)	0.31 (0.43)	.....
Beam feedback CRT	No	.....	Yes	Yes	.....
Resolution (TVL)	> 310 (>650)	Equiv. to 5MHz	>800	.....	.....
Luma bandwidth	To 5MHz	± 0.5dB to 6MHz	± 1dB to 8MHz Mono	± 0.5dB to 5.5MHz	.....
Chroma bandwidth	To 0.9MHz	± 1MHz	± 1dB to 12MHz RGB	± 0.3dB to 5.5MHz RGB	.....
Aperture correction	± 4dB range	Adjustable	6.5dB gain @ 2.5MHz	Yes	.....
Chroma decoder	Comb filter	Notch and comb filter	Comb filter	Comb filter	Notch
Demodulation axes	R-Y, B-Y	R-Y, B-Y	.....	R-Y, B-Y	R-Y, B-Y
X-Y outputs	No	Yes (Yes, No)	.....	Option on N, P	No
Blue gun only test	No	Yes	Yes	Yes	No
Underscan	To 10%	Yes	Adjustable range	Yes	No
Available for	N, P, S, RGB	N, PAL/M/N, S	N, PAL/B	N, PAL/B/M/N, S	N3.58/4.43, P
Multistandard unit	N or P/S	Option	Self sensing	Auto dual, triple	S, 1/3/4-standard
Composite inputs	A, B inputs	A, B inputs	A, B	Yes	Yes
Component inputs	RGB inputs	RGB	RGB	RGB	No
VCR input/output	No	No	No	No	No
Integral AF amp/speaker	No	No	No	No	No
	†LDK7020 dot mask				
<b>Reader Service Number</b>	621	622	623	624	625

Manufacturer	Digivision Broadcast	Electrohome	Electronic Visuals	Ikegami Electronics
<b>Model/Series Number</b>	BCV37 (BCV51)	ECM 1311†‡	ECM 1900 series†‡	EV6151B‡
Application	Utility	Graphics/EGA	Graphics (CGA/EGA/PGA)	Master control
CRT diagonal	14" (20")	13"	19"	20", 51cm
CRT type	Delta-dot	Anti-glare, dot	High resolution (TVL)	In-line, dot EBU phosphor
Dot/stripe pitch in mm	0.31 (0.43)	0.31	0.31	0.4
Beam feedback CRT	.....	.....	.....	.....
Resolution (TVL)	600	720 dot x 540 line	1024 x 800 interlaced	9MHz equivalent
Luma bandwidth	< ± 3dB to 10MHz	>30MHz RGB	-3dB @ 35MHz	-3dB to > 10MHz
Chroma bandwidth	To 10MHz	.....	.....	± 1.1MHz
Aperture correction	Switch selection	.....	No	.....
Chroma decoder	Notch filter	None	None	Notch filter
Demodulation axes	R-Y, B-Y	n.a.	None	U, V
X-Y outputs	.....	No	No	.....
Blue gun only test	.....	No	No	No
Underscan	Yes	-5%, +10%	No	No
Available for	N, CCIR 625/50	RGB/RS-170, IBM-TTL	Analog RGB, TTL	PAL-D std (P opt)
Multistandard unit	No	Auto sync sensing	Switched, sync sensing	No
Composite inputs	N, CCIR 625/50	No	No	A, B, C P encoded
Component inputs	RGB, Y/Cr/Cb	RGB, TTL	RGB, TTL	RGB
VCR input/output	No	No	No	No
Integral AF amp/speaker	No	No	No	No
		†Computer aspect ratio	†Computer aspect ratio	
<b>Reader Service Number</b>	626	627	628	629

Manufacturer	Ikegami Electronics		JVC Company		
<b>Model/Series Number</b>	TM14(TM20)(TM10)-9RH	TM14(TM20)-10RH	◆TM14(TM20)-15RH	TM-9U (-22U‡,-63U‡)	VM-R190SU
Application	Master control	Master control	Master control	Portable mastr, utility	Utility
CRT diagonal	13" (19") [8.5"]	13" (19")	13" (19")	9" (5")	19"
CRT type	In-line self-converge dot	Delta gun, delta dot	In-line, dot	In-line slot	In-line, dot
Dot/stripe pitch in mm	0.31 (0.43) [0.28]	0.31 (0.43)	0.31 (0.43)	0.47	0.4
Beam feedback CRT	No	Yes	No	No	No
Resolution (TVL)	700 [600]	800	700	310	>600
Luma bandwidth	-3, +1dB to 8MHz	-3, +1dB, 60Hz-10MHz	-3, +1dB, 60Hz-10MHz	To 4MHz	>8MHz
Chroma bandwidth	± 0.5dB 0.3(0.6)MHz	± 0.5dB, I-0.6, Q-0.3	≤ -2dB, 1.3MHz R-Y, B-Y	To 3.58MHz	> 1.2MHz
Aperture correction	+10dB	+10dB	10dB	No	Yes
Chroma decoder	Comb, notch filters	Comb filter	Adaptive Faroudja comb	Comb filter	Comb, notch filters
Demodulation axes	I/Q [R-Y, B-Y]	I/Q	R-Y, B-Y	R-Y, B-Y (I/Q)	R-Y, B-Y
X-Y outputs	R-Y, B-Y [No]	Yes	Yes	No	No
Blue gun only test	Yes [No]	Yes	Yes	No	No
Underscan	90%	90%	Yes	Yes (no)	Yes
Available for	N	N	N	N	N, IBM CGA/TTL
Multistandard unit	No	No	No	No	No
Composite inputs	A, B, C [A, B]	Yes	Yes	Yes	2-inputs
Component inputs	RGB option [No]	RGB, other components	RGB, Y/R-Y/B-Y opt	No	RGB, M-II, Beta, Y/C
VCR input/output	No	No	No	No (Yes)	8-pin
Integral AF amp/speaker	No	No	No	No (Yes)	No
<b>Reader Service Number</b>	631	632	633	634	635

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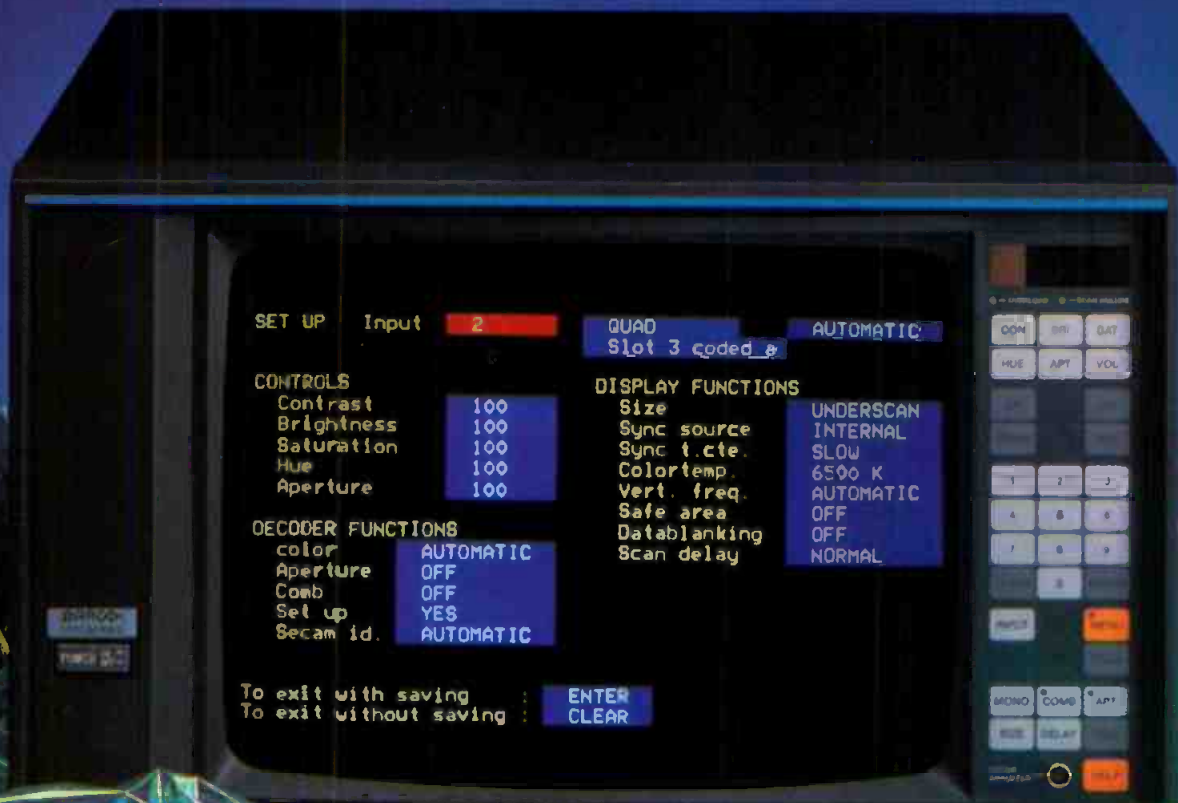
# Color Video Monitors

Manufacturer	JVC Company	Lenco		Panasonic Industrial	
Model/Series Number	TM-2048U‡ (-13U‡)	PCM 519-4	ICM-219‡	BT-S1000N (BT-S series)	CT-1030M, 1301 (1400)‡
Application	Utility	Master control	Utility	Utility	Utility (& data)
CRT diagonal	19" (13")	19" (14")	19" (14")	10" (7", 13", 19")	10", 13" (14")
CRT type	In-line	in-line do	Inline slot	In-line	In-line (dot)
Dot/stripe pitch in mm	..... (0.47)	0.47	0.68	.....	..... (0.49)
Beam feedback CRT	No	No	No	No	No
Resolution (TVL)	> 350	650	450	300	300, 280 (370 or 580-dot)
Luma bandwidth	.....	To 10MHz	To 5.5MHz	To 4.2MHz	To 4.2MHz
Chroma bandwidth	.....	To 3.5MHz ± 1dB	To 3.5MHz ± 1dB	To 1.5MHz	To 1.2MHz
Aperture correction	Yes (No)	± 3dB	± 6dB	No	1301 & 1400 only
Chroma decoder	Comb filter	Comb filter	No	Notch or comb filter	Comb, notch
Demodulation axes	R-Y, B-Y	I, Q	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y
X-Y outputs	No	No	No	No	No
Blue gun only test	No	Yes	No	Yes	No
Underscan	No	Yes	Yes	Yes	No
Available for	N	N, RGB	N	N	N, (RGB, RGB/TTL)
Multistandard unit	No	No	No	No	No
Composite inputs	A and B (A only)	N	N	Line 1, VCR, (Line 2)	Encoded
Component inputs	No	RGB	No	No	(RGB)
VCR input/output	8-pin	No	No	Yes	8-pin connector
Integral AF amp/speaker	Yes	No	No	Yes	Yes
				Also: BT-S1300N, 1900N, S700N, 701N, 702N	
<b>Reader Service Number</b>	<b>636</b>	<b>637</b>	<b>638</b>	<b>639</b>	<b>640</b>

Manufacturer	Panasonic Industrial		Pesa Electronics	Philips T&M	Sharp Electronics
Model/Series Number	BT-M1301Y (-D1910Y)	CT-1331Y (2010, 2580V)‡	BM-4300 series	PM 5625 G/L/M	XM-1900 (XM-1300)
Application	Utility	S-VHS monitor	Utility, master	GP/utility	Master, graphics
CRT diagonal	13", (19")	13", 20", 25"	9", 14", 10"	14"	19" (13")
CRT type	In-line, dot	.....	PIL, stripe	In-line self-converging	In-line dot
Dot/stripe pitch in mm	0.39 (0.55)	Medium res	0.31, 0.44, 0.31	0.65	0.44 (0.31)
Beam feedback CRT	No	No	.....	No	Yes
Resolution (TVL)	550	420, 450	> 450, > 600, > 600	> 310	600
Luma bandwidth	To 4.2MHz	To 3.9MHz	± 0.5dB 50Hz-5MHz	-3dB @ 5MHz	7MHz
Chroma bandwidth	To 1.5MHz	To 1.5MHz	.....	0.9dB to 3.58MHz	3.58MHz
Aperture correction	Yes	No	No	± 4dB	To + 8dB
Chroma decoder	Notch, comb filters	.....	Comb, notch filters	Notch filter	Comb or notch filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	I/Q	R-Y, B-Y	R-Y, B-Y
X-Y outputs	No	No	No	No	No
Blue gun only test	Yes	No	No	Yes	Yes
Underscan	± 5%	.....	Yes	Yes	To 5%
Available for	N	N, S-VHS	N, P	P, S, N	N
Multistandard unit	No	.....	.....	P/S opt	No
Composite inputs	A, B composite	A, B VCR	N or P	A, B encoded	N
Component inputs	Y/C, Y/R-Y/B-Y opt	Y/C from VCR	RGB	RGB	RGB, TTL
VCR input/output	8-pin connector	8-pin connector	No	No	No
Integral AF amp/speaker	No	Yes	No	No	No
<b>Reader Service Number</b>	<b>641</b>	<b>642</b>	<b>643</b>	<b>644</b>	<b>645</b>

Manufacturer	Sharp Electronics	Sony Broadcast			Tektronix
Model/Series Number	XM-900	◀BVM1900/2000	BVM1201/1301	BVM 8021/9021	650HR series
Application	Utility	Master control	Master control	Utility	Master & graphics
CRT diagonal	9"	19"	12"	8"	12"
CRT type	In-line stripe	Trinitron	Trinitron	Trinitron	Trinitron
Dot/stripe pitch in mm	0.47 stripe pitch	0.30	0.25	0.25	0.25
Beam feedback CRT	Yes	Yes	No	No	No
Resolution (TVL)	310	900	600	400	480
Luma bandwidth	To 5MHz	10MHz	8MHz	-3dB at 4MHz	6MHz
Chroma bandwidth	To 3.58MHz	1.5	1.5	1.5	1.3
Aperture correction	.....	± 8dB (4.5-9MHz)	+ 8dBm at 4.5MHz	0, + 8dBm range, 4.5MHz	+ 10dB
Chroma decoder	Comb filter	Comb filter	Precision	Comb filter	Notch filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	.....	.....	UV or R-Y, B-Y
X-Y outputs	No	Yes	Yes	No	Yes
Blue gun only test	Yes	Yes	Yes	Yes	B/W display of blue
Underscan	To 5%	Yes 5%	Yes	-5%/+ 10%	To 20% 10%
Available for	N	N, P	N	N	N, P, S, RGB
Multistandard unit	No	Switch selected	No	No	Switch selected
Composite inputs	Yes	N, P	N	Yes	Yes
Component inputs	No	RGB or Y/Cr/Cb	RGB, Y/Cr/Cb	No	RGB
VCR input/output	No	No	No	Yes	No
Integral AF amp/speaker	No	No	No	Yes	No
<b>Reader Service Number</b>	<b>646</b>	<b>647</b>	<b>648</b>	<b>649</b>	<b>650</b>

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BARCO INDUSTRIES' new CVS professional broadcast monitor is microprocessor-based to make it intelligent in operation and easy to use.

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## Color Video Monitors

Manufacturer	Videotek		
Model/Series Number	HR-130 (HR-190)	VM-13PRO (Studio-13)	AVM-13 (AVM-19)
Application	Master control, graphics	Master control	Utility
CRT diagonal	13" (19")	13", 8" (13")	13" (19")
CRT type	PIL, delta self-converge	Trinitron Plus	Slot mask, in-line
Dot/stripe pitch in mm	0.31	0.25	.....
Beam feedback CRT	No	No	No
Resolution (TVL)	> 600 (> 750) center	380	280/-13" (350/-19" comb)
Luma bandwidth	± 0.3dB to 8MHz	2dB to 3.2MHz	To 3MHz
Chroma bandwidth	± 1dB to 1MHz	To 1.5MHz	To 1MHz
Aperture correction	6dB boost, 4.2MHz	Yes	± 3dB
Chroma decoder	Comb or notch	(Comb or notch)	Switched comb or notch
Demodulation axes	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y
X-Y outputs	No	No	No
Blue gun only test	Yes	Yes	Yes
Underscan	Yes	To 10%	90% of full screen
Available for	N, RGB	N	N only
Multistandard unit	Switch-selected	No	No
Composite inputs	Yes	A, B, C	Yes
Component inputs	RGB	No	No
VCR input/output	No	No	8-conductor
Integral AF amp/speaker	No	No	1.2W/8Ω (1.5W/8Ω)
Reader Service Number	651	652	653

## Digital Video Effects Systems

Manufacturer	Abekas Video Systems		Alta Group	Ampex AVSD
Model Series	A52	A53 (warp opt)	Pyxis w/audio	ADO/1000/2000/3000
Output channels	1 or 2	1 or 2	1	1, expands to 4
No. of image planes	1	1	1	1
System control	Dedicated, soft keys	Dedicated, soft keys	Dedicated keys	Dedicated, soft keys
Instruction memory	DataKey device	Floppy disk	ROM (Still-store)	Floppy disk

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# Digital Video Effects Systems


Manufacturer	Abekas Video Systems			Alta Group	Ampex AVSD
Model Series	A52	A53 (warp opt)	Centaurus	Pyxis w/audio	ADC/1000/2000/3000
Parameter display	Control panel display	Control panel	Control panel	On control panel	Control panel, CRT
VCR connection	No	No	Inc S-VHS out	Yes	No
TBC functions	No	No	Dual, frame sync	Dual, frame sync	No
Remote control port	Switcher/editor/GPI	Switcher/editor/GPI	Switcher/editor/GPI	Editor/GPI	Switcher/editor/GPI
System S/N ratio	52dB	52dB	70dB	53dB	.....
Diff phase, gain	2°, 2%	2°, 2%	3°, 3%	3°, 3%	.....
Sampling rate, bits	14.2MHz, 8-bit	14.2MHz, 8-bit	8-bit, full bandwidth	8-bit luma, chroma	Y-13.5, C-6.75 8-bit
Image size variation	Continuous	Continuous	.....	.....	Continuous
Compression/expansion	Variable	Variable	.....	.....	Infinite
Rotations around	.....	X, Y, Z simultaneous	.....	.....	X, Y, Z simultaneous
Perspective effects	.....	Cube/cyl/page turn	.....	.....	Page turn/cyl/3D/cube
Image freeze	Fld/frm/storyboard(1)	Fld/frm/stroae	Fld/frm/update	Frm/fld each TBC	Fld/frm/trail/update
Picture splits	Yes	.....	H/V, 4-way	Yes	.....
Mirror effects	.....	.....	.....	No	.....
Push-on/off	Yes	Yes	Yes	No	Yes
Posterization (levels)	8, Y & C	8, Y & C	Yes	Yes	Inf. w/false colors
Mosaic tiling	Variable	.....	.....	No	Infinite tile sizes
Programmable sequences	Yes	Yes	No	Yes	Yes
Reader Service Number	866	867	868	869	870

Manufacturer	CEL (Grunder Assoc)		Convergence	DSC/Digital Services	
Model Series	EFX-2	MS-101	CDS-2000	Eclipse	Illusion
Output channels	1	1	1	1	1, expands to 9
No. of image planes	1	1	1	1	1
System control	Touchscreen (Maurice)	Dedicated keys	Knobs on chassis	Dedicated keys	Dedicated keys
Instruction memory	Non-volatile RAM, disk	Non-volatile RAM	.....	Floppy disk	Bubble memory
Parameter display	Control panel	Control panel	.....	Control panel, CRT	Control panel, CRT
VCR connection	Yes	Yes	Yes	No	No
TBC functions	TBC, frame store	TBC, frame store	2-channel TBC w/audio	No	No
Remote control port	GPI	GPI	Switcher/editor	GPI	Editor/GPI
System S/N ratio	56dB	56dB	> 50dB	52dB	.....

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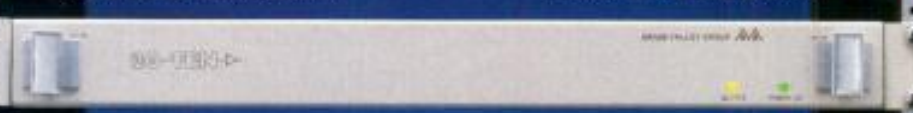
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# Digital Video Effects Systems

Manufacturer	CEL (Grunder Assoc)		Convergence CDS-2000	DSC/Digital Services	
	Model Series			Eclipse	Illusion
	EFX-2	MS-101			
Diff phase, gain	.....	.....	3°, 3%	1°, 1%	3°, 3%
Sampling rate, bits	Y-12.9MHz, 7-bit	Y-12.9MHz, 7-bit	.....	14.38MHz, 8-bit	Y-13.5MHz 8-bit
Image size variation	Variable	Stepped	.....	Continuous	Continuous
Compression/expansion	Continuous	1:4	.....	Variable	Variable
Rotations around	.....	.....	.....	X, Y, Z	Z
Perspective effects	Yes	Yes	.....	Page turn, cube, geo.	Yes
Image freeze	Frm/flid, multi, strobe	Frm/flid, multi, strobe	.....	Fld/frm, strobe	Fld/frm, strobe
Picture splits	Yes	Yes, x4/x9/x16	Yes	No	H/V, field
Mirror effects	.....	.....	No	H & V	H/V, diagonal
Push-on/off	Yes	Yes	Yes	Yes	Yes
Posterization (levels)	6 w/false color	6 w/false color	No	2 w/false color	2 w/false color
Mosaic tiling	H pixelization	H pixelization	No	10 steps H, V	10 levels
Programmable sequences	Yes	Yes	No	Yes	Yes
Other	Component/composite	Composite/component			
<b>Reader Service Number</b>	<b>871</b>	<b>872</b>	<b>873</b>	<b>874</b>	<b>875</b>

Manufacturer	DSC/Digital Services		GML/Gunnerfield Marketing		Grass Valley Group Kaleidoscope DPM-1
	Model Series		Proteus	X-calibre	
	SX-2000D	For-A Corporation FA-440			
Output channels	1	1	1	1, expands to 2	1, expands to 5
No. of image planes	1	1	1	1	2 per channel
System control	Dedicated keys	Dedicated keys	Dedicated keys	Dedicated, soft keys	Dedicated, soft keys
Instruction memory	RAM, bubble memory	ROM	RAM	ROM, floppy disk opt.	Floppy disk
Parameter display	Control panel	On control panel	Control settings	Control panel	On control panel
VCR connection	No	Yes	Multiple VCRs	Yes	No
TBC functions	No	Yes	Yes	Dual. frame store	No
Remote control port	Editor/GPI	.....	Switcher/editor/GPI	GPI	Switcher/editor
System S/N ratio	.....	55dB	58dB	58dB	.....
Diff phase, gain	3°, 3%	2°, 2%	2°, 2%	2°, 2%	.....
Sampling rate, bits	Y-13.5MHz, 8-bit	Y-9MHz, C-2.2MHz	7.2MHz 8-bit	8-bit	.....
Image size variation	Continuous	Stepped	Stepped	Continuous	Continuous
Compression/expansion	Variable	1:4, 1:2	1:4, 1:2	Variable	Variable
Rotations around	Z	.....	No	No	X, Y, Z
Perspective effects	H/V	.....	.....	No	Yes
Image freeze	Fld/frm, strobe	Fld/frm, update	Fld/frm, update, 2-pic	Fld/frm, strobe	Update/multi/trail/decay
Picture splits	Yes	H/V	H/V	Yes	Yes
Mirror effects	H/V, diagonal	H	H/V	H/V	Yes
Push-on/off	Yes	.....	Yes	Yes	Yes
Posterization (levels)	2 w/false color	7 levels	10 w/false color	Yes	Yes
Mosaic tiling	10 levels	H, V	7 tile sizes	Yes	Yes
Programmable sequences	Yes	Yes	Yes	Yes	Yes
<b>Reader Service Number</b>	<b>876</b>	<b>877</b>	<b>878</b>	<b>879</b>	<b>880</b>

Manufacturer	Harris Video Systems		Microltime		NEC DVE System 10
	Model Series		Genesis 1 (Act 1 ctl)	RP-1	
	HDE-100 (HDE-150D)	HDE-200 (HDE-200D)			
Output channels	1 (expands to 2)	1 (expands to 2)	1	1, expands to 2	1
No. of image planes	1	1	1	1	1
System control	Dedicated keys	Dedicated keys	Dedicated, soft keys	Dedicated, soft keys	Dedicated, soft keys
Instruction memory	None (bubble memory)	No (bubble cartridge)	RAM, DataKey device	Floppy disk	Floppy disk
Parameter display	Control panel	Control panel	Control panel	Control panel, CRT	Control panel, CRT
VCR connection	No	No	No	.....	.....
TBC functions	No	No	No	.....	.....
Remote control port	Switcher/editor	Switcher/editor	GPI	GPI	GPI
System S/N ratio	50dB	50dB	58dB	58dB	56dB
Diff phase, gain	2°, 2%	2°, 2%	2°, 2%	2°, 2%	2°, 2%
Sampling rate, bits	14.3MHz, 8-bit	14.3MHz, 8-bit	8-bit	13.5MHz, 8-bit	14.2MHz, 8-bit
Image size variation	Continuous	Continuous	Continuous	Continuous	Variable
Compression/expansion	Variable	Variable	Variable	Variable	Continuous
Rotations around	.....	.....	H, V	X, Y, Z	X, Y, Z simultaneous
Perspective effects	.....	.....	.....	Page turn/cube	Page turn/cube/waves
Image freeze	Update, multi x4/x9/x16	Update, multi x4/x9/x16	Field, strobe	Frm/flid, strobe, trail	Frm/flid, multi, strobe
Picture splits	Yes	Yes	No	Yes	Yes
Mirror effects	No (Option)	Yes	Yes	Yes	Yes
Push-on/off	Yes	Yes	Yes	Yes	Yes
Posterization (levels)	Yes	Yes	9 w/false color	w/false colors	Variable
Mosaic tiling	Yes (Option)	Yes	Variable	Yes	Variable H, V
Programmable sequences	Yes	Yes	Yes	Yes	Yes
Other	.....	.....	.....	Composite, component	.....
<b>Reader Service Number</b>	<b>881</b>	<b>882</b>	<b>883</b>	<b>884</b>	<b>885</b>



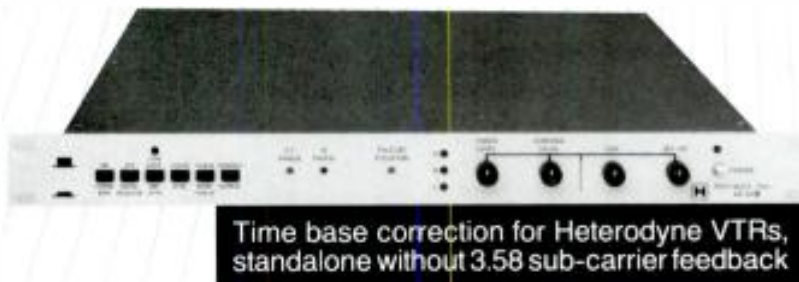
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**TIME BASE CORRECTOR**



Time base correction for Heterodyne VTRs, standalone with 3.58 sub-carrier feedback



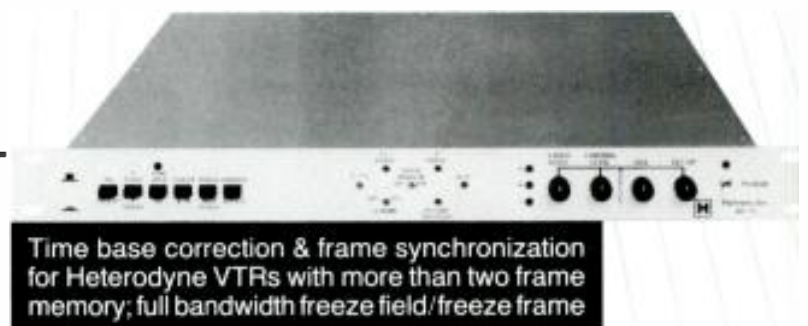
Time base correction for Heterodyne VTRs, standalone without 3.58 sub-carrier feedback

## AE61B

**TIME BASE CORRECTOR**

## AF71

**TBC/FRAME SYNCHRONIZER**



Time base correction & frame synchronization for Heterodyne VTRs with more than two frame memory; full bandwidth freeze field/freeze frame

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## Digital Video Effects Systems

Manufacturer	NEC	Pinnacle Systems	Quantel	QuesTech	
Model Series	DVE System 100	System 2010	DPE5800 Encore	DVM8000 Mirage	Charisma
Output channels	1, expands to 2	Multiple	1, expands to 15	1, expandable	Multiple
No. of image planes	1	Multiple	.....	.....	.....
System control	Dedicated keys	Dedicated keyboard	Dedicated, soft keys	Dedicated, soft keys	Control panel
Instruction memory	Floppy disk	3.5" disk, RAM	Floppy/hard disk, RAM	Floppy/hard disk, RAM	Floppy disk, RAM
Parameter display	Control panel	Menu CRT	Keyboard, CRT	External CRT	CRT, keyboard
VCR connection	.....	Possible	No	No	Yes
TBC functions	.....	Frame buffer	No	No	Yes
Remote control port	GPI	RS232/422	Switcher/editor	Switcher/editor	ESbus
System S/N ratio	50dB	54dB inc quantizing	.....	.....	51dB
Diff phase, gain	2°, 2%	<2°, <2%	.....	.....	1.5°, 2.5%
Sampling rate, bits	14.2MHz, 8-bit	CCIR 601 4:2:2	13.5MHz	13.5MHz	Per CCIR 601
Image size variation	Continuous	Continuously variable	Continuous	Continuous	Yes
Compression/expansion	Variable	Variable axis	Infinite	Infinite	Infinite
Rotations around	No	X, Y, Z	X, Y, Z	X, Y, Z	X, Y, Z
Perspective effects	No	.....	Floating viewpoint	Page turn/3D/cyl/cube	w/Z-axis effects
Image freeze	Fld/frm, update, multi	Multi-freeze	Fld/frm, multi	Fld/frm	Multi, trail, sparkle
Picture splits	H/V	Yes	H/V	H/V, diagonal	Yes
Mirror effects	Yes	Yes	H, V	No	Yes
Push-on/off	Yes	Yes	Yes	Yes	Yes
Posterization (levels)	Variable	Multiple	256, false color	.....	16, false color
Mosaic tiling	Variable	Variable aspect	Yes	.....	Yes
Programmable sequences	Yes	6,000 keyframe memory	Yes	Yes	Yes
Other		Component processing			
<b>Reader Service Number</b>	<b>886</b>	<b>887</b>	<b>888</b>	<b>889</b>	<b>890</b>

Manufacturer	Shintron	Thomson Video
Model Series	Chromaflex 770	TTV-5305
Output channels	1	2 composite, YCrCb
No. of image planes	1	.....
System control	Dedicated keys	Dedicated, soft keys
Instruction memory	ROM	EEROM, floppy disk
Parameter display	Control panel	Control panel
VCR connection	Yes	Yes
TBC functions	TBC, frame store	No
Remote control port	Editor	Switcher
System S/N ratio	52dB	55dB
Diff phase, gain	3°, 3%	3°
Sampling rate, bits	14.3 Y, 4.78 R-Y/B-Y	13.5MHz, 8-bit
Image size variation	Continuous	Continuous
Compression/expansion	Variable	Variable
Rotations around	Z	X, Y, Z
Perspective effects	Yes	Page turn/3D
Image freeze	Frm/fld, strobe	Fld/frm
Picture splits	H/V, fld from fld	H/V, diagonal
Mirror effects	H/V, diagonal	No
Push-on/off	No	Yes
Posterization (levels)	9 w/false color	Yes
Mosaic tiling	9 sizes	Yes
Programmable sequences	No	Yes
<b>Reader Service Number</b>	<b>891</b>	<b>892</b>

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Net Administrator  
76703, 1036

## Editor Controllers

Edit command entries for these audio and video editing control systems are typically entered on the system keyboard. Those offering other command entry means (touchscreen or mouse) are noted with a diamond (◆). All video editing units provide assemble, insert and split edit modes unless noted with a bullet (•). If edit decision list (EDL) management is provided, EDL backup is typically included. Models not providing A/B roll mode are noted with a dagger (†).

Manufacturer	Adams-Smith	Albrecht Elektronik	Alpha Audio	Ampex AVSD	
Model Series	2600 A-V (CC)†	ESP-M series	The Boss 8400†	◆Ace Micro	◆Ace 200
Suggested for	On, off-line	On-line	On, off-line audio	On-line	On, off line
VTRs/ATRs record/play	2-R, 16P (1R, 4P)	1 record, 4 source	Various	1R, 3P	2R, 14P
Videodisc interface	Yes	.....	No	Yes	Yes
Microprocessor	Multiple 8-/16-bit	Multiple 8-bit	Multiple 8-bit	Distributed 16-bit	Distributed 16-bit
Internal storage	>1,000 (100)	3 event	1,000 event	300	6000
Ext storage type	Disk (None)	Paper tape	Floppy disk	F.disk, tape	F.disk, tape
Edit decision list	Yes (no)	No	Yes	Yes	Yes

## Editor Controllers

<b>Manufacturer</b> . . . . .	<b>Adams-Smith</b>
<b>Model Series</b> . . . . .	<b>2600 A-V (CC)†</b>
Edit data display . . . . .	LED displays
Printer interface . . . . .	RS-232C
Animation mode . . . . .	No
Time code reader . . . . .	Yes (No)
Time code generator . . . . .	Yes (Yes)
Time code types . . . . .	SMPTE, EBU
Color framing per . . . . .	NTSC, PAL (None)
Edit accuracy . . . . .	± 1 (± 0.01) frame
Transport control . . . . .	Keyboard
Device interfaces . . . . .	Switcher, title, Effects & (mixer)
Control structure . . . . .	232/422, EBus
†A/V model for standard editing; CC in audio-for-video.	
<b>Reader Service Number</b> . . . . .	<b>796</b>

<b>Albrecht Elektronik</b>
<b>ESP-M series</b>
LED displays
TTY
No
Interface option
In interface
EBU, LTC/VITC
PAL
± 0 frame
Fader, k.board
Switcher, mixer, Effects
Coaxial serial
<b>797</b>

<b>Alpha Audio</b>
<b>The Boss 8400†</b>
CRT, printout
RS-232 Centronics
No
External
External
SMPTE, EBU
No color framing
± 0.03 frame
Keyboard
.....
232/422, EBus
<b>798</b>

<b>Ampex AVSD</b>	
<b>◆Ace Micro</b>	<b>◆Ace 200</b>
CRT	CRT
RS-232	RS 232
Yes	Yes
Yes	Yes
Yes	No
LTC, VITC	LTC, VITC
NTSC, PAL	NTSC, PAL
± 0 frames	± 0 frames
J.stick, k.board	J.stick, k.board
Switcher, mixer, effects	Switcher, mixer, stills graphics, effects
422, GPI	422, GPI
<b>799</b>	<b>800</b>

<b>Manufacturer</b> . . . . .	<b>Audio Kinetics</b>
<b>Model Series</b> . . . . .	<b>Master Mix†</b>
Suggested for . . . . .	Audio mixdown
VTRs/ATRs record/play . . . . .	Multitrack ATR
Videodisc interface . . . . .	No
Microprocessor . . . . .	Centralized 8-bit
Internal storage . . . . .	A/B
Ext storage type . . . . .	Disk
Edit decision list . . . . .	No
Edit data display . . . . .	LED displays
Printer interface . . . . .	No
Animation mode . . . . .	No
Time code reader . . . . .	Yes
Time code generator . . . . .	Yes
Time code types . . . . .	LTC
Color framing per . . . . .	No
Edit accuracy . . . . .	± 0
Transport control . . . . .	No
Device interfaces . . . . .	Mixer, fader opt
Control structure . . . . .	.....
<b>Reader Service Number</b> . . . . .	<b>801</b>

<b>BHP</b>
<b>◆TouchVision</b>
Off-line, non-linear
To 24 sources
.....
Multiple
.....
Yes
CRT
.....
Possible
Yes
.....
SMPTE VITC
NTSC
± 0 frame
Knob
.....
422/232
<b>802</b>

<b>BTS</b>
<b>BBE 900</b>
On, off-line
1R, 3P
No
Centralized 8-bit
128
None
Yes
CRT
None
No
Yes
No
LTC/VITC/ctl-trk/sync
NTSC, PAL
± 0
J.stick, K.board
Switcher, mixer
GPI equipment
422, EBus, GPI
<b>803</b>

<b>Calaway Eng/Quanta</b>	<b>Cipher Digital</b>
<b>CED, CED+ (MK III)</b>	<b>SOFTOUCH</b>
On, off-line	Audio editing
1R, 3P (1R, 5P)	4 transports
No	.....
Centralized 8(16)bit	Distributed
1,000	Multiple
Floppy disk	Ext memory cartridges
Yes	.....
CRT	LED displays
RS-232	No
Yes	Dialog replacement
In interface	Yes
In interface	Yes
LTC/VITC/ctl-trk/sync	LTC, VITC
NTSC, PAL	NTSC, EBY
± 0 frame	± 0
Keyboard, knob	Keyboard
Switcher, mixer, graphic, titles	5 com ports
422/232, GPI	
<b>804</b>	<b>805</b>

<b>Manufacturer</b> . . . . .	<b>CMX Systems</b>
<b>Model Series</b> . . . . .	<b>330XL</b>
Suggested for . . . . .	On, off-line
VTRs/ATRs record/play . . . . .	1R, 4P
Videodisc interface . . . . .	Yes
Microprocessor . . . . .	Distributed 16-bit
Internal storage . . . . .	500
Ext storage type . . . . .	Floppy disk
Edit decision list . . . . .	Yes
Edit data display . . . . .	CRT
Printer interface . . . . .	RS-232
Animation mode . . . . .	Yes
Time code reader . . . . .	In interface
Time code generator . . . . .	In interface
Time code types . . . . .	LTC, VITC, ctl-trk
Color framing per . . . . .	NTSC, PAL
Edit accuracy . . . . .	± 0 frames
Transport control . . . . .	K.board, Gizmo knob
Device interfaces . . . . .	Switcher, mixer
Control structure . . . . .	422/232, GPI
‡Integral 5-in video, 6-in audio switcher.	
<b>Reader Service Number</b> . . . . .	<b>806</b>

<b>3100 (3400/3600)</b>
On, off-line
1R, 6P
Yes
Distributed 16-bit
700 (3,000)
Floppy disk
Yes
CRT
RS-232
Yes
Option
Option
LTC, VITC
NTSC, PAL
± 0 frames
K.board, Gizmo knob
Switcher, mixer
422/232, GPI
<b>807</b>

<b>CMX-8000</b>
Off-line
.....
4 to 24 disk
Distributed 16-bit
Yes
Floppy disk
Yes
CRT
RS-232
Yes
Yes
.....
LTC, VITC
Yes
± 0 frames
Keyboard
Switcher opt, mixer
VTRs
422, GPI
<b>808</b>

<b>CASS 1 (CASS 1E)</b>	<b>CMX-100‡</b>
Audio for video	on-line
1R, 5P	1R, 2P
.....	.....
PC-AT	Distributed
Yes	50
Floppy disk	.....
Yes	Yes
CRT	CRT
RS-232	Yes
.....	.....
Yes	Available
.....	Available
LTC	LTC
.....	NTSC, PAL
± 0	± 0 frame TC
Keyboard	Keyboard knob
Mixer, TimeLine Lynx	4 GPI, ROM VTR
Adams-Smith, others	software
422, GPI	422
<b>809</b>	<b>810</b>

<b>Manufacturer</b> . . . . .	<b>Convergence</b>
<b>Model Series</b> . . . . .	<b>ECS-204x (205)</b>
Suggested for . . . . .	On, off-line
VTRs/ATRs record/play . . . . .	1R, 3P (1R, 7P)
Videodisc interface . . . . .	No
Microprocessor . . . . .	Centralized 8-bit
Internal storage . . . . .	1,000

<b>Super 90†</b>
On, off-line
1R, 1P
No
Centralized 8-bit
Single

<b>ECS-195 (ECS-195+)</b>
On, off-line
1R, 2P
No
Centralized 8-bit
50 (500)

<b>ECS-900+</b>	<b>Edifron</b>
On, off-line	<b>Model -250† (500V)</b>
1R, 5P	Off (& on-line)
No	2R/4P (1R/6P)
Centralized 8-bit	Yes
1,000	Distributed 8-bit
	999

## Editor Controllers

Manufacturer	Convergence				Editron Model -250† (500V)
	ECS-204x (205)	Super 90†	ECS-195 (ECS-195 +)	ECS-900+	
Model Series	ECS-204x (205)	Super 90†	ECS-195 (ECS-195 +)	ECS-900+	Model -250† (500V)
Ext storage type	F.disk, tape, PC	F.disk, tape, PC	F.disk, tape, PC	F.disk, tape, PC	Tape (F-disk)
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	LCD flat panel (CRT)
Printer interface	RS-232	RS-232	RS-232	RS-232	RS-232
Edit modes	Assemble, insert	Assemble, insert	Assemble, insert	Assemble, insert	Assemble, insert
Split modes	Audio	Audio	Audio	Audio	No (Yes)
Animation mode	Yes	Yes	Yes	Yes	No
Time code reader	Yes	Yes	Yes	Yes	Yes
Time code generator	No	Option	Option	Yes	Yes
Time code types	LTC, cti-trk	LTC, cti-trk	LTC, cti-trk	LTC, cti-trk	LTC
Color framing per	NTSC	No	Yes	Yes	NTSC, PAL
Edit accuracy	± 0 frames	± 1frame cti-trk	± 0 frames	± 0 TC, ± 2 cti-trk	± 0 frames
Transport control	J.stick, k.board	J.stick, k.board	J.stick, k.board	J.stick, k.board	J.stick, k.board
Device interfaces	Switcher, GPI, mixer	.....	Switcher, mixer	Switcher, mixer	Switcher, GPI, mixer (& effects, graphics)
Control structure	422/232, GPI	422	422, GPI	422, GPI	422, EBus, parallel
Reader Service Number	811	812	813	814	815

Manufacturer	Editron		EECO		Generic Designs DeskTop
	-Model 100 off-line†	Model 500A	EMME	Ives II (Ives II Pro)	
Suggested for	Audio sweetening	Audio sync, sweetening	On, off-line	On, off-line	On, off-line
VTRs/ATRs record/play	1R, 4P	1R, 14P	9, any function	1R, 1-2P	Multiple
Videodisc interface	No	.....	No	No	.....
Microprocessor	Distributed 8-bit	Distributed 8-bit	Distributed 16-bit	Centralized 8-bit	PC MS-DOS system
Internal storage	99	999	750	Single	.....
Ext storage type	Tape	Floppy disk	F.disk, tape, PC	F.disk, tape, PC	Per PC system
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	LED display	CRT, LCO flat panel	CRT	CRT	CRT
Printer interface	RS-232	RS-232	RS-232	RS-232	Centronics parallel
Animation mode	No	.....	No	Yes	.....
Time code reader	Yes	Yes	Yes	Yes	Yes
Time code generator	Yes	Yes	Option	No	.....
Time code types	LTC	LTC	LTC, cti-trk	LTC, cti-trk	SMPTE
Color framing per	NTSC, PAL	NTSC, PAL	NTSC	NTSC	NTSC
Edit accuracy	± 0 frame	± 0 frames	± 0 frames	± 0 frames	.....
Transport control	Keyboard	J.stick, keyboard	J.stick, k.board	J.stick, k.board	Keyboard
Device interfaces	GPI	16-channel GPI	Switcher	.....	Parallel switcher
Control structure	422, EBus, parallel	422, EBus, parallel	422/232, GPI	422/232, GPI	422
Reader Service Number	816	817	818	819	820

Manufacturer	Grass Valley Group		JVC Company		JVC/Paltex Abner
	IPS-100	Model 51Em	Model 31 (41m)	RM-G850U† (-86U†)	
Suggested for	On/off-line, flyaway	On, off-line	On, off-line	On, off-line	On, off-line
VTRs/ATRs record/play	4, assignable	7 total	7 total	1R, 1P, 2P opt (1/1)	1 record, 2 play
Videodisc interface	No	Option	Option	No	No
Microprocessor	Centralized 16-bit	Distributed 16-bit	Distributed 16-bit	Centralized 8-bit	Centralized 8-bit
Internal storage	1,000	16,000	250 (2,000)	Single event	20 event
Ext storage type	Floppy disk	F.disk, tape	F.disk, tape	No	F-disk, P-tape
Edit decision list	Yes	Yes	Yes	No	Yes
Edit data display	CRT	CRT	CRT	LEO display	CRT
Printer interface	RS-232	RS-232	RS-232	No	RS-232C
Animation mode	Yes	Yes	Yes	No	Yes
Time code reader	In interface	Yes	Yes	No	Yes
Time code generator	In interface	No	No	No	.....
Time code types	LTC, VITC	LTC, VITC	LTC, VITC	Control track	SMPTE, EBU, cti-trk
Color framing per	NTSC, PAL	NTSC, PAL	NTSC, PAL	525/60, 625/50	NTSC, PAL
Edit accuracy	± 0 frames	± 0 frames	± 0 frames	± 2 frames	± 1 frame
Transport control	K.board, Jog-pad	K.board, jogger pot	K.board, jogger pot	Keyboard knobs	Knob
Device interfaces	Switcher, mixer, GPI titler (integral)	Switcher, effects, Stills, title, mixer	Switcher, effects, GPI Still store, titler	None	Switcher, mixer, still graphics, effects
Control structure	422	422/232, GPI	422/232, GPI	No bus	.....
Reader Service Number	821	822	823	824	825

Manufacturer	Paltex		Director (Producer)
	Esprit (Esprit Plus)	EDDI	
Model Series	Esprit (Esprit Plus)	EDDI	EXCEL
Suggested for	On & off-line	Off-line, non-linear	On, off-line
VTRs/ATRs record/play	5-transport (6)	To 8 VHS sources	3, assignable record
Videodisc interface	Yes	To 4 laser disc	Yes

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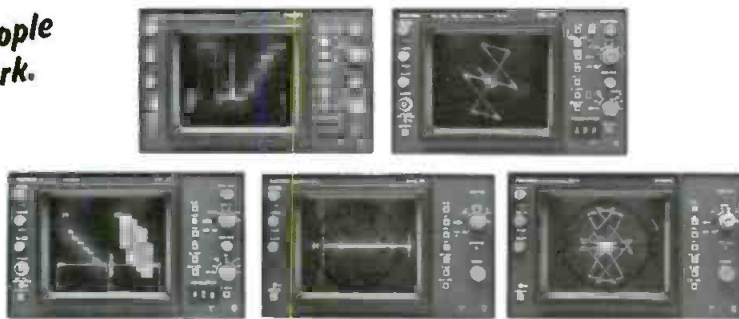
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# PHILIPS

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## Editor Controllers

Manufacturer	Omicron Video	Paltex			
Model Series	Elecon EM7100 series	Esprit (Esprit Plus)	EDDi	EXCEL	Director (Producer)
Microprocessor	Z80 based	Multiple 16-bit	Proprietary	Distributed 16-bit	Multiple 16-bit
Internal storage	192 event	700 event	4,000 event/project	326	500 (998) event
Ext storage type	Disk, tape	F-disk/P-tape (H-disk)	Floppy disk	F-disk, P-tape	F-disk/P-tape (H-disk)
Edit decision list	Yes	Yes	Dual log	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT
Printer interface	Serial	RS-232C	.....	RS-232C	RS-232C
Animation mode	Yes	Yes	Possible	Yes	Yes
Time code reader	Yes	Yes	Yes	Yes	Yes
Time code generator	Yes	.....	.....	.....	.....
Time code types	All timing formats	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU
Color framing per	NTSC	NTSC, PAL	NTSC, PAL	NTSC, PAL	NTSC, PAL
Edit accuracy	± 0 frame	± 0	± 0 frame	± 0 frames	± 0
Transport control	Keyboard, knob	Keyboard, knob	Knob	Keyboard, knob	Keyboard, knob
Device interfaces	For various switchers	Switcher, effects Mixer	Various	Switcher, mixer Effects	Switcher, effects Mixer
Control structure	.....	232/422, parallel	.....	332/422 parallel	232/422 parallel
Reader Service Number	826	827	828	829	830

Manufacturer	Panasonic Broadcast	Sony Broadcast	Spectra Image	United Media	Videomedia
Model Series	AU-A65	BVE-9000	Spectra system	Commander series	Magnum system
Suggested for	On, off-line	On, off-line	On, off-line	On, off-line	Any
VTRs/ATRs record/play	3 VTRs, 1 ext device	8R, 6P	5 VTRs or	8-machine	5 source, 1 record
Videodisc Interface	.....	No	5 2-head disks	Yes	.....
Microprocessor	Yes	Centralized 16-bit	Centralized 16-bit	Distributed 16-bit	Z80As distributed
Internal storage	128	512, expand to 999	1,000	500 event	250 event
Ext storage type	Floppy disk	Floppy disk	Floppy disk	F-disk, P-tape	Floppy disk
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	LED displays	CRT	CRT	CRT	CRT
Printer interface	.....	RS-232	RS-232	RS-232	RS-232C/serial
Animation mode	Possible	No	Yes	Yes	Possible
Time code reader	.....	Yes	No	Yes	In interfacing
Time code generator	.....	No	Option	Yes	In interfacing
Time code types	LTC, cti-trk	LTC/VITC/cti-trk/sync	LTC, VITC	SMPTE, EBU, cti-trk	SMPTE, EBU, cti-trk



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## Editor Controllers

Manufacturer	Panasonic Broadcast	Sony Broadcast	Spectra Image	United Media	Videomedia
Model Series	AU-A65	BVE-9000	Spectra system	Commander series	Magnum system
Color framing per	NTSC	NTSC, PAL	NTSC, PAL	NTSC, PAL	Yes
Edit accuracy	±0 frames TC	±0 frames TC	±0 frames	0-frame	±0, or per machine
Transport control	Keyboard knob	K.board, shuttle pot	Keyboard	Keyboard	Shuttle arms
Device interfaces	GPI	Switcher, GPI mixer	Switcher, mixer, self-contains	Switcher, mixer, title Effects, still, graphics	Switcher, transports printer
Control structure	Host PC port	422	422	232/422, UMI-bus	232C, ser/parallel
Reader Service Number	831	832	833	834	835

Manufacturer	Videomedia
Model Series	◆Mickey 1 (Mickey 2) Eagle I/II/III series
Suggested for	Any
VTRs/ATRs record/play	1 record, 2 source
Videodisc interface	.....
Microprocessor	Z80A distributed
Internal storage	50 event
Ext storage type	.....
Edit decision list	Yes
Edit data display	CRT
Printer interface	Yes
Animation mode	.....
Time code reader	In interfacing
Time code generator	In interfacing
Time code types	SMPTE, EBU, ctl-trk
Color framing per	Yes
Edit accuracy	±0 or per machine
Transport control	Opto-mechanic mouse
Device interfaces	Video/audio fader
Control structure	232C/ser, LAN
Reader Service Number	836

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# Electronic Graphic Art Systems

These video graphic generator systems incorporate full-color memory unless marked with a diamond (◆). Anti-aliasing is provided through software; those including hardware anti-aliasing are indicated by a bullet (•). The artist-tablet interface is with a stylus, except those supporting a mouse marked with a double dagger (‡). All include some integral image storage system, multiple on-line type faces and provide air/definable brushes. If a system is limited by the number of colors available on the screen, the number possible is indicated parenthetically after the palette. A face/font compose feature is standard unless indicated by a dagger (†). Abbreviations include: F.disk (floppy), H.disk (hard/Winchester), S.tape (streaming), R.pack (removable hard disk), F.buffer (frame), pers (perspective), str (stretch), ref (reflection), rot (rotation), geo (geometric), brdr (border), mag (magnify), F.color (full), pvw (preview), pstr (posterization), stncl (stencil), DigVid indicates to digitized video.

Manufacturer	Alias Research	Ampex AVSD	Aurora Systems	Aurora Systems (Harris)	Barco Ind (Wavefront)
Model/Series	Alias/1	AVA-3	System/280	System/220	Producer‡
Base computer	68020/S.G. Iris	68000	68020	IBM PC/AT	68020/S.G. Iris
Internal memory	8MB RAM/16MB virtual	.....	4MB Ram	512kB	8MB RAM, 16MB virtual
Memory architecture	32-bit	24-bit	32-bit	32-bit	32-bit
Off-line storage	F/H.disk, S.tape	Tape cartridge	R.pack/H.disk/S.tape	F/H.disk, S.tape	F/H.disk, S.tape
Image resolution	1024x768 pixels	768x484 pixel	720x486 13.5MHz 74ns/px	512x486 pixel	1024x768 pixel
Palette	16.7 million	16.7 million	16.7 million	16.7 million	16.7 million
Image sources	NTSC, tablet Eikonix hi-res camera	Any source Camera, tablet	RGB, modem, tablet Ethernet	RGB, tablet, modem	NTSC/RGB, tablet
Output drivers	NTSC, Betacam, DigVid Film recorder	Video F.buffer ESS-3 R.pack	RGB F.buffer, modem Film recorder, Ethernet	RGB F.buffer, modem Film recorders	RGB F.buffer/Scitex Dicomed, Film recorder
Encoder/decoder/sync	Int/not req/int	Internal	External	External	External
VTR controller	Lyon-Lamp VAS-5	Internal	Internal	Internal	Diaquest
Image manipulations	Standard	Pers/distort/flp Comp/exp/rot	Skew/Pers/str/copy Rot/ref/move/scale	Pers/str/copy Rot/ref/move/scale	All standard types
Artist's tools	All standard	Geom/grid/zooms Cut-paste	Geom/curve trace/mag Fill/brdr/write-on	Geom/curve trace/mag Fill/brdr/write-on	All standard types
Texture mapping	Animated/bump/natural	.....	.....	.....	Texture/bump/ref
Shading	Lambert, Phong, Blinn	.....	Reflectance	Reflectance	Gouraud, Phong
Animation features	Obj/light/camera	Objs/lights/camera	Color/reveal/motion	Color/reveal/motion	Obj/light/camera
3D render features	Wireframe pvw/F.color	Wireframe pvw/F.color	Wireframe pvw/F.color	Wireframe pvw/F.color	Wireframe pvw/F.color
CRTs used for	Canvas	Canvas	Menu, canvas, system	Menu, canvas, system	Canvas-system, RGB
Multiple user	.....	.....	.....	.....	Yes
Remote/data input by	IGES//RS-232/Ethernet Pixar render engine Opt 3D modeling package	RS-232/422	RS-232 net/Ethernet Opt Wx, 3D modeling	RS-232 net, Ethernet Opt Wx, 3D modeling pkg	RS-232, Ethernet Opt render engine
Reader Service Number	954	955	956	957	958

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## Electronic Graphic Art Systems

Manufacturer	BTS Broadcast Television Systems	Vidifont Graphics	CGL/Computer Graphic Laboratories	ColorGraphics Systems	
Model/Series	•FGS-4500		◆Instamation†	3D ArtStar	
Base computer	68000 series µP	Opt to Viditext II	PC/AT or equiv	DEC 11/73	68010
Internal memory	.....	70/260MB, 2000 pic ext	Host memory 4MB	.....	4-image
Memory architecture	16-bit	16-bit	24-bit	24-bit	32-bit
Off-line storage	R.pack/F.disk/S.tape	40/140MB H.disk	Floppy disk	F.disk/H.disk pack	Yes
Image resolution	4kx4k internal	.....	506x486 pixel	.....	768x483-pixel
Palette	16.7 million	16.7 million(> 2000)	32,780	16.7 million	16.7 million
Image sources	RGB, tablet, library	NTSC/RGB, library Tablet	RGB, tablet, camera	RGB, tablet, camera	Tablet, Library Camera, Wx data
Output drivers	RGB F.buffer, Scitex Film recorder, DigVid	RGB/NTSC F.buffer	F.buffer	F.buffer, film printer Film recorder	Encoder
Encoder/decoder/sync	External	Int/int/ext	Ext/int-ext/ext	External	.....
VTR controller	Ext, BTS	.....	Internal	Internal	.....
Image manipulations	Standard types	Standard types, stencils Crop/geo/mosaic/montage	Scale/rot/mirror Copy/move	Std 2D manipulations Pers/transforms	Cut-paste, wash Overlay, pix repeat
Artist's tools	Geo/retouch	Standard types	Color correction Enhance, crop	Geo/grids/std tools/ mosaic/pstr	Standard tools GEOS images
Texture mapping	Texture/bump	.....	No	.....	.....
Shading	Gouraud, Phong, others	.....	No	.....	.....
Animation features	Objs/lights/camera	Color, 2D	50 ind 2D objects	2D motion, color	Yes
3D render features	Wireframe pww/F.color	No	None	.....	Yes
CRTs used for	Canvas, status	Canvas, edit	Menu, canvas	Menu, canvas	Canvas-menu
Multiple user	.....	Yes	No	Yes	Yes
Remote/data input by	Ethernet Opt Pixelerator	RS-232/422	Ethernet from Images II+	Ethernet	RS-232/422
Reader Service Number	959	960	961	962	963

Manufacturer	Cubicomp	Cubicomp (Vertigo)	Digital Arts	Dubner Computer	Harris
Model/Series	PictureMaker	V-2000	DGS 1.0/DGS 2.0‡	DPS-1†	◆Aurora System/75
Base computer	IBM PC/AT	68020/68881	PC-AT (80386 opt)	68000 series	IBM PC/AT enhanced
Internal memory	.....	4MB RAM	.....	2-image	512kB
Memory architecture	16-bit	32-bit	16-bit	8-bit	16-bit

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Circle (93) on Reply Card

# Electronic Graphic Art Systems

Manufacturer Model/Series	.Cubicomp PictureMaker	Cubicomp (Vertigo) V-2000	Digital Arts DGS 1.0/DGS 2.0†	Dubner Computer DPS-1†	Harris ♦Aurora System/75
Off-line storage	F.disk/40-140MB H.disk	H.disk, S.tape	F.disk	Yes	F/H.disk
Image resolution	.....	720x486 pixel	.....	768x525-pixel	512x486 pixel
Palette	16.7 million	16.7 million	16.7 million	16.7 million	16.7 million (128)
Image sources	RGB, tablet, library	RGB, tablet	RGB/composite video	Camera, video	NTSC, modem, tablet
Output drivers	RGB F.buffer	Frame buffer, DigVid Film recorder	Tablet, ASCII files RGB F.buffer	Tablet Encoder	RGB F.buffer, modem Film recorder
Encoder/decoder/sync	External	External	Film recorder	.....	Ext/not req/ext
VTR controller	Diaquest	Internal	External	.....	Lyon-Lamb VAS
Image manipulations	Std/stencil/crop geo/mosaic	Standard types	Lyon-Lamb MiniVAS	Standard types	Move/copy/scale/ref Rot/str/align
Artist's tools	Standard types	Standard types	Per/translation scaling	Standard types	Geo/curve trace/mag Fill/brdr/write-on
Texture mapping	Yes	Texture/bump	Digital matte	Standard types	.....
Shading	Gouraud, Phong	Texture/bump	Transparency	.....	.....
Animation features	Objs/lights/camera	Gouraud, Phong, others	Texture/ref/bump/shadow	.....	.....
3D render features	Wireframe pvw/F.color	Gouraud, Phong, others	Gouraud, Phong, flat wf	.....	Color/reveal/motion
CRTs used for	Canvas, system	Obj/lights/camera	Obj/lights/camera	.....	.....
Multiple user	Yes	Wireframe pvw/F.color	8-bit pvw, real-time	.....	.....
Remote/data input by	RS-232/422	Canvas	Menu, RGB	Canvas	Menu, canvas, system
Reader Service Number	964	.....	No	No	Extra display only
		RS-232	.....	RS-232	RS-232 net. opt WX
		Pixar render engine	.....	967	968
		965	966		
Manufacturer Model/Series	.Imageering ICMS Paintstore	3M Company Silver	ANI-MAKER†	Microtime Image Maker†	Pinnacle Systems Model 2030
Base computer	M-68000	Proprietary	PC-AT (80386 opt)	PC-AT (80386 opt)	Proprietary
Internal memory	2MB op sys/2MB picture	.....	2 images	2 images	.....
Memory architecture	16-bit	.....	16-bit	16-bit	32-bit
Off-line storage	.....	F.disk	Floppy disk	Floppy	F.disk
Image resolution	5.5MHz flat equiv	.....	8kx8k pixel	8kx8k internal	4.2MHz NTSC equiv.
Palette	16.7 million	65,000	16.7 million	16.7 million	16.7 million
Image sources	Library disk, camera	RGB/NTSC, tablet	RGB source, tablet	RGB source, tablet	RGB/NTSC source, Tablet
Output drivers	RGB/NTSC, SLR still	Component scan-in	.....	.....	Component scan-in
Encoder/decoder/sync	NTSC F.buffer	Video F.buffer	RGB F.buffer, film recorder, Bernoulli box	RGB F.buffer, film recorder, Bernoulli box	F.buffer
VTR controller	External	Internal	External	External	.....
Image manipulations	Lyon Lamb	.....	Internal	Internal	.....
Artist's tools	3-axis tilt, scale Perspective	Standard, flips Multi-freeze, DigVid	Perspective	Perspective	Standard, flips Multifreeze, DigVid
Texture mapping	Color ramp/poster/mosaic	Grid, std tools	Cut-paste, move	Cut-paste, move	Geom, grids, std tools
Shading	Geo/stncl/cut-paste/wsh	Mosaic/pstr	Transparency	Transparency	mosaics, pstr
Brush types	.....	.....	Texture, reflectance	Texture, reflectance	.....
Tablet type	(Color correction)	Air, user defined	Gouraud, Phong, metallic	Gouraud, Phong, metallic	.....
Animation features	Various, antialiased	Stylus	Size, density adj.	Size, density adj.	Air, user-defined
3D render features	Pressure sensitive	2D, Digvid	Mouse	Mouse	Stylus
CRTs used for	Real-time trajectories	.....	Wireframe, render pvw	Obj/light/camera/3D	2D motion, DigVid
Multiple user	.....	Menu-canvas	Yes	Wireframe, render pvw	No
Remote/data input by	Modem	.....	Menu, RGB	Menu, RGB	Menu, canvas
Reader Service Number	969	970	Yes	Yes	973
		.....	Modem, LAN, renderer	Modem, LAN, renderer	
		.....	971	972	
Manufacturer Model/Series	.Pinnacle Systems Model 3000	Quanta ♦QUANTAPAIN	Quanta Dimension 32	Quantel -Paintbox	Rank Cintel Art-File
Base computer	Proprietary	Proprietary	32000 series w/math	68000 µP	Proprietary
Internal memory	.....	.....	8MByte	.....	200 images
Memory architecture	32-bit	16-bit	32-bit	16-bit	24-bit
Off-line storage	F.disk	F.disk/20-40MB H.disk	Floppy disk	.....	Tape cartridge
Image resolution	4.2MHz NTSC equiv	640x485 pixel	640x485 pixel	.....	720x484 CCIR
Palette	16.7 million	16.7 million (256)	16.7 million	16.7 million	16.7 million
Image sources	RGB/NTSC, tablet	Camera, RGB/NTSC.	RGB/NTSC, CCIR-601	RGB, Tablet	RGB, Tablet
Output drivers	Component video opt	Tablet, other	.....	Library	Library
Encoder/decoder/sync	F.buffer	RGB F.buffer	RGB F.buffer, encoder	RGB F.buffer	RGB F.buffer
VTR controller	Internal	Encoder	Network	Film recorder	.....
Image manipulations	.....	Internal	Internal	External	External
Artist's tools	Standard/flips/DigVid Multifreeze	Internal	Internal	.....	.....
Texture mapping	Move/pers/resize/mosaic	Move/pers/resize/mosaic	Move/pers/resize/copy	Standard types	Ref/copy/move/paste
Shading	rot/flip/fractal	rot/flip/fractal	Mosaic/rot/flip	Standard types	Expand, reduce
Brush types	Geo/grids/std tools	Geo/rubberbanding	Geo/paint/fixative	.....	Geo/color/mirror
Tablet type	Mosaic/pstr	Fill/mag	mag/graph/mix	.....	rot/defocus/fill/stncl

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## Electronic Graphic Art Systems

**Manufacturer** ..... **Pinnacle Systems**  
**Model/Series** ..... **Model 3000**

Texture mapping ..... Yes  
 Shading .....  
 Animation features ..... Obj/lights/camera  
 3D render features ..... Wireframe pvw/F.color  
 CRTs used for ..... Menu-canvas  
 Multiple user .....  
 Remote/data input by .....

**Reader Service Number** ..... **974**

**Quanta**  
 ◆ **QUANTAPAINT**

.....  
 .....  
 Color/motion  
 .....  
 Menu, canvas  
 No  
 To Quanta CGs,  
 Opt business graphics  
**975**

**Quanta**  
 Dimension 32

.....  
 Phong, gamma correction  
 Color/motion/pan  
 Eireframe/F.color  
 System, canvas  
 Yes  
 Yes  
 Opt render engine  
**976**

**Quantel**  
 ◆ **Paintbox**

.....  
 .....  
 w/Harry system  
 .....  
 Canvas  
 Yes  
 RS-232  
**977**

**Rank Cintel**  
 Art-File

.....  
 .....  
 .....  
 Canvas  
 5 work stations  
 RS-422  
**978**

**Manufacturer** ..... **Symbolics**  
**Model Series** ..... **Symbolics**

Base computer ..... Proprietary/LISP-AI  
 Internal memory ..... Virtual memory  
 Memory architecture ..... 32-bit  
 Off-line storage ..... Tape cartridge  
 Image resolution ..... to 1280x1024  
 Palette ..... 16.7 million  
 Image sources ..... RGB, tablet  
 ..... Camera  
 Output drivers ..... F.buffer  
 ..... Film recorders  
 Encoder/decoder/syncExternalExternal  
 VTR controller ..... Internal  
 Image manipulations ..... All std, user defined  
 .....  
 Artist's tools ..... Geo/3D geo/std tools

Texture mapping ..... Textures/bump/ref  
 Shading ..... Gouraud, Phong  
 Animation features ..... Obj/lights/camera  
 3D render features ..... Wire/solid pvw  
 CRTs used for ..... Menu-canvas, RGB  
 Multiple user ..... Yes  
 Remote-data input by ..... Yes  
**Reader Service Number** ..... **979**

**Transformations**  
**EFX‡**

MicroVAX  
 5MB RAM, 4GB virtual  
 32-bit  
 H.disk, tape cartridge  
 .....  
 16.7 million  
 RGB, tablet  
 RGB F.buffer  
 Lyon-Lamb VAS  
 Perspective

Transparency, script  
 projections  
 Texture/bump/ref/shadow  
 Gouraud, Phong, flat  
 Obj/lights/camera  
 Real-time/wire/F.color  
 Menu, RGB  
 .....  
 .....  
**980**

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# Graphic Titlers

For the production titler systems in this category, the following type style abbreviations have been used: A - serif, B - sans serif, C - italic, D - script.

Manufacturer	Aston Electronics		BTS	Chyron	
Model/Series	Aston 3	Aston 4	Viditext II	Scribe	Chyron IV (4200)
Subtitle control	Manual/timed/TC opt	Manual, timed	Manual, timed	Manual, time code	Time code
Page format	40 char/21 line	56 char/14 line	64 char/31 line	64 char/24 line	62 char/24 line
Resolution	31.25ns	10ns	48ns	.....	27ns
Anti-aliasing	.....	Hardware/software	Hardware/software	Hardware	.....
On-line type faces	4	8	8	8	12
Type styles	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D
Type face storage	Disk	Disk	Disk, RAM	Disk	Disk
Face/font compose	Option	Logo compose opt	Option	No	Option
Display flash	Yes	Yes	Char/word/line/page	By character	Yes
Edging effects	Full edging control	Full edging control	Full edge control	Full edge control	Full edge control
Auto centering	Yes	Yes	Assignable center	Yes	Horizontal
Roll/crawl control	8 speeds	8 speeds	Variable	Variable	Variable
Keyer/colorizer	External keyer	External keyer	Integral	Integral	Integral
Color palette	4,096	4,096	4,096	16.7 million	512
Colors per screen	8 text, 8 bknd	40/screen	64/screen	256/screen	185/screen
Internal memory	2 pages	2 pages	300 pages	2 pages	2 page
Memory architecture	16-bit	24-bit	16-bit/bit-slice	32-bit	16-bit
Integral still-store	No	No	Graphic Store opt	No	No
Off-line storage	150 pages	Floppy/Winchester	Floppy/Winchester	Floppy/Winchester	Floppy/Winchester
Access time (page)	<1s	<1s	<0.9s	0.5s	1s
Effective planes	1 plane	3	32 planes	2	3
Remote control	RS-232	RS-232/422	RS-232/422	RS-232/422	RS-232
Image sources	.....	.....	RGB, composite	Camera	Camera, tablet/Wx
Multiple user system	No	2-station	2 keyboard on-line	2 stations	3 stations
Automation interface	Various	Various	No	No	No
			2D animation std, 3D opt		
			Sports, election pkgs.		
Reader Service Number	435	436	437	438	439

## Want More information on advertised products?

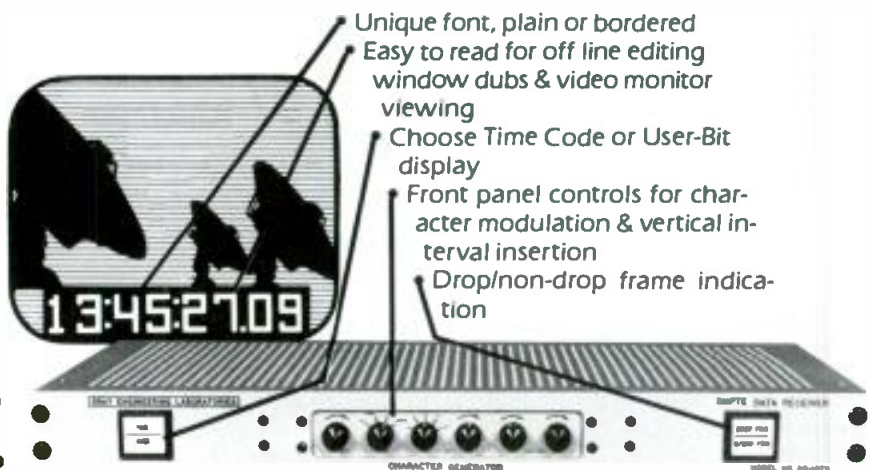
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# Graphic Titlers

Manufacturer Model/Series	Chyron		Texta	Dubner Computer Systems	
	RGU-2	VP-2		CBG-2	20-K
Subtitle control	Manual, time code	Manual, remote ctl	Manual	Manual	Manual
Page format	62 char/ 20 line	.....	100 char/30 lines	100 char/16 lines	100 char/16 line
Resolution	27ns	35ns	37ns	525x1024 pixel	37ns/485x1384-pixel
Anti-aliasing	.....	.....	Hardware/software	Hardware/software	Software
On-line type faces	4	6	255	255	8
Type styles	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D
Type face storage	Disk	ROM	Disk	Disk	Disk
Face/font compose	Option	No	Yes	No	Yes
Display flash	Full flash control	Yes	By character	By character	By character
Edging effects	Surround/shadow	Full edge control	Full edging control	Full edging control	Full edging control
Auto centering	Horizontal	Yes	Yes	Yes	Yes
Roll/crawl control	Variable	Variable	9 speeds	Variable speeds	9 speeds
Keyer/colorizer	Integral	Integral	Integral	Integral	Integral
Color palette	64	512	.....	4,096	16.7 million
Colors per screen	8/screen	16/screen	.....	128	256
Internal memory	2 page	1 page/4000 lines	.....	2 pages	1,000 pages
Memory architecture	16-bit	8-bit	.....	Encoded frame buffer	8-bit frame buffer
Integral still-store	No	No	Yes	Yes	No
Off-line storage	Floppy	Floppy	Floppy/Winchester	Floppy/Winchester	Winchester disk
Access time (page)	1s page/frame	.....	<0.5s/page	0.25s/page	0.25s/page
Effective planes	2	Infinite	.....	3	1
Remote control	RS-232	RS-232	RS-232/422/IEEE	RS-232/422/IEEE	RS-232/422
Image sources	Camera	None	Bit-pad/camera/Wx	Bitpad/camera/Wx	Weather
Multiple user system	2 stations	Yes	.....	2 stations	.....
Automation interface	No	No	Yes	Yes	Yes
<b>Reader Service Number</b>	<b>440</b>	<b>441</b>	<b>442</b>	<b>443</b>	<b>444</b>

Manufacturer Model/Series	For-A Corporation		ICM Video	JVC Company	
	VTW-220	VTW-400	CG-7000P	M-1000 (M-1500)	Mindset M-3000
Subtitle control	.....	Manual	Manual, clocked	.....	.....
Page format	32 char/8 line	32 char/8 line	38 char/16 line	.....	.....
Resolution	16x20 pixel	24x24 pixels	48x64 dot character	640x240 pixel	640x400 pixel
Anti-aliasing	.....	.....	Hardware	(Glyph software)	.....
On-line type faces	1, 4 sizes	2, 4 sizes	8	1, 4 sizes (3 sizes)	5, 3 sizes
Type styles	1	1	A/B/D	San serif, options	A/B/C/D
Type face storage	ROM	ROM	ROM	ROM cartridge	Disk
Face/font compose	No	No	Yes	No	Yes
Display flash	Character	Character	Character	Yes	Yes
Edging effects	Yes	Yes	Surround edge	Yes	Yes
Auto centering	Yes	Page, H, V	.....	Yes	Yes
Roll/crawl control	9 speed	4, w/transitions	Variable	Yes	Yes
Keyer/colorizer	Integral	Integral	Integral	Integral	Integral
Color palette	512	64	Unlimited	512	512
Colors per screen	14	64	.....	4	4
Internal memory	32 pages	8 pages (600 opt)	80 pages	20 (40) pages	.....
Memory architecture	8-bit	8-bit	8-bit	8-bit	8-bit
Integral still-store	No	No	No	No	No
Off-line storage	32K RAM card	Floppy disk	.....	Cartridge, f.disk	Disk
Access time (page)	0.5s	0.5s	2s/page	.....	.....
Effective planes	1	1	1	Background, title	Background, title
Remote control	RS-232	RS-232	.....	..... (RS-232)	RS-232, parallel
Image sources	Background video	.....	.....	Bknd video, tablet	Bknd video, tablet
Multiple user system	No	No	No	No	No
Automation interface	No	No	No	No	No
<b>Reader Service Number</b>	<b>445</b>	<b>446</b>	<b>447</b>	<b>448</b>	<b>449</b>

Manufacturer Model/Series	Knox Video	Laird Telemedia			PESA
	K-200 Chromafont II	7200 (1450)	D-3600 (D-2200)	D-6000	CG-4722
Subtitle control	Manual	Manual	Manual, clocked	Manual/clocked	Manual, time code
Page format	32C/17L, 32TVL font	60c/24l 12TVL (....)	32 char/10 lines	768x483 pixels	32 char/16 rows
Resolution	.....	35ns	35ns (70ns)	35ns	35ns
Anti-aliasing	None	.....	.....	.....	.....
On-line type faces	8, 2 sizes	4 (6)resident	5, 16 sizes, reverse	Unlimited (15 std)	8
Type styles	A/B/C	.....	A/B/C/D	A/B/C/D	A/C/D
Type face storage	ROM	Disk	ROM & (disk)	ROM, Disk	Disk
Face/font compose	No	Yes (No)	No	Yes	Yes
Display flash	Character, page	Yes	Yes	Yes	Yes
Edging effects	Yes	Full edging control	Yes	Yes	Yes
Auto centering	Yes	Horizontal	Yes	Yes	Yes
Roll/crawl control	10 speeds	Variable (9r/6c)	Multiple speeds	Variable speeds	8 speeds
Keyer/colorizer	Integral	External units	Integral	Integral	Integral

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## Graphic Titlers

Manufacturer	Knox Video	Laird Telemedia	3M Company	PESA	
Model/Series	K-200 Chromafont II	7200 (1450)	D-3600 (D-2200)	D-6000	CG-4722
Color palette	512	32k (65k)	4,096 (512)	128 char/1024 bknd	112
Colors per screen	16 combinations	32 screen (....)	16 char/16 bknd (8/8)	16 char/256 bknd	.....
Internal memory	64 pages	100 lines (pages)	1 page	1 page	15 pages
Memory architecture	8-bit	8-bit	8-bit	8-bit	8-bit
Integral still-store	No	No	No	No	No
Off-line storage	No	Floppy disk	1,000 pages/disk	100 pages/disk	128 pages/disk
Access time (page)	.....	0.5s	$\frac{1}{30}$ s	$\frac{1}{30}$ s	<1s
Effective planes	Background, title	1	Background, title	Background, title	1
Remote control	.....	.....	RS-232	RS-232	RS-232
Image sources	Input video	None	Background video	Digitizer, tablet	Camera
Multiple user system	No	4 kboard (...)	No	Multiple keyboards	.....
Automation interface	No	.....	Closure switch	.....	Yes
<b>Reader Service Number</b>	<b>450</b>	<b>451</b>	<b>452</b>	<b>453</b>	<b>454</b>

Manufacturer	Quanta	Quantel	Ryley Communications	
Model/Series	QCG-38	QCG-5000	Cypher	CapGen Series 2
Subtitle control	Manual, auto	Manual, auto	Manual, programmed	.....
Page format	40 char/13 lines	64 char/24 lines	.....	32 char/12 lines
Resolution	18ns	29ns	.....	11.1ns
Anti-aliasing	.....	.....	Hardware/software	Hardware
On-line type faces	8, 8 sizes	2, 52 sizes	Numerous	2, 4 sizes
Type styles	A/B/C	A/B/C/D	90 available	A/B/C
Type face storage	ROM	ROM, disk	Disk	Disk
Face/font compose	No	Yes	Yes	No
Display flash	Yes	Yes	[Numerous effects	By word
Edging effects	Yes	Yes	[manipulations on	Yes
Auto centering	Yes	Yes	[generated titles	Yes
Roll/crawl control	10 speeds	10 speeds	Variable	9 speeds
Keyer/colorizer	Integral	Integral	Within system	Integral
Color palette	512	16.7 million	16.7 million	64
Colors per screen	13 ch/13 bknd/8 edge	16 ch/16 bknd/16 edge	16.7 million	64
Internal memory	20 pages	400/disk	.....	400 pages
Memory architecture	8-bit	8-bit	16-bit	8-bit
Integral still-store	No	No	Limited	No
Off-line storage	Disk	Disk	Floppy/Winchester	Floppy disk
Access time (page)	0.5s	0.5s	<1s	<1s
Effective planes	Background, title	Background, title	Multiple	1
Remote control	RS-232	RS-232	RS-422	.....
Image sources	Input video	Camera, tablet	CCIR 601 eqpt	.....
Multiple user system	No	No	.....	4 keyboards
Automation interface	No	Various	Yes	Scorepad option
<b>Reader Service Number</b>	<b>455</b>	<b>456</b>	<b>457</b>	<b>458</b>

## Video Signal Processors

These systems include analog component translator equipment, standards conversion units and signal correction products. N, P, S denote NTSC, PAL and SECAM, respectively. YCrCb is used to denote equiband color different components.

Manufacturer	AVS Broadcast	BTS	CEL/Grunder	Cox Electronics'	
Model/Series	ADAC	AVS-6500	XCC 6016 corrector	P156-2	ACC 200 translator
Enhancement	H aperture, detail	H aperture	.....	Digital sampling	* RGB-Betacam/MII
Noise reduction	9dB Y, 12dB C	6dB Y, 9dB C	.....	Motion interpolation	* - Betacam/MII-RGB
Color correction	RGB gains, pedestals	Chroma retiming	RGB/YUV decode adapter	TBC/freeze functions	No
Contrast correction	Manual adjustment	Manual control	Gamma control	With setup	No
Sync regeneration	Yes	TBC, freeze modes	Yes	Yes	No
Standards conversion	NTSC, PAL/M/N, SECAM	NTSC, PAL (SECAM opt)	W/decoders, encoders	P/S to N, N to P	No
Dubbing application	Yes	Yes	Yes	Yes	Yes
Production application	Yes	.....	Yes	Yes	Yes
On-air application	Yes	Yes	Yes	Possible	No
Format conversions	Encoded, 601, YCrCb	Composite, RGB	Yes	No	RGB-component analog
Video response	-3dB to 5.5MHz	-3dB to 3.5MHz	$\pm 0.5$ dB to 5MHz Y	-3dB 2.5MHz N/3.5 P	$\pm 0.1$ dB, to 5.5MHz
S/N ratio	>55dB	.....	>70dB Y	53dB	>46dB unwt'd
Envelop delay	$\pm 5$ ns chr/<1% K-factor	.....	.....	.....	.....
Diff phase, gain	1.5°/1.5%	.....	.....	.....	time $\delta$ <5ns
Video level adjust	0.5V-2V	-300, +100 IRE	$\pm 40$ % white	$\pm 50$ %	None
Chroma level adjust	+3dB	.....	.....	$\pm 50$ %	None
Pedestal level adjust	$\pm 60$ mV	$\pm 8.5$ IRE	$\pm 30$ % black	$\pm 150$ mV	None
Chroma phase adjust	$\pm 180^\circ$	$\pm 180^\circ$	.....	.....	None



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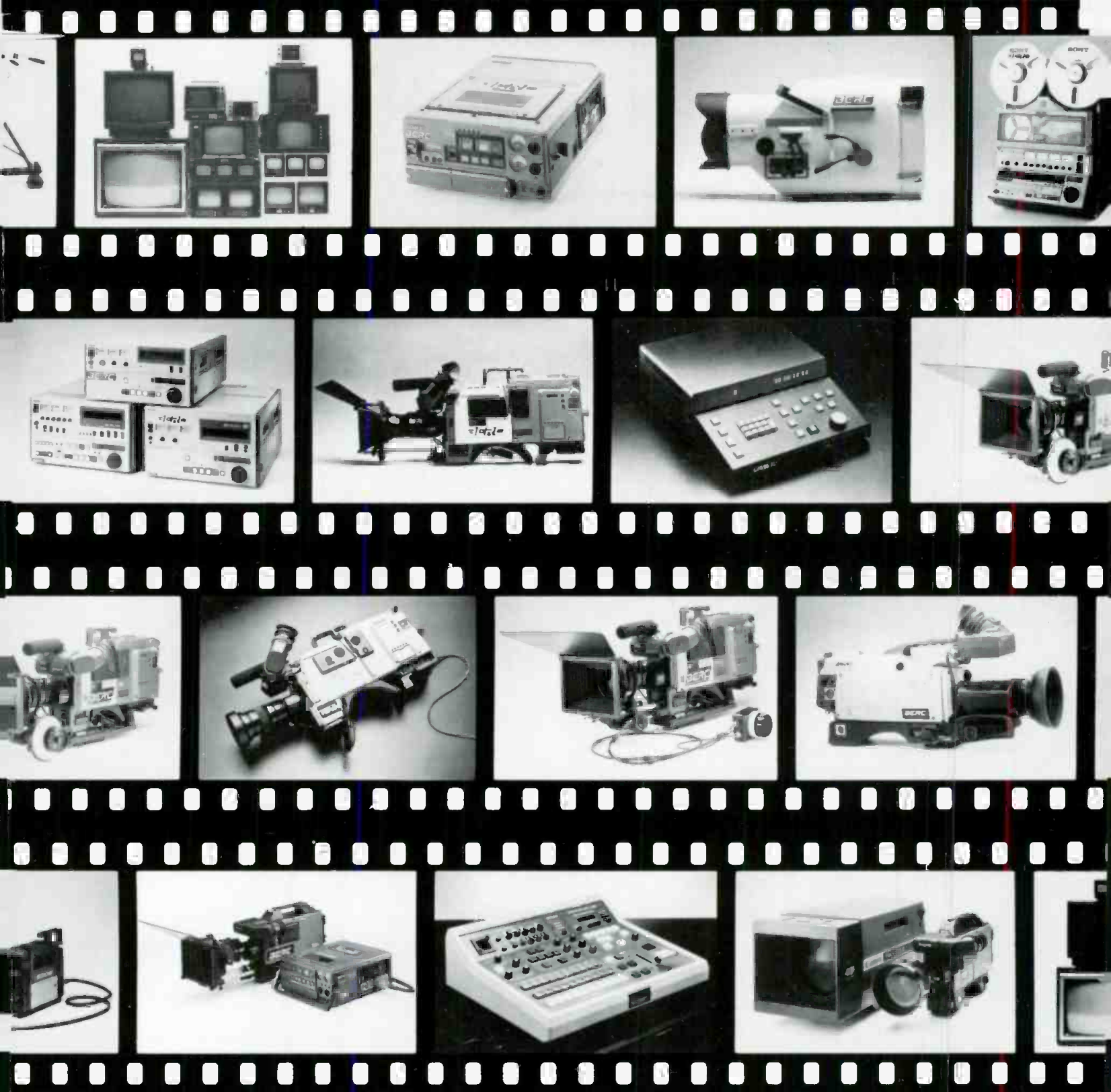
# Video Signal Processors

Manufacturer	ADAC	AVS Broadcast	BTS	CEL/Grunder	Cox Electronics <sup>1</sup>
Model/Series	ADAC	AVS-6500	XCC 6016 corrector	P156-2	ACC 200 translator
Subcarrier phase range	360°	± 180°	.....	360°	None
Sync level adjust	Fixed	.....	With output encoders	No	None
RGB gain/pedestal adjust	Yes	None	Yes	No	None
Programmable system	Yes	No	Yes	No	None
Component formats	Yes	RGB	RGB, YUV	No	None
Remote control type	RS-232, other	Manual only	Proprietary	None	None
<sup>1</sup> US representative, BVS/Broadcast Video Systems.					
<b>Reader Service Number</b>	<b>725</b>	<b>726</b>	<b>727</b>	<b>728</b>	<b>729</b>

Manufacturer	Cox Electronics	Electrocraft	Faroudja Laboratories	Flesh tone corrector
Model/Series	600, 660 series	CPS-84 (PAL)	CTC-N transcoder	VHP detail processor
Enhancement	No	H crispening	No	Small detail, H & V
Noise reduction	No	>6dB chroma	No	Effective
Color correction	RGB gain/ped/gamma	RGB gain, lift, gamma	Color balance	No
Contrast correction	Manual control	Yes	From setup/gain	Effective
Sync regeneration	No	Yes	Yes	No
Standards conversion	No	No	No	No
Dubbing application	Yes	Yes	Yes	Yes
Production application	Yes	Yes	Yes	Yes
On-air application	Yes	Yes	.....	Yes
Format conversions	RGB-YCrCb	Y-C/YUV/RGB/PAL	YCrCb, RGB, bidir.	No
Video response	± 0.1dB 5.5MHz	To 3.5MHz luma	± 0.3dB 8MHz	± 1dB 4.2MHz
S/N ratio	65dB	.....	60dB	60dB
Envelop delay	± 10ns	480ns adjustable	<5ns relative	<20ns
Diff phase, gain	0.5°, 0.5%	.....	.....	2.5°, 2.5%
Video level adjust	± 30 IRE	± 6dB	± 2dB	[Boosts detail by
Chroma level adjust	-90, +30 IRE	± 6dB	± 5 IRE balance	[200% under 10 IRE
Pedestal level adjust	± 30 IRE	150mV range	± 15 IRE	[100% to 20 IRE
Chroma phase adjust	± 40°	None	No	[5% at 100 IRE
Subcarrier phase range	± 40°	None	± 2µs genlock	.....
Sync level adjust	Not ops control	0-180°	± 10 IRE	.....
RGB gain/pedestal adjust	Both gain & pedestal	To 200mV p-p gamma	Pedestal black bal	No
Programmable system	600/660TC(J) timecode	No	No	No
Component formats	660/660TC	Yes	Yes	No
Remote control type	RS-232/422	None	.....	.....
<b>Reader Service Number</b>	<b>730</b>	<b>731</b>	<b>732</b>	<b>733</b>

Manufacturer	For-A	Fortel	Leitch Video	Lenco
Model/Series	CCS-4300/4350 (-4400)	CC-1 (CC-2)	VPA-330N (VPA-331N)	PCD-473
Enhancement	No	Color only	No	No
Noise reduction	No	Yes	No	Inherent
Color correction	RGB gain/ped/gamma	Gamma/ped/level	Chroma AGC	Hue, gain
Contrast correction	Yes	Via setup	Luminance AGC	.....
Sync regeneration	Yes	CC-1	RS-170A phasing	No
Standards conversion	No	(For 525, 625)	No	No
Dubbing application	Yes	Yes	Yes	Yes
Production application	Yes	Yes	Yes	Yes
On-air application	Yes	Yes	Yes	Yes
Format conversions	4400 YCrCb-encoded	Encoded-RGB (No)	Yes	Enc.-RGB/YCrCb/YIQ
Video response	± 0.1dB 4.2(± 0.5 8MHz)	± 1dB 4.2/± 0.25 5.5	± 0.1dB 5MHz luma	± 0.5dB 5MHz Y
S/N ratio	60dB random, 50dB hum	60dB	>60dB	>55dB non-coherent
Envelop delay	YC delay 40ns/K(2T) 0.5	.....	.....	.....
Diff phase, gain	<0.5°/ <0.5	1.5° 1.5%	<0.2°, <0.5%	.....
Video level adjust	± 3dB (± 3dB YCrCb)	± 20IRE RGB ± 3dB	± 2.5dB	± 6dB
Chroma level adjust	± 3dB (± 3dB CrCb)	± 5dB RGB ± 3dB mstr	± 2.5dB	+6dB saturation
Pedestal level adjust	± 20IRE (± 10% Y)	± 20IRE	± 10 IRE	.....
Chroma phase adjust	± 15°	.....	± 20°	± 22°
Subcarrier phase range	± 1° on 4350	.....	.....	.....
Sync level adjust	Fixed	.....	± 10 IRE	.....
RGB gain/pedestal adjust	± 30%Gain/ ± 15%Ped	Also B/W gamma	No	No
Programmable system	No	No	No	No
Component formats	4400 only	YCrCb/M-II/Beta/RGB	No	Component outputs
Remote control type	Proprietary	.....	Conductor/function	No
<b>Reader Service Number</b>	<b>735</b>	<b>736</b>	<b>737</b>	<b>738</b>

Manufacturer	Quantel	Shintron	Snell & Wilcox/Merlin Engineering
Model/Series	SATIN	MC-1 intermatrix	DIP 9800
Enhancement	Yes	No	H/V aperture
			DIP 9700A
			DIP 9710 (DIP 9720)
			H/V detail
			H/V detail



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## Video Switchers, Master & Production

Manufacturer	Quantel	Shintron	Snell & Wilcox/Morlin Engineering		
			Model/Series	DIP 9800	DIP 9700A
	<b>SATIN</b>	<b>MC-1 Intermatrix</b>			
Noise reduction	Yes	No	Temporal recursive fltr	0/6/9dB Y, 0/6/9/12dB C	4-level Y/C NRS
Color correction	.....	No	Color balance	Color balance correction	YC delay only
Contrast correction	.....	No	Inherent/Y-C delay adj	Yes	Inherent
Sync regeneration	TBC functions	Sync replacement	Inherent	Yes	Inherent
Standards conversion	NTSC, PAL, SECAM	Intercomponent	All conversions	All stds available	NTSC-PAL(& SECAM)
Dubbing application	Yes	Yes	Yes	Yes	Yes
Production application	Yes	Yes	Yes	Yes	Yes
On-air application	Yes	.....	Yes	Yes	Yes
Format conversions	RGB to composite	RGB-YIQ-YCrCb-M-Beta	Composite, RGB, YCrCb	YUV out to SECAM enc.	Composite only
Video response	>4.2MHz NTSC	± 0.5dB 10MHz	± 1dB 3.3MHz NTSC	± 0.5dB 3.3MHz, NTSC	± 1dB 3.3MHz
S/N ratio	.....	.....	52dB wtd flatfield	52dB CCIR wtd	52dB CCIR wtd
Envelop delay	.....	.....	-100, +600ns adj	-100, +600ns adj	-100, +600ns adj
Diff phase, gain	.....	.....	.....	.....	.....
Video level adjust	.....	None	± 6dB continuous	1V ± 6dB	± 6dB continuous
Chroma level adjust	.....	None	Yes	Yes	.....
Pedestal level adjust	.....	None	± 150mV continuous	± 150mV	.....
Chroma phase adjust	.....	None	NTSC only	NTSC only	NTSC output only
Subcarrier phase range	.....	None	Yes	.....	.....
Sync level adjust	.....	None	Fixed	.....	.....
RGB gain/pedestal adjust	No	None	Color balance	Color balance	.....
Programmable system	Yes	None	No	.....	No
Component formats	CCIR 601 compatible	Yes	RGB, YUV	YUV out SECAM	(YUV out 9720)
Remote control type	RS-422	None	Duplicate ctl panel	Duplicate ctl panel	None
<b>Reader Service Number</b>	<b>740</b>	<b>741</b>	<b>742</b>	<b>743</b>	<b>744</b>

Manufacturer	Sony Broadcast	Tamron Industries	Tektronix	Video International	VTA Tech.
	<b>BVX-30 system</b>				
Enhancement	H-V detail	No	No	H & V	.....
Noise reduction	15dB luma	No	No	Yes	Grain reduction
Color correction	RGB gain/ped/gamma	Balance alteration	No	Level/phase/YCrCb	16-vector system
Contrast correction	No	Inherent	Automatic	Inherent	Yes
Sync regeneration	Yes	Adds sync	Yes	Inherent, TBC	Replaces sync
Standards conversion	No	Slide to video	None	PAL/N/M, NTSC, SECAM,	NTSC, PAL
Dubbing application	Yes	No	No	Y/C inputs	Yes
Production application	Yes	Yes	No	Yes (3602 w/effects)	Yes
On-air application	Yes	No	Yes	Yes	Possible
Format conversions	No	No	No	YCrCb-RGB-composite	Any component type
Video response	± 0.5dB 5MHz	To 4.2MHz	.....	>5.5MHz (13.5/8-bit)	± 0.3dB 8MHz
S/N ratio	>51dB	.....	>60dB to 5MHz	54dB	55dB 5.5MHz
Envelop delay	<1%	.....	± 3dB correction	2% K-factor	<1%
Diff phase, gain	2°, 3%	.....	0.5°, 0.5%	2°/2%	1°/1%
Video level adjust	± 3dB	Creates video	± 6dB	Yes	± 100%
Chroma level adjust	± 3dB	from film positive or	± 3dB	Yes	-90, +100%
Pedestal level adjust	± 20 IRE	negative transparency.	± 10 IRE	Yes	-40, +100 IRE
Chroma phase adjust	90°	Some manipulations	± 25°	Yes	± 60°
Subcarrier phase range	360°	are available.	.....	Yes	.....
Sync level adjust	.....	.....	± 3dB	Yes	Standard fixed
RGB gain/pedestal adjust	± 30% gain, ± 15% ped	.....	No	Yes	Yes, also gamma
Programmable system	Yes	.....	Per VIRS reference	.....	1000 color events
Component formats	.....	.....	No	Yes	All formats
Remote control type	BVR-10, BVR-30	.....	Function/conductor	.....	RS-232/422, GPI
<b>Reader Service Number</b>	<b>745</b>	<b>746</b>	<b>747</b>	<b>748</b>	<b>749</b>

## Video Switchers, Master & Production

Master control and studio production switching systems include an integral black source, unless marked with a bullet (•). Non-synchronous signal detection is available unless marked with a dagger (†). Production units without re-entry facilities are noted with a star (★). All production systems include effects manipulation as standard features.

Manufacturer	Model Series	Ampex AVSD			Beaveronics
		4100 MC-4 (4100 H)	AVC 330 Century	AVC Vista	
					<b>Model BI-154 (-156)</b>
Control application	Master (production)	Production	Production	Production	Production
# of inputs	28V/26-5A(26V/24A)	32 video	10-18	32V, 16A opt	15 video
Integral matte source	Yes	1/keyer, fills	5 generators	Yes	Yes
Key sources	26 int, 4(6) ext	Any int, 30 ext	int/ext/masks	32 int, 6 ext	4 int, 2 ext
Chroma keyers	1(7)enc/4(6) RGB	Spectrakey/enc/RGB	RGB/enc/Spectrakey	10 enc, 6 RGB	RGB or enc.
Downstream keyer	All sources	Linear/chroma/luma/ext	Unikey linear	All sources	(4-source, BI-156)
Switching buses	2(8), 3(4 aux) opt	Multiple	4 aux, 2 with reentry	8, 16 aux opt	4 (6, 2 aux opt)
Mix Effects amps	None (3)	3 w/3-level keyer	Dual multilevel keyers	3	1-2 (2-3)
Pattern generator	None (64 + 36 opt)	Yes	32 inc/pixel dissolve	164 patterns	32 patterns

## Video Switchers, Master & Production

Manufacturer	Ampex AVSD				Beaveronics
Model Series	4100 MC-4 (4100 H)	AVC 330 Century	AVC Vista	AVC-33S (AVC series)	Model BI-154 (-156)
Wipe effects	No (rotary/soft-edge)	164 hard, soft	Rotary, hard, soft	Rotary, soft, user pgmd	Soft-edge
Border effects	No (integral)	Hard, soft, combined	Hard, soft, halo	Integral	Integral
Shadow effects	Options	Yes	Yes	Options	Option
Quad split feature	(Options)	Yes	.....	Options	Option
Automation interface	Parallel options	SuperStar integral	RS-232/422, GPI ports	SMPTE serial opt	No
Programmable functions	X-fade/fade-black	Multiple event setups	User configurable	x-fade, fade-black	No
Digital effects port	No	For ADO system	ADO options	Yes	No
Path length or deviation	300 $\mu$ s (700 $\mu$ s)	.....	Differential 1.5°	650 $\mu$ s	220 $\mu$ s (350 $\mu$ s)
Crosstalk at subcarrier	<-60dB (55dB)	<-55dB	$\leq$ -55dB	60dB	53dB
Audio preview, follow	Yes (No)	No	AVC audio system opt	Option	No
Audio level control	w/metering(No)	No	[Electroluminescent	Option	No
Audio mixer interface	No	No	[display, extended	Yes	No
Edit control interface	3-telecine, 9-VTR(...)	Yes	[memory options.	.....	No
Reader Service Number	751	752	753	754	755

Manufacturer	Beaveronics	BTS Broadcast TV Systems		Cox Electronics	Cox/Abekas
Model Series	Model 712	MCS-2000	R102ME (RME series)	T24-2 (T24-PO)†	Model T8
Control application	Production	Master	Production	Production (master)	Production
# of inputs	12 video	250V, 250A	16 or 24	23V (& 23A)	8 video
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	3 int, 1 ext	Int, ext	Various	4 external	8 int, 2 ext
Chroma keyers	RGB integral	No	RGB std, enc.	Enc/RGB (opt)	Enc., RGB opt
Downstream keyer	4-source opt	250 sources	Yes	4 source opt (std)	2 sources opt
Switching buses	4	150, 150 aux	10 prime	10/4 aux (2/2 aux)	3 prime, 1 aux
Mix Effects amps	1 efx-key, 1 mix	No	2	3 (1)	1, multilayer
Pattern generator	10 patterns	120 patterns	60 patterns	100 (9) patterns	80 patterns
Wipe effects	Soft-edge	User program	Rotary, soft-edge	Rotary & (soft-edge)	Rotary, soft-edge
Border effects	Integral	No	Yes	Integral	Integral
Shadow effects	Options	Integral	.....	Integral	Option
Quad split feature	No	No	No	Integral (No)	No
Automation interface	No	RS-232/422	Option	Editor/memory/SMPTE	Serial, relay
Programmable functions	.....	X-face, face-black	Option	X-fade, fade-black	X-fade, fade-black
Digital effects port	No	No	Yes	Yes (No)	No
Path length or deviation	140ns	100°	.....	1.2 $\mu$ s	2 $\mu$ s
Crosstalk at subcarrier	53dB	60dB	.....	56dB	58dB
Audio preview, follow	No	Yes	No	No (Yes)	Option
Audio level control	No	w/metering	No	No (w/meters)	No, meter opt
Audio mixer interface	No	No	No	No (Yes)	Yes
Edit control interface	No	.....	RS-422 port	Yes (No)	Yes
Reader Service Number	756	757	758	759	760

Manufacturer	Crosspoint Latch				Echolab
Model Series	6109 (6119)†	6129AHK (6139)†	6112(AK) [6124A]	6150BK†	SE-3
Control application	Production	Production	Production	Master	Production
# of inputs	8 (5)	8 (8/16/24)	8 [12]	16V, 16A	10V
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	7 int/1 ext (5 int/1 ext)	Int/2 ext per M/E	Multi int, 2 ext	4 ext	2 int, 3 ext
Chroma keyers	RGB std (opt)	RGB, 2nd opt (dual)	Options	No	Enc., RGB opt
Downstream keyer	..... (Yes)	Dual, 4-input	Yes	No	2 sources
Switching buses	3 primary	3 primary (6 primary)	4 primary	2	3
Mix Effects amps	1	2 (3)	Independent dual	1	2½
Pattern generator	32 (12) patterns	32 patterns (12, 32/ME)	12 per ME	Patterns optional	40 patterns
Wipe effects	Soft edge	Soft-edge	Soft-edge	No	Soft, programmed
Border effects	Integral	Integral	Yes	Optional	Integral
Shadow effects	Integral	Integral	.....	No	Optional
Quad split feature	No	(on 6139)	No	No	Integral
Automation interface	Serial, parallel	7203/7239 AutoDrive	RS-232/422	Serial	No
Programmable functions	X-fade, fade-black	Auto-trans/sequences	Yes (AK $\mu$ P controlled)	Fade-black, X fade	Yes
Digital effects port	Yes	No	.....[6124A]	No	Optional
Path length or deviation	...( $\pm$ 1.5° differential)	$\pm$ 1° differential	$\pm$ 1.5° differential	.....	12 $\mu$ s
Crosstalk at subcarrier	50dB	50dB (55dB 4.43MHz)	50dB 3.58MHz [4.43]	50dB	52dB
Audio preview, follow	Yes	Yes (No)	No	Yes	No
Audio level control	No	No	No	w/metering	No
Audio mixer interface	No	No	No	Yes	Yes
Edit control interface	No (yes)	Yes (6403 interface)	6403 editor module	.....	.....
Reader Service Number	761	762	763	764	765

# Video Switchers, Master & Production

Manufacturer	Model Series	SE-6	Equilab DV-5	Electrocraft VM-8548	ERCA -TM2/6C†	For-A ★PVM-500† (CVM-500 <sup>1</sup> )
Control application		Production	Production	Production	Production, ENG	Production, remote
# of inputs		10V	10V	8	6 component or PAL	6 NTSC/PAL (6)
Integral matte source		Yes	Yes	Yes	External source	Yes
Key sources		2 int, 5 ext	4 ext	Various int, 1 ext	Title only	Any int, 2 ext
Chroma keyers		Enc. or RGB opt	Enc. or RGB opt	RGB	Yes	CCK-500 EXKEY opt
Downstream keyer		2 sources	2 sources	Yes	Possible	Integral
Switching buses		5	4 prime, 3 aux	4 primary	3	4 primry
Mix Effects amps		2½	1½	Yes	2	1
Pattern generator		40 patterns	Programmable	23 programmable	Programmable	22 patterns
Wipe effects		Soft, programmable	Soft, rotary options	Soft-edge	Limited geometrics	Yes
Border effects		Integral	Integral	Yes	Yes	No
Shadow effects		Optional	Optional	.....	.....	No
Quad split feature		Integral	Optional	No	No	No
Automation interface		RS-422	RS-422	Yes	No	FXM-500 EXTROL
Programmable functions		.....	x-fade, fade-black	Yes	Limited features	Transitions
Digital effects port		Optional	Yes	No	No	No
Path length or deviation		12µs	0.3µs	.....	.....	.....
Crosstalk at subcarrier		52dB	52dB	.....	.....	.....
Audio preview, follow		No	No	No	No	No
Audio level control		No	No	No	No	No
Audio mixer interface		Yes	Yes	No	No	No
Edit control interface		.....	.....	No	No	Yes
<sup>1</sup> Component analog model accommodates RGB, Y/R-Y/B-Y formats.						
Reader Service Number		766	767	768	769	770

Manufacturer	Model Series	For-A PVM-600	Grass Valley Group Model 300-3A (series)	1600-1L (1600-1X)	Model 1680 (series)	Model 100 (100CV) <sup>†</sup>
Control application		Production, editing	Production	Production	Video production	Production
# of inputs		12	24 video	10 primary	10-24V, audio opt	8 video (8 component)
Integral matte source		Internal	Yes	Yes	Yes	Yes
Key sources		2	26 int, 6-32 ext	Int, ext	10-24 int, 10-22 ext	8 int, 2 ext, 1 DSK
Chroma keyers		CCK-500 EXKEY	Enc. or RGB	RGB or enc.	Enc., RGB	RGB
Downstream keyer		Yes	26 sources std	Std on -1X	4-source standard	8 sources
Switching buses		4 prime, key select	12	4 output	4-8, 1 aux on -16F	3
Mix Effects amps		1	3	1	1 to 3	1
Pattern generator		24 patterns	44 patterns	Yes	54 patterns	10 patterns
Wipe effects		Hard, soft-edge	Rot, soft, programmed	Soft-edge, rotary	Soft-edge, rotary	Soft-edged
Border effects		Hard, soft, modulated	Integral	Option	Option	Optional
Shadow effects		.....	Integral	Yes	Option	Option
Quad split feature		No	Option	.....	Option	.....
Automation interface		GPI, 422-serial opt	.....	Yes	Serial std	Serial opt
Programmable functions		Yes	Yes	(4 auto transitions)	Via E-MEM	Auto transitions
Digital effects port		FXM-500 EXTROL	Yes	.....	Yes, w/E-Disk	Key-MEM
Path length or deviation		.....	0.7µs	<1.5° deviation	<1.5° deviation	206ns
Crosstalk at subcarrier		<-54dB 4.43MHz	-54dB	<-55dB	<-54dB	<-54dB
Audio preview, follow		No	.....	Option	[Series includes:	.....
Audio level control		No	.....	.....	]-16K/-24F/-24K	.....
Audio mixer interface		No	.....	Parallel option	.....	AMX-100 mixer
Edit control interface		Yes	.....	Parallel option	Serial	RS-232/422. GPI
<sup>2</sup> Component model accommodates RGB, Y/R-Y/B-Y, YIQ analog types.						
Reader Service Number		771	772	773	774	775

Manufacturer	Model Series	Grass Valley Group 1600-4S	Model 200-2	Ikegami Electronics DSS-5108C 4:2:2	Image Video ★8200 series (custom)	Intergroup Video Series 9600
Control application		Master	Production	Component, production	Master	Production
# of inputs		To 24V, 24A + 6A stereo	20 primary	8 RGB, Y/R-Y/B-Y, YIQ	30V, 30A + 12A	16, 24
Integral matte source		Yes	Yes	Yes	Yes	Yes
Key sources		Int, ext	Int, ext Key, fill	3 Super, 1 key	All int, 5 ext	12 input
Chroma keyers		.....	Multi-format component	Option	RGB for PAL	RGB w/ shadow
Downstream keyer		.....	Full feature	Standard	5-input	Yes
Switching buses		2 prime	12	A, B, Key	4 primary	8 primary, 2 aux
Mix Effects amps		Key/matte only	2	1	.....	1 or 2
Pattern generator		.....	32, programmable	>64 patterns	12 patterns/PAL	42 patterns
Wipe effects		.....	Soft-edge, rotary	Yes	No	Rotation, soft
Border effects		Analog, digital opt	Yes	Yes	For keys	Yes
Shadow effects		No	Yes	.....	For keys	Yes
Quad split feature		No	.....	.....	No	.....
Automation interface		For M-200 series	For E-MEM	Editor control opt	Option	RS-232/422
Programmable functions		Yes	Auto transitions	Cut, fade, wipe	Yes	REFEX memory
Digital effects port		No	Kaleidoscope DPM-1	No	Yes	.....
Path length or deviation		<1° deviation	<1.5° deviation	.....	Design dependent	.....

## Video Switchers, Master & Production

Manufacturer	Grass Valley Group		Ikegami Electronics	Image Video	Intergroup Video
Model Series	1600-4S	Model 200-2	DSS-5108C 4:2:2	★8200 series (custom)	Series 9600
Crosstalk at subcarrier	<-60dB V, <-80dB A	<-54dB	.....	56dB	.....
Audio preview, follow	Yes	.....	No	Yes	Option
Audio level control	w/L/R/SAP meters	.....	No	w/metering	Option
Audio mixer interface	Integral	.....	No	No	Option
Edit control interface	No	Serial, GPI	Option	No	RS-232/422
Reader Service Number	776	777	778	779	780

Manufacturer	JVC Company	Kaitronics	Omicron Video	Polar Video	Ross Video
Model Series	KM-2000U (1200U)†	-CMS-12†	Model 507†	PVM-1 portable†	210/216
Control application	Production	Master	Master	Production	Production
# of inputs	8 (5)	12, expand to 20	.....	4 video	10 (16)V, 10A
Integral matte source	Yes	No	Yes	Yes	Yes
Key sources	1 int, 1 ext	N/A	Ext	Int, ext	Int,ext
Chroma keyers	RGB	No	Optional	No	RGB (& enc.)
Downstream keyer	1 source	No	1 source	No	3 sources
Switching buses	2, 1 aux (2 primary)	Prgm, prvw	2 V, 2+2 A	3	3
Mix Effects amps	2	0	1	2	1 multilayer
Pattern generator	13 (6) patterns	No	None	22+ patterns	12-24 patterns
Wipe effects	Soft-edge -2000U	No	No	No	Soft-edge
Border effects	No	No	No	No	Analog key border
Shadow effects	No	No	Integral	No	No
Quad split feature	No	No	No	No	No
Automation interface	No	RS-232C	Optional	PAF-1 opt	RS-422 optional
Programmable functions	Fade-black 2000U	Possible	Fade-black	X-fade, fade-black	X-fade, fade-black
Digital effects port	No	No	No	No	Yes
Path length or deviation	.....	.....	.....	.....	250µs
Crosstalk at subcarrier	50dB	55dB	50dB 4.5MHz	50dB 4.5MHz	>53dB
Audio preview, follow	.....	Possible	No	No	No
Audio level control	No	w/R-L metering	No	No	No
Audio mixer interface	No	Yes	No	No	No
Edit control interface	No	RS-232C	.....	No	.....
Reader Service Number	781	782	783	784	785

Manufacturer	Ross Video			Shintron	
Model Series	RVS-508 (514) [517]	RVS-524	RVS 210A (RVS 216A)	Empress 2000 (EC2000)†	★Model 372
Control application	Production	Production	Production	Production (component)	Production
# of inputs	16,20,24 ([12,20])	12 or 20 NTSC, PAL/-M	10 (16) NTSC, PAL	10 + key + spare	8
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	Int, ext	Any int, ext, titler	Int, ext	Int, ext	Int, ext
Chroma keyers	RGB, enc. available	Opt enc., RGB	RGB (& enc.)	RGB	No
Downstream keyer	Yes ([...])	Yes	3-source	Option	Yes
Switching buses	8(4)[7] prime, to 10 aux	4 primary	3 primary	4 primary	3
Mix Effects amps	Single ([dual])	1 MLE	1 multilevel	1	1
Pattern generator	62 per ME	27 patterns	12 patterns	16 pattern	8-pattern
Wipe effects	Rotary, soft-wipe	9 rotary, hard, soft edge	Hard, soft	Soft-edge	Soft-edge
Border effects	Yes	Yes	Analog key border	Yes	Yes
Shadow effects	Yes	Yes	No	No	No
Quad split feature	Integral options	No	No	No	No
Automation interface	Encore memory system	Scene store memory	RS-422 option	RS-422 & Empress	No
Programmable functions	Auto transitions	Yes	x-fade, fade-black	Yes	Auto take PV-PGM
Digital effects port	Option	Yes	Yes	No	No
Path length or deviation	± 1/5° NTSC, PAL/-M	± 1.5° differential	≤ 1.5° NTSC/PAL	50ns	2°/length 258ns
Crosstalk at subcarrier	> 53dB 3.58/4.43MHz	53dB 3.58/4.43MHz	≤ -53dB 4.43MHz	< -50dB	< -50dB
Audio preview, follow	No	No	Opt mixer	No	No
Audio level control	No	No	No	No	No
Audio mixer interface	No	No	For 12-input mixer	No	No
Edit control interface	RS-422	Option	Yes	RS-422, SMPTE	No
Reader Service Number	786	787	788	789	790

Manufacturer	Shintron	Thomson Video Equipement		Utah Scientific
Model Series	★390 YUV/YIQ/YCrCb†	TTV 5630S (SECAM)	TTV 5650 Digital	MC-501 (MC-502 <sup>2</sup> )
Control application	Production	Production	Production/CCIR 601	Master
# of inputs	4 sets	16 (24, 32 options)	16	30-150 V/A, 8 audio only
Integral matte source	Yes	Yes	Yes	Yes
Key sources	External	Int, 4 ext	Yes	3 ext, preview
Chroma keyers	No	2-6 RGB possible	3 inputs	No
Downstream keyer	Option	Yes	.....	.....
Switching buses	4 primary	7 primary	7 primary	Preset/Pgm/8x3A(Prvw/Key)
Mix Effects amps	1	1 w/4 effects buses	1 w/4 effects buses	No

## Video Switchers, Master & Production

Manufacturer	Shintron	Thomson Video Equipment		Utah Scientific
Model Series	★390 YUV/YIQ/YCrCb†	TTV 5630S (SECAM)	TTV 5650 Digital	MC-501 (MC-502 <sup>9</sup> )
Pattern generator	16	4 to 5	4 generators	Option
Wipe effects	Soft-edge	Soft edges	Various types	Option
Border effects	Yes	Yes	Yes	Edges for key
Shadow effects	.....	.....	Yes	Yes for key
Quad split feature	No	.....	YEs	No
Automation interface	RS-422 & GPI	Edit controller	Edit controller	SAS-1 system
Programmable functions	30-event memory	MemBox storage	MemBox storage	Yes
Digital effects port	.....	.....	Yes	.....
Path length or deviation	50ns, <40ns deviation	1.5μs	.....	Differential ≤ ± 1.0°
Crosstalk at subcarrier	.....	<-50dB 4.43MHz	.....	≤ -60dB
Audio preview, follow	(Inputs include:	No	No	Yes
Audio level control	.....	No	No	L/R. Over/under
Audio mixer interface	.....	No	No	.....
Edit control interface	Integral	Yes	Yes	.....
*Preview and key buses in addition to those for 501 system.				
Reader Service Number	791	792	793	794

## Routing Switcher Systems

These distribution routing switchers are generally larger format, matrix type systems, not stacked, looped-input systems.

Manufacturer	BSM	BTS	CEL/Grunder Assoc	Datatek	
Model Series	Modula/Mini Modula	TVS/TAS-2000	P169V/P169A	D-2400	D-2000 AV
Crosspoint matrix	8x8 (8x8)	10x10	8x4	20x10 (4-8 level)	25x1/50x1
Typical system size	256x256 (24x32)	450x150	8x4x3	40/60/80/160x20	256x256 8-level
Audio response	± 0.1dB 10-50k	± 0.1dB 20-20k	-3dB 10-100k	± 0.5dB 20-20k	-0.1dB 20-20k
Harmonic distortion	<0.1%	<0.005% 20-20k 10dBv	.....	<0.005% 16dBu 600Ω	0.05% 30dBm
S/N ratio	-80dBm noise floor	85dB hum & noise	<-90dBm	-116dB 20kHz ba	-75dBm
Audio crosstalk worst	-90dB max	<-90dB worst	-70dB	-82dB 20kHz 30dBu	<-85dB to 20kHz
Video response	± 0.1dB 15MHz	± 1.5dB to 15MHz	0.1dB 6MHz	± 0.05dB 10MHz	± 0.25dB 10MHz
Diff phase/gain	<0.1°, <0.1%	< ± 1°, <0.1%	± 0.2°, ± 0.2%	0.05°, 0.05%	0.15°, 0.15%
Video S/N ratio	> 65dB noise floor	> 75dB	> 80dB	75dB 5MHz	60dB 6MHz bw
Video crosstalk worst	-65dB max	> 60dB worst	<-55dB to 4.43MHz	<-63dB 5MHz	<-60dB 4.43MHz
Control format	RS-232 & others	SMPTE-422 bus	RS-423/422	RS-232/422	RS-232C
Applicable to CAV	Possible	Yes	Yes	Possible	Possible
Reader Service Number	401	402	403	404	405

Manufacturer	Di-Tech		Dynair Electronics		Dynamic Technology
Model/Series	5861-V/5862-A	5800 (5850) series	DYNASTY 100	Series 21 (25)	Routermaster
Crosspoint matrix	32x2	20x1 (40x1)	.....	10x10	16x4, 16x8, 32x4
Typical system size	64x32 A/V 10-level	100x15 AFV (>200x200)	50x80-V/ 100x80-A	100x50 AV (20x20 AV)	16/32 in, 1/4/8 out
Audio response	± 0.1dB 20-20k	± 0.25dB 20-20k	± 0.2dB 30-20k	± 0.2dB 30-20k	12dBm in, 20dBm out
Harmonic distortion	<0.1% 24dBu	<0.5% >18dBm	0.1% 8dBm 15kHz	0.1% 8dBm 15kHz	0.1%, 20Hz-20kHz
S/N ratio	> 104dB below 24dBu	<-70dBm (<-80dBm)	-75dBm	-75dBm	-80dBm 20Hz-20kHz
Audio crosstalk worst	<-70dB to 20k	<-70dB to 20kHz	<-80dB 15kHz worst	<-80dB	-70dB, 10kHz, 600Ω
Video response	± 0.5dB 12MHz	± 0.25dB to 10MHz	± 0.1dB to 20MHz	± 0.3dB 8MHz	± 0.1dB, 5.5MHz
Diff phase/gain	<0.25°, <0.25%	<0.25°, 0.25%	0.2°, 0.2%	<0.15°, <0.15%	0.1°, 0.1%
Video S/N ratio	> 70dB	<-65dBV	100dB 100MHz bw	65dB hum+ noise	80dB wtd
Video crosstalk worst	<-60dB 4.5MHz	<-60dB 4.5MHz	<-50dB 5MHz (-25/100)	<-60dB 5MHz	-60dB, 4.43MHz
Control format	Serial coax/tw pair	Serial, parallel	Various forms	RS-232C/423, others	8-bit binary code
Applicable to CAV	Possible	[multilevel audio	Yes	.....	.....
Reader Service Number	406	407	408	409	410

Manufacturer	Dynamic Technology	Editron Australia	Grass Valley Group		Intergroup Video
Model/Series	3900 series	S1500 Audio	Horizon systems	Horizon HX-series	Series 1100
Crosspoint matrix	16s in, 8s out	32x24	16x16	16x16 to 64x64	10x10 AFV, 20x10 A/V
Typical system size	128x128 max	64x96 stereo	128x128	128x128	80x80
Audio response	12dBm in, 20dBm out	± 0.25dB 25-20k	± 0.1dB 20-20k	24dBu, 12.28V	± 0.1dB 30-15k
Harmonic distortion	0.1%, 40Hz-20kHz	<0.05% 24dBm	<0.5% 24dBu	<0.5%, 20Hz-20kHz	<0.025%
S/N ratio	-80dB hum+ noise	>90dB	>100dB 24dBu	>100dB ref +24dBu	>78dB
Audio crosstalk worst	-70dB, 10kHz, 600Ω	<-70dB overall	<-90dB overall	<-80dB 20Hz-20kHz	≤ -70dB
Video response	± 0.1dB, 5.5MHz	.....	-0.5, +0.1dB 8MHz	± 0.15dB, 5MHz	± 0.25dB to 8MHz
Diff phase/gain	0.1°, 0.1%	[Each output has	<0.1°, <0.1%	<0.1°, <0.1%	<0.25°, <0.25%
Video S/N ratio	80dB wtd	[3-out DA	>75dB	>75dB	≥ 65dB
Video crosstalk worst	-60dB, 4.43MHz	.....	-60dB 5MHz worst	-60dB, 5MHz	≤ 62dB
Control format	RS-422	Various types	RS-422/232C	RS-232/422	Various types
Applicable to CAV	.....	.....	Yes	.....	Yes
Reader Service Number	411	412	413	414	415



## Routing Switcher Systems

Manufacturer	ITC/3M	McCurdy Radio Ind	NEC America	Omicron Video	PESA
Model/Series	Audio Switcher	ACP-1 (ACP-24)	TKA-500B/AKA-500B	553-20/10-4V/A	SIM-4032
Crosspoint matrix	32x32	200x2 (24x2)	8x16	10x1	16x2
Typical system size	32x64, 64x32, 256x256	200x>200 (24x24)	512x512 A/V 6-level	20x10 4V/1A	32x32
Audio response	± 0.1dB 20-20k 0dBm	± 0.2dB 20-20k	± 0.2dB 20-20k	± 1dB 50-15k	0.5dB 100-10k
Harmonic distortion	<0.01% 0dBm	<0.1% -10, +24dBu	<0.01% 8dBu	0.25% 6dBm 1kHz	≤0.1%
S/N ratio	<90dB 0dBm	>95dB wideband	-85dBu	-80dBm A-wtd	≥65dB
Audio crosstalk worst	<-90dB 1kHz 20cBm	<-80dB worst case	-85dB 20-20k worst	.....	<-75dB
Video response	[Includes memory	[Unit for audio	-0.5, +0.2dB 10MHz	± 0.1dB 5MHz	[Design intent is
Diff phase/gain	[backup, system	[only.	± 0.2°, ± 0.2%	<0.25°	[for intercom use.
Video S/N ratio	[alerts operator	.....	64dB unwt'd 10MHz	>65dB	.....
Video crosstalk worst	[of failures.	.....	<-50dB 10MHz worst	<-60dB 3.58MHz	.....
Control format	To 31 remote controls	X-Y, DTMF, other	BSNET LAN, RS-422	RS-232/422	RS-232C
Applicable to CAV	.....	.....	Yes	Yes	.....
Reader Service Number	416	417	418	419	420

Manufacturer	pro-bel	Shintron	Sierra Video Systems	Utah Scientific
Model/Series	Analog systems	ADAM mixed A/D	12X-Q4 [12xC4-12xV4]	Series 8/16
Crosspoint matrix	8x1/8x8	4-in, 4-out buffers	4-RGB/pulsex4	8x8, 16x4
Typical system size	256x64/144x256	128x128, 256x256	12x4	16x24 V/SA/TC
Audio response	< ± 0.2dB 15-20k	<0.25dB 20-20k	.....	± 0.1dB 20-20k
Harmonic distortion	<0.05% 8dBu	<0.1% 30-20k 8dBu	[For analog video	0.1% 24dBm
S/N ratio	>90dBu true RMS DIN	>80dB wtd	[component use	100dB 24dBm
Audio crosstalk worst	<-90dB worst	<-96dB 20kHz	.....	-80dB
Video response	-0.5, +0.25dB 8MHz	[Mixed analog &	-3dB to 30MHz	-0.5, +0.1dB 8MHz
Diff phase/gain	<0.2°, <0.2% 4.43MHz	[digital in/out,	<0.25°, <0.25%	± 0.25°, 0.25%
Video S/N ratio	>73dB wtd luminance	[per CCIR, AES, EBU	63dB typical	.....
Video crosstalk worst	<-60dB adjacent	.....	<-60dB, 5MHz	≥ 50dB 3.58MHz
Control format	RS-232C/422/485	RS-422/485/232	RS-422 bus	RS-232
Applicable to CAV	Possible	.....	Yes	Yes
Reader Service Number	421	422	423	424

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- 233\* 50 outputs video/2 ch audio, dubing system DA.
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- 240-2 VCA audio DA, remote control system DA.
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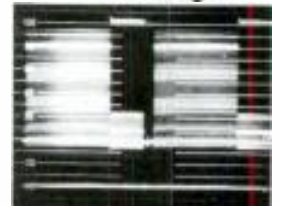
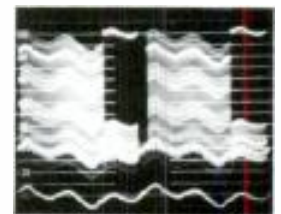
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# Still-Store Image Library Systems

Manufacturer	Abekas Video Systems		Ampex AVSD	ASACA/ShibaSoku	
Model/Series	A42 video slide proj	A62 (A64) recorder <sup>1</sup>	ESS-3	ADS-2000	ADR-5000 <sup>2</sup>
Disk medium	Winchester	Winchester	Winchester, floppy	Winchester	Magneto-optical
# of work stations	1	1	To 10	1	1
Output channels	2-pgm, 1-prvw	1-pgm, 1-prvw	10-pgm, 15-prvw	Dual pgm, prvw	1-prg, 1 prvw
Color standards	NTSC	NTSC-RGB(CCI601-PAL)	NTSC, PAL	NTSC	CCIR 601, NTSC
Directory.catalog	Data list, proof sheet	Parameter display	List, proof sheet	16-pix proof sheet	Data list
Integral effects	Yes	Key, matte (& layering)	Yes	No	.....
Editing control port	GPIB	RS-232/422/GPIB/SMPTE	GPI	.....	RS-422
Portable system	Yes	No	No	No	No
Video response	± 0.25dB to 4.2MHz	± 0.25dB 4.2MHz (5.5)	± 0.5dB to 5MHz	± 0.5dB to 6MHz	[Specifications in
S/N ratio	52dB	52dB (56dB)	.....	> 50dB	[conformance with
Diff. phase, gain	2°, 2%	2°, 2%	1°, 1%	<2°, <2%	[CCIR 601 for use
K factor	1%	1%	.....	.....	[in digital
Chroma luma delay	5ns	.....	.....	.....	[television
Time base stability	.....	.....	.....	.....	.....
TBC requirement	.....	.....	External required	.....	.....
Composite digital	Yes	.....	Yes	Composite coded	Yes
Component digital	No	RGB, YCrCb (YUV)	4:2:2 encoded	.....	Yes
# of drives max	3	1 (2)	25 possible	8	2-disk system
Streaming tape	Yes	No	No	Option	.....
Frames per disk	350	.....(30s/disk)	100 on 80MByte drive	700	10 minutes or 18,000
Frames per systems	1050 (2100 fields)	3000, 100s time (60s)	25,000	5,600	stills, 6.5GByte
Worst case access	0.8s	Instantaneous	3s	6-55ms, 27ms nom	30-500ms, jump dep
Programmed sequences	Yes	Loops, sequence editor	Yes	Yes	Yes
<sup>1</sup> Allows real-time record with simultaneous play <sup>2</sup> Includes 2-channel 16-bit audio recording.					
<b>Reader Service Number</b>	<b>893</b>	<b>894</b>	<b>895</b>	<b>896</b>	<b>897</b>

Manufacturer	BTS	Harris Video Systems		Leitch Video	Logica
Model/Series	Vidifont GraphicStore	ESP series	Iris C (Iris-II)	DSF-3100N still file	Gallery 2000 library
Disk medium	Winchester, floppy	Winchester	Winchester	Winchester	Optical/disk
# of work stations	1	Multiple	2 (6)	LAN possible	Multiple
Output channels	1 pgm, 1 prvw	2-pgm, 1-prvw	4-pgm, 4 prvw (12, 12)	Single, dual	Multiple
Color standards	NTSC, PAL	NTSC	NTSC, PAL, SECAM	NTSC	CCIR 601/525 & 625
Directory.catalog	Data list, proof sheet	Pack review mode	Data list	Still review mode	Proofsheet
Integral effects	w/Vidifex 3-D	No	Yes	Limited options	w/Art File graphics
Editing control port	RS-232/422	RS-232	RS-232	PC SCSI interface	Yes
Portable system	No	No	Yes (No)	.....	No
Video response	1088x483 pixel	± 0.5dB to 5MHz	± 0.2dB to 4.2MHz	± 0.15dB to 4.5MHz	± 0.5dB 5.5MHz
S/N ratio	.....	56dB	57dB (56dB)	> 70dB	[per CCIR 601
Diff. phase, gain	.....	<2°, <2%	1°, 1%	<1°, <2%	[recommendation
K factor	.....	1%	1%	.....	[for digital
Chroma luma delay	.....	.....	17ns	± 10ns	[TV use.
Time base stability	.....	± 1ns	.....	.....	.....
TBC requirement	Integral unit	Integral unit	Integral	Inc 2 frame buffers	No
Composite digital	.....	Yes	.....	Yes	A/D conversion
Component digital	RGB analog	No	4:1:1 sampling	.....	YUV 4:2:2 encoded
# of drives max	8	4	2 (8)	Multiple	Multiple
Streaming tape	No	No	No	.....	No
Frames per disk	70-250, 40-140MByte	100, 200, 750 drives	1,066	600	2,800 525-line
Frames per systems	2,000 max	400, 800, 3,000	2,132 (8,528)	Expand to 10,000	56,000
Worst case access	5s	<450ms	600ms	<0.6s	1s
Programmed sequences	Yes	Yes	Yes	10 seq of 99	Yes
<b>Reader Service Number</b>	<b>898</b>	<b>899</b>	<b>900</b>	<b>901</b>	<b>902</b>

Manufacturer	Oktel	Optical Disc Corp	Quantel	Rank Cintel	TEAC
Model/Series	OR6000	#610A	Library Systems	Slide File	LV-200A/200 <sup>3</sup>
Disk medium	Winchester	Optical DRAW system	Winchester	Winchester	Optical, WORM
# of work stations	1	1	1 or multiple (1)	5	1
Output channels	1	1	multiple pgm, 1-prvw	3-pgm, 3-prvw	Pgm
Color standards	NTSC, PAL	NTSC, PAL	NTSC, PAL, SECAM	NTSC, RGB, PAL, SECAM	NTSC
Directory.catalog	.....	.....	Data list, proof sheet	Proof sheet	None
Integral effects	No	No	Yes	Yes	No
Editing control port	RS-232, IEEE-488	No	RS-422	RS-232/422/QIC02	RS-232C
Portable system	.....	No	If desired	Yes	Yes
Video response	4.2MHz bandwidth	[For preparation of	[Meets requirements	± 0.5dB to 5.5MHz	330TVL equivalent
S/N ratio	50dB	[recordable Laser	[for digital TV	[Per CCIR 601	45dB
Diff. phase, gain	.....	[Videodiscs only,	[integrated studios.	[recommendation	.....
K factor	.....	[not for on-air	[CLL6000 accesses	[for digital	.....
Chroma luma delay	.....	[broadcast use.	[40 drives for	[television use.	.....
Time base stability	.....	.....	[100,000 frames	.....	.....
TBC requirement	.....	.....	[from 25 stations	Integral	TBC suggested

## Still-Store Image Library Systems

Manufacturer	Oktel	Optical Disc Corp	Quantel	Rank Cintel	TEAC
Model/Series	DR6000	#610A	Library Systems	Slide File	LV-200A/200 <sup>3</sup>
Composite digital	Yes	Yes	Yes	Yes	No
Component digital	.....	No	YCrCb	YUV 4-2-2 encoding	RS-170A analog, FM
# of drives max	Multiple option	1	8 (2)	2	1
Streaming tape	.....	No	No	Yes	No
Frames per disk	1,800 (60s)	n.a.	800	390	54,000/side
Frames per systems	.....	n.a.	6,400 (1,600)	500,000	108,000
Worst case access	1.5s, 500ms average	n.a.	0.5s	1s	1s across disk
Programmed sequences	Loops, random access	No	Yes	Yes	w/RAM pack
<sup>3</sup> Includes FM-based audio; 200 is play only unit.					
Reader Service Number	903	904	905	906	907

## Video TBCs/Frame Synchronizers

Equipment for use in stabilizing playback images from VTR/VCR systems or in synchronizing imported video signals from satellite, ENG microwave or other out-of-house sources. Models marked with a diamond (◆) do not include a coherent 3.58MHz output signal. A single dagger (†) indicates image enhancement features, while a double dagger (‡) includes color correction.

Manufacturer	ALTA Group	Ampex AVSD			Apert-Herzog
Model Series	◆Cygnus†‡	TBC-40 <sup>1</sup> (TBC-80)	Zeus 1	TBC-6	Model H (Model H2)
Function	TBC, synchronizer	TBC only	TBC, framestore	TBC only	TBC, synchronizer
Sample freq.bits	.....	14.3MHz/8-bit	14.3MHz/9-bit <sup>2</sup>	14.3MHz/8-bit	15.4MHz/8-bit
Correction window	1 field	15 TVL	60 TVL, 1-frame	28 TVL	2-field
Video bandwidth	290 TVL	±0.2dB to 4.2MHz NTSC	±0.2dB to 5MHz	±0.2dB to 4.2MHz	To 4.2MHz
S/N ratio	>55dB	56dB	≥58dB	56dB	54dB
Differential phase/gain	<3°/ <3	2°/2	<2°/ <2	2°/2	3°/3%
Residual error	.....	±2.5ns C/ ±10ns L	<2.5ns C/ <10ns L	±2.5ns C	±12ns
Advanced sync out	.....	Yes	Yes	Yes	Yes
Component in/out	No	Composite only	Composite	Composite	No
Velocity compensation	.....	Yes	Digital	Yes	No
Heterodyne processing	Yes	No (for 1/2", U)	Yes	Yes	Model H
Non-servo capstan	Yes	No	Yes	No	Model H
Dropout compensation	Yes	Yes	Spatial	Yes	No
Dynamic tracking	Yes	No (0-1.5x play)	-1, +3x play, full color	Yes	No
Noise reduction	Yes	No	Adaptive comb filter	No	No
Production effects	w/4-in A/V switcher	No	No	No	No
<sup>1</sup> TBC-40 upgrades to TBC-80, TBC-6					
<sup>2</sup> In PAL/SECAM, sampling is at 17.7MHz, video bandwidth extends to 6MHz.					
Reader Service Number	656	657	658	659	660

Manufacturer	DVS/Scientific Atlanta			For-A	
Model Series	◆DPS-165	DPS-170	DPS-17J	F-800 Autocor	FA-410 (FA-430†‡)
Function	Synchronizer	TBC	TBC, synchronizer	TBC, synchronizer	TBC
Sample freq.bits	4xFsc/8-bit	4xFsc	4xFsc/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	>525 TVL	16 TVL	>525 TVL	2-field memory	16 TVL
Video bandwidth	±0.25dB, 0-4.2MHz	±0.25dB, 0-4.2MHz	±0.25dB, 0-4.2MHz	±0.3dB to 5MHz	-0.5dB to 4.2MHz
S/N ratio	>57dB	>57dB	>57dB luma wtd	58dB	58dB color, 56dB V17-358
Differential phase/gain	<2°/ <2	<2°/ <2	<2°/ <2	2°/2	2°/2
Residual error	.....	.....	.....	±25ns	2° color, 15ns VTR-358
Advanced sync out	No	8-line advance	8-line advance	Yes	Yes
Component in/out	No	Composite only	Composite only	Composite	Composite (Y-688)
Velocity compensation	.....	Yes	Yes	Yes	No
Heterodyne processing	No	Yes	Yes	Yes	Yes
Non-servo capstan	Yes	.....	Yes	Yes	Yes
Dropout compensation	.....	RF/TTL	Yes	Yes	Yes
Dynamic tracking	.....	-1, +3x	-1, +3x	Yes	No
Noise reduction	No	No	No	No	No (6dB)
Production effects	No	No	No	No	No
Reader Service Number	661	662	663	664	665

Manufacturer	For-A			Fortel	
Model Series	FA-740	◆FA-400 (T&C-420)	TA-450N, TA-450P	◆Turbo 2†	Y-688 <sup>2</sup> TEC†
Function	Dual TBC w/effects	TBC, frame store	TBC, framestore	TBC	Total error corrector
Sample freq.bits	8.95-Y/2.2-C/8-bit	14.3MHz/8-bit	13.5-Y/6.75-C/8-bit	13.5MHz 4:1:1 CCIR-601	14.3/8 Y; 7.2/8 CrCb
Correction window	1-frame	1-frame	2-field	Infinite window	32 lines
Video bandwidth	3.5MHz Y, 0.9MHz C	±0.5dB to 4.2MHz	3.5-N, 4.43-P, 5.5-Y	4.2MHz NTSC dub mode	-3dB to 5MHz
S/N ratio	55dB	58dB	58dB	57dB	57dB w/o comb encoded
Differential phase/gain	2°/2	2°/2	2°/2	1°/1%	0.5°/0.5% dub in/out

# Video TBCs/Frame Synchronizers

Manufacturer	For-A				Fortel
Model Series	FA-740	◆FA-400 (TBC-420)	TA-450N, TA-450P	◆Turbo 2†	Y-688**TEC†
Residual error	.....	±2° (±10ns)	±2° C, ±15ns Y	±15ns L, ±2° C	.....
Advanced sync out	.....	Yes	Yes	Yes	Yes
Component in/out	Yes	Composite	Composite/RGB/YC/YCrCb	Y/688, VTR direct, YCrCb	Y/688
Velocity compensation	.....	No	Yes	No	Yes
Heterodyne processing	Yes	Yes	Yes	No	Yes
Non-servo capstan	.....	Yes	Yes	No	Yes
Dropout compensation	Yes	No (Yes)	Yes	Yes	Yes
Dynamic tracking	.....	No	Yes	Yes	Yes
Noise reduction	Comb filtering	No	No	Luminance only	To 6dB
Production effects	Yes	No	No	Frame, field freeze	No
Reader Service Number	666	667	668	669	670

Manufacturer	Fortel	Fougerolle SA	GML America/Gunnerfield Marketing Ltd	
Model Series	DHP525†	◆MPV 1000	◆GML8000 PAL/SECAM†‡ SYSTEM	GML4004S PAL/SECAM‡
Function	TBC	Dual TBC synchronizer	TBC, synchronizer	Dual TBC w/effects
Sample freq.bits	13.5MHz 4:1:1 CCIR-601	13.5MHz/8-bit	13.5MHz/8-bit	13.5MHz/8-bit
Correction window	Infinite	2-fields/channel	1-field	16 TVL
Video bandwidth	-3dB to 2.2MHz	5MHz RGB or YCrCb	5.5MHz lum, 3mhz chr	To 3MHz w/color under
S/N ratio	57dB	.....	55dB	55dB
Differential phase/gain	1°/1%	.....	4°/4%	4°/4%
Residual error	±15ns L, 2° C	.....	±25ns	±25ns
Advanced sync out	Yes	No	No	Yes
Component in/out	Composite only	RGB, YCrCb	Y/C, RGB opt	RGB out
Velocity compensation	.....	.....	Yes	No
Heterodyne processing	.....	.....	Yes	Yes
Non-servo capstan	Yes	.....	Yes	Yes
Dropout compensation	Yes	RF or TTL	Yes	Yes
Dynamic tracking	.....	No	Yes	Channel A only
Noise reduction	Luminance	No	Yes	Noise coring
Production effects	Field/frame freeze	No	Yes	Solar, poster, mosaic, reveals, conceals, wipes
Reader Service Number	671	672	673	675

Manufacturer	Harris Video				
Model Series	HVS 690	AC20AS 1 or 2-channel	540, 550 (560)	Model 642	VW-3
Function	TBC, synchronizer	TBC, synchronizer	TBC	TBC, synchronizer	TBC, synchronizer
Sample freq.bits	14.3MHz/9-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	1 frame	1 field, 1 frame opt	16 TVL	2 field	1 frame
Video bandwidth	±0.5dB to 4.2MHz	4.2MHz	±0.5dB 4.2MHz #540	±0.5dB to 4.2MHz	±0.5dB to 5MHz
S/N ratio	59dB	55dB, >56dB sync mode	>59dB (56dB)	58dB unwt'd	56dB
Differential phase/gain	±2°/±2%	2°/2%	2°/2% (3°/3%)	<2°/2%	<2°/2%
Residual error	±20ns L/±2ns C	±10ns	±20(15)ns L/±2ns C	±2ns sync, ±20ns TBC	±20ns
Advanced sync out	Standard sync	Yes	Yes	16 line advance	Yes
Component in/out	No	No	No	No	No
Velocity compensation	Look-ahead, by-line	No	Not 560	No	Direct, hetero mode
Heterodyne processing	Yes	Yes	550, 560	No	Yes
Non-servo capstan	Yes	No	No	No	.....
Dropout compensation	RF, TTL	Yes	RF, TTL	Yes	TTL, RF
Dynamic tracking	No	±40x play	540, 550 option	-1, +3x play	No
Noise reduction	No	No	No	12dB frame recursive	No
Production effects	Freeze frame, field	Yes w/20PRC	No	No	Field, frame freeze
Editor controllable	.....	Editor controllable	.....	.....	.....
Reader Service Number	676	677	678	679	680

Manufacturer	Harris Video	Hotronic		JVC Company	
Model Series	◆632 NTSC (631 PAL)‡	AE61 (◆AE61B)	AF71	SA-T3000U component	SA-T1000
Function	Synchronizer	TBC	TBC, synchronizer	TBC	TBC
Sample freq.bits	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	858H, 8-bit	4xFsc/8-bit
Correction window	2-field	16 TVL	4-field	±16 lines	525 lines
Video bandwidth	0.5dB 5MHz(.5dB 4.2)	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	-3dB 4.5MHz Y, 1.5MHz C	±0.5dB to 4.2MHz
S/N ratio	57dB (56dB)	58dB	58dB	>56dB	>58dB
Differential phase/gain	2°/2% (1°/1%)	<2°/2%	<1.5°/1.5	<2°/2%	±2°/±2%
Residual error	±10nsL/±2° C (±20nsL)	±20ns L	±20ns	.....	Y±15ns
Advanced sync out	Sync out	Yes	Yes	.....	Yes
Component in/out	RGB	No	Composite	YCrCb	No
Velocity compensation	Yes	No	No	.....	No
Heterodyne processing	Yes	Yes	Yes	.....	Yes
Non-servo capstan	Yes	.....	No	.....	Yes
Dropout compensation	Yes	Option	Yes	Yes	Yes

## Video TBCs/Frame Synchronizers

Manufacturer	Harris Video	Hotronic	JVC Company		
Model Series	◆632 NTSC (631 PAL)‡	AE61 (◆AE61B)	AF71 SA-T3000U component SA-T100U		
Dynamic tracking	No	No	No		
Noise reduction	12dB range L, C	Option	3dB C		
Production effects	630 compress/position	No	No		
Reader Service Number	681	682	683 684 685		
Manufacturer	Leitch Video	Lenco	Microtime		
Model Series	◆DFS-3000N	TBC-450	T-300 (T-320) T-220 FIT Tx2‡		
Function	Synchronizer	TBC	TBC	TBC, format interchange	Single, dual TBC
Sample freq.bits	14.3MHz/8 or 9-bit	14.3MHz/8-bit	14.3MHz/8-bit	13.5MHz/8-bit	13.5MHz
Correction window	Infinite	16-line	35 TVL	1-field	1-frame, infinite
Video bandwidth	±0.15dB to 4.5MHz	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	~3dB 5MHz NTSC, PAL	2.6MHz NTSC, 5MHz Y/C
S/N ratio	>70dB	58dB	58dB	58dB	58dB
Differential phase/gain	<1°/ <%	2°/2	2°/2	2°/2	2°/2
Residual error	.....	±20ns	±10ns	±10ns	.....
Advanced sync out	H&V adjustable	Yes	Yes	No	Yes
Component in/out	Composite only	No	Composite	Composite/YIQ/YCrCb/YC	Composite/YC/YCrCb
Velocity compensation	.....	.....	Averaging (.....)	No	.....
Heterodyne processing	No	Yes	Yes	Yes	Yes
Non-servo capstan	Yes	.....	Yes	Yes	.....
Dropout compensation	Inherent	By pixel, RF, TTL	Yes	Yes	Yes
Dynamic tracking	No	.....	No	-1, 3x play	-1, 3x
Noise reduction	Adaptive processing	No	No	No	To 5dB
Production effects	Field, frame freeze	No	No	No	No
Reader Service Number	686	687	688	689	690
Manufacturer	.....	Microtime	NEC America	Nova Systems	
Model Series	◆S-130 (S-230/230D)	T-320D	◆FS-18 (FS-19)	Model 620 Model 501 (511)	
Function	TBC, synchronizer	TBC	Synchronizer, TBC opt	TBC, framestore	TBC
Sample freq.bits	4xFsc/8-bit	14.3MHz/8-bit	14.3MHz/8-bit (10-bit)	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	1-frame, NTSC, PAL/-B	1-field	Infinite	2-field	32 TVL
Video bandwidth	±0.3dB to 5MHz	±0.5dB to 4.2MHz	Y 5MHz (2.4MHz hetero)	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz

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## Video TBCs/Frame Synchronizers

Manufacturer	Microtime	NEC America	Nova Systems		
Model Series	◆S-130 (S-230/230D)	T-320D	◆FS-18 (FS-19)	Model 620	Model 501 (511)
S/N ratio	>58dB	58dB	53dB (60dB)	58dB	58dB
Differential phase/gain	2°/2	2°/2	2°/2 (1°/1)	<2°/ <2	<2°/ <2
Residual error	.....	± 10ns L	.....	± 2°, ± 10ns	2° C, ± 10ns
Advanced sync out	No (Yes)	Yes	Yes	Yes	Yes
Component in/out	Composite	Composite	No	Composite	Composite
Velocity compensation	.....	.....	Yes	No	Yes
Heterodyne processing	Yes	Yes	Card option	Yes	No (Yes)
Non-servo capstan	Yes	.....	Yes	Yes	No
Dropout compensation	Yes	Yes	RF & TTL	Yes	Yes
Dynamic tracking	No	Yes	No	Yes	Opt (Yes)
Noise reduction	No	.....	4-field option	To 6.2dB	No
Production effects	No	No	Diagnostics	No	No
			Audio sync interface		
<b>Reader Service Number</b>	<b>691</b>	<b>692</b>	<b>693</b>	<b>694</b>	<b>695</b>

Manufacturer	Nova Systems	Panasonic Broadcast	Prime Image	Sony Broadcast	
Model Series	◆Model 700	Nova Sync	◆AU-TB50	TBC+ series <sup>3</sup>	BKH-3010 (BKH-3050)
Function	TBC	Synchronizer	TBC	TBC, synchronizer	TBC (for BVH-3000/3100)
Sample freq./bits	14.3MHz/8-bit	14.3MHz/8-bit	13.5MHz/8-bit	8-bit, luma, chroma	14.3MHz/9-bit
Correction window	32-line	1-frame	32-line	16 line/1-frame	15 TVL
Video bandwidth	2.5MHz-Y, 1.1MHz-C	4.2MHz	Y 4.5MHz, C 1.5MHz	4.2MHz	±0.5dB to 4.2MHz
S/N ratio	58dB	58dB	>54dB component	58dB	>49dB
Differential phase/gain	<2°/ <2	2°/2	1°/1	1.5°/1.5%	<4°/ <4
Residual error	± 10ns	.....	.....	± 15ns	± 2.5ns C, ± 15ns mono
Advanced sync out	Yes	.....	10H-21H	Yes	.....
Component in/out	Composite	Composite	CTCM Y-C	Y/688, NTSC, YCrCb	Per signal system
Velocity compensation	No	Yes	.....	.....	Yes
Heterodyne processing	Yes	Direct	.....	Yes	Option
Non-servo capstan	.....	Yes	.....	No	No
Dropout compensation	Yes	Yes	1-line Y & C	TTL, RF	Digital
Dynamic tracking	No	Yes	-1x, +2x	Yes	With 3050, -1 to +3x play
Noise reduction	No	No	No	.....	Inherent reduction
Production effects	No	No	No	Poster, sepia, mosaic	No
<sup>3</sup> Various configurations - Dub-TBC+, TBC+, TBC+SYNC, TBC+ w/wo effects.					
<b>Reader Service Number</b>	<b>696</b>	<b>697</b>	<b>698</b>	<b>699</b>	<b>700</b>

Manufacturer	Tektronix	Video International	
Model Series	◆110-S	TBC 3000 NTSC/PAL-M††	DTC 2502 Auto Std††
Function	TBC, synchronizer	TBC, synchronizer	TBC, format converter
Sample freq./bits	14.3MHz/10-bit	13.5-Y/6.75-C 8-bit	13.5-Y/6.75-C/8-bit
Correction window	2-field, 4-field	1-frame	1-frame
Video bandwidth	To 4.2MHz	>5.5MHz	>5.5MHz
S/N ratio	60dB unwdt	54dB	54dB
Differential phase/gain	1°/1%	2°/2	2°/2
Residual error	± ns	.....	.....
Advanced sync out	No	Yes	Yes
Component in/out	No	Composite/RGB/YC/YCrCb	Composite/RGB/YC/YCrCb
Velocity compensation	No	.....	Yes
Heterodyne processing	Yes	.....	Yes
Non-servo capstan	Yes	.....	.....
Dropout compensation	No	TTL	TTL-RF
Dynamic tracking	No	Yes	Yes
Noise reduction	Linkable to	4-level to 15dB	4-level selectable
Production effects	AF synchronizer	No	No
<b>Reader Service Number</b>	<b>701</b>	<b>702</b>	<b>703</b>

## Time Code Equipment

These systems are based on SMPTE/EBU timing code specifications for use in editing facilities. The following abbreviations are used for operating modes: DF drop frame, NDF non-drop frame, CF color frame and JS jam sync. LTC (longitudinal time code) is the 80-bit code system, while VITC (vertical interval time code) is the 90-bit system written by the video head into the vertical blanking interval of the video signal.

Manufacturer	Adams-Smith	Albrecht Electronics	Audio Kinetics	Cipher Digital	
Model Series	System 2600	TCU-E	Striper [High speed]	GEARBOX TC converter	CDI-716A generator
Portable unit	No	Yes	No	Rack-mount	Rack-mount
Operating modes	DF/NDF/CF/JS	NDF/CF/JS	DF/NDF/JS	DF/NDF	DF/NDF/CF/JS+ offset
Standards supported	SMPTE, EBU	EBU	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU
Time reference	Video, 60Hz, xtal	Video	Xtal, video, slave	Input code	Video, 60Hz, xtal
Data entry for	Time, user bits	Time, user bits	Time	No	Time, user bits

## Time Code Equipment

Manufacturer	Adams-Smith	Albrecht Electronics	Audio Kinetics	Cipher Digital	
Model Series	System 2600	TCU-E	Striper (High speed)	GEARBOX TC converter CDI-716A generator	
Data display of	Time, user bits	Time, user bits	Time, user bits	None	Time, user bits
Reading speed range	Still-100x play	1/20x-30x play	.....	Play speed	1x-256x tack frame rate
Editor interface	Yes	No	.....	.....	RS-232/422
VITC code output	SMPTE, EBU	EBU standard	.....	No	No
LTC output signal	0dBm, 1Vp-p 600Ω	0-4Vss	0-17Vp-p bal	Std levels	+ 4dBm (0.5-1Vp-p)
Synchronizer function	Yes	Yes	No	No	No
Power requirement	110/220Vac	220Vac	110Vac	110/220Vac	110/220Vac
LTC-VITC translation	Yes	Yes	No	[Reshapes TC signal	No
User bit recognition	Yes	No	.....	[and converts from	No
Time code comparator	Yes	Yes	No	[one time reference	No
Video display keyer	16-char/10-100TVL	8-16 char/16TVL	No	[to another.	No
Display window	2-line	2-line	n.a.	No	No
Reader Service Number	914	915	916	917	918

Manufacturer	Cipher Digital			Convergence	
Model Series	COI700A, 710A reader	CDI735CD/V/L	CDI750 master	VCG76/77 series	EECO VIG850 master
Portable unit	Rack-mount	Rack-mount	Rack-mount	VCG76 only	Rack-mount
Operating modes	DF/NDF/CF	DF/NDF/CF	DF/NDF/CF/JS	DF/NDF	DF/NDF/CF/JS
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU	SMPTE	SMPTE, EBU
Time reference	Video	Video	Video, tach, xtal	Video	Video, slave to TC
Data entry for	.....	Time -735CD	Time, user bits	No	Time, user bits
Data display of	Time, user bits	Time, user bit -CD/L	Time, user bits	Time, user bits VCG-77	Time, user bits
Reading speed range	1/20x-80x	1/20x-80x	1/20x-80x	1/20x-20x (-77), 1/10x-30x	± 45x play
Editor interface	Data output options	RS-422/232	RS-232/422	.....	RS-422
VITC code output	No	No	No	No	Yes
LTC output signal	Restored + 4dBmΩ	Restored + 4dBm	+ 4dBm (0.5-2Vp-p)	.....	1Vp-p, 30Ω source
Synchronizer function	No	-CD/B control channels	Event controller	No	No
Power requirement	110/220Vac	110/220Vac	110/220Vac	10-18Vdc(76), 110Vac	110/220Vac
LTC VITC translation	No	No	No	No	Yes
User bit recognition	No	-CD	Yes	.....	Yes
Time code comparator	No	-CD	Yes	No	No
Video display keyer	Variable format	-V	Variable format	Yes	8-char
Display window	Variable	Variable	Variable	Variable	.....
Reader Service Number	919	920	921	922	923

Manufacturer	Convergence		Datum		
Model Series	TCR65/66/67	PTG56 (MTG55/57)	5303 time processor	5350TC generator	5360 reader (5370 VCG)
Portable unit	TCR66 only	PTG56 only	Rack-mount	Rack-mount	Rack-mount
Operating modes	DF/NDF	DF/NDF/CF(55/57 JS)	DF/NDF/CF/JS	DF/NDF/CF	DF/NDF/CF
Standards supported	SMPTE	SMPTE	SMPTE, CBU	SMPTE, EBU	SMPTE, EBU
Time reference	Video	Video	Video	Video, 60Hz	Video
Data entry for	None	Time	Time, user bits	Time	None
Data display of	Time, user bits	Time (56/57)	Time, user bits	Time, user bits	Time, user bits
Reading speed range	1/20x-20x(65), 1/10x-30x	1/20x-30x -56/-57	1/20x-80x	.....	1/20x-90x
Editor interface	.....	.....	Yes	Yes	Yes
VITC code output	No	No	Yes	No	No
LTC output signal	.....	0dBm	2Vp-p, 600Ω	2Vp-p, 600Ω	2Vp-p, 600Ω
Synchronizer function	No	No	No	No	No
Power requirement	7-16Vdc(66), 110Vac	9V(56), 110Vac(55/57)	110/220Vac	110/220Vac	110/220Vac
LTC VITC translation	No	No	Yes	No	No
User bit recognition	Yes	No	Yes	No	No
Time code comparator	No	.....	No	No	No
Video display keyer	No	No	8-char/variable	No	(8-char/variable)
Display window	No	No	1-line	No	(1-line)
Reader Service Number	924	925	926	927	928

Manufacturer	Denecke	ESE		Evertz Microsystems	
Model Series	Dcode TC-1 reader	727 (257) [258] readers	ES 256 (255VCG) readers	ES261 generator	3700D LTC master
Portable unit	Yes	Rack mount	Rack-mount	Rack mount	Rack-mount
Operating modes	DF/NDF/CF	DF/NDF	.....	DF/NDF/CF(JS opt)	DF/NDF/CF/JS
Standards supported	SMPTE, EBU	SMPTE	SMPTE	SMPTE	SMPTE, EBU
Time reference	Video	Video	Video	Video, 60Hz, xtal	Video, xtal
Data entry for	No	Time	No	Time (User bit opt)	Time, user bits
Data display of	Time or user bits†	Time	Time	No	Time, user bits‡
Reading speed range	± 1/20x-50x	.....	1/20x-20x	.....	± 1/20x, 70x L, 0-20x V
Editor interface	parallel port opt	.....	.....	No	RS-232C, 1200 baud
VITC code output	No	n.a.	No	No	No
LTC output signal	1V 2kΩ reshaped	n.a.	.....	0dBm 600Ω	± 6dBm
Synchronizer function	No	No	No	No	.....

## Time Code Equipment

		ESE			Everiz Microsystems
<b>Manufacturer</b> . . . . .	<b>.Denecke</b>	<b>727 (257) [258] readers</b>	<b>ES 256 (255VCG) readers</b>	<b>ES261 generator</b>	<b>3700D LTC master</b>
<b>Model Series</b> . . . . .	<b>Dcode TC-1 reader</b>				
Power requirement . . . . .	7024Vac/dc, 110Vac	110Vac	110Vac	110Vac	110/220Vac
LTC VITC translation . . . . .	No	No	No	No	No
User bit recognition . . . . .	No	No	No	No	Yes
Time code comparator . . . . .	No	Yes	No	No	.....
Video display keyer . . . . .	No	No	8-char/5-175TVL	No	24-char/16-32TVL
Display window . . . . .	No	No	.....	No	1, 2-line
	†TS1, TS1/2 slates Grande concert slate				‡# 3600D reader
<b>Reader Service Number</b> . . . . .	<b>929</b>	<b>930</b>	<b>931</b>	<b>932</b>	<b>933</b>
		Everiz Microsystems		For-A	
<b>Manufacturer</b> . . . . .		<b>EV-Bloc system†</b>	<b>ECM 4010 master</b>	<b>TCR-3500 reader/timer</b>	<b>TGR-3300 reader/genera- tor</b>
<b>Model Series</b> . . . . .	<b>4900 reader/translator</b>				
Portable unit . . . . .	No	Rack, modular	No	Rack-mount	Rack-mount
Operating modes . . . . .	DF/NDF/CF/JS	DF/NDF/CF/JS	DN/NDF/CF/JS	DF/NDF/CF/JS	DF/NDF/CF/JS
Standards supported . . . . .	SMPTE, EBU	SMPTE, EBU, NTSC/PAL	SMPTE, EBU	EBU, SMPTE	EBU, SMPTE
Time reference . . . . .	Video, xtal	Video, other	Video, xtal	Video, xtal	Video, xtal
Data entry for . . . . .	None	Time, user bits	Time, user bits	Time, user bits	Time, user bits
Data display of . . . . .	Time, user bits	Time, user bits	Time, user bits	Time, user bits	Time, user bits
Reading speed range . . . . .	$\frac{1}{20}x-70x$ (#611/622)	$\pm \frac{1}{30}x-70x$	$\frac{1}{20}x-70x$ VITC; 0-40xLTC	.....	$\frac{1}{20}x-110x$ L, 0-10x V
Editor interface . . . . .	Yes	Via RS-232C/422	RS-232/422	Yes	No
VITC code output . . . . .	49V option	Yes	Yes	No	Yes
LTC output signal . . . . .	+12dBm	+12dBm, 1/4" phone jack	-20, +12dBm	2.2Vp-p 600Ω	0dB, 600Ω bal
Synchronizer function . . . . .	No	w/machine controller	.....	No	No
Power requirement . . . . .	110/220Vac	115/230Vac	115/230Vac	110 or 220Vac	110 or 220Vac
LTC VITC translation . . . . .	Yes	Yes	Yes	No	Yes
User bit recognition . . . . .	Yes	Yes	Yes	Yes	Yes
Time code comparator . . . . .	No	Yes	.....	Yes	Yes
Video display keyer . . . . .	24-char/8-16TVL	#613 video cg/keyer	Yes	8-char, 8-16TVL	8-char. 18-36TVL
Display window . . . . .	1-line	2-sizes, positioning	Variable	1-line	Position control
		†# 612/621 generators			
<b>Reader Service Number</b> . . . . .	<b>934</b>	<b>935</b>	<b>936</b>	<b>937</b>	<b>938</b>
		Gray Engineering Labs		JVC Company	
<b>Manufacturer</b> . . . . .	<b>.Fostex</b>	<b>VID225 (VIE224)</b>	<b>DT113/104F/213</b>	<b>DR115/107B/109B</b>	<b>TGP47U</b>
<b>Model Series</b> . . . . .	<b>4030/4035/4050</b>				
Portable unit . . . . .	No	Rack-mount	Rack-mount	Rack-mount	Yes
Operating modes . . . . .	DF/NDF/CF	DF/NDF	DF/NDF/CF	DF/NDF/CF readers	DF/NDP/CF
Standards supported . . . . .	SMPTE/EBU	SMPTE	SMPTE/EBU	EBU, SMPTE	SMPTE
Time reference . . . . .	Crystal clock	Video	Video, 60Hz, BCD in	Video	Video, crystal
Data entry for . . . . .	Time	(Incoming LTC only)	Time, user bits external	None	Time/user bits
Data display of . . . . .	9-digit clock	Time, user bits	Time, user bits	109B time, user bits	Time/user bits
Reading speed range . . . . .	.....	$\frac{1}{100}x-100x$ L, $\leq 4x$ V	Real time	$\frac{1}{100}x-100x$	.....
Editor interface . . . . .	Yes	Yes	Yes	Yes	No
VITC code output . . . . .	No	Yes	w/FCM-227	No	No
LTC output signal . . . . .	w/level control	Yes (No)	+8dBm 600Ω	Reshaped	.....
Synchronizer function . . . . .	4030/4035	No	No	No	No
Power requirement . . . . .	110Vac	110/220Vac	110/220Vac	110/220Vac	12Vdc
LTC VITC translation . . . . .	No	Yes	No (FCM-227)	No	No
User bit recognition . . . . .	No	Yes	Yes	Yes	No
Time code comparator . . . . .	Yes	No	No	(115 4-channel)	No
Video display keyer . . . . .	No	No	DT213, variable	Variable format	No
Display window . . . . .	No	No	DT213, variable	Variable	No
<b>Reader Service Number</b> . . . . .	<b>939</b>	<b>940</b>	<b>941</b>	<b>942</b>	<b>943</b>
		Shintron			Skotek
<b>Manufacturer</b> . . . . .	<b>.Noriyuki</b>	<b>#647 gen (646 reader)</b>	<b>#640 (641) readers</b>	<b>#690 ET master</b>	<b>TCR-111 (-111C)</b>
<b>Model Series</b> . . . . .	<b>YAM-7LTC read/gen</b>				
Portable unit . . . . .	Yes	Rack-mount	Yes	Rack-mount	$\frac{1}{2}$ -wide rack
Operating modes . . . . .	DF/NDF/CF/JS	DF/NDF	DF/NDF/CF (NDF/CF)	DF/NDF/CF/JS	DF/NDF/CF
Standards supported . . . . .	SMPTE/EBU	SMPTE, EBU	SMPTE/EBU (EBU only)	SMPTE, EBU	EBU/SMPTE
Time reference . . . . .	Video, crystal	Video	Video	Video, xtal	Video
Data entry for . . . . .	Time	Time, user bits (None)	Time, user bits	Time, user bits	Time, user bits
Data display of . . . . .	8 LCD time	Time, user bits	Time, user bits	Time, user bits	LEDs, time, user bits
Reading speed range . . . . .	$\frac{1}{10}x-50x$	( $\frac{1}{16}x-40x$ )	n.a.	$\pm \frac{1}{100}x-80x$	$\frac{1}{100}x-40x$ play
Editor interface . . . . .	No	No	No	RS-422 interface	RS-232/422 on 111C
VITC code output . . . . .	No	No	No	Yes	No
LTC output signal . . . . .	2.5Vp-p 10kΩ	0dB 30kΩ	0dB $\pm$ 2dB 2kΩ	0dBm, <10Ω source	Reshaped
Synchronizer function . . . . .	No	No	No	Yes	No
Power requirement . . . . .	9Vdc	110/220Vac	3-AA 4.5Vdc	110/220Vac	110Vac
LTC VITC translation . . . . .	No	No	No	Yes	No
User bit recognition . . . . .	No	No	No	Yes	Yes



## Time Code Equipment

Manufacturer	Shintron			Skotel
Model Series	.Noriyuki YAM-7LTC read/gen	#647 gen (646 reader)	#640 (641) readers	#690 ET master TCR-111 (-111C)
Time code comparator	No	No	No	Yes
Video display keyer	No	(646 only variable)	No	Yes
Display window	No	(Variable)	No	15-char/5-line
Reader Service Number	944	945	946	947 948

Manufacturer	Skotel	Sony Broadcast		TimeLine	United Media
Model Series	TCR-112 (-132)	BVG-1600 G(1500 R)	BVG-100 gen/reader	Lynx/VSI module	205 generator
Portable unit	1/2-wide rack	No	Yes	No	No
Operating modes	DF/NDF/CF	DF/NDF/CF/JS	DF/NDF/CF/JS	DR/NDF/CF/JS	DF/NDF/CF
Standards supported	EBU/SMPTE	SMPTE/EBU	SMPTE/EBU	SMPTE, EBU	SMPTE/EBU
Time reference	Video	Video	Video	Video, 60Hz, xtal	Video
Data entry for	Time, user bits	Time/user bits	Time/user bits	Time, user bits	Timer, user bits
Data display of	Time, user bits	8-digit time/user	8-digit time/user	Time, user bits	Dual 8-digit
Reading speed range	1/60x-40x play	1/32x-110x	Normal play	± 1/60x-60x	(310 reader)
Editor interface	.....	BVG-1500 only	No	RS-422/232C	Yes
VITC code output	TCR-132 only	SMPTE/EBU	SMPTE/EBU	No	No
LTC output signal	Reshaped	0-8dBm	2.5Vp-p 10kΩ	-10, +8dBm	+8dBm
Synchronizer function	No	No	No	Yes	No
Power requirement	110Vac	110-220Vac	9-18Vdc	110/220Vac	100-240Vac
LTC VITC translation	TCR-132 only	BVG-1500 only	No	No	No
User bit recognition	Yes	BVG-1500	No	Yes	.....
Time code comparator	Yes	BVG-1500	No	No	.....
Video display keyer	Yes	BVG-1500	No	No	Yes
Display window	Var size/position	8 (9) 1-line	No	No	Variable format
Reader Service Number	949	950	951	952	953

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Circle (105) on Reply Card

1988 BG/SB **Broadcast Engineering** 167

# Automated Cassette Players

These automation playback systems are based on 1", 19mm and 1/2" in cassette type media. They are integrated deck/control computer systems, not controllers that may be interfaced to an assortment of playback transports.

Manufacturer	Ampex AVSD	ASACA/ShibaSoku	BTS	Odetics	Panasonic Broadcast	Sony Broadcast
Model/Series	ACR225	ACL-6000C	BCN-100	TCS-2000	MARC II (MARC I)	BVC-10 Betacart
Recording format	Composite digital	Betacam/M-II	1" B	Betacam/M-II	M-II	Betacam
No. play decks	3-4	2-5	2-3	4-6	5 max	4 max
Specific play deck	Ampex	.....	...	per format	Std M-II unit	
Output channels	2 simultaneous	5 simultaneous	Single channel	1, 6 optional	2 + monitor	3 simultaneous
No. record decks	3-4	1-4	1-3	2	1-2	0
Edit features	.....	per VCR	Full feature	.....	Full feature	No
Control computer	Ampex proprietary	Universe 6853	Integral	IBM PC/AT	IBM PC/AT	Integral
RS- Control interface	232/422/ESbus	.....	423	232	422	422
Master automation port	Yes	Yes	...	Yes	Interface opt	Yes
Record/delayed play	.....	Yes	Yes	Yes	Yes	No
As-run log feature	Yes	Yes	Yes	Yes	Yes	Yes
Event verification	Yes	Yes	Yes	Yes	.....	Yes
Cassette ID type	Bar-code/time-code	Bar-code	LTC data	Bar-code/time-code	Bar-code/time-code	Bar-code
TC reader/generator	LTC type	..	LTC type	LTC	Reader	LTC
Auto cueing	Yes	Yes	Yes	Yes	Multicut cassette	Yes
Storage magazine	256 D-2 cassettes	600 cassettes	32 1" cassettes	280 max	1,179 max (123)	40 max
Shortest segment	1s	.....	2-frame + 2s	1 video frame	10-15s (10s)	1s/4-event seq.
System TBC	Yes	Integral/deck	Integral	TBC/deck	AU-TB50	Per deck
Manual override	.....	All functions	Yes	All functions	All functions	Yes
Reader Service Number	908	909	910	911	912	913

## Video Recorders – Begins on page 240



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Circle (207) on Reply Card

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# TASCAM

A 32-Track version of the ATR-80 will be available soon. ©1986 TEAC Corporation, Tokyo.  
Harman (Audio) UK, LTD. Mill St. Slough, Berks. SL2 5DD.

Circle (208) on Reply Card

# Audio equipment specs

## Audio Mixers, On-Air

These control consoles are primarily designed for use in master control locations of radio and TV facilities, although they may also allow production and post production applications. All provide mic/line input capabilities. Those with automation preparation are marked with a diamond (◆). In audio frequency ranges Hz is understood. Transformer balanced and active balanced input and output connections are abbreviated TB and AB, respectively.

Manufacturer	.ADM Technology	Arrakis Systems	ATI/Audio Technologies	Audtronic
Model/Series	ST-240 series II	250SC	Model 5000	200 series
Modular construction	Yes	No	Yes	Yes
# of mixing positions	24	6-ch rack-mount	16 (32 input)	24
Output channels	Pgm/aud/aux/cue/mono	Pgm/aux/mono	Pgm/aud/mono/mix	Pgm/aud/mono/cue
Channel fader types	Slider, VCA	Rotary/VCA	P&G slider/VCA	Slider, VCA
Bus switching by	Push button	Push button	Push button	Push button
Input patch points	Yes	No	Prefader	Yes
Internal switching by	Electronic	Solid-state	Solid-state	Mechanical, VCA
Machine starts/stops	Relay	Relay	Yes	Yes
Talkback circuits	Yes	No	.....	Yes
Cue circuits	On fader, bus switch	On fader	On fader	On fader
Metering types	VU, PPM	VU meters	VU meters	VU
Speaker muting	Yes	Programmable	Yes	Yes
Int cue amp speaker	Yes	Amp only	2W/channel	Yes
Input connections	TB 600Ω	AB 1k/100kΩ	Bal 1k/100kΩ	AB 150/10kΩ
Output connections	TB 600Ω	Bal 600Ω	Bal 600Ω	TB/AB ±50Ω
Output level	8dBm	27dBm max	27dBm	4dBm, 30dBm max
AF response	±1dB	±0.5dB 20-20k	±0.5dB 20-20k	0,-1dB 8dBm
Distortion	0.07% 1kHz 24dBm	0.02% 8dBm	0.02% 8dBm	<0.01% 1kHz 24dBm
S/N ratio, mic/line	-125dBm EIN/72dB	72dB mic/82dB line	62dB mic/82dB line	-128.5dBm EIN/>82dB
Crosstalk (worst)	-72dB 8dBm 100-10kHz	-90dB 2kHz	Below noise	<-83dB 20kHz
Reader Service Number	1240	1241	1242	1244

Manufacturer	Audtronic	Autogram	B.F.E.	Broadcast Audio
Model/Series	400 series	◆R/TV-20	BC-20	System 6
Modular construction	Yes	Yes	Yes	Yes
# of mixing positions	24	20	16 auto/12 fader	6
Output channels	Pgm/aux/cue	Pgm/aud/cue/mono	Pgm/aud/aux/cue/mono	Pgm/aud/util/mono/cue
Channel fader types	Slider, VCA	Slider	Slider	Slider
Bus switching by	n.a.	Push button	Push button	Push button
Input patch points	Yes	Yes	Yes	Yes
Internal switching by	n.a.	Solid-state	Mechanical	Mech, electronic
Machine starts/stops	Yes	Solid-state, relay	10 contacts	Push buttons
Talkback circuits	Yes	No	Yes	No
Cue circuits	Yes	On fader	Push button PFL	On fader
Metering types	VU, LED opt	VU	LED, PPM	VU, peak LED
Speaker muting	Yes	Yes	Yes	Yes
Int cue amp speaker	Yes	Amp only	Yes	Amp only
Input connections	AB bridging	AB 600/20kΩ	TB/AB 1k/5.7kΩ	TB/AB 1.5k/20kΩ
Output connections	n.a.	AB 600Ω	TB/AB 600Ω	TB 150Ω
Output level	n.a.	8dBm	6dBm	28dBm max
AF response	n.a.	±0.1dB	±0.5dB	±0.5dBm
Distortion	n.a.	0.05% 15kHz 18dBm	0.5% 15kHz 18dBu	<0.02% 28dBm 1kHz
S/N ratio, mic/line	n.a.	-124dBm EIN/92dB	-120dBm EIN/82dB	-125dBm EIN/90dB
Crosstalk (worst)	n.a.	-68dB 15kHz 18dBm	-65dB 15kHz 18dBm	-80dB 15kHz
Reader Service Number	1245	1246	1248	1249

# Audio Mixers, On-Air

Manufacturer	Broadcast Audio			Broadcast Electronics		Dorrough Electronics
	Model/Series	System V	System 16 series IV	10S350A	10S250A (8S250A)	Model 700
Modular construction	No	Yes	No	No	No	No
# of mixing positions	5	16, 6-module ext	10	10 (8)	10 (8)	7
Output channels	Pgm/aud	Pgm/aud/aux/cue/mono	Pgm/aud/cue/mono	Pgm/aud/cue/mono	Pgm/aud/cue/mono	Pgm/aud/cue
Channel fader types	Rotary	Slider	Slider	Rotary	Rotary	Rotary
Bus switching by	Push button	Push button	Push button	Keyswitch	Keyswitch	Keyswitch
Input patch points	No	Yes	No	No	No	No
Internal switching by	Mechanical	Solid-state	Solid-state	Solid-state	Solid-state	Mechanical
Machine starts/stops	4 switches	Solid-state, relay	No	No	No	No
Talkback circuits	No	No	No	Yes (no)	No	No
Cue circuits	Yes	On fader, keyswitch	On fader, keyswitch	On fader	On fader	On fader
Metering types	VU	VU, LED peak	VU	VU	VU, LED opt	VU, LED opt
Speaker muting	Yes	Yes	Yes	Yes	Yes	Yes
Int cue amp speaker	Yes	Amp only	Yes	Yes	Yes	Yes
Input connections	TB/AB 150/10k/20kΩ	TB/AB 1.5kΩ	AB 54kΩ	AB 54kΩ	AB 150/10kΩ	AB 150/10kΩ
Output connections	TB/unbal 600Ω	Xfmr 150Ω	Xfmr 600Ω	Xfmr 600Ω	AB 600Ω	AB 600Ω
Output level	30dB max	8dBm, 28dBm max	8dBm	8dBm	26dBm max	26dBm max
AF response	± 1dB 20-20k	-0.5dB 8dBm	-0.5dB 8dBm	-0.5dB 8dBm	n.a.	n.a.
Distortion	0.02% 20-20k	<0.02% 1kHz 28dBm	0.05% 1kHz 18dBm	0.075% 1kHz 18dBm	n.a.	n.a.
S/N ratio, mic/line	72dB ref 8dBm	-125dBm EIN/90dB	70dB	70dB 18dBm	n.a.	n.a.
Crosstalk (worst)	Below noise	<-80dB 15kHz	n.a.	n.a.	n.a.	n.a.
Reader Service Number	1250	1251	1252	1253	1254	1254

Manufacturer	EELA Audio		Hallikainen & Friends		Harris Broadcast		Harrison Systems
	Model/Series	SBM series	TVA 142/TVA 132	Medalist-AU	Medalist series	AIR-7	
Modular construction	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of mixing positions	16	36 max	12 max	8, 10, 12	36	36	36
Output channels	Pgm/aud/cue/mono	Pgm/aud/cue	Pgm/aud/mono	Pgm/aud/mono opt	Pgm/aud/aux/cue	Pgm/aud/aux/cue	
Channel fader types	Slider, VCA	Rotary	Slider, VCA	Slider or rotary	Slider	Slider	
Bus switching by	Push button	Keyswitch	Push button	Push button	Push button	Push button	
Input patch points	No	No	No	No	No	No	
Internal switching by	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	
Machine starts/stops	Yes	No	Yes	Yes	2 circuits	2 circuits	
Talkback circuits	Yes	No	No	No	Yes	Yes	
Cue circuits	PFL bus switch	On fader	On-fader, push button	On-fader, push button	On-fader	On-fader	
Metering types	LED, other	VU w/peak LED	VU	VU	VU, PPM, LED	VU, PPM, LED	
Speaker muting	Yes	No	Yes	Programmable	Yes	Yes	
Int cue amp speaker	Yes	No	Yes	Yes	Speaker	Speaker	
Int headphone amp	Yes	No	Yes	Yes	.....	.....	
Input connections	AB/TB 5k/40kΩ	TB 150/15kΩ	AB 5k/8kΩ	AB 150/600Ω	AB 1.2k/10kΩ	AB 1.2k/10kΩ	
Output connections	TB/unbal 600Ω	Bal 600Ω	AB 200Ω	AB 20Ω	AB 600Ω	AB 600Ω	
Output level	6dBm nom	8dBm, 22dBm max	24dBm max	24dBm max	24dBm max	24dBm max	
AF response	-1dB 6dBm	± dB 8dBu	± 0.5dB	-0.5dB 8dBm	± 0.2dB	± 0.2dB	
Distortion	0.05%	0.25% 1kHz 22dBm	0.05% 8dBm	0.05% 8dBm	0.1% 7kHz 18dBm	0.1% 7kHz 18dBm	
S/N ratio, mic/line	<-126dBm EIN	-115dBm EIN/74dB	-127dBv EIN	-127dBm EIN/> 95dB	-128dBm EIN	-128dBm EIN	
Crosstalk (worst)	<-66dB 16kHz 6dBm	-82dB 1kHz 8dBm	-85dB 15kHz 18dBm	-85dB 15kHz 18dBm	-65dB 15kHz 4dBm	-65dB 15kHz 4dBm	
Reader Service Number	1255	1256	1257	1258	1259	1259	

Manufacturer	Howe Technologies			Logitek		
	Model/Series	8000 (9000)	Model 10000	7512A	Stereorack (Audiorack)	Perfectionest-8 (12)
Modular construction	Yes	Yes	No	No	No	No
# of mixing positions	22	32	12	6	8 (12)	8 (12)
Output channels	Pgm/aud/cue/mono	Pgm/aud/mono	Pgm/aud/cue/mono	Pgm/preview	4-pgm/aud/mono/cue	4-pgm/aud/mono/cue
Channel fader types	Rotary (slider)	Slider, VCA	Slider	Rotary, VCA	Slider or rotary opt	Slider or rotary opt
Bus switching by	Push button	Push button	Push button	Push button	Push button	Push button
Input patch points	Yes	Yes	No	No	Yes	Yes
Internal switching by	Solid-state	Solid-state	Solid-state	Electronic	Solid-state	Solid-state
Machine starts/stops	Yes	Optical isolators	Yes	Yes	Yes	Yes
Talkback circuits	No	Yes	Yes	Yes	No	No
Cue circuits	On-fader, bus switch	n.a.	Push button	On-fader	Dn-rader	Dn-rader
Metering types	VU, PPM, LED	VU	VU, PPM	VU	VU, peak flasher	VU, peak flasher
Speaker muting	Yes	Yes	Yes	No	Yes	Yes
Int cue amp speaker	Yes	n.a.	Yes	Amp only	Yes	Yes
Input connections	AB 600/10kΩ	AB 10kΩ	AB 600/10kΩ	AB 1k/600Ω	AB 1k/600Ω	AB 1k/600Ω
Output connections	AB 150Ω	AB 150Ω	AB 150Ω	AB 600Ω	AB 600Ω	AB 600Ω
Output level	4dBm nom	4dBm	4dBm	0dBm, 23dBm max	4dBm	4dBm
AF response	± 0.1dB 4dBm ref	± 0.1dB 4dBm	± 0.1dB 4dBm	± 0.3dB	± 0.25dB 4dBm	± 0.25dB 4dBm
Distortion	0.03% 1kHz 4dBm	0.025% 1kHz 4dBm	0.03% 1kHz 4dBm	0.04% (0.1%)	0.008% 1kHz 4dBm	0.008% 1kHz 4dBm
S/N ratio, mic/line	-124dBm EIN	-124dBv EIN	-124dBm EIN	72dB (64dB)	-125dBm EIN/88dB	-125dBm EIN/88dB
Crosstalk (worst)	-70dB 10kHz 4dBm	-70dB 10kHz 4dBm	-70dB 10kHz 4dBm	-75dB	-80dB	-80dB
Reader Service Number	1260	1261	1262	1263	1264	1264

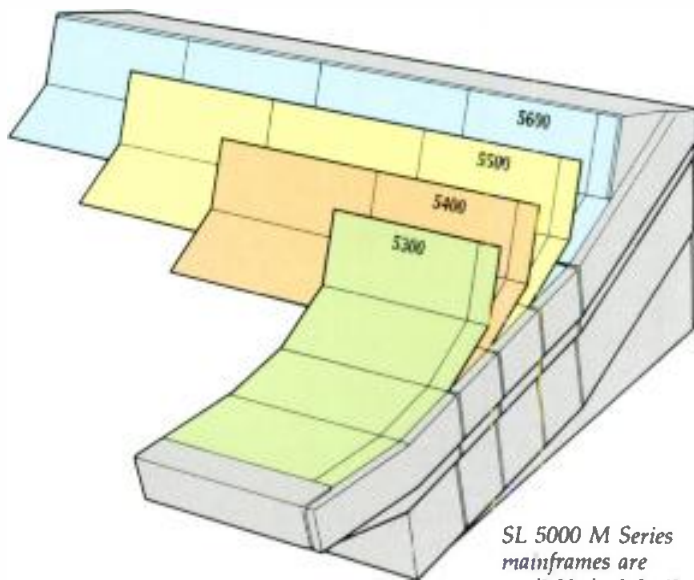
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# Audio Mixers, On-Air

Manufacturer	LPB	McCurdy Radio	Neve Electronics/Siemens
Model/Series	Signature III	Alpha A-8S	Series "S"
Modular construction	No	No	Yes
# of mixing positions	6, 8, 10 models	8	26
Output channels	Pgm/aud/cue/mono	Pgm/mono	Pgm/aud/mono/cue
Channel fader types	Rotary	Rotary	Slider, VCA
Bus switching by	Key switch	Push button	Push button
Input patch points	No	No	Yes
Internal switching by	Mechanical	Solid-state	Electronic
Machine starts/stops	9 circuits	10 circuits	Yes
Talkback circuits	No	No	Yes
Cue circuits	On-fader	Bus switch	On-fader
Metering types	VU	LED	VU, PPM
Speaker muting	Yes	Programmable	Yes
Int cue amp speaker	Amp, speaker	Amp, speaker	No
Input connections	TB 150/600Ω	AB 150/600Ω	AB 10k/20kΩ
Output connections	TB 600Ω	TB/AB 600Ω	AB 60Ω
Output level	24dBm max	24dBm max	28dBu max
AF response	±0.5dB 8dBm	±0.3dB 8dBm	±0.5dB
Distortion	0.06% 18dBm	05% 20-20k 8dBm	0.1% mic/0.01% line
S/N ratio, mic/line	75dB mic/78dB line	76dB mic/80dB line	<-125dBv EIN/>90dB
Crosstalk (worst)	-61dB 1kHz 8dBm	-65dB 1kHz 8dBm	-80dB typical
Reader Service Number	1265	1266	1267

Manufacturer	Pacific Recorders & Eng	Radio Systems	Russco Electronics
Model/Series	BMX Series III	AMX	BMX Series II
Modular construction	Yes	Yes	Yes
# of mixing positions	34 max	34	26 max
Output channels	Pgm/aud/aux/cue/mono	Pgm/aud/util/mon/cue	Pgm/aud/cue/mono
Channel fader types	Slider	Slider	Slider
Bus switching by	Push button	Push button	Push button
Input patch points	Yes	Yes	Yes
Internal switching by	Solid-state, mech	Relay, electronic	Mechanical
Machine starts/stops	Yes	Yes	Yes
Talkback circuits	Yes	Yes	Yes
Cue circuits	Push button	Push button	Push button
Metering types	VU, PPM, NTP	VU, PPM	VU, PPM
Speaker muting	Yes	Yes	Yes
Int cue amp speaker	Amp only	Stereo line out	Yes
Input connections	TB/AB 1k/40kΩ	TB/AB 1k/40kΩ	TB/AB 1.5k/10kΩ
Output connections	TB/AB 30Ω	AB/TB 30Ω	TB/AB 95Ω
Output level	28dBm max	28dBm, 28dBm max	28dBm max
AF response	-0.9dB 8dBm	-0.9dB	-1.5dB 8dBm
Distortion	<0.01% 1kHz 28dBm	<0.008% 8dBm	<0.03% 1kHz 28dBm
S/N ratio, mic/line	-127dBm EIN/88dBu	-127dBu EIN	-127dBu EIN/82dBu
Crosstalk (worst)	-85dB 1kHz 28dBm	<-75dB 20kHz	<-85dB 1kHz 28dBm
Reader Service Number	1270	1271	1272

Manufacturer	SATT Communications	Solid State Logic	Sonosax	Soundcraft	Soundtracs/AGK
Model/Series	SAM-83	◆SL 5000 M	◆SX series	SAC-2000	FM Broadcast
Modular construction	No	Yes	Yes	Yes	Yes
# of mixing positions	8	64	32	24 max	.....
Output channels	Pgm/aux/cue/mono	Pgm/aud/aux/mono/cue	Pgm/aud/aux	Pgm/aud/aux/mono/cue	Pgm/aud/aux/cue/mono
Channel fader types	Slider	Slider	Slider	Slider	Slider
Bus switching by	Key switch	Centrally assigned	Push button	Push button	Push button
Input patch points	No	Yes	Yes	Yes	No
Internal switching by	Mechanical	Solid-state	Solid-state	Solid-state	Mechanical
Machine starts/stops	2 relay contacts	Relay contacts	Solid-state, relay	Yes	8 circuits
Talkback circuits	Yes	Yes	Yes	Yes	Yes
Cue circuits	On-fader	On-fader	On-fader	Push button	Bus switching
Metering types	PPM, VU opt	VU, PPM, LCD	LED	VU	LED
Speaker muting	No	Yes	Yes	Yes	Yes
Int cue amp speaker	None	Amp only	Amp only	Speaker	Amp only
Input connections	TB 600/1kΩ	AB/TB 600Ω	AB/TB 600Ω	Active bal	Xfmr
Output connections	TB 600Ω	TB/AB 35Ω	TB/AB 25Ω	AB 600Ω	Xfmr
Output level	6dBm at 0VU	28dBm max	26dBm max	26dBm max	4dBm/-10dBv
AF response	-1,0.5dB 6dBm	±0.5dB 8dBm	±0.1dB 6dBm	-1dB 8dBm	.....
Distortion	0.015% 1kHz 6dBm	0.05% 1kHz 20dBm	0.02% 1kHz 6dBm	0.01% 20-20k 8dBm	0.015% 1kHz
S/N ratio, mic/line	-128dBm EIN/85dB	-127.5dBm EIN	-128dBm/-115dBm	80dB	.....
Crosstalk (worst)	-95dB 15kHz 6dBm	-80dB 20kHz 8dBm	-80dB 1kHz 6dBm	-65dB 1kHz 8dBm	.....
Reader Service Number	1275	1276	1277	1278	1279





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Reporter: Denise O'Brien.  
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77 Selleck Street  
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## Audio Mixers, On-Air

Manufacturer	Southern Broadcasting	Studer	Tore Seem Audio	UREI	Ward-Beck Systems
Model/Series	◆Alldesign console	970	SEECON	1690	R2200
Modular construction	Yes	Yes	Yes	No	Yes
# of mixing positions	16	18, expands by 9s	16-40	12	22
Output channels	Pgm/aud	Pgm/aud	Pgm/aux/sub/mono	Pgm/aud/mono opt	Pgm/aux/cue/mono
Channel fader types	Slider, VCA control	Slider	Slider	Slider	Slider
Bus switching by	Push button	Push button	Push button	Push button	Push button
Input patch points	.....	Yes	Yes	No	No
Internal switching by	CMOS devices	n.a.	n.a.	Solid-state	Mechanical
Machine starts/stops	With sequencing	Yes	Fader switches	Switch contacts	22 relay contacts
Talkback circuits	Yes	Yes	Yes	No	Yes
Cue circuits	Hall effect switching	PFL, push button	PFL	On-fader	On-fader
Metering types	VU, LED	PPM, VU	PPM, bar graph, LED	VU	VU, PPM opt
Speaker muting	Yes	Yes	n.a.	Yes	Programmable
Int cue amp speaker	Yes	Yes	Yes	Yes	Amp, speaker
Input connections	AB 40kΩ	1.6k/10kΩ	AB > 1k/10kΩ	AB/TB opt 1.5k/10kΩ	Xfmr 750/24kΩ
Output connections	AB 600Ω	Bal <200Ω	AB 20Ω	Xfmr 600Ω	Bal 600Ω
Output level	8dBu, 16dBu max	6,15dBu	6dBu, 20dBu max	4dBm, 24dBm max	8dBm for 0VU
AF response	-0.3dB 16-16k	-1, +0.5dB	±0.5dB	±1dB 8dBm	±1dB 8dBm
Distortion	0.007% 1kHz 8dBu	<0.03% 6dBm	<0.1% 20dBu	0.02% 4dBm	0.25% 15kHz 18dBm
S/N ratio, mic/line	-92dBu ref 8dBu	<-125dBu EIN/93dB	-124dBu EIN/80dBu	-124dBm EIN	-125dBm EIN/78dB
Crosstalk (worst)	-83dB 1kHz	<-80dB	n.a.	n.a.	-75dB 15kHz 8dBm
Reader Service Number	1280	1281	1282	1283	1284

Manufacturer	Ward-Beck Systems	Wheatstone Group
Model/Series	Series ST - M500	A-500a
Modular construction	Yes	Yes
# of mixing positions	24(12m-12st)/36(12-24)	22
Output channels	Pgm/aud/aux/cue/mono	Pgm/aud/aux/mono opt
Channel fader types	Slider	Slider
Bus switching by	Push button	Push button
Input patch points	Yes	Yes
Internal switching by	Solid-state, mech	Solid-state, relay
Machine starts/stops	6 circuits	Yes
Talkback circuits	Yes	Yes
Cue circuits	On-fader, bus switch	On-fader, push button
Metering types	VU, PPM opt	VU, Yes
Speaker muting	Programmable	Yes
Int cue amp speaker	Amp, speaker	Speaker opt
Input connections	TB 1.5k/20kΩ	AB/TB opt 150/20kΩ
Output connections	Bal <100Ω	AB 600Ω
Output level	8dBm nom	26dBm max
AF response	±0.5dB 8dBm	±0.5dB 0dBm
Distortion	0.2% 20kHz 24dBm	<0.005% 1kHz 18dBm
S/N ratio, mic/line	-125dBm EIN/80dB	-128dBm EIN/90dB
Crosstalk (worst)	-75dB 15kHz 8dBm	-90dB 1kHz
Reader Service Number	1285	1286

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## Audio Mixers, Portable

This equipment includes ENG mic mixing systems to smaller production consoles, most easily carried by one person. Input impedance generally represents the load presented by the system to an audio source. The output impedance value, if <100Ω, indicates the impedance of the unit as a source, while values >125W typically indicate an acceptable loading value.

Manufacturer	a&a Systemes de Communications	ADM Technology	Allen/Heath Brenell	AMEK Consoles
Model Series	CORA series (CORA-229) Report'2 (Report'4)	RM 1083	SR series	BC-II series
Modular system	Yes	No	No	3-chassis sizes
# of inputs	17	2 M/1 L (4 M/L)	13, 22, 30	28
# of mixing buses	2	1 (2)	2 or 6	6 to 4 subs to 2 out
Stereo output	No	No	3 pairs	Yes
Output provisions	Line, telco,	Pgm, Telco, phone	Line, aux, phones	Line, aux, phones
Channel fader type	Rotary, sliders	Rotary	TBM slider	Slider
EQ, filtering	Yes	Yes	4-band, shelving, peak	Pre & post
Test oscillator	Yes	Yes	No	Variable
Metering types	VU meters	LED VU ladder (VU)	LED displays	VU, PPM, LED
Compression limiting	Yes	Limiter	No	Option
Telco interface	Yes	2/4-wire w/touchpad	No	No
Power requirements	220Vac	2 9Vdc or external dc	110Vac	120Vac



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Point Blank.



### RM-765/780

# Fostex

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## Audio Mixers, Portable

Manufacturer	a&a Systemes de Communications		ADM Technology	Allen/Heath Brenell	AMEK Coasoles
Model Series	CORA series (CORA-229)	Report'2 (Report'4)	RM 1083	SR series	BC-II series
Operating weight	78 lbs	4.5 (22) lbs	.....	.....	.....
AF input connections	Xfmr bal, unbal	Xfmr bal (unbal)	Xfmr bal	Active	Xfmr & active bal
Input impedance (load)	200/600/10k $\Omega$	500/10k $\Omega$	600 $\Omega$	.....	150 $\Omega$
Input levels	-40, +40dB	-65dB, +12dB	+8dBm	.....	Mic/line switched
Output connections	Active bal	Balanced	Xvmf bal	Unbalanced	Active bal
Output impedance	600/1k $\Omega$	600 $\Omega$	600 $\Omega$	.....	150 $\Omega$
Output level	+12dB max	+12dBm	+8dBm	.....	+22dBm, 25dBv 6k $\Omega$
AF response	$\pm$ 3dB	40-15k	$\pm$ 1dB +24dB ref	$\pm$ 1dB, 20Hz-20kHz	$\pm$ 0.5dB +20dBm ref
Distortion	.....	.....	0.07%, 1kHz, +24dBm	<0.05%, +4dBm out	0.02%, 1kHz 0dBm
Signal noise ratio	.....	.....	-125.5dBm EIN	-125dBv EIN	-128dBm EIN
Crosstalk (worst)	.....	.....	-72dB 100Hz-10kHz	<-60dB 4dBm	-88dB 1kHz +20dBm
Reader Service Number	1001	1002	1003	1004	1005

Manufacturer	Audio Developments			Audio + Design/SWA	Audio-Technica
Model Series	AD160 (-260) ENG	AD062 (062-M)	AD145 (145-E)	M series	AT4462 Modu-Comm
Modular system	Yes	Yes	Yes	Yes	No
# of inputs	3 (4)	4-16	4/6/8, phantom power	16	6
# of mixing buses	1 (2)	5	2	2	L/R
Stereo output	No (Yes)	Yes	1 pair	Yes	Yes
Output provisions	Line mic, phones	Line, mic, phones	Mic, line, phones (2 mon)	Aux, phones, line	Line, Modu-Comm phones
Channel fader type	Rotary	Slider	Slider (VCA)	Slider	Rotary
EQ, filtering	Prefader filters	Prefader (3-band EQ)	Prefader, hi-pass	Pre, post	No
Test oscillator	Fixed frequency	Fixed, variable	1kHz	Variable	1kHz, 400Hz, 4.5kHz
Metering types	VU, PPM	VU, PPM (on bridge)	VU/PPM (LED for PFL)	VU & PPM	Dual VU
Compression limiting	Limiting	2-channel limiter (no)	No	Yes	Limiter
Telco interface	No	No	No	No	No
Power requirements	9-48Vdc	9-48Vdc	9-48Vdc	110-220Vac	12-18Vdc, 2 9V cells
Operating weight	3 (5) lbs	20 lbs (32 lbs, 10-in)	14 lbs	.....	4.7 lbs
AF input connections	Xfmr bal	Xfmr(m), active(l) bal	Xfmr bal(mic/line,line)	Xfmr bal	Xfmr bal
Input impedance (load)	1k(3k) $\Omega$	1k/100k $\Omega$	1k/10k $\Omega$	600 $\Omega$	1.5k/47k $\Omega$
Input levels	Mic/line (switched)	Switched mic/line	-35, +20dBm, switched	Switched mic/line	Switched mic/line
Output connections	Active (xfmr) bal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal
Output impedance	20(75) $\Omega$	75 $\Omega$	<75 $\Omega$ source	600 $\Omega$	1 $\Omega$ source
Output level	+24dBm	+24dBm maximum	+24dBm	+24dBm	+22dBm maximum
AF response	$\pm$ dB 0dBm	$\pm$ 1dB, 0dBm	$\pm$ 1dB	$\pm$ 0.5dB at +12dBm ref	-1, +1dB 40-20k
Distortion	0.35%, 1kHz, 0dBm	<0.05%, 0dBm	0.05%, 1kHz +0dBm	0.05% +12dBm	<0.1% +4dBm
Signal noise ratio	-125dBm EIN	-126dBm EIN	-126dB EIN	80dBm	-127 dBv EIN 150 $\Omega$
Crosstalk (worst)	-60dB 40Hz-15kHz	<-70dB 40Hz-15kHz	<-70dB 40Hz-15kHz	-70dB 10kHz	-65dB R to L
Reader Service Number	1006	1007	1008	1009	1010

Manufacturer	Audix	Bandiva/Connectronics		Broadcast Electronics	Calrec
Model Series	MXT500	SECK 1882	SECK62 (SECK112)	4S50AP (4M50AP/4R50A)	Mini Mixer
Modular system	Yes	No	No	No	Yes
# of inputs	14	72 mic/line/tape/ins	6M/6L, 4 aux, (12M/12L)	12 (8/10)	To 18
# of mixing buses	2 main, 2 aux	L/R+8 subgroup	L/R, solo	1 stereo (1 mono)	2 + aux
Stereo output	Yes	Yes	Yes	Yes (no)	Yes
Output provisions	Line, aux, phone, mono	Line, mon, group, solo	Line, phones, 4 aux	Line, aux, phones	Line, aux, link, mono
Channel fader type	Slider, rotary	Slider, rotary pan	Slider	Rotary	Slider
EQ, filtering	Yes	Shelving, peak-dip	HF, LF, mid-sweep	None	3-band, HF, LF
Test oscillator	1kHz fixed	30Hz slate tone	.....	Fixed tone on 4R50A	Yes
Metering types	Dual VU or PPM	LED bar graph, peak	LED bar graph	VU	Dual VU
Compression limiting	No	No	No	No	Stereo linkable
Telco interface	No	No	No	No	No
Power requirements	110-220Vac/24Vdc	340Vac, $\pm$ 48Vdc	220-240Vac(50Hz)	110Vac	120/240Vac or $\pm$ 12Vdc
Operating weight	35 lbs	42 lbs	11(17.6) lbs ps 2.2 lb	20 (20/10) lbs w/o bat	26 lbs
AF input connections	Xfmr bal	Active bal	Balanced	Act bal (act/xfmr)	Xfmr bal
Input impedance (load)	1.2k/10k $\Omega$	>1k/10k/20k/50k $\Omega$	1k/50k $\Omega$	20k $\Omega$	1.2k/10k $\Omega$
Input levels	Switchable, mic/line	-55, +10dBm, +20dB	-60,-30,-15dBu	Switchable mic/line	+28dBu(l) max
Output connections	Xfmr bal, floating	Active bal	Balanced	Xfmr bal	Xfmr bal
Output impedance	75 $\Omega$ nominal	<50 $\Omega$	600/1k $\Omega$ aux	600 $\Omega$	600/10k $\Omega$
Output level	+24dBu max into 600 $\Omega$	+21dBu 20-20k	+21dBm max	+8dBm	+24dBm to 600 $\Omega$ max
AF response	$\pm$ 0.5dB, +24dBm	-1dB, 20-20k	-2dB, 20-20k	-1(-2)dB +8dBm	$\pm$ 0.5dB, 30Hz-15
Distortion	<0.1%, 40-20k, +18dBm	<0.0056%, 1kHz	0.03% 1kHz, 0.04% 10kHz	0.1(0.5/0.3)% 1kHz	<0.05%, 40-16k, +12dBu
Signal noise ratio	-125dBm EIN	-124dBu EIN, 77dB	-127.5dBm EIN, 74dB	65(60/70)dB	-127dBu EIN, 80dB
Crosstalk (worst)	<-70dB 30Hz-15kHz	-55dB 1kHz	.....	.....	.....
Reader Service Number	1011	1012	1013	1014	1015

## Audio Mixers, Portable

Manufacturer	Comprehensive Video	Comrex Corporation	D&R Electronica b.v.		DDA/Klark-Teknik
			300 Mark II	700 Mark 3	
Model Series	MX1001 (MX1002)	SLX Sports Mixer			Series S PA
Modular system	.....	No	No	Yes	Yes
# of inputs	3 max	7 max	20	2/channel + aux	16, 24, 32
# of mixing buses	3	1	L/R, 2 aux send	L/R line, 3 aux	8
Stereo output	No	No	Yes	Yes	Yes
Output provisions	Line, mic, aux, phones	Line, aux, phone	Line, mono, aux	Line, phones	L/R, mono, mon, phone
Channel fader type	Rotary	Slider	ALPS or plastic slider	ALPS, P&G sliders	Slider
EQ, filtering	No	Yes	3-band	4-band	4-band
Test oscillator	Fixed (none)	Fixed	1kHz	.....	Yes
Metering types	VU	VU	Bargraph	LED bargraph	VU
Compression limiting	No	w/bandwidth extender	No	No	Sidechain opt
Telco interface	No	Yes	No	No	No
Power requirements	12Vdc (3-9V batteries)	110Vac, external dc	50/60Hz ac	ac	110 or 220 Vac
Operating weight	3 lbs (38 oz)	15 lbs	.....	.....	.....
AF input connections	Xfmr bal	Active bal	Balanced	Bal, unbal	Bal, unbal
Input impedance (load)	50-600Ω autosense	150Ω	2k/10kΩ	2k/10kΩ	>2k/10kΩ
Input levels	Switchable mic/line	Switchable mic/line	Mic, line switched	Mic, line switched	Mic, line switched
Output connections	Xfmr bal	Xfmr bal	Balanced	Balanced	Active bal
Output impedance	50-600Ω autosense	600Ω	100Ω	100Ω	<75Ω
Output level	-20, +4dBm	-9, +6dBm	0dBu	+4dBu	+26dBv max
AF response	.....	±0.5dB	±0.025dB, 20Hz-20kHz	0.025dB, 20Hz-20kHz	<0.75dB, 20Hz-20kHz
Distortion	.....	0.5%, 50-15k	0.039%	<0.01% any level	<0.05%
Signal noise ratio	60dB EIN	-127dB EIN	-126.5dBu EIN >80dB	-126.5dB EIN, 83dB	-127dBv, 84dB
Crosstalk (worst)	.....	<-60dB 1kHz	.....	.....	<-80dB 1kHz
Reader Service Number	1016	1017	1018	1019	1020
<b>Manufacturer</b>	<b>Digitec</b>	<b>EELA/ESL</b>	<b>Electro-Voice</b>	<b>EMT/Gotham Audio</b>	<b>Harrison Systems</b>
<b>Model Series</b>	<b>UPS 6166 (6000 series)</b>	<b>S20 (S22) Reportophone</b>	<b>ELX-1</b>	<b>EMT multioutput mixer</b>	<b>MX-8 (Pro-7)</b>
Modular system	Yes	No	No	Yes	Yes
# of inputs	16	2	5	30 max	8 (24)
# of mixing buses	6	1	1	4	2-st/2-mono (4-group)
Stereo output	Yes	No	No	Yes	Yes
Output provisions	4 pgm, 2 aux	Telco line	Line, mic, phones	Line, aux, phones	Line, phones, (aux)
Channel fader type	Slider	Rotary	Rotary	Slider	Slider
EQ, filtering	3-band peak, high-pass	No	Yes	Post-fader	No (prefader)

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## Audio Mixers, Portable

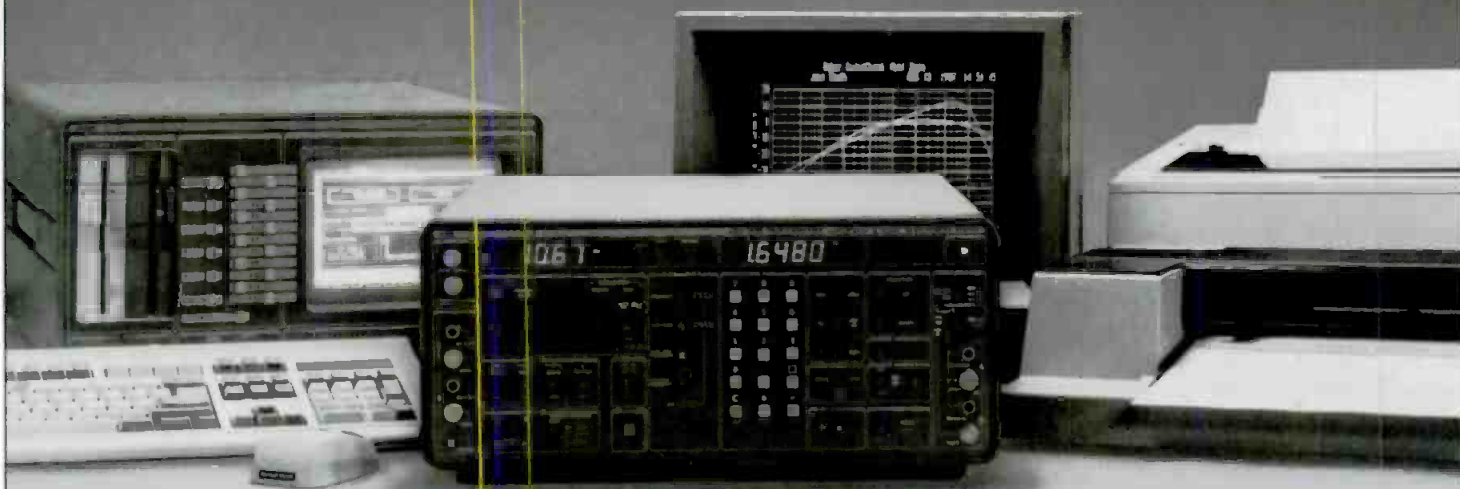
Manufacturer	Digitec	EELA/ESL	Electro-Voice	EMT/Gotham Audio	Harrison Systems
Model Series	UPS 6166 (6000 series)	S20 (S22) Reportophone	ELX-1	EMT multioutput mixer	MX-8 (Pro-7)
Test oscillator	60Hz, 1kHz, 12kHz	No	Lo-freq 100Hz	Variable	Fixed (variable)
Metering types	VU, PPM	LED	LED VU, PPM display	VU, PPM, LED	VU (PPM, LED)
Compression limiting	Yes	Yes	Yes	Yes	No
Telco interface	Option	Tone (pulse) dial	Yes	No	No
Power requirements	120/240Vac, int/ext 12Vdc	9Vdc	120Vac, 24-45Vdc	120Vac	± 15Vdc
Operating weight	55 lbs	2.5 (3) lbs	5.5 lbs w/batteries	60 lbs	25 (125) lbs
AF input connections	Xfmr bal	Xfmr bal	Active bal	Xfmr bal	Active bal
Input impedance (load)	> 1k/>5kΩ	1.2k/40kΩ	6kΩ for low Z mics	600Ω	150Ω
Input levels	-70, +20dBu	Mic, line	Switched mic/line	Switchable mic/line	Mic (& line)
Output connections	Balanced	Hybrid bal	Xfmr bal	Xfmr bal	Active al
Output impedance	<50Ω	600Ω	10/60Ω	600Ω	600Ω
Output level	+21dB max	-3dB 600Ω	.....	+6dBm	-24dBm max
AF response	-1, +0.5dB	-3dB	-125dB, +4dBm	-1,0.5dB, +6dBm	± 0.2dB, +4dBm = 0VU
Distortion	<0.2%, +12dBu	<0.1%, 200-7k	<).15%, 50-20k, +18dBu	0.1%, 1kHz, 6dBm	.....
Signal noise ratio	-125dBu EIN	-122dBm EIN	-128dBu EIN, 150Ω in	>54dB	-129dBm EIN
Crosstalk (worst)	<-70dB overall	.....	.....	<-70dB 1kHz	-65dB 15kHz
Reader Service Number	1021	1022	1023	1024	1025

Manufacturer	Ikegami Electronics	JVC Company	Klark Technik	Logitek
Model Series	ABX-160A	SS-M208E portable	MI-2000U	PCM402
Modular system	Yes	No	No	No
# of inputs	16	8 +2 aux + echo	16	6
# of mixing buses	6, 4 groups, mono	2	4	1
Stereo output	Yes	Yes	Yes	Per setup
Output provisions	Line, aux, mon	Pgm, mon/echo	Pgm, aux, mon, send	A/B, monitor
Channel fader type	Slider	Slider	Slider, rotary pan	Rotary and pan
EQ, filtering	Yes	2-band peaking	3-band	80Hz, 160Hz high pass
Test oscillator	Variable	.....	1kHz	1kHz tone
Metering types	VU, 3 pair L&R	Fluorescent	12-LED bar graphs	Single VU movement
Compression limiting	No	.....	No	5:1 slope limiting
Telco interface	No	No	No	No
Power requirements	110-220Vac	120Vac	110Vac or 12Vdc	12 AA cells
Operating weight	.....	18.7 lbs	18 lbs	6 lbs
AF input connections	Balanced	Active bal & unbal	Bal, XLR, unbal RCA	Xfmr bal
Input impedance (load)	600Ω	50-600/10k/25k/50kΩ	10kΩ	>1k/>5kΩ
Input levels	Mic, line switchable	-60dBs mic, -20dBs	-70, -10dB	Mic, line
Output connections	Balanced	Xfmr bal & unbal	Bal XLR, unbal RCA	Xfmr bal w/50dB atten.
Output impedance	600Ω	600/10kΩ	600Ω/10kΩ recorder	<33Ω
Output level	+4dBm	+4dBm pgm	0dB	+16dB into 600Ω
AF response	± 0.3dB, 30Hz-20kHz	-2,0dB, 20Hz-20kHz	-2,0dB, 20Hz-20kHz	.....
Distortion	0.1%	<0.2%, +10dBs out	<0.1% +20dB output	.....
Signal noise ratio	>56dB mic, 75dB line	-120dBs EIN	-128dB EIN IHF-Awtd 150Ω	.....
Crosstalk (worst)	<-50dB	<-60dB 1kHz	<-70dB 1kHz Pgm-Aux	.....
Reader Service Number	1026	1027	1028	1029

Manufacturer	Logitek	Micro-Trak	Pacific Recorders & Eng	Precision Design
Model Series	Audiorack	Sport mixers	NewsMixer	ROAM-8
Modular system	No	No	Yes	No
# of inputs	6	5 max	2 per channel	8
# of mixing buses	2	1	Mix 1, 2	To telco
Stereo output	No	No	No	Monaural
Output provisions	Line, aux, mic, phones	Line, phones	Mix 1,2, tape 1.2	Line, telco
Channel fader type	Rotary	Rotary	Rotary	Sliders
EQ, filtering	No	No	Available	3-band
Test oscillator	Fixed	None	Yes	Pink-noise
Metering types	VU	VU	Dual ANSI VU	LCD bargraph
Compression limiting	No	No	Available	Peak limiting
Telco interface	No	Yes	Yes	Yes
Power requirements	120Vac, 12Vdc	110/220Vac, dc	117Vac	ac or dc/std D cells
Operating weight	20 lbs	8 lbs	.....	13.75 lbs
AF input connections	Active bal	Xfmr bal	Balanced	Electronic bal
Input impedance (load)	150/600Ω	600/150Ω	30k/40kΩ	600Ω
Input levels	Switchable mic/line	Switchable mic/line	-70, -35dBu; -30, +9dBu	Mic, line
Output connections	Xfmr bal	Xfmr bal/telco	Balanced	Balanced
Output impedance	600Ω	600Ω	30Ω	600Ω
Output level	0dBm	+8dBm	+24 max	+4dB
AF response	± 0.3dB, 0dBm	Per telco regs	-0.7,0dB, 20Hz-20kHz	± 0.2dB, 20Hz-20kHz
Distortion	0.1%, 1kHz, +4dBm	0.5%, 1kHz, +8dBm	<0.01% +24dBm out	0.01% THD+N, SMPTE

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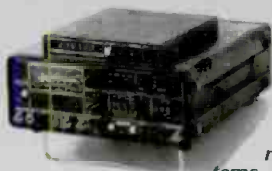
Amber offers the only GPIB based total automated test system package for audio, broadcast and communications testing. The package includes the Amber model 5500, a GPIB Programmable Audio Measurement System with state-of-the-art performance, comprehensive measurement capability, fast operation and modular expansion. Amber AudioCheck™ software runs on any IBM XT/AT compatible computer and can program complete sequences of tests including sweeps, testing against limits, control of other GPIB instruments, storage and retrieval of tests and data and output of hard copy on printers and plotters.

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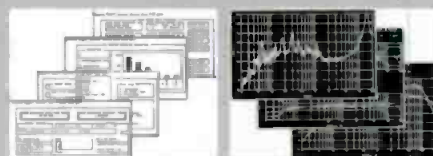
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*Amber also makes one of the most popular portable high performance audio measurement systems — the 3501. Half the weight and size of comparable instruments, the 3501 has one of the best reliability records in the industry and was the recent winner of a US Navy requirement for over 400 instruments.*

**DEMO DISK AVAILABLE** An AudioCheck™ demonstration disk and manual with all features except GPIB commands are available for your evaluation. System requirements: MS-DOS computer with 640k RAM and CGA monitor card. Send \$10 for your copy.



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## Audio Mixers, Portable

Manufacturer	Logitek	Micro-Trak	Pacific Recorders & Eng		Precision Design
Model Series	Audiorack	Sport mixers	NewsMixer	StereoMixer	ROAM-8
Signal noise ratio	-114dBm EIN	-120dBm EIN	-126dBu EIN 150 $\Omega$ source	-126dBu EIN, -88dBu line	.....
Crosstalk (worst)	-70dB 1kHz	.....	<-80dB 1kHz	<-70dB 1kHz	.....
Reader Service Number	1031	1032	1033	1034	1035
Manufacturer	Ramko Research	RAMSA/Panasonic Audio			
Model Series	Primus Sidekick	P-4MS (P-5MX)	WR-M10	WR-133	WR-500
Modular system	No	No	No	No	No
# of inputs	2-line, 2-mic/line	4 (5)	4 mono, 6 stereo	18	8/12
# of mixing buses	1	2 (1)	2	3	3
Stereo output	No	Yes (mono)	Yes	Yes	3
Output provisions	Line, phones	Phones & (line)	Main, record, monitor	Mono, main, record	1 pair
Channel fader type	Rotary	Rotary	Rotary, slider	Proprietary slider	Proprietary slider
EQ, filtering	No	Yes (no)	2-band peaking EQ	2-band peaking	2-band peaking
Test oscillator	Yes	No	No	No	No
Metering types	Vu	LED ladder (no)	Signal, Peak, Clip LEDs	Dual VU movement	Dual VU movements
Compression limiting	Yes	No	Compressor for mono	No	No
Telco interface	No	No	No	No	No
Power requirements	9Vdc	120-240Vac	120Vac, 10W	120Vac	110Vac or 12Vdc
Operating weight	2.5 lbs	.....	13.2 lbs	22 lbs	21.8 lbs
AF input connections	Balanced	Active bal	Active bal, unbal	Bal XLR, unbal RCA/phone	Bal mic/unbal line/phono
Input impedance (load)	.....	.....	>5k/>20k/>50k $\Omega$	10k/20k $\Omega$	600 $\Omega$ /10k $\Omega$
Input levels	Switchable mic/line	Switchable, mic/line	-60,-6dBu; line, phono	-80, +20dB	-70, +4dB
Output connections	Balanced	Active bal	Xfmr floating, isolated	Bal XLR, unbal phone/RCA	Bal, unbal
Output impedance	Low Z source	600 $\Omega$	600 $\Omega$	600/10k $\Omega$	600/10k $\Omega$
Output level	+16dBm, 0dBm = 0VU	+26dBm max	+4dBu, -10dBu recorder	+4dBm, -10dB record	+4dBm
AF response	< +1.5dB, 20-20k	-1.5, 0dB	-1, +0.5dB, 20Hz-20kHz	-2, +0.5dB, 20M-20kHz	-2, +0.05dB, 20Hz-20kHz
Distortion	0.08%, +8dBm	0.008%, 1kHz, +8dBm	0.1% THD, 0.1% IMD	<0.1% THD +18dBm	<0.3% 18dBm output
Signal noise ratio	72dB(m)/90dB(l)	70dB(m), 90dB(l)	-125dBm EIN IHF A-wtd	-129dBm EIN	-128dBm EIN
Crosstalk (worst)	.....	<-65dB 1kHz	-65dB 1kHz	<-65dB 1kHz	.....
Reader Service Number	1036	1037	1038	1039	1040
Manufacturer	Rupert Neve	SATT Communications	SEEM Audio A/S		Shure Brothers
Model Series	5422 (542 series)	SAM-42	SEESAM 2	Pluto 3/1 mini mixer	M-267 mix mixer
Modular system	Yes	No	Yes, multiunit possible	No	No
# of inputs	10	6	8 (to 24)	1 mic/line, 2 mic	4 max
# of mixing buses	2 + 2 aux	2	10	1	1
Stereo output	Yes	Yes	Yes	No	No
Output provisions	Line, 2-aux, phones	Line, phones	line, aux, subgroups	Line, phones	Line, mic, phone
Channel fader type	P&G slider	Slider	P&G sliders	Rotary	Rotary
EQ, filtering	3-band, high-pass	No	Yes	Low-cut	Prefader
Test oscillator	Variable	Fixed tone	.....	1kHz tone	1kHz
Metering types	VU, PPM	PPM, VU opt	Dual LED PPMs	VU	VU, LED
Compression limiting	No	Optional	Output limiters	Yes	Peak limiter
Telco interface	No	Yes	Option	.....	No
Power requirements	120Vac or int Vdc	110-220Vac, $\pm$ 15Vdc	115-220Vac, +12,24Vdc	6 1.5V cells, ext 9Vdc	120/240Vac, 27Vdc
Operating weight	42 lbs w/batteries	8.5 lbs	.....	6 lbs	5 lbs
AF input connections	Xfmr bal	Xfmr bal	Active, xfmr bal	Balanced	Xfmr bal
Input impedance (load)	1.2k/10k $\Omega$	1k/600 $\Omega$	>1k/600/>10k $\Omega$	1k/10k $\Omega$	150/600 $\Omega$
Input levels	Switchable mic/line	Switched mic/line	+6dBm	Switched mic/mic/line	Switchable mic/line
Output connections	Xfmr bal	Xfmr bal	Xfmr bal	Balanced	Xfmr bal
Output impedance	50 $\Omega$	600 $\Omega$	<40 $\Omega$	<40 $\Omega$	150/600 $\Omega$
Output level	+4, +8, +20dBu, 600 $\Omega$	+20dBm, +21dB 5k $\Omega$	+20dBu into 600 $\Omega$	+9dB limiting level	+18dBm, -34dBv 150 $\Omega$
AF response	$\pm$ 0.5dB	-1, +0.5dB	$\pm$ 0.5dB	$\pm$ 0.5dB, 40-15k	$\pm$ 2dB, +4dBm
Distortion	<0.05%, 30-15k	0.01%, 1kHz, +6dBm	<0.1% 20-20k	0.15% 40-15k, +9dB	0.35% 20kHz, +15dBm
Signal noise ratio	-125dBm EIN	-128dBm EIN	-125dBu EIN, 80dBu	5dB, CCIR 468	-128.5dBm EIN
Crosstalk (worst)	<-60dB 15kHz	-90dB 15kHz	.....	.....	.....
Reader Service Number	1041	1042	1043	1044	1045
Manufacturer	Shure Brothers		Sonosax		Sony/Pro Audio
Model Series	FP42 (FP51) mic	FP32 (FP31) ENG	SX-PR6 (-PR2, -PR4)	SX-S series (SX-V)	MX-P61
Modular system	No	No	Yes	Yes	Yes
# of inputs	4 max	3 max	6 (2, 4)	6, 8, 10 (10)	17
# of mixing buses	2 (1)	2 (1)	3	5	7
Stereo output	Yes (No)	Yes (no)	Yes	Yes	Yes
Output provisions	Line, phones, mic	Line, aux, mic, phones	R/L line, phone	Line, aux, phones	Line, aux, phones



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**MC-200**  
Maximum Mounting Weight: 286 lbs.  
Elevation: 24-49 inches

**MC-300**  
Maximum Mounting Weight: 242 lbs.  
Elevation: 23-60 inches

## TR-60/TR-90 TRIPODS



Featuring collapsible tubular leg construction, integral spreaders, flip-tip legs with spikes and rubber padding.

**TR-60**  
Maximum Mounting Weight: 132 lbs.  
Elevation: 20-45 inches

**TR-90**  
Maximum Mounting Weight: 198 lbs.  
Elevation: 26-48 inches

## SC-15 CAM HEAD

Designed for use with all pedestals and tripods, it features a convenient "V" wedge mounting system and center-of-gravity adjustment control. The modular panning rod may be used on both sides.

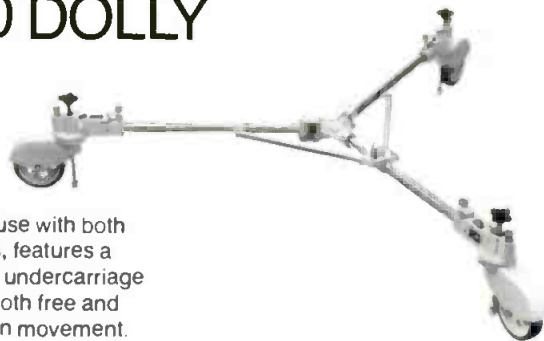
Maximum Mounting Weight: 330 lbs.  
Tilting:  $\pm 50^\circ$ ; Panning:  $360^\circ$



## CD-10 DOLLY

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## Audio Mixers, Portable

Manufacturer	Studer ReVox		TASCAM		Tellax Communications
Model Series	Model 069	Model 961/962	246 Portastudio	M-208 (M-216)	TFX-131B (TFX-31C)
Output level	+6, +15dBu to 600Ω	24dBm, 2.4dBu 300Ω	10dBV ± 1dB	+20dBu max	+4dBm = 0VU
AF response	-1, +0.5dB, 40Hz-15kHz	-1, +0.5dB +4dBm	0.05%, 1kHz	-2, +1dB, 20Hz-25kHz	± 3dB, 90-15k
Distortion	0.1%, 1kHz, +15dBm	0.03%, 30Hz-15kHz	>65dB THF a-wtd	<0.03%, -10dBV input	<1%, +14dBm clipping
Signal noise ratio	-93dB	-125dBm EIN	-65dB 1kHz	-128dB IHF A-wtd	.....
Crosstalk (worst)	-78dB 40Hz-15kHz	<-80dB 15kHz	-65dB 1kHz	<-60dB 1kHz	.....
Reader Service Number	1056	1057	1058	1059	1060

Manufacturer	UREI Electronics	Ward-Beck Systems	Yamaha International		
Model Series	1620 music mixer	T-1202A	EMX200/EMX300	MC1204/-1604/-2404	M508/MS12
Modular system	No	Yes	Yes	Yes	Yes
# of inputs	11	24	8/12	12/16/24 + sub inputs	8/12
# of mixing buses	1	3	L-R, FB, echo	4 + 2 + 2 + cue	L-R, FB, echo
Stereo output	Yes	No	Yes	Yes	Yes
Output provisions	Tape, PA, phones	Line, phones	Line, EQ, phone, FB	Line/phone/grp/FB/echo	Line/FB/phones/echo
Channel fader type	Rotary	Slider	Slider	Slider	Slider
EQ, filtering	R/L tone controls	Yes	3-band EQ	3-band	3-band EQ
Test oscillator	No	1kHz fixed	.....	.....	No
Metering types	None	VU or PPM opt	VU, peak LED	VU, peak LED	VU
Compression limiting	No	No	Internal delay	.....	No
Telco interface	No	Yes	No	No	No
Power requirements	110, 220Vac	115-230Vac	110Vac	120Vac	110Vac
Operating weight	13 lbs. rack-mount	120 lbs	68/77 lbs	48/57/74 lbs	34/44 lbs
AF input connections	Bal, unbal	Xfmr	Bal, unbal	Bal & unbal	Bal & unbal
Input impedance (load)	150/10k/47kΩ	1.5k/30kΩ	1k/10kΩ	4k/10kΩ	600/1k/2k/4k/10kΩ
Input levels	Mic, line, phono	Mic, line	Mic, line	Mic, line	Mic, line
Output connections	Bal, unbal	Balanced	Unbal	Bal & unbal	Balanced
Output impedance	<50kΩ	.....	370KOC5W	150Ω	150Ω source
Output level	+20dB max in 200 Ω	+8dBm = 0VU	+20dB (7.75V)	+20dB max	+24dB max
AF response	± 1dB, 20Hz-20kHz	± 1dB ref +8dBm	-3, +3dB 20Hz-20kHz	-3, +1dB 20Hz-20kHz	-3, +1dB 20Hz-20kHz
Distortion	<0.1% +4dB	0.25% 20kHz +18dBm	<0.2%	<0.1%	<0.5% 20Hz-20kHz
Signal noise ratio	<-126dB EIN	-125dBm EIN, 75dB	-126dB EIN (66dB)	-128dB EIN	-127dB EIN
Crosstalk (worst)	.....	-70dB 15kHz	-60dB	-60dB 1kHz	-60dB
Reader Service Number	1061	1062	1063	1064	1065

## Audio Mixers, Studio/Production

The stereo production mixers in this category include direct out, multitrack recording outputs unless marked with a diamond (♦). Input and output connections are abbreviated AB (active balanced) and TB (transformer balanced). A dagger (†) indicates no remote machine start/stop switching. Systems not specifically stating automation preparation are noted with a double dagger (‡). In audio frequency ranges, Hz is understood.

Manufacturer	ADM Technology		AMEK Systems & Controls		
Model/Series	Post-Pro 12†	VP series†	APC-1000	Angela M65†	G2520†
Modular construction	Yes	Yes	Yes	Yes	Yes
Mixing positions	12	16 max	150	65	48 (64)
Mixing buses	2	3	64	24	24 (24)aux
Patch points	No	No	Routing keyboard	Yes	Yes
Fader types	Slider	Slider	P&G moving fader/VCA	Slider	P&G slider w/VCA's
Equalizer	3-band	4-band	4-band	4-band	4-band
Filtering	High, low-pass	.....	High, low-pass	High, low-pass	High, low-pass
Panpots	No	Yes	Yes	Yes	Yes
Grouping	2 groups	3 groups	10 subs	4 stereo subs	Multiple
Sends-returns	None	1-pre, 1-post	8 send pre/post	6 each pre/post	Multiple
Solo bus	None	PFL	AFL/PFL/in-place	AFL/PFL/in-place	AFL/in-place
Compression/limiting	No	Yes	Compress, expand	No	Option
Talkback/muting	Yes	Yes/No	With routing	Yes	W/routing
Lineup oscillator	Fixed frequency	Variable	Yes	Variable	Variable
Metering types	VU	VU/PPM	Plasma	VU/LED	200-seg plasma
Input connections	Bal 600Ω	TB 600Ω	AB 150Ω	AB 150Ω	AB 1k(m)/10kL)Ω
Output connection	Bal 600Ω	Xfmr 600Ω	Bal 150Ω	Unbal 150Ω	Unbal 150Ω
Output levels	8dBm	8dBm = 0VU	22dBv	21dBm	22dBm
AF response	± 0.4dB	± 1dB 24dBm	± 1dB 4dBm	± 1dB 4dBm	± 1dB 4dBm ref
Distortion	0.05% 1kHz 24dBm	0.07% 1kHz 24dBm	0.02% 1kHz 10dBm	0.02% 1kHz 10dBm	<0.2% 1kHz 10dBm
S/N ratio	75dB line	-125.5dBm EIN/72dB	-128dBm EIN mic	-128dBm EIN mic	-127dBm EIN mic
Crosstalk (worst)	-85dB 1kHz 8dBm	-72dB 100-10k 8dBm	-80dB 1kHz	-80dB 1kHz	-78dB 1kHz
Reader Service Number	1287	1288	1289	1290	1291

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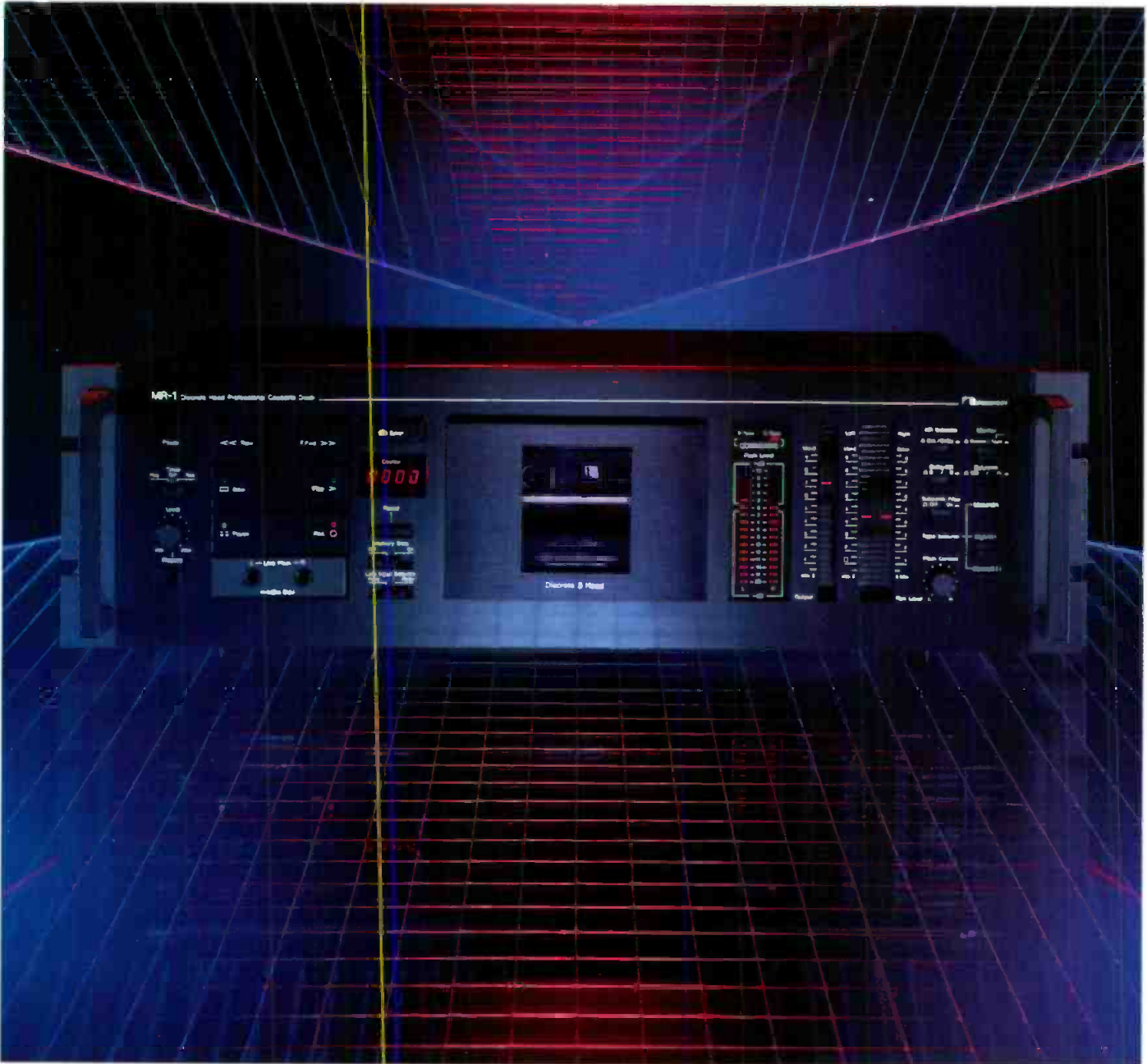
## Audio Mixers, Studio/Production

Manufacturer	<b>Arrakis Systems</b>	<b>Auditronics</b>	<b>Audix Ltd</b>	<b>Calrec by AMS</b>	
Model/Series	Model 10000‡	Series 310	MXT 1200 series‡	AAT3000 assignable Assignable console	
Modular construction	Yes	Yes	Yes	Yes	
Mixing positions	18, 24, 30	32	48	24-100	48, 72 (128 max)
Mixing buses	Pgm/aud/util/mono	4-8+2+1	8	24+8+2	8 grp+8 aux+4 main
Patch points	Yes	Yes	Yes	Computer control	Computer control
Fader types	P&G slider	Slider	Slider	Slider (VCA opt)	Slider
Equalizer	3-band	Peak/shelf/swept	4-band	4-band	4-band
Filtering	High, low-pass	High, low-pass	High-pass	.....	.....
Panpots	Yes	Yes	Yes	Yes	Yes
Grouping	4 or 8	4 or 8	8 each	24, 8 aux	8 stereo/8 aux
Sends-returns	2 aux send	2-4 pre & post	4 pre, post	Various	Multiple, pre/post
Solo bus	Yes	In-place	AFL/PRL	In-place	Yes
Compression/limiting	No	Accessory	Yes	.....	Yes
Talkback/muting	Yes	Accessory/No	Yes	Yes	Yes
Lineup oscillator	Multi-tone	11-frequency	Variable	Yes	Yes
Metering types	VU	VU (PPM opt)	VU, LED PPM	VU, bargraph	LED bargraph, VU
Input connections	AB low/high-Z	AB >1.5k/50kΩ	TB 1.2k/10kΩ	Bal/unbal 1.2k/10kΩ	TB/AB >1.2k/10kΩ
Output connection	AB 600Ω	AB <60Ω	TB 150Ω	Bal/unbal 150Ω	AB <75Ω
Output levels	27dB	4dBv ref 0.775Vrms	24dBm max	24dBm max	24dBu max
AF response	±10dB 20-20k	0,-0.5dB 20-20k	±0.5dB 24dBm	±0.5dB 24dBm	-0.25,0dB 20-20k
Distortion	0.1%	<0.05% THO 20-20k	0.1% 18dBm	0.05% 18dBm	<0.005% 20dBm
S/N ratio	-100dB line	<-129dB EIN/>84dB	-125dBm EIN/80dB	<-125dBm EIN	<-128.5dBu/-90dBu
Crosstalk (worst)	-80dB 20kHz	<-65dB 20-20k	-70dB 18dBm	<-70dB 18dBm	<-90dB 100-10k
<b>Reader Service Number</b>	<b>1292</b>	<b>1293</b>	<b>1294</b>	<b>1295</b>	<b>1296</b>

Manufacturer	<b>Calrec by AMS</b>	<b>D&amp;R Electronics</b>	<b>DDA/Klark-Teknik</b>	<b>Digilec</b>	
Model/Series	UA8000 M studio (M OB)	8000 series III	AMR-24	UPS6500	
Modular construction	Yes	Yes	Yes	P control	
Mixing positions	64 max	To 64	24 + 8	24-48	
Mixing buses	32	24grp/8sub/4main/aux	8 groups	24	8-16
Patch points	Yes	Yes	96 points	Yes	P controlled
Fader types	Slider	Slider	ALPS slider (P&G opt)	Slider	Slider/VCA control
Equalizer	4-band	3/4-band	4-band	4-band	3-band
Filtering	High, low-pass	High, low-pass	High-pass	High-pass	High, low-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Grouping	32 S/9 R	32 total	8 groups	24 groups	8-16 groups
Sends-returns	Pre & post	Pre & post	8 aux send, pre/post	2 st, 4m pre/post	6/in monitor system
Solo bus	AFL/PFL/in-place	PFL/AFL/in-place	PFL/in-place	AFL/PFL/in-place	Yes
Compression/limiting	Yes	Option	Accessory	No	.....
Talkback/muting	Yes	Available	Yes	Yes	Yes
Lineup oscillator	Variable	6-tone/slate/pink	9-tone, slate	Variable	6-frequency
Metering types	Bargraph	Bargraph	LED bargraph	VU	VU(PPM/bar graph)
Input connections	TB/AB 20kΩ	TB/AB 1.2k/10k/20kΩ	AB >4kΩ	AB >2k/10kΩ	TB >1k/5kΩ
Output connection	AB <22Ω	TB 600Ω	100Ω	AB <75Ω	TB <20Ω
Output levels	26dBm max	22dBu max	22dB, 1kΩ	26dBv	12dB nom, 22dB max
AF response	±0.25dB 4dBm	±0.5dB 30-15k	-0.5dB 20-20k	-0.25dB 20-20k	-1,+0.5dB 30-20k
Distortion	0.007% 1kHz 20dBm	<0.01% 40-16k	0.009% 1kHz	<0.05%	<0.2% typical
S/N ratio	80dB	<-127dBm/-80dBu	-128dB EIN/-96.5dB	-127dBv/-82dBv	<-125dBm EIN
Crosstalk (worst)	-80dB 100-10k 4dBm	.....	<-79dB 100-10k	<-82dBv 1kHz	<-80dB 20kHz
<b>Reader Service Number</b>	<b>1297</b>	<b>1298</b>	<b>1299</b>	<b>1300</b>	<b>610</b>

Manufacturer	<b>EELA Audio</b>	<b>Fostex</b>	<b>Graham-Patten Systems</b>	<b>Grass Valley Group</b>	<b>Harrison Systems</b>
Model/Series	S-3000† (S-300‡)	450†‡ (450-16)	ESAM† 608, 612, 616	AMX-90	TV-4 (TV-3)
Modular construction	Yes	No	No	Yes	Yes
Mixing positions	.....	8 (16)	8, 12, 16 channel	.....	60
Mixing buses	30 (13)	7	Stereo pgm, pvw	3	10 (8) stereo
Patch points	Yes	.....	No	No	Yes
Fader types	Slider	Slider	Slider w/VCA	.....	Slider
Equalizer	Shelving, swept	3-band	Sidechain	None	3-band
Filtering	High, low-pass	No	.....	.....	High (& low) pass
Panpots	Yes	Yes	No	No	Yes
Grouping	9 grps (variable)	4x2	No	.....	8
Sends-returns	4 each	2 pre/3 post	No	.....	6 each (6 pre)
Solo bus	AFL (PFL)	AFL	No	PFL	AFL/PFL/in-place
Compression/limiting	No (Yes)	No	Sidechain accessory	No	No
Talkback/muting	Yes/No	None	No	Yes	Yes
Lineup oscillator	Yes	No	No	Fixed	Variable
Metering types	VU, PPM	VU/PPM/LED	VU, PPM	VU, PPM	VU, PPM, LED
Input connections	AB (& TB) 1.2k/10kΩ	AB/unbal 1.2k/10kΩ	AB >20kΩ	Bal >1kΩ	AB 150Ω

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Circle (114) on Reply Card

## Audio Mixers, Studio/Production

Manufacturer	EELA Audio	Fostex	Graham-Patten Systems	Grass Valley Group	Harrison Systems
Model/Series	S-3000† (S-300‡)	450†† (450-16)	ESAM† 608, 612, 616	AMX-90	TV-4 (TV-3)
Output connection	AB (& TB <40Ω)	Unbal 600Ω	AB <30Ω	Bal <20Ω	AB 600Ω
Output levels	..... (20dBm max)	10dBv into 10Ω	30dBm max	12dBm	24dBm
AF response	±1dB	-2, +1dB ref -10dBv	±0.5dB	±0.5dB 30-20k	±0.2dB 4dBm
Distortion	0.01% (0.06%)	0.05% 1kHz -10dBv	<0.1% for 16dBu	0.2%	...
S/N ratio	-127dBm EIN (-126dBm)	-126dBm EIN	100dB per input	-125dBm EIN	-129dBm EIN mic
Crosstalk (worst)	-76dB 1k/(-61 15k)	-60dB 1kHz -10dBv	<-82dB 15kHz	-70dB 10k-20k	-65dB 15kHz
Reader Service Number	463	464	465	466	467

Manufacturer	JVC	Logitek	McCurdy Radio	Mitsubishi Pro Audio	Neve Electronics
Model/Series	◆MI-2000U††	◆Custom Audio Series	SS8900E‡	Westar 8000 (8200†)	Digital transfer
Modular construction	No	Yes	Yes	Yes	.....
Mixing positions	8	12	32 std	...	.....
Mixing buses	Pgm, aux, mon	2	8 sub, 2 mstr	24	1 digital, 1 analog
Patch points	No	No	Yes	Yes	No
Fader types	Slider	Slider	Slider	Slider	Slider
Equalizer	3-band	3-band	3/4-band	4-band	Formant Spectrum EQ
Filtering	None	..	High pass	High, low-pass	High, low-pass
Panpots	Yes	Yes	Yes	Yes	.....
Grouping	.....	No	8 sub, 2 mstr	8 groups	No
Sends-returns	Through aux	No	4 switch selected	8 pre, 8 post	Yes
Solo bus	PFL	...	In-place	In-place, AFL, PFL	.....
Compression/limiting	No	No	No	Option (No)	Limit/compress/expand
Talkback/muting	Yes	Yes	Option	Yes/No	No
Lineup oscillator	1kHz	No	No	Variable	.....
Metering types	None, peak LED	Vu	VU, PPM	VU, PPM, LED	Bar graph
Input connections	Low-Z, 10k/50kΩ	AB 150/600Ω	AB/TB 150/600Ω	TB/AB 10kΩ	Bal digital 75/50kΩ
Output connection	Bal/unbal 600/10kΩ	AB 600Ω	AB 150/600Ω	TB/AB 30Ω(75Ω)	AB 50Ω analog
Output levels	0dBm	4dBm nominal	24dBm max	28dBm max (26dBm)	12dBu
AF response	-2dB 20-20k mic	±0.5dB 4dBm	±1dB 30-20k	±0.5dB (-0.75dB)	.....
Distortion	<0.3% 30-20k 20dB	0.04% 1kHz 4dBm	0.01% 18dBm	0.05%	.....
S/N ratio	-128dB EIN 150Ω	-126dBm EIN mic	-125dBm EIN	-129dBm (-127dBm) EIN	.....
Crosstalk (worst)	-70dB 1kHz pgm/aux	-80dB 1kHz 8dBm	<-65dB 30-20kHz	-70dB (-90dB)	.....
Reader Service Number	468	469	470	471	472



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## Audio Mixers, Studio/Production

Manufacturer	Neve Electronics	Orion Research	Ramko Research	RAMSA/Panasonic Audio	
Model/Series	Model 8232	V series	AMU series	◆DC38-10S‡ WR-T812‡ (T820)	
Modular construction	Yes	Yes	Yes	No	Yes
Mixing positions	32	60	32	10 max	12 (20)
Mixing buses	4+6 aux	4+8 aux	8 stereo	2	10
Patch points	Yes	Yes	Yes	No	No
Fader types	P&G slider	P&G slider	Slider	Slider	Slider
Equalizer	4-band	4-band	7-band	No	3-band
Filtering	High, low-pass	High, low-pass	High, low-pass	No	High pass
Panpots	Yes	Yes	Yes	No	Yes
Grouping	8 VCA optional	To 48/48	2/2 all stereo	No	8 groups
Sends-returns	6 pre/post switched	8 pre/post switchable	4 pre/post	No	12 (20)
Solo bus	AFL, in-place	AFL/PFL/in-place	PFL	None	Pre-fader
Compression/limiting	No	Yes	No	No	No
Talkback/muting	Yes	Yes	Yes	Yes	Yes
Lineup oscillator	Variable	Variable	Variable	Yes	1kHz/10kHz/slate
Metering types	VU+PPM, plasma	VU+PPM, plasma	VU/LED	LED	VU, bar graph
Input connections	TB/AB 1.2k/20kΩ	TB/AB 1.2k/10kΩ	AB 10kΩ	Bal 150Ω, high-Z	AB 5k/10kΩ
Output connection	TB/unbal 10Ω	AB 15Ω	Bal 600Ω	Bal 600Ω	600/3kΩ
Output levels	4/8dBm, 22dBm max	4/8dBm, 26dBm max	27dBm max	8dBm nom	20dB
AF response	±0.5dB 4/8dBm/0VU	±0.5dB 4/8dBm	±0.5dB 8dBm	-2dB ref 8dBm	-0.8, +0.5dB 20-20k
Distortion	<0.06% 100-10k 20dB	<0.04% 20-20k 20dBm	0.05% 20kHz 8dBm	0.5% 8dBm	0.08% 18dB 20-20k
S/N ratio	-124dBm EIN/76dB	-125dBm EIN/80dB	-128dBm EIN/-112dBm	63dB	-132dB typical
Crosstalk (worst)	-60dB 15kHz 20dBm	-80dB 20kHz 20dBm	-85dB 1kHz 8dBm	-70dB 1kHz 8dBm	60dB 1kHz
Reader Service Number	473	474	475	476	477

Manufacturer	RAMSA/Panasonic Audio	Solid State Logic	Sonosax	Sony Pro Audio	
Model/Series	WR-8616‡ (8428)	SL 6000 E stereo video	SL 4000 E series Master SX-T	MXP-2036	
Modular construction	Yes	Yes	Yes	No	Yes
Mixing positions	16 (28)	64	64	14	32
Mixing buses	11 (10)	6	4	10	4
Patch points	No	Yes	Yes	Yes	.....
Fader types	Sliders	Slider	Slider	Slider	Slider
Equalizer	3-band	4-band	4-band	3-band	3-band

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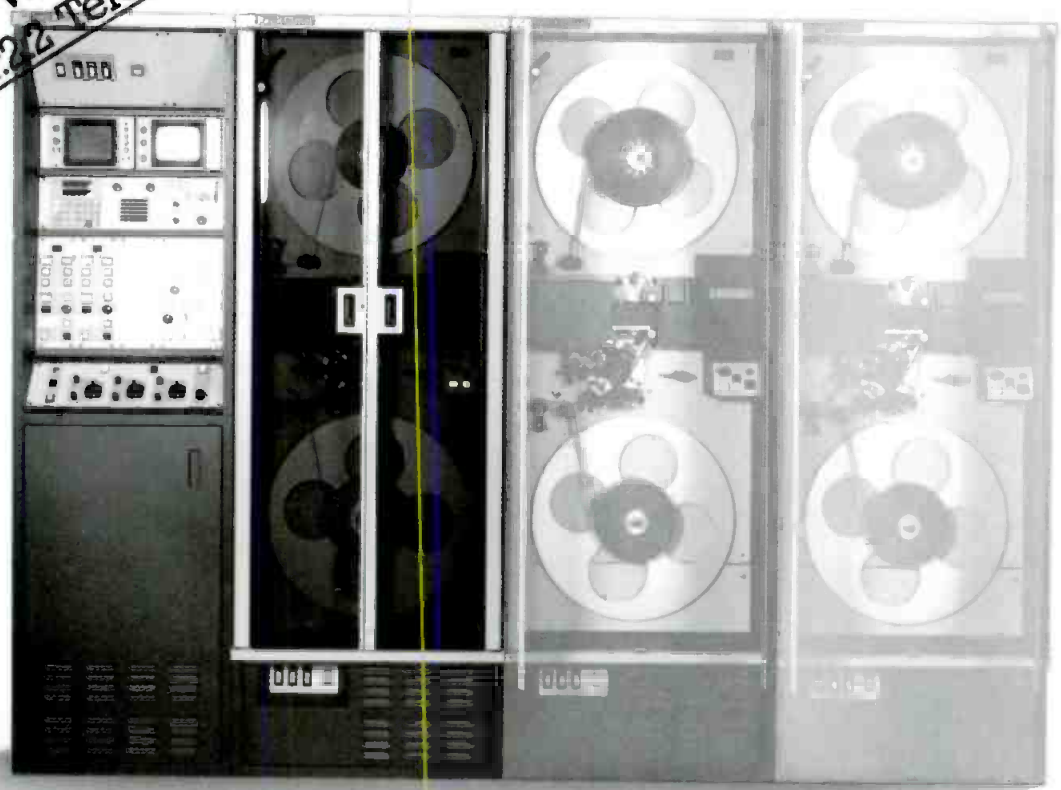


# Audio Mixers, Studio/Production

Manufacturer	.RAMSA/Panasonic Audio	Solid State Logic	Sonosax	Sony Pro Audio	
Model/Series	WR-8616‡ (8428)	SL 6000 E stereo video	SL 4000 E series Master SX-T	MXP-2036	
Filtering	High, low-pass	High, low-pass	High, low-pass	Low-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Grouping	2 (4) groups	32/8+6	32/8 VCA	Subs on request	4 groups
Sends-returns	2 + 2 effects	6 pre, 6 post	4 pre/post, 4 return	...	.....
Solo bus	Yes	AFL, PFL, in-place	AFL, PFL, in-place	AFL or PFL	Yes
Compression/limiting	No	Yes	Expander/gate	Yes	Available
Speaker muting	Option	Yes	Yes	Yes	Yes
Lineup oscillator	1kHz/slate	Variable	Variable	Fixed frequency	<0.05% THD
Metering types	Bar graph & VU	VU, PPM, Bargraph	VU, PPM, plasma	PPM, LED	VU, ladder
Input connections	AB 150/600Ω	600/35Ω	TB/AB 600Ω	TB/AB 5kΩ	TB/AB 1.2k/10kΩ
Output connection	AB 600Ω load	Bal <35Ω	AB <35Ω	TB/AB 25Ω	TB/AB 60Ω nom
Output levels	23(24)dBm max	26dBm 600Ω	26dBm 600Ω	26dBm max	0dBm nom
AF response	-1.5,+0.5dB 20-20k	±0.5dB	±0.5dB 4dBm	±0.1dB	±0.5dB
Distortion	0.05% 1kHz	0.03% 1kHz 4dBm	0.03% 1kHz 4dBm	0.02% 1kHz 6dBm	0.05%
S/N ratio	-132dB (<-127dB)	-128.5dBm EIN mic	84dB	-129dBm EIN/-115dBm	-126dB
Crosstalk (worst)	<-60dB 1kHz	-64dB 10kHz 4dBm	-64dB 10kHz 4dBm	-80dBm 1kHz 6dBm	<-70dB
Reader Service Number	478	479	480	481	482
Manufacturer	.Sony Pro Audio	Soundcraft	Soundtracs/AKG Acoustics	Studer ReVox	
Model/Series	MXP-3000 series	TS-12	CP6800 series MR series‡	Model 963‡	
Modular construction	Yes	Yes	Yes	Yes	
Mixing positions	18-52	24, 36	.....	24+8	60-in/4sub/4-master
Mixing buses	3	Mix, channel	.....	8 + 2	4-8sub/4master/4aux
Patch points	.....	Yes	Yes	.....	To +6dB
Fader types	Slider	Sliders	Slider, VCA control	Sliders	Slider
Equalizer	Shelving/parametric	4-band	5-band	4-band	3-band
Filtering	High, low-pass	High-pass	High-pass	High-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Grouping	8	12/8	Various config	8	4 or 8
Sends-returns	6 pre/8 post	6/6	Various config	6 pre/post	4 pre/post switched
Solo bus	PFL/in-place	PFL, in-place	In-place	Yes	Post-fader
Compression/limiting	No	.....	.....	.....	Per channel/system
Talkback/muting	Yes	Yes	Yes	Yes	Yes
Lineup oscillator	Variable	Yes	11-tone	30Hz, 1kHz	5-frequency
Metering types	VU/PPM	VU	Bargraph	10-seg bar graph	VU or bar graph
Input connections	TB/AB 1.5k/7kΩ	AB 2k(m)/10kΩ(l)	AB 4k/10kΩ	AB 2k/10kΩ	TB >5kΩ
Output connection	TB/AB 120Ω	5k/600Ω	AB 50Ω	Unbal 50Ω	TB <50Ω
Output levels	22dBm 2kΩ	21dBu, 26dBu max	22dBm	22dBm max	24dBm
AF response	-0.3dB 4dBm	-1dB 20-20k 10dBu	.....	.....	-0.1,0 30-15k
Distortion	0.1% 1kHz 4dBm	<0.005% 1kHz	<0.015%	<0.015%	0.03% 4dB... 30-15k
S/N ratio	80dB	-128.5dBm EIN	-127.5dBm/>72dB	-127dBm/>78dB	-125dBm EIN mic
Crosstalk (worst)	-70dB 20kHz	-80dB between groups	.....	<-70dB	-80dB 4dBm 15kHz
Reader Service Number	483	484	485	486	487
Manufacturer	.Studer Revox	TASCAM	Ward-Beck Systems	Wheatstone	
Model/Series	Series 900	M-600 series	M-500 series‡‡	ST3642/ST series‡	SP-5
Modular construction	Yes	Yes	Yes	Yes	Yes
Mixing positions	To 50+24 master	24-32	12-20	36	48
Mixing buses	24	16+8+4+2	8main/4aux/2master	23	8
Patch points	Yes	Yes	Access patches	Yes	Yes
Fader types	Slider, VCAs	Slider	Slider	Slider	Slider
Equalizer	3-band	3/4-band	3-band	3-band	8-band
Filtering	High, low-pass	High-pass	No	High-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Grouping	8 groups	16 pgm	8 main, 4 aux	2-st, 2-m/4-st	8 groups
Sends-returns	5 pre/post switched	16 aux	Yes	6 pre/6 post	4 pro, post
Solo bus	In-place	PFL	In-place, PFL	AFL, PFL	PFL
Compression/limiting	w/VCA faders	No	Sidechain opt	Yes	No
Talkback/muting	Yes	Yes	Yes	Yes	Yes
Lineup oscillator	Variable	4-tone	3-tone	Variable	Variable
Metering types	VU, PPM	VU	VU meters	VU, PPM	VU movement
Input connections	TB/AB 75kΩ	Bal 2.2k/40kΩ	Bal 2k/100kΩ	TB 1.5k/20kΩ	AB/TB 150/10kΩ
Output connection	TB 50Ω	Bal 100Ω	Bal 100Ω	Bal <100Ω	AB 600Ω
Output levels	6dBm typical	4dBm nominal	18dBV maximum	8dBm nom, 30dBm max	22dBm max
AF response	-1,0.5dB 6dBm	-1.5,+0.5dB 20-20k	±1dB 20-20k	<±1dB 20-20k	±0.5dB 20-20k
Distortion	0.1% 31-16k 6dBm	<0.015% 14dBm	0.025% 1kHz	<0.2% 24dBm	<0.005% 18dBm
S/N ratio	-125dBm EIN mic	-130dBm EIN DIN	68dB unwt'd mic-pgm	-125dBm EIN	-129dBm EIN/>90dB
Crosstalk (worst)	-85dB	<-60dB 1kHz	<-70dB 1kHz	<-75dB 30-15k	<-90dB 1kHz
Reader Service Number	488	489	490	608	609



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Circle (118) on Reply Card

## Audio Mixers, Studio/Production

Manufacturer	Wheatstone		Yamaha International	
	Model/Series	3224 series†	RMM2408††	PM3000
Modular construction	Yes	Yes	Yes	Yes
Mixing positions	48	24 max	24, 32, 40	19
Mixing buses	24	8	8	19
Patch points	Yes	Yes	Yes	Yes
Fader types	Slider	Slider	Slider	Slider
Equalizer	3-band	3-band	3-band	4-band
Filtering	12dB/oct high-pass	High-pass	High-pass	High-pass
Panpots	Yes	Yes	Yes	Yes
Grouping	24 groups	8 groups	8 groups	8, VCA control
Sends-returns	2 pre/4 post	2-send switchable	2-send switchable	Yes
Solo bus	AFL/PFL	AFL	AFL	In-place
Compression/limiting	No	No	No	.....
Talkback/muting	Yes/No	Yes/No	Yes/No	Yes
Lineup oscillator	Variable tone	Variable	Variable	w/pink noise
Metering types	VU	VU	VU	VU, peak LED
Input connections	AB 150/40kΩ	TB 600Ω	TB 600Ω	Bal/TB 1k/3k/10kΩ
Output connection	AB <10Ω	Unbal 600Ω	Unbal 600Ω	Bal/TB opt 150Ω
Output levels	28dBm max	4dBm for 0VU	4dBm for 0VU	4dBu nom
AF response	± 0.1dB 0dBm	-3dB ref 4dBm	-3dB ref 4dBm	-3, +1dB 4dBm
Distortion	0.05% 20dBm	0.1%	0.1%	<0.1% 14dBm
S/N ratio	-129dBm EIN/90dB	-128dBm EIN	-128dBm EIN	-128dBm EIN
Crosstalk (worst)	<-90dB 1kHz	-70dB 1kHz 4dBm	-70dB 1kHz 4dBm	-60dB 1kHz
Reader Service Number	654	655	655	1496

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Manufacturer	Sony/Pro Audio		Straight Wire Audio	Studer	
	Model/Series	CDP-5000		CDP-3000/CDS-3000	A727
System configuration	Single player	Multiplayer	Single player	Single player	Multiplayer
Player trays	.....	2 per controller	.....	.....	3 max
Programmable	Yes	Yes	Limited, speed adjust	Multiple event	To 3 events
Output connection	Bal 600Ω	Balanced	Bal XLR 600Ω	Xfmr bal <50Ω source	Xfmr bal, unbal, <40Ω
Output level	4dBm	4dBm nom	4dBm	15dBm max	6dBm
Audio response	-1, +0.5dB 20-20k	-1, +0.8dB 20-20k	± 0.3dB 20-20k	± 0.1dB 20-20k	± 0.5dB 20-20k
Distortion	0.01%	0.01%	0.003%	<0.006%	<0.01%
Dynamic range	>94dB	94dB	96dB	96dB	>90dB
Crosstalk	90dB 1kHz	<90dB 1kHz	94dB	<90dB 1kHz	<80dB
S/N ratio	.....	.....	>96dB	>100dB	>90dB
Access time	2s	2s	.....	3sec	<2sec
Reader Service Number	491	492	493	494	495

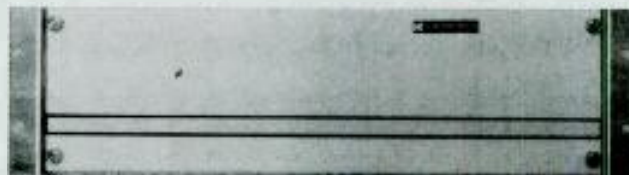
Manufacturer	Studer	Studer/ReVox	TASCAM	Technics/Panasonic
Model/Series	Philips LHM-2002	B226	CD-501	SL-P50P
System configuration	Multiplayer	Single player	Single player	Single player
Player trays	99 max	.....	1	1
Programmable	To 55 events	To 19 events	Yes, remote control	Yes
Output connection	Xfmr bal	Unbal <500Ω	XLR bal 600Ω load	Bal 600Ω
Output level	6dBm nom	0-2V	0dBm nom	-10, +4dBm
Audio response	-0.05dB 20-20k	± 0.1dB 20-20k	± 0.3dB 5-20k	0.5dB
Distortion	0.01% 6dBm	<0.005%	0.0025% 1kHz	<0.01%
Dynamic range	>90dB	96dB	>96dB	>96dB
Crosstalk	80dB 20kHz 6dBm	<90dB	<-95dB	-90dB
S/N ratio	>90dB unwt'd	>100dB	>96dB	>96dB
Access time	2s	<3s random	.....	<6s
Reader Service Number	496	497	498	499



# Compact Video/Audio Switchers

## Routing Switchers

10 x 1, 10 x 5 and 10 x 10 Complimentary Series of Video/Audio, Vertical Interval Switchers . . .

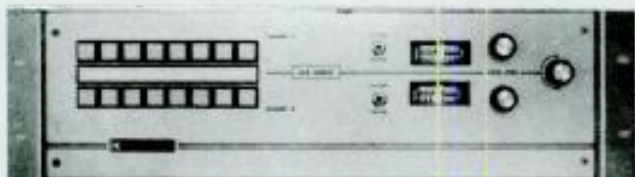


Starting with 10 x 1 Routing Switcher, easily expandable with matching 10 x 5, 10 x 10 Series.

Remote control up to 5,000 feet with a twisted pair allows for easy and flexible installation and any later changes, accomplished by using RS-422/232C serial data which also lends itself to computer/modem usage.

Individual audio connectors allow changing any single input without power shutdown, as encountered in switchers that use multi-pin connectors.

Typically, a 10 x 10 Routing Switcher including stereo audio and power supply occupies only 5 1/4" of your valuable rack space.



## Component/RGB Switchers

30 MHZ, Bandwidth, Vertical Interval Switching, and Audio Follow . . .

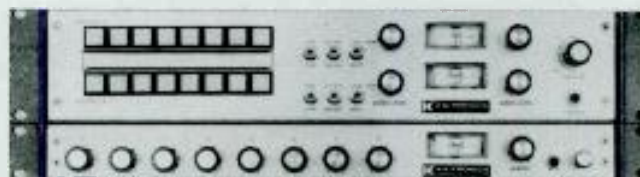
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AM-8000 Broadcast Audio Mixer



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Circle (119) on Reply Card

# Audio Cartridge Recorders

These recorders use 1/4" continuous-loop cartridges for spot or longer announcements. Replay-Inhibit is not available on units marked with a diamond (◆). Models are stereo unless marked with a bullet (•). Models marked with a dagger (†) are belt-driven. A star (★) indicates fast-forward mode. In audio response ranges, Hz is understood.

Manufacturer	APPEL	Audi-Cord	◆Series 2100C	Broadcast Electronics	PT90RPS★ (PhaseTrak90)
Model/Series	•Model 578†	Series A/S/TDS		◆Series 3000A★	
Deck control logic	Transistor	CMOS devices	TTL & CMOS devices	TTL	.....
Remote control bus	No	Yes	None	None	Simple remote
Record timer	Yes	Yes	No	No	Option
Sec, Tert tones	Yes	Yes	Sec only	No	Sec, Tert, AFSK
Sec, tert output	TTL	Solid-state	Relay closure	Relay closure	Solid-state
Phase correction	n.a.	None	No	No	Non-encoded type
Capstan motor	ac-synchronous	ac-synchronous	ac-synchronous	ac-synchronous	dc-servo
Play speeds	7.5	7.5	3.75/7.5	3.75/7.5	7.5 (3.7/15 options)
Meter types	VU rec/play/erase	VU movement	Taut-band A	Taut-band A	LED VU
Monaural model	.....	S21, A21	2100RP	3200ARP, 3400ARP	PT90P
Play only model	Model 557	S11/-16, A11/-16	2100P	3100/3200/3400AP/APS	PT90PS
Multideck model	Model 2214	TDS-1, TDS-6 twins	None	.....	.....
Input connection	Balanced	Xfmr bal	Active bal	Xfmr bal bridging	Active bal
Input level	-5, +20dB 5kΩ	-22,-12dBm	-10dBm	-20, +20dBm 50kΩ load	8dBm
Output connection	Balanced	Xfmr bal	Active bal	Xfmr	Active bal
Output level	12dBm 110Ω	-8dBm	0dBm	-54/ +10dBm 600/150Ω	24dBm <75Ω source
AF response	±1.5dB 40-12.5k	±2dB 50-15k	±2dB 50-15k	±2dB 50-15k	±2dB 40-16k
S/N ratio	54dB	>47dB stereo	>52dB	>52dB unwt'd	80dB w/Dynafex NRS
Crosstalk L-R-Cue	.....	<-50dB	-50dB 1kHz	-50dB 1kHz	-50dB
Distortion	<1.5% 1kHz	1% 1kHz 160nWb/m	2%	<2% tape dependent	<1.5% tape dependent
Wow & flutter	±0.3% unwt'd	0.15% peak wtd	≤0.15%	≤0.15% DIN wtd 7.5ips	0.12% DIN wtd 7.5ips
Reader Service Number	1169	1170	1171	1172	1173

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## Audio Cartridge Recorders

<b>Manufacturer</b> . . . . .	Cartridge Technology
<b>Model Series</b> . . . . .	◆CT-1001★
Deck control logic . . . . .	CMOS devices
Remote control bus . . . . .	15-pin D-connector
Record timer . . . . .	Yes
Sec, Tert tones . . . . .	Yes
Sec, tert output . . . . .	Solid-state
Phase correction . . . . .	No
Capstan motor . . . . .	dc-servo
Play speeds . . . . .	3.75
Meter types . . . . .	VU/PPM movement
Monaural model . . . . .	.....
Play only model . . . . .	.....
Multideck model . . . . .	.....
Input connection . . . . .	Active bal (Xfmr opt)
Input level . . . . .	-10.0dBm (30kΩ)
Output connection . . . . .	Floating xfmr bal
Output level . . . . .	-10.0dBm (150Ω)
AF response . . . . .	± 1dB 40-15k
S/N ratio . . . . .	> 44dB 22-22k PPM
Crosstalk L-R-Cue . . . . .	< -36dB
Distortion . . . . .	1.5% 1kHz 405nWb/m
Wow & flutter . . . . .	< 0.12% DIN wtd
<b>Reader Service Number</b> . . . . .	1174

<b>Manufacturer</b> . . . . .	Fidelipac
<b>Model Series</b> . . . . .	Dynamax CTR34
Deck control logic . . . . .	.....
Remote control bus . . . . .	50-pin D-connector
Record timer . . . . .	No
Sec, Tert tones . . . . .	Yes
Sec, tert output . . . . .	Relay contact
Phase correction . . . . .	.....
Capstan motor . . . . .	dc servo
Play speeds . . . . .	7.5ips
Meter types . . . . .	LED VU displays
Monaural model . . . . .	CTR33
Play only model . . . . .	.....
Multideck model . . . . .	3-deck
Input connection . . . . .	Diff-bal bridged 10kΩ
Input level . . . . .	-17, +20dBm
Output connection . . . . .	-bal 440Ω source
Output level . . . . .	20dBm 600Ω clipping
AF response . . . . .	± 2dB 50-16k
S/N ratio . . . . .	≥ 55dB hum/noise
Crosstalk L-R-Cue . . . . .	≤ -50dB 1kHz
Distortion . . . . .	≤ 1%
Wow & flutter . . . . .	0.15% DIN wtd
<b>Reader Service Number</b> . . . . .	1175

<b>Manufacturer</b> . . . . .	Fidelipac
<b>Model Series</b> . . . . .	Dynamax CTR14★ (124)
Deck control logic . . . . .	CMOS devices
Remote control bus . . . . .	Simple remote
Record timer . . . . .	No (Yes)
Sec, Tert tones . . . . .	Yes
Sec, tert output . . . . .	Solid-state, relay
Phase correction . . . . .	No (Yes)
Capstan motor . . . . .	ac-sync (dc-servo)
Play speeds . . . . .	7.5 (3.75, 7.5, 15, var)
Meter types . . . . .	Bar graph
Monaural model . . . . .	CTR13 (CTR123)
Play only model . . . . .	CTR11/-12 (-111/-112)
Multideck model . . . . .	Use CTR34 (.....)
Input connection . . . . .	Active bal
Input level . . . . .	-17, +26dBm
Output connection . . . . .	Active bal
Output level . . . . .	20dBm
AF response . . . . .	± 2dB 50-16k
S/N ratio . . . . .	59dB unwt'd 0VU
Crosstalk L-R-Cue . . . . .	-50dB 1kHz 0VU
Distortion . . . . .	1% 1kHz 0VU
Wow & flutter . . . . .	≤ 0.12%
<b>Reader Service Number</b> . . . . .	1176

<b>Manufacturer</b> . . . . .	Delta series★
Deck control logic . . . . .	μprocessor
Remote control bus . . . . .	Simple remote
Record timer . . . . .	Ext timer trigger
Sec, Tert tones . . . . .	Yes
Sec, tert output . . . . .	Solid-state, relay
Phase correction . . . . .	No
Capstan motor . . . . .	dc-servo
Play speeds . . . . .	7.5 (3.5, 15 opt)
Meter types . . . . .	Taut-band A
Monaural model . . . . .	Delta IV/I
Play only model . . . . .	Delta I-M/-S
Multideck model . . . . .	Delta III-M/-S
Input connection . . . . .	Xfmr or active bal
Input level . . . . .	± 18dB 20kΩ load
Output connection . . . . .	Xfmr or active bal
Output level . . . . .	± 18dBm 275Ω source
AF response . . . . .	± 2dB 50-16k
S/N ratio . . . . .	60dB unwt'd 0VU
Crosstalk L-R-Cue . . . . .	< -50dB 1kHz 0VU
Distortion . . . . .	< 1.5% 1kHz 0VU
Wow & flutter . . . . .	0.15% DIN wtd
<b>Reader Service Number</b> . . . . .	1177

<b>Manufacturer</b> . . . . .	ITC/3M
<b>Model Series</b> . . . . .	99B series★
Deck control logic . . . . .	μprocessor
Remote control bus . . . . .	Simple remote
Record timer . . . . .	Ext timer trigger
Sec, Tert tones . . . . .	Yes
Sec, tert output . . . . .	Solid-state, relay
Phase correction . . . . .	ELSA system
Capstan motor . . . . .	dc-servo
Play speeds . . . . .	7.5 (3.75, 15, var opt)
Meter types . . . . .	Taut-band A/peak LED
Monaural model . . . . .	RPME
Play only model . . . . .	PM mono/PS stereo
Multideck model . . . . .	None
Input connection . . . . .	Xfmr active bal
Input level . . . . .	-20, +28dB 20kΩ
Output connection . . . . .	Xfmr bal
Output level . . . . .	-18, +25dBm 600Ω
AF response . . . . .	± 1dB 31.5-16k
S/N ratio . . . . .	> 44dB 22-22k PPM
Crosstalk L-R-Cue . . . . .	< -45dB/1kHz
Distortion . . . . .	1.5% 1kHz 405nWb/m
Wow & flutter . . . . .	< 0.12% DIN wtd
<b>Reader Service Number</b> . . . . .	1178

<b>Manufacturer</b> . . . . .	ITC/3M
<b>Model Series</b> . . . . .	OMEGA series
Deck control logic . . . . .	μprocessor
Remote control bus . . . . .	Simple remote
Record timer . . . . .	No
Sec, Tert tones . . . . .	Sec only

<b>Manufacturer</b> . . . . .	Otari
<b>Model Series</b> . . . . .	CTM-10SR★
Deck control logic . . . . .	μprocessor
Remote control bus . . . . .	Yes
Record timer . . . . .	LED min/sec
Sec, Tert tones . . . . .	Yes

<b>Manufacturer</b> . . . . .	Pacific Recorders & Eng.
<b>Model Series</b> . . . . .	◆Micromax†
Deck control logic . . . . .	CMOS devices
Remote control bus . . . . .	Yes
Record timer . . . . .	Yes
Sec, Tert tones . . . . .	Yes

<b>Manufacturer</b> . . . . .	Sonifex
<b>Model Series</b> . . . . .	◆CQ 20-R†★
Deck control logic . . . . .	CMOS
Remote control bus . . . . .	Simple remote
Record timer . . . . .	No
Sec, Tert tones . . . . .	Sec only



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## Audio Cartridge Recorders

Manufacturer . . . . . ITC/3M

Otari

Pacific Recorders & Eng.

Sonifex

## Audio Cassette Recorders

Manufacturer	a&a Systemes de Comm.	Fostex	JVC Company	Nakamichi	
Model/Series	Maj'30 Jingle	250 (250AV)	X-15	KD-V601J	MR-1 (MR-2)
Output connection	Bal, unbal, 600Ω	Unbal	Unbal	5kΩ	Bal, (unbal)
Output level	+18dBm max	-10dBv, 10kΩ	-20dBv 20kΩ	0-500mV	+4dBm
AF response	-3, +2dB 35-14k	-3, +2dB 20-18k	±3dB 20-12.5k	±3dB 20-14k metal	±3dB, 20-20k
S/N ratio	50dB	71dB wtd <sup>1</sup>	50dB unwtd	58dB metal	70(68)dB A-wtd <sup>1</sup>
Crosstalk Pgm-Pgm	>35dB separation	-50dB 1kHz 0VU	-40dB 1kHz 0VU	65dB 1kHz <sup>9</sup>	-60dB 1kHz 0VU
Distortion	1.5% 315Hz	1.5% 315Hz	1.5% 1kHz 0VU	1% 0VU 1kHz metal	0.9(1)% 400Hz 0VU
Wow & flutter	.....	<0.02%	±0.1%	0.05% WRMS	0.048% (0.06%)
Equalization	Types I, II	3180+70μs	3180+70μs	Std, metal, chrome	3180+120 or 70μs
<sup>1</sup> S/N figure based on use of Dolby C noise reduction.					
Reader Service Number	1159	1160	1161	1162	1163

Manufacturer	Studer	TASCAM	Yamaha Int'l		
Model Series	A721	B215	234 Syncaset	122mkII (112R/112)	MT44-D (MTIX)
Deck control logic	μP control	μP control	TTL	TTL (w/reverse)	In 4-channel mixer
Timer	Yes	Yes	Tape counter	Index & (counter)	Time, (tape) modes
Cue track	No	No	No	In FF, RWD modes	No
Capstan drive type	Direct	Direct	Belt	Direct bidirectional	....
Other play speeds	None		3.75ips ±12%	±12% (±15%)	±10% pitch
No. of heads	3	3	2 4-channel	1-E, 1-R, 1-P, Acculign	4-track R/P, E
Meter types	Peak program	Bar graph	VU, peak LEDs	L/R VU, peak LED (ladder)	LED bar graph
Input connection	Xfmr bal 10kΩ	Unbal 100kΩ	Unbal	XLR 40kΩ, RCA 30kΩ	Unbal 50(10)kΩ
Input level	+4dBu	-34dBm	Mic, line	+4dBm, -10dBv	-10dB (+10dBu max)
Output connection	Xfmr bal, <50Ω source	Unbal	Unbal, RCA, 1/4" phone	XLR 100Ω bal, RCA 100Ω	Unbal 2.5(1)kΩ
Output level	+4dBu in 600Ω	0dBm, 47Ω	-10dBv nominal	+4dBm, -10dBv	-10dB (-10dBu)
AF response	-3, +2dB 20-≥18kHz	-3, +2dB 20-22k	±3dB 40-14k	±3dB 25-17, -20VU	≤3dB 20-12.5k
S/N ratio	72dB Type IV <sup>1</sup>	72dB A-wtd <sup>1</sup>	>95dB IHF A wtd, dbx NR	80dB <sup>1</sup> >1kHz	67dB <sup>1</sup> (85 dbx)
Crosstalk Pgm-Pgm	<-40dB @ 1kHz	-40dB, 1kHz, 0VU	-50dB, 1kHz, 0VU	<-45dB, 1kHz, 0VU	>50(55)dB separation
Distortion	≤1.5% Types I/II/IV	<1.5%, 315Hz, 0VU	1%, 1kHz, 0VU	1%, 400Hz, 0VU	<1%
Wow, flutter	0.1% wtd C-46 to C-90	0.1%, DIN 45507	0.06%	0.04% NAB, 0.08% DIN	0.06% (<0.05%)
Equalization	Types I, II, IV	3180μs + 12μs/70μs	3180μs + 70μs	3180μs + 70μs, 120μs	3180μs + 120μs/70μs
<sup>1</sup> S/N figure based on use of Dolby C noise reduction.					
Reader Service Number	1164	1165	1166	1167	1168



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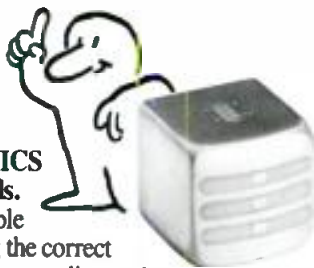
# Audio Reel-type Recorders

A dc-servo capstan motor is common to all models unless marked with a dagger (†). Belt-drive capstan models are noted with a bullet (•). In audio response range, Hz is understood.

Manufacturer Model Series	AEG AG/AEG Corp		Digitec F500	Fostex	
	M-20 series	M-21 series		-Model 20 (80)	B-16 series
No. of tracks	2, 2ime code	2	2, mono/stereo/sync	3(8)	16
Tape width	1/4"	1/4", 1/2"	1/4"	1/4"	1/2"
Deck control logic	μP 8085	μP 8085	μprocessor	μprocessor	μprocessor
Edit interface type	RS-232/422	Optional remote	Sync, RS-232	SMPTE port	Synchronizer
Recording timer	LCD	LCD	LED opt	Yes	Yes
Cue track	Center TC	No	SMPTE TC center	SMPTE TC center	No
Phase correction	Yes	No	No	No	No
Reel motor	dc-servo	dc-servo	dc-servo	dc-servo	dc-servo
Tape speeds	3.75-30, 20-50% var	2, 3.75-30, var	3.75/7.5/15, var	7.5/(15)ips	15/30ips
No. of heads	3 (6, TC model)	3 amorphous	2	3 (2)	2 (-DM has 3)
Meter types	VU in bridge	2 VU in bridge	VU panel	Bar graph	Bar graph
Equalization	NAB, IEC1/2	NAB, CCIR, DIN, AES	NAB, CCIR	NAB & (IEC)	IEC/15, AES/30
Input connection	Bal 5k/>10kΩ	Xfmrless bal, 10kΩ	Bal ≥15kΩ	Act unbal 30kΩ	RCA 25kΩ
Input level	+24dBm max	+24dBm max	+22dBu max	-10dBv	-10dBv
Output connection	Bal, xfmr opt <45Ω	Xfmrless bal, <40Ω	Bal, ≤50Ω source	Act unbal 10kΩ	RCA unbal 10kΩ
Output level	+24dBm	+24dBm max	+20dBu max	-10dBv	-10dBv
AF response	±1.5dB 20-16k 7.5ips	±1.5dB 20-16k 7.5ips	±2dB 31-16k 7.5ips	±3dB 30-20k(40-18k)	±3dB 40-18k
S/N ratio	>1dB stereo 7.5ips	>70dB 7.5ips	>71dB 7.5ips	70dB (60dB)	80dB wtd
Crosstalk Pgm-Pgm	-55dB stereo/-65dB 2-tr	<-60dB 1/4" 1kHz	<-40dB stereo	-70dB	-55dB 1kHz 0VU
Distortion	<0.6% max stereo/2-tr	<0.6% 510nWb/m	<1%	<1% 1kHz 0VU	1% 1kHz 0VU
Wow & flutter	<0.06% 7.5ips	<0.06% DIN 45507	<0.06% 7.5ips	±0.06% 15ips	±0.05% peak wtd
Reader Service Number	1186	1187	1188	1189	1190

# Two Rules Every Broadcast Professional Ought to Know

## RULE 1



**Always Use NORTRONICS Replacement Tape Heads.** NORTRONICS salespeople will assist you in selecting the correct replacement head for your recording and duplicating equipment, even over the telephone. Just tell us the manufacturer and model number of your equipment—or the manufacturer's head part number—and we guarantee you'll get the right part every time.

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- ITC/3M
- Pentagon
- Recordex
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## Audio Reel-type Recorders

Manufacturer	Lyrec A/S	Nagra-Kudelski			Otari
Model Series	TR-55 (TR-533)	IV-STC	T-Audio Time Code	MTR-10-2	MX5050B-II
No. of tracks	2 (24)	3	2-track or stereo	2	2
Tape width	1/4", 1/2" (2")	1/4"	1/4"	1/4"	1/4"
Deck control logic	μP control	Mechanical	μprocessor	μprocessor	TTL
Edit interface type	Audio/tape controller	To synchronizers	RS-232/422/SMPTE	RS-422	None
Recording timer	On panel, controller	Mechanical	Electronic	Yes	Yes
Cue track	None	SMPTE time code	Center time code	SMPTE center option	No
Phase correction	Yes	No	With ± 10° 10kHz	Yes	No
Reel motor	dc-servo (ac-servo)	dc	Servo	dc-servo	ac-synchronous
Tape speeds	7.5/15(15/30 ± 33%), var	3.75, 7.5, 15 ips	3.75-30ips, var	3.75-30ips, var	3.75/7.5/15, var
No. of heads	3	4	4	3 or 4	4
Meter types	VU movements	VU movements	LEDs	VU, peak LEDs	VU, peak LEDs
Equalization	NAB, CCIR (& AES)	NAB, CCIR, NAGRA	NAB, DIN, IEC	NAB, IEC, AES-30ips	NAB, IEC
Input connection	Xfmr bal(floating) 8kΩ	Bal, unbal	Bal, floating 10kΩ	Active bal, xmtr opt	Active bal
Input level	-6, +24dBm max	Mic, line levels	390mV-4.4V	4dBm	10kΩ
Output connection	Xfmr bal(floating) 40Ω	Resistive bal	Bal floating 30Ω	Active bal, xmtr opt	Active bal
Output level	24dBm max	1V to 5kΩ	775mV-4.4V	28dBm max	27dB max
AF response	± 1dB/60-18k	2dB 30-30k	± 1.5dB 30-15k 7.5ips	± 2dB, 20-25k	± 2dB, 20-20k
S/N ratio	62dB unwt'd	>72dB	72dB	73dB unwt'd 30ips	72dB unwt'd
Crosstalk Pgm-Pgm	-40dB 1kHz, (<-46dB)	<-60dB 1kHz	<-88dB	-60dB 1kHz 0VU	-55dB 1kHz, 0VU
Distortion	0.4%, 1kHz 0VU	<1% 810nWb/m 400Hz	0.3% NAB 7.5ips	0.25% 1kHz 0VU	0.5% 1kHz 0VU
Wow & flutter	0.04% 15ips pk wtd	0.028% NAB, 15ips	<0.025% 7.5ips	0.04%	0.04% 15ips
Reader Service Number	1191	1192	1193	1194	1195

Manufacturer	Otari		Sony Pro Audio		Soundcraft
Model Series	MX-70	MX-80	APR-5000 series	APR-2003 portable	Saturn
No. of tracks	8, 16	24, 32	Full, half, half C	3	24
Tape width	1"	2"	1/4"	1/4"	2
Deck control logic	μprocessor	μprocessor	16-bit μprocessor	.....	μP control
Edit interface type	RS-232, 422	RS-232/422	Serial, parallel	No	Via remote, autolocator
Recording timer	Yes	Yes	.....	Tape counter	Digital display
Cue track	No	No	On APR-5003	Yes	No
Phase correction	Yes	Adjustments	.....	.....	.....
Reel motor	dc-servo	dc-servo	dc	dc	dc-servo
Tape speeds	7.5, 15, 30, var	7.5 + 100/-50%, 15 ± 50%	7.5, 15, 30ips ± 50%	3-75, 7.5ips	7.5, 15, 30 + 100/-50%
No. of heads	3	3	.....	3	3
Meter types	VU	24/32 VU	.....	VU	24-VU option
Equalization	NAB, IEC, AES-30ips	AES, NAB, IEC	NAB, AES	.....	NAB, IEC, AES
Input connection	Act bal	Act bal 10kΩ	.....	Bal, 10kΩ	Bal (xfmr opt) 10kΩ
Input level	Switchable level	4dBm, 30dBm max	.....	-70dBs, + 4dBs	-10, + 20dBm
Output connection	Act bal	Act bal, 5Ω source	.....	Unbal 600Ω	Bal (xfmr opt) 75Ω
Output level	Switchable level	4dBm	.....	1V to 10kΩ load	28dBm max
AF response	± 2dB 30-20k	± 2dB 30-18k 7.5ips	-1.5, +.75dB, 30-20k	± 3dB, 30-18k, 7.5ips	-2, + 1dB 40-21k 15ips
S/N ratio	72dB unwt'd, 8-ch	>65dB 7.5	>67dB 7.5ips	.....	62dB, 15ips
Crosstalk Pgm-Pgm	-55dB 1kHz	<-55dB 2kHz 24-tr	.....	.....	-47dB, 1kHz
Distortion	0.2%, 1kHz 0VU	<0.3% 1kHz	Variable per bias	.....	.....
Wow & flutter	0.04%, 30ips	<0.08% 7.5ips	.....	± 0.08% 7.5ips	0.03%, 15/30ips
Reader Service Number	1196	1197	1198	1199	1200

Manufacturer	Stellavox		Studer/ReVox		
Model Series	SP8	TD9'	A807	A820 series (A812)	A810
No. of tracks	3	1-5	2	2 to 24 (2)	2
Tape width	1/4 ±	1/4, 1/2	1/4"	1/4" to 2" (1/4")	1/4"
Deck control logic	Mechanical	μprocessor, CMOS	μP control	μP, TTL, CMOS	μP
Edit interface type	Manual editing	RS-422 & direct	Serial, parallel	RS-232, RS-422	RS-232, RS-422
Recording timer	Option	SMPTE center	LED display	Yes	Yes
Cue track	SMPTE center track	SMPTE center	No	SMPTE center track (No)	SMPTE center
Phase correction	No	No	Yes	Yes	Yes
Reel motor	dc-servo	dc-servo	ac servo	dc-servo	ac servo
Tape speeds	3.75, 7.5, 15ips, var	3.75-30ips, variable	3.75, 7.5, 15 ± 7 HT	3.75-30 ± 7 semitones	3.75-30ips ± 7 semitones
No. of heads	4	5 possible	3 (optional 1/4-track)	3 or 4 (3)	3
Meter types	Tautband A	Tautband A	VU movement	VU movement	VU
Equalization	NAB, DIN, IEC	NAB, IEC, DIN	NAB, CCIR	NAB, CCIR	NAB, CCIR
Input connection	Balanced	Balanced	Xfmr bal > 10kΩ	Xfmr, act bal 10kΩ	Bal float > 10Ω
Input level	-72dBm mic	6dBm	24dBu max	24dBm max	24dBm max
Output connection	Balanced	Balanced	Xfmr bal < 50Ω	Xfmr, act bal < 50Ω	Bal, float, < 50Ω
Output level	6dBm typical	15dBm max	24dBu max 600Ω	24dBm max	24dBm max
AF response	-1, + 1dB 20-20k	-2, + 1dB 30-20k	± 2dB 30-16k 7.5ips	± 2dB 30-16k 7.5ips	± 2dB 20-16k 7.5ips
S/N ratio	68dB	70dB	72dB, ASA-A wtd	> 65dB, 1/4" 7.5ips	> 65dB rms, 7.5ips stereo



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## Audio Reel-type Recorders

Manufacturer	Stellavox		Studer/ReVox			
	Model Series	SP8	TD9'	A807	A820 series (A812)	A810
Crosstalk Pgm-Pgm		-55dB 1kHz OVU	-55dB	<-55dB separation	<-55dB stereo 1kHz	<-55dB stereo 1kHz
Distortion		0.6% 1kHz OVU	0.5% 1kHz OVU	≤1% 7.5ips 1kHz	<0.5% 1kHz	<0.6% stereo 1kHz
Wow & flutter		0.02%	0.02%	0.07% 7.5ips	<0.06% 7.5ips	<0.07% 7.5ips
*Modular head block allows changes of head configuration and tape width.						
Reader Service Number		1201	1202	1203	1204	1205

Manufacturer	Studer/ReVox	TASCAM		TTC/Scully Tape	
	Model Series	Model 42B (44)	Model 48	250 series†	280B series
No. of tracks	2	2 (4)	8	1, 2, 3	1, 2, 4
Tape width	1/4"	1/4"	1/2"	1/4"	1/2, 1/4
Deck control logic	TTL, μP	μP control	μP control	Solenoid	Solenoid
Edit interface type	.....	Synchronizer	SMPTE synchronizer	No	No
Recording timer	Yes	Yes	Yes	No	No
Cue track	No	Possible	Cue by RTZ, STC	No	No
Phase correction	.....	No	No	No	No
Reel motor	Triac control	dc-servo	dc-servo	Torque	ac hysteresis
Tape speeds	3.75-15ips	7.5, 15 ± 12% var	15ips ± 12% pitch	3.75/7.5, 7.5/15	3.75-30 available
No. of heads	3	3	3	3	3
Meter types	VU movements	2VU (4VU)	8 VU	VU	VU option
Equalization	NAB, CCIR	NAB, IEC/CCIR	IEC/CCIR, NAB	NAB or IEC	NAB, IEC
Input connection	Bal, >5kΩ	Bal 10kΩ, unbal 50kΩ	Bal 10kΩ, unbal 50kΩ	Bal 10Ω line	Xfmr bal
Input level	-10, +10dBu	+4-28dBm, -10, +18dBV	+4-28dBm, -10, +18dBV	200mV min 250-600Ω	200mV 10kΩ min
Output connection	Bal <50Ω	Bal <20Ω, unbal 60Ω	Bal 20Ω, unbal 60Ω	Unbal (xfmr bal opt)	Xfmr bal 60Ω
Output level	+22dBu 600Ω load	+28dBm/+18dBV max	+28dBm/+18dBV max	+17dBm max 600Ω	+24dB max 600Ω load
AF response	-3, +2dB 30-20k	±2dB 30(40)-16k	±3dB 40-20k	±2dB 50-15k	±2dB 30-15k
S/N ratio	>66dB 7.5ips	68(67)dB A-wtd	69dB A wtd	>66dB 7.5ips	68dB 2-TR, 7.5ips
Crosstalk Pgm-Pgm	<-45dB stereo 1kHz	<-55dB 1kHz OVU	<-55dB 1kHz OVU	.....	<-60dB 250nWb/m
Distortion	<0.3% 7.5ips	0.8% OVU 1kHz	0.8% OVU 1kHz	<0.7% 250nWb/m	<3%
Wow & flutter	<0.08% 7.5ips	0.06% NAB wtd	0.05% NAB wtd	<0.1% 7.5ips	0.05% w/dc-servo
Reader Service Number	1206	1207	1208	1209	1210

## Audio Processors, Level Control

These products provide compression, limiting, AGC action and expansion control over levels of audio signals. A diamond (◆) indicates group delay. Those providing multiband processing are denoted with a bullet (•). Those using digital processing techniques are marked with a dagger (†). Matrix processing is indicated with a star (★). Systems not indicating stereo facilities are marked with a double dagger (‡).

Manufacturer	Aphex Systems	ATI/Audio Technologies	Audio + Design/SWA			
	Model/Series	#300 Compellor	700 Dominator	EM1000 Emph'a'Sizer	Gemini Easyrider	Express-Limiter Mk.III
Design function						
Compression	w/AGC	.....	Yes	Yes	Yes	Yes
Limiting	Peak	Peak	Peak	Peak	Peak	Peak/clip/asymm
Limiting pre-emp	No	No	Pre/post/side EQ	No	No	w/side chain
Expansion	No	No	Yes	No	No	Yes
Gate threshold	No	No	Yes	No	No	No
Programmable	No	No	User	User, factory	User, factory	Factory, user
Meter type	LED ladder	LED ladder	LED bargraph	Bargraph	Bargraph	VU, GR meter
Meter functions	In/out/GR/peak/VU	Gain reduction	Output, GR	GR	GR	In/out level, GR
Time constants	Pgm dep	Pgm dep	Variable	Variable, pgm dep	Variable, pgm dep	Variable, pgm dep
Input connection	Act bal/unbal	Act bal	Xfmr, act bal	Unbal, xfmr opt	Unbal, xfmr opt	Act bal 12kΩ
Input level	27dBm	24dBm	Mic. line	36dBm max	36dBm max	24dBm
Output connection	Act bal/unbal	Act bal/unbal	.....	Unbal xfmr opt	Unbal xfmr opt	Act bal <1Ω
Output level	27dBm	24dBm	24dBm, mic	19dBm	19dBm	20dBm max
AF response	±1dB 5-65k 20dBm	±0.5dB 20-50k	±0.25dB, 30-20k	±0.5dB, 30-20k	±0.5dB, 30-20k	±0.5dB, 30-20k
Distortion	<0.1% 1kHz 20dBm	<0.04% 1kHz 20dBm	0.2%, 22dBm	<0.1%	<0.1%	<0.1%
S/N ratio	95dB 27dBm unwt	80dB unwt 20dBm	80dB	82dB	82dB	82dB
Reader Service Number	1074	1075	1076	1077	1078	1078

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# CHRISTIE

## ELECTRIC CORP.

## Audio Processors, Level Control

Manufacturer	Audio + Design/SWA	Audioarts/Wheatstone	Broadcast Electronics	Brooke Siren Systems
Model/Series	F601 Super-Dynamic	Model 1202	FM-601 limiter	FDS360 limiter DPR 402
Design function				
Compression	No	Yes	w/AGC	No
Limiting	Peak/clip/asymm	Peak	Peak	Peak
Limiting pre-emp	Selectable curve	De-essing	Flat 25/75µs	No
Expansion	No	No	Yes	No
Gate threshold	No	No	Yes	No
Programmable	User, pgm dep	User	User	User
Meter type	Meter, clip LEDs	LED bargraph	3 meters	None
Meter functions	VU, GR	Output, compress	2 VU, 1 gain	.....
Time constants	User set, pgm dep	Variable	Variable	Fixed
Input connection	Act bal 12kΩ	Bal 20kΩ	Xfmr bal 600Ω	Act bal bridging
Input level	24dBm max	18dBm max	20dBm	n.a.
Output connection	Act bal 600Ω	Bal 10kΩ	Xfmr bal 600Ω	Unbal xfmr opt
Output level	24dBm	22dBm max	20dBm max	20dBm max
AF response	±0.5dB, 30-20k	±0.5dB, 20-50k	±0.5dB, 30-20k	Adjustable
Distortion	<0.2%	0.04%	0.75%	0.05%
S/N ratio	90dB	>90dB	>60dB	85dB
Reader Service Number	1079	1080	1081	1082 1083

Manufacturer	CRL Systems			D&R Electronica	Dorrough Electronics
Model/Series	AM-2/AM-4 systems	TVS-3010	FM-2/FM-3/FM-4	Compressor/limiter	-610 FM/TV/AM†
Design function					
Compression	w/gain control	w/AGC	w/AGC	Yes	Yes
Limiting	Asymmetric	Yes	Peak	Peak	Peak, asymm
Limiting pre-emp	NRSC	.....	....	No	Yes
Expansion	No	No	No	No	No
Gate threshold	.....	.....	.....	No	Yes
Programmable	Yes	.....	Yes	User	Frequency mix
Meter type	LED ladder	LED ladder	LED ladder	LEDs	Segment LED display
Meter functions	GR, peaks	Gain reduction	Peaks, GR	GR	GR/out/level/peak
Time constants	Programmable	Pgm dep	Programmable	0.3/3/7ms a, var r	Pgm dep
Input connection	Act bal, unbal	Balanced	Act bal, unbal	Unbalanced	Act bal bridging
Input level	4dBm	.....	4dBm	±20dBu	20dBm
Output connection	Act bal, unbal	Balanced	Act bal, unbal	Unbalanced	Act bal
Output level	4dBm	.....	4dBm	±20dBu	20dBm
AF response	±1dB 50-15k	±0.75dB 50-15k	±1dB 50-15k	±0.5dB, 20-20k	n.a.
Distortion	<0.5%	.....	<0.5%	<0.046%	0.3% below clipping
S/N ratio	65dB unwt'd	>70dB S+N/N	<65dB	81dB	72dB at comp threshold
Reader Service Number	1084	1085	1086	1087	1088

Manufacturer	EMT-Franz/Gotham		Eventide	Furman Sound	
Model/Series	227DX AM	266X FM/TV peak limit	Omnipressor‡	LC-6	LC-3A (LC-X)
Design function					
Compression	Yes	No	Yes	Yes	Yes
Limiting	Peak, asymm	Peak	Peak	Peak	Peak
Limiting pre emp	No	Variable	No	No	De-ess
Expansion	Yes	No	Yes	Noise gate	No (Yes)
Gate threshold	No	No	Yes	Yes	No (Yes)
Programmable	Yes	No	User	User	User
Meter type	LED, meter	LEDs	Meter	LED bargraph	LED bargraph
Meter functions	Peak, GR	Peak	In, out, gain	GR	GR (& output)
Time constants	Pgm dep	Pgm dep	Variable	Adjustable	Adjustable
Input connection	Xfmr bal	Xfmr bal	Act bal, xfmr opt	Act bal brdg opt	Act bal bridg opt
Input level	8dBm	8dBm	20dBm max	23dBv max	18dBm max
Output connection	Xfmr bal	Xfmr bal	Unbal, xfmr opt	Act bal opt	Act bal opt
Output level	8dBm	8dBm	18dBm max	23dBv 2.5kΩ	23dBv 5kΩ
AF response	±0.5dB 30-15k	±0.3dB 30-15k	-0.5dB 20-15k	±0.5dB 20-20k	-0.5dB 20-20k
Distortion	<0.25% 1kHz 8dBm	<0.2% 1kHz 8dBm	0.5% 1kHz	<0.1% w/compression	0.05% 1kHz 18dBm
S/N ratio	72dB	92dB	90dB	-92dBv	-86dBv
Reader Service Number	1089	1090	1091	1092	1093

## Audio Processors, Level Control

**Manufacturer** ..... Industrial Research  
**Model/Series** ..... DI-4019

**Design function** .....  
 Compression ..... No  
 Limiting ..... Peak  
 Limiting pre-emp ..... No  
 Expansion ..... No  
 Gate threshold ..... No  
 Programmable ..... Factory  
 Meter type ..... LED bargraph  
 Meter functions ..... GR  
 Time constants ..... 100-500ms a, 1dB/s r  
 Input connection ..... Xfmr bal bridging  
 Input level ..... 24dBv max  
 Output connection ..... Xfmr bal 600Ω  
 Output level ..... 20dBm max  
 AF response ..... ± 1dB 20-20k  
 Distortion ..... <0.15%  
 S/N ratio ..... 85dB, 10dB GR  
**Reader Service Number** ..... 1094

**Inovonics**

<b>-250</b> ★†	<b>222</b> ★	<b>260† TV/FM (+255†)</b>
w/AGC	No	w/AGC
Peak, asymm	Peak, asymm	Peak
Yes	NRSC filter	Yes
No	No	No
Yes	No	Yes
Digital/RS-232 opt	No	No (User)
LEDs	LEDs	LEDs
GR	GR	GR
Programmable	n.a.	Pgm dep (& user)
Act bal bridging	Act bal bridging	Act bal bridging
10dBm	15dBm max	10dBm max
Act bal	Act bal 600Ω	Act bal 600Ω
0-15dBm	15dBm max	15dBm max
± 0.5dB 10-15k	± 1dB, 10-9.7k	± 0.5dB, 10-15(20)k
<0.5%	1% w/limiting	<0.25%
70dB	>75dB	75dB (80dB)
<b>1095</b>	<b>1096</b>	<b>1097</b>

**Marti**  
**CLA-40A†**  
 w/AGC  
 Peak, asymm  
 Yes  
 No  
 No  
 Switch select  
 Meter  
 Output, GR  
 0.8/2/5s release  
 Bal 600Ω  
 20dBm max  
 Bal 600Ω  
 20dBm max  
 ± 0.5dB, 50-15k  
 <1% any compr lvl  
 66dB 10dBm  
**1098**

**Manufacturer** .....  
**Model/Series** ..... -8100A Optimod-FM

**Design function** .....  
 Compression ..... w/AGC  
 Limiting ..... Peak  
 Limiting pre-emp ..... Yes (De-ess)  
 Expansion ..... No  
 Gate threshold ..... Yes  
 Programmable ..... User, pgm dep  
 Meter type ..... 5 meters  
 Meter functions ..... GR, VU, volts  
 Time constants ..... Pgm dep  
 Input connection ..... Act bal

**Urban Associates**

<b>Co-Operator (424)</b>	<b>◆9100A Optimod-AM</b> ★	<b>-8182A Optimod-TV</b>
w/AGC (Yes)	w/AGC	Yes
Peak	Peak, asymm	Peak
Yes	NRSC filter opt	Yes
No	No	No
Yes	Yes	Yes
Pgm dep & (user)	User, pgm dep	User, pgm dep
Bargraph (4 meters)	8 meters	5 meters
GR, output(GR/VCA)	GR, VU, volts	GR, VU, voltage
Adjustable	Pgm dep	Pgm dep
Act bal bridging	Act bal bridging	Act bal bridging

**ProTech Audio**  
**663CL (663CL1)**  
 Yes  
 No  
 No  
 No  
 User  
 Meter  
 GR, output  
 0.05-0.5ms a/0.05-5s r  
 Xfmr bal 600Ω(unbal)

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## Audio Processors, Level Control

Manufacturer	Orban Associates				ProTech Audio
Model/Series	-8100A Optimod-FM	Co-Operator (424)	◆9100A Optimod-AM★	-8182A Optimod-TV	663CL (663CL1)
Input level	-30, +10dBm	-10dBm	-30dBm	-30, +10dBm	27dBm max
Output connection	Act unbal comp stereo	Act bal 93(100)Ω	Act bal 290Ω	Act bal 370Ω	Xfmr bal 600Ω(unbal)
Output level	4Vp-p	>20dBm (26dBm)	20dBm	20dBm	27dBm (20dBm) max
AF response	± 0.75dB 50-15k	± 0.25dB	± 1dB 50-7.5k	± 0.75dB 50-15k	± 0.5dB (0.25dB)
Distortion	0.05%	<0.05(0.03)% 1kHz	<0.2%	<0.25% 50-15k	0.4%
S/N ratio	75dB	>85dB	75dB	75dB	78dB
Reader Service Number	1099	1100	1101	1102	1103

Manufacturer	Symetrix	TEXAR	UREI		Valley International
Model/Series	528 voice‡	-Audio Prism†	1176LN (1178)	LA-4	400 mic‡ (440)
Design function					
Compression	Yes	w/AGC	No	RMS compressor	Yes (w/AGC)
Limiting	No	Peak, asymm	Peak	No	No (Peak)
Limiting pre-emp	De-ess	Yes	No	No	3-band EQ (de-ess)
Expansion	Yes	Yes	No	No	Yes
Gate threshold	No	Yes	No	No	Noise gate (No)
Programmable	Threshold/comp ratio	Yes	User	Compress ratio	User (& auto)
Meter type	LED bargraph	LED ladder	VU meter	VU	2(3) LED bargraphs
Meter functions	GR, de-ess, output	GR	Output, GR	Output, GR	In, out, VU, GR
Time constants	Fixed	Pgm dep	20-800μs 0.05-1.1s	Pgm dep	Fixed (adjustable)
Input connection	Act bal bridging	Act bal	Act bal bridging	Act bal bridging	Act bal bridging
Input level	18dBm max	-10dBm	20dBm max	20dBm	26dBm max (24dBm)
Output connection	Act bal xfmr opt	Act bal	Xfmr bal 600Ω	Xfmr bal 150Ω	Act bal < 50(40)Ω
Output level	24dBm max	14dBm	24dBm	24dBm 600Ω	26dBm (24dBm)
AF response	Param EQ, notch	-1dB 50-15k	± 1dB 20-20k	± 0.5dB, 20-20k	n.a.
Distortion	n.a.	0.3% 10dBm	<0.5% 50-15k/1.1s	<0.25% 30-15k	<0.05% (0.015%)
S/N ratio	n.a.	72dB unwt'd	>81dB	-90dB EIN	-128dB EIN (>78)
Reader Service Number	1104	1105	1106	1107	1108

Manufacturer	Valley International				Yamaha International
Model/Series	Leveller	610	Dynamite	Commander‡	GQ2020
Design function					
Compression	w/AGC	w/AGC	Yes	w/AGC	1:1-∞:1
Limiting	No	Peak	Peak	No	Yes
Limiting pre-emp	No	Yes	No	No	.....
Expansion	No	Yes	Yes	Yes	Yes
Gate threshold	No	No	Noise gate mode	No	Yes
Programmable	Pgm dep	User, auto	User	User, auto	No
Meter type	4 LED bargraphs	LED bargraph	LED bargraph	LED bargraph	5-seg LED
Meter functions	In/out, VU, GR	GR	GR	GR	GR
Time constants	Pgm dep	Adjustable	Variable	Variable	Adjustable
Input connection	Act bal bridging	Act bal bridging	Act bal	Act bal bridging	Unbal 30kΩ
Input level	24dBm	24.5dB	24dBm max	24dBm	32dB max
Output connection	Act bal <50Ω	Act bal <50Ω	Unbal	Act bal <50Ω	Unbal 600Ω
Output level	24dBm 600Ω	24dBm 600Ω	21dBm 600Ω	24dBm 600Ω	+20dB max
AF response	n.a.	n.a.	n.a.	n.a.	± 2dB, 20-20k
Distortion	<0.01%, 1kHz quiescent	<0.015% 1kHz	<0.04% 1kHz quiescent	<0.01%, 1kHz	<0.03%
S/N ratio	<-83dB 20-20k	<-75dB 20-20k	<-83dB 20-20k	<-83dB 20-20k	<-87dB IHF-A
Reader Service Number	1109	1110	1111	1112	1113

## Audio Delay Systems

These systems include products for simple delay to complex effects generation. Although not actually delay-based, time modification systems are included. Models marked with a diamond (◆) include AF contouring or multiband control. Digital delay techniques are used unless the model is noted with a bullet (•).

Manufacturer	AKG Acoustics			AMS/Advanced Music Systems	
Model/Series	TDU-8000 + R800	MSP-126	◆ADR68K	DMX 15-80S	DMX15T
Design features	Delay Phasing, flanging	Effects processor Echo, reverb Phasing, reverb	Reverb, effects Plate, room Echo, reverb Phasing, flanging	Delay/pitch change Talkshow delay Pitch change	Time modification Pitch change
Programmable	User	Factory, user	Factory, user	User	User
Delay range	1.3s	360ms	8s	> 50s	n.a.
Stereo operation	2-ch in, 8-ch out	Stereo, tapped line	Yes	Yes	Yes
AF bandwidth	20kHz	20kHz	15kHz	18kHz	18kHz

## Audio Delay Systems

Manufacturer	AKG Acoustics			AMS/Advanced Music Systems	
Model/Series	TDU-8000 + R800	MSP-126	◆ADR68K	DMX 15-80S	DMX15T
Input connection	Act bal, bridging	Act bal, bridging	Act bal, bridging	Act bal, bridging	Act bal, bridging
Output connection	Unbal	Act bal	Act bal	Act bal	Act bal, bridging
Dynamic range	110dB a-wtd	80dB	86dB	90dB	90dB
Remote control	Yes	No	Yes	No	w/interfaces
Interfaces	No	No	MIDI	Keyboard	RS-422/SMPTE, 9K6/19K2
Reader Service Number	1116	1117	1118	1119	1120

Manufacturer	AMS/Advanced Music System		ART/Applied Research & Technology		
Model Series	◆RMX 16	A/V Sync	DR1 (DR2a)	PD3	◆1500
Design features	Reverb, echo Room, plate Phasing, flanging	Audio synchronizer	Reverb, effects 21 (9) room Programs	Delay system Effective echo Multiaudio sync	Digital delay Effective echo Plate, room Phasing, flanging User
Programmable	Factory, user	User, automatic	Factory, user	No	User
Delay range	1.5s	1.2s	25s (12.8s) decay	255ms	0.15-1500ms
Stereo operation	n.a.	3-channel	Yes (Stereo out)	1-in, 3-channel out	.....
AF bandwidth	18kHz	18kHz	14kHz (10kHz)	20kHz	22kHz
Input connection	Act bal, bridging	Act bal, bridging	Balanced	Act bal	n.a.
Output connection	Act bal	Act bal	Unbalanced	Act bal	n.a.
Dynamic range	90dB	90dB	>90dB (75dB)	90dB unwtD	>90dB
Remote control	Yes	Yes	Yes	No	Yes
Interfaces	Bar code want opt	Video, TTL	MIDI	None	.....
Reader Service Number	1121	1122	1123	1124	1125

Manufacturer	Audio/Digital		BEL Electronics	EMT-Franz/Gotham	
Model Series	ADD-2 (ADD-3)	TC-4	TC-5	BD 320	# 445
Design features	Digital delay Effective Reverb, echo	Broadcast delay Talkshow delay Dump option	Delay processor Effective Reverb, echo	Delay system Talkshow delay Reverb, echo Plate, room Phasing, flanging Time modification	Delay Talkshow delay

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## Audio Delay Systems

Manufacturer	Audio/Digital			BEL Electronics	EMT-Franz/Gotham
	Model Series	ADD-2 (ADD-3)	TC-4	TC-5	BD 320
Programmable	User	User	User	Manual setting	User
Delay range	0-490ms	6.8s	500ms, exp to > 1s	8s std, expandable	21.8s
Stereo operation	No	w/2 units	No	Possible	w/2, 4, 6 outputs
AF bandwidth	20kHz	15kHz	20kHz	15kHz for 8s	20kHz
Input connection	Act bal,(xfmr opt)	Act bal, unbal	Act bal, unbal	Bal bridging	Act bal, bridging
Output connection	Act bal,(xfmr opt)	Act bal, unbal	Act bal, unbal	Unbal	Act bal
Dynamic range	> 90dB	85dB A-wtd	90dB a-wtd	.....	88dB
Remote control	No	Yes	.....	.....	Yes
Interfaces	None	.....	None	.....	Serial remote
Reader Service Number	1126	1127	1128	1129	1130

Manufacturer	Eventide			Model Series	
	EMT-Franz/Gotham	CD 254 (JJ 193)	BD 931 (BD 932)		BD 955 (BD 980)
Design features	Reverb, echo Plate, room	Delay (multitap) (AV synchronization)	Broadcast delay w/delay dump	Broadcast delay w/delay dump (Time modification)	Special effects Plate, room Reverb, echo Phasing, flanging
Programmable	Factory, user	Internal switches	No	User	Factory, user
Delay range	999ms (440ms)	254ms (2.046s)	3.2, 6.4 s (BD 932 only)	6.4s (10s)	3.2s
Stereo operation	Stereo output	No	16kHz	w/2 inputs (Yes)	Yes
AF bandwidth	12kHz (15kHz)	12kHz	Bal bridging	7.5-15kHz (20kHz)	15kHz or 8kHz
Input connection	Act bal, bridging	Act bal, bridging	Act bal	Bal bridging (act)	Act bal
Output connection	Act bal	Act bal,(4 out)	90dB	Act bal	Act bal
Dynamic range	88dB (75dB)	> 90dB	No	90dB	87dB
Remote control	246S (252S) rmt ctl	No	No	Yes	Yes
Interfaces	No	No	No	No	IEEE, MIDI
Reader Service Number	1131	1132	1133	1134	1135

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## Audio Delay Systems

Manufacturer	Eventide	Fostex	Furman Sound	Industrial Research	JBL/UREI
Model Series	H969(949) Harmonizer	3050	◆RV-3	DF-4015	7922
Design features	Time modification +100%, -200% Pitch change Phasing, flanging	Reverb, echo	Reverb, echo Plate, room	4-tape Delay line	Dual output delay
Programmable	User	.....	Factory, switch select	User	User
Delay range	3.06s (393.75ms)	270ms	n.a.	192ms	327ms
Stereo operation	w/2 units	No	Stereo output	No	No
AF bandwidth	16kHz, 8kHz	10kHz	11kHz	15kHz	20kHz
Input connection	Bal/unbal	Unbalanced	n.a.	Xfmr bal bridging	Act bal, bridging
Output connection	Act bal, unbal	Unbalanced	n.a.	Xfmr bal	Xfmr
Dynamic range	>90dB	.....	79dB	90dB	>90dB
Remote control	Keyboard input	.....	On, off	No	No
Interfaces	(IEEE)	.....	No	No	No
Reader Service Number	1136	1137	1138	1139	1140

Manufacturer	Klark Teknik		KORG		
Model Series	DN 716	DN 773	◆SDD-3300	◆DRV-3000	DRV-2000
Design features	Delay line AV synchronizator	Broadcast Delay Talkshow delay AV synchronization	3 digital delays No Reverb, echo Phasing, flanging	Special effects Plate, room Reverb, echo Pitch change Phasing, flanging	Reverb Plate, room Reverb, echo Phasing, flanging
Programmable	User	Internally	Factory, user	Factory, user	Factory, user
Delay range	1.3s	10s stereo, 20s mono	500ms	n.a.	n.a.
Stereo operation	3 outputs	Yes	3 channel	Through put	Yes
AF bandwidth	20kHz	20kHz	16kHz	20kHz	12kHz
Input connection	Act bal, bridging	Act bal, bridging	Unbal bridging	Unbal bridging	Unbal bridging
Output connection	Unbal xfmr opt	Xfmr	Unbal	Unbalanced	Unbal
Dynamic range	>90dB	85dB	80dB	89dB	80dB
Remote control	No	Yes	Yes	Wireless control	Yes
Interfaces	No	No	MIDI	MIDI	MIDI
Reader Service Number	1141	1142	1143	1144	1145

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## Audio Delay Systems

Manufacturer	Lexicon				
Model Series	1300	2400 (1200)	◆PCM 70	◆480L (224X)	◆#200 (PCM60)
Design features	AV delay Synchronizer	Time modification 0.75-1.33x range AV synchronizer ± 10% pitch change	Effects Processor Plate, room Reverb, echo Phasing, flanging	Effects processor Plate, room Reverb, echo Phasing, flanging	Reverb Plate, room Reverb, echo
Programmable	User	Factory, user	Factory, user	Factory, user	User & (factory)
Delay range	2.048s	n.a.	936ms	n.a.	n.a.
Stereo operation	Yes (mono in)	Yes (2-1200 needed)	Mono in, stereo out	Yes	Yes
AF bandwidth	20kHz	15kHz	15kHz	20kHz (15kHz)	10kHz reverb
Input connection	Xfmr bridging	Xfmr, active opt	Act bal, bridging	Act bal, bridging	Act bal, bridging
Output connection	Xfmr	Xfmr, active opt	Unbal	Act bal	Xfmr (unbal)
Dynamic range	>90dB	90dB	80dB	98dB (86dB)	84dB (80dB)
Remote control	Through interface	Yes	Yes	LARC system	Yes
Interfaces	RS-232/422	Many, ask Mfgr.	MIDI	MIDI, RS-232	.....
Reader Service Number	1146	1147	1148	1149	1150

Manufacturer	Lexicon	McCurdy Radio	NEC	Urban Associates	Tektronix
Model Series	PCM 41	ADU-10/-10S	AS-18	◆111B dual reverb	118-AS
Design features	Delay processor Reverb, echo Phasing, flanging	Delay Talkshow delay w/delay dump	AV synchronizer	Reverb, echo	AV synchronizer
Programmable	User	User	User	User	No
Delay range	400ms (4800ms)	7.1s	4s	30ms fixed - 2s	160ms, expandable
Stereo operation	No	ADU-10S	2-3 channel	Yes	No
AF bandwidth	16kHz	20kHz	20kHz	6kHz	20kHz
Input connection	Act bal, bridging	Balanced	Bal bridging	Act bal	Balanced
Output connection	Unbal	Balanced	Balanced	Xfmr bal	Balanced
Dynamic range	90dB DIN	>90dB	90dB	n.a.	100dB
Remote control	Yes	ADR-10-L panel	HPD-6377 panel	No	Yes
Interfaces	No	RS-422	Video, frame pulses	No	TEK 110-S video synchronizer
Reader Service Number	1151	1152	1153	1154	1155

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## Audio Delay Systems

Manufacturer	Yamaha International		
Model Series	REV-7	◆SPX90 effects	◆YDD-2600
Design features	Plate, room 15 early reflection Phasing, flanging	Plate, room 2 early reflection 4 pitch change, 2 flange/phase programs 128 programs	Talkshow delay AV synchronizer
Programmable	Factory, user		Yes
Delay range	99.9ms + 9.9s	.....	2.66s adjustable
Stereo operation	Dual channel	Yes	Yes
AF bandwidth	20Hz-12kHz	20Hz-12kHz	20Hz-20kHz
Input connection	Bal 10k $\Omega$ + 4dBm	Unbal 10k $\Omega$	Bal > 10k $\Omega$ + 4dBu
Output connection	Bal 600 $\Omega$ + 4dBm	Unbal 600 $\Omega$	Bal 600 $\Omega$ + 4dBm
Dynamic range	>90dB typical	>90dB typical	$\geq$ 90dB
Remote control	w/RC7 controller	MIDI	Yes
Interfaces	MIDI bus	MIDI bus	RS-232, serial I/O
Reader Service Number	1156	1157	1158

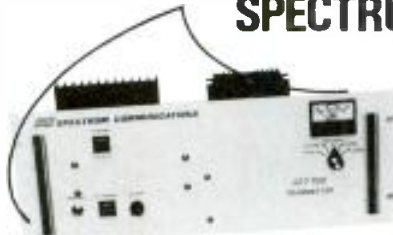
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Manufacturer	Comrex Corporation			Gentner Engineering	C N Rood Electronics
Model Series	PTLX/RTLX	PLX II/RLX II	TLX/PLX (PLX micro $\diamond$ )	EFT-1000	System 114M/110D
System type	Dual line	Single line	Single line	Single line	Dual line
Frequency offset	250Hz, 2kHz	250Hz	250Hz	250Hz	350Hz, 2.1kHz
AF response	$\pm$ 2dB, 50Hz-50kHz	$\pm$ 1.5dB 50Hz-3kHz	$\pm$ 2.5dB 50Hz-3kHz	$\pm$ 0.5dB 50Hz-3.5Hz	$\pm$ 0.5dB, 50Hz-4.95kHz
Translation error	0.08Hz	0.08Hz	0.08Hz	0.0006Hz	$\pm$ 1Hz
Source inputs	600 $\Omega$ line	600 $\Omega$ line	600 $\Omega$ line	Mic, line	Mic, line
Output connection	Xfmr bal	Xfmr bal	Balanced	Active bal	Xfmr bal

*Nothing*

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## Telephone Bandwidth Extenders

Manufacturer	Comrex Corporation			Gentner Engineering	C N Rood Electronics
Model Series	PTLX/RTLX	PLX II/RLX II	TLX/PLX (PLX micro♦)	EFT-1000	System 114M/110D
Output level	-9, +8dBm	-10, +4dBm	-9dBm	-13dBm	0dBm ± 9dBm adj.
Packaging	Portable	Portable	Rack-mount	Portable, rack	Portable
Powering	120/240Vac	120Vac	120-240Vac	110-220Vac, 9Vdc	90-220Vac
Input connection	Xfmr bal	Xfmr bal	Xfmr bal	Balanced	Xfmr bal
Input level	-40dBm	-40dBm	-40dBm	-25dBm	-10, +17dBm
AF output connection	Unbalanced	Xfmr bal	Unbalanced	Active bal	Active bal
AF output level	0dBm	0dBm	+8dBm	+10dBm	0dBm ± 12dBm adj
Packaging	Rack-mount	Desktop unit w/couplers	Rack-mount (portable) ♦w/coupler, AGC	Rack, desktop unit	Rack-mount
Reader Service Number	1066	1067	1068	1069	1070

Manufacturer	C N Rood Electronics		
Model Series	System 110M/110D	System 111M/111D	System 112M/112D
System type	Dual line	Dual line	Single line
Frequency offset	350Hz, 2.1Hz	350Hz, 2.1kHz	350Hz
AF response	± 0.5dB 50Hz-4.95kHz	± 0.5dB 50Hz-4.95kHz	± 0.5dB 50Hz-3.05kHz
Translation error	± 1Hz	± 1Hz	± 1Hz
Source inputs	Mic, line	Mic, line	Mic, line
Output connection	Xfmr bal	Xfmr bal	Xfmr bal
Output level	0dBm ± 12dBm adj	0dBm ± 12dBm adj	-6dBm
Packaging	Rack-mount	Rack-mount	Portable
Powering	110-220Vac	110-220Vac	R14S battery
Input connection	Xfmr bal	Xfmr bal	Xfmr bal
Input level	-30, +17dBm	-30, +17dBm	-6dBm
AF output connection	Active bal	Active bal	Active bal
AF output level	0dBm	0dBm	0dBm w/auto EQ
Packaging	Rack-mount	Rack-mount	Rack-mount
Reader Service Number	1071	1072	1073

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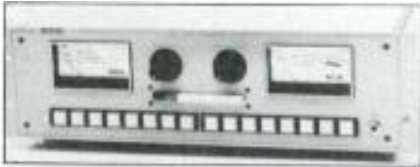
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# Wireless Microphone Systems

These low power FM mic/transmitter, receiver links are intended for in-studio, on-set performer use. Range is limited to approximately 1,100 feet, dependent upon the surroundings. Unless marked with a diamond (◆), the transmitters do not have a line input facility. For 9Vdc powering on most units, the MN1604 transistor radio battery is recommended. Most systems operate in the 150-216MHz band and may extend to 130MHz and to 250MHz. Others in low frequency ranges are marked with a bullet (•); those in the UHF spectra are noted with a star (★). In audio response ranges, Hz is understood. Stability of FM center carrier is rated  $\leq 0.005\%$  for all models.

Manufacturer	AKG Acoustics	Beyer Dynamic	Cetec Vega
Model Series	System 185	-System 85 (185 <sup>2</sup> ) System TS185	T-80 series/R-40 series CVX "Reporter" series
Audio response	-2dB 40-20k(-15k)	$\pm 1$ dB, 40-20k	$\pm 1.5$ dB 90-15k
S/N ratio	>90dB, >85dB <sup>1</sup>	>56dB mic dependent	>100dB
Distortion, system	<0.2%	<0.5%	0.15% THD/IMD typical
Modulation control	Switchable limiter	Limiting	Limiting, compression
Companding function	Low Noise compander	Yes	Dynex II
Transmitter model	T185.10W (T185.10N)	SEM85R-LN (SEM185 US)	T-81/82/83/84/87
Transmitter packaging	Hand-held	Handheld	Handheld
RF output level	$\approx 25$ mW ( $\approx 35$ mW)	25mW	50mW
Carrier deviation	$\pm 60$ Hz ( $\pm 12$ kHz)	$\pm 50$ kHz, $\pm 65$ kHz peak	$\pm 15$ kHz
Microphone type	Dynamic, condenser	Electret	Dynamic, electret, ribbon
Power requirement	9Vdc	9Vdc	9Vdc
Operating weight	13.6 oz w/mic, bat	360gm	9-13.5oz per model
Receiver model	SR185.10 [SR185.11]	NE85.31 (NE185.31)	R-41/42/42W
Sensitivity for SNR	1 $\mu$ V, >35dB [>55dB]	1 $\mu$ V >50dB	<0.7 $\mu$ V, 20dB quieting
Spurious rejection	>110dB	>100dB (>110dB)	-90dB
Output connection	Bal 600 $\Omega$ , unbal	Bal XLR, headphone	Bal XLR
Audio output level	+6dBm or variable	+6dBm	Mic, line selectable
Power requirement	110-220Vac, 15-27Vdc	110-220Vac, 15-27Vdc	110-220Vac, 12Vdc
Metering	AF, RF, battery levels	+Vdc, RF/transmit level	RF, VU/AF proc. diversity
Panel indicators	LED ladder	LED displays	Meter, point LEDs
Antenna types	50 $\Omega$ SO-239 for whips	TTA85-MA whip accessory	Whip, dipole
Diversity receiving	[SR185.11]	Yes	R-42 only
Multichannel system	No	3-channel	No
<sup>1</sup> S/N ratio w/companding and 1mV into receiver, W & N units, respectively. <sup>2</sup> Type 185 approved for US, UK use.			
Reader Service Number	1211	1212	1214
		1213	1215

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## Wireless Microphone Systems

Manufacturer	Cetec Vega		CumTek	Edcor	
	Model Series	77Dynex II/R-33 ProPlus	Pro 1B/1H systems	◆Model 72 (172)	E COM Highband
Audio response	± 1.5dB 45-15k	± 1.5dB, 100-13k	± 3dB (-2dB) 40-15k	± 2dB 200-16k	± 2dB 200-16k
S/N ratio	> 100dB	103dB typical	75dB (95dB) unwt'd	.....	.....
Distortion, system	< 0.5%, 0.2% typical	< 0.4%	< 1% (0.5%)	1%	1%
Modulation control	Limiting/compression	Limiting, compression	Compression	Soft compression	Soft compression
Companding function	Dynex II	Dynex II	No (Yes)	.....	.....
Transmitter model	Model 77 Dynex II	T-37 (T-36/-39)	M72L (M72CL)	E COM 1	E COM 1 Lavalier
Transmitter packaging	Bodypack	Bodypack (handheld)	Body, pocket pack	Hand-held	Pocket pack
RF output level	50mW	50mW (40mW)	50mW	100mW	100mW
Carrier deviation	± 15kHz	± 15kHz	± 30kHz, ± 15kHz in US	± 7.5kHz	± 7.5kHz
Microphone type	Electret, dynamic	Electret	Dynamic, electret	EV671 element	Various lavalier
Power requirement	9Vdc	9Vdc	9Vdc	12Vdc	9Vdc
Operating weight	5oz	6oz (10oz)	4 oz (4.5 oz)	8.7 oz w/o battery	10.7 oz w/o battery
Receiver model	R-33 ProPlus	R-31A (66B portable)	MR-72 (MR172)	E COM 5	E COM 2 or 3
Sensitivity for SNR	< 2.5µV, 50dB	< 2.2µV, 50dB	0.5(0.7)mV 20dB quieting	1µV 20dB quieting	1µV, 12dB SINAD
Spurious rejection	< -70dB	< -80dB	-65dB (-80dB)	-70dB	-70dB
Output connection	Bal, 600Ω, 150Ω	Bal 600Ω, 150Ω	Active bal	.....	.....
Audio output level	Line, mic	Mic, line	0dBm (+ 8dBm)	3Vp-p	100mV or line
Power requirement	9Vdc, 10-20Vdc	110Vac or (dc)	12Vdc, 115Vac	12Vdc, 115Vac	12Vdc, 115Vac
Metering	RF, AF, battery	RF, AF (and battery)	AF (& RF) level	.....	.....
Panel indicators	LED display	LEDs (VU meter)	Power, carrier	Carrier presence	Carrier presence
Antenna types	Various	Whip	Whip or dipole	Furnished	Whip furnished
Diversity receiving	No	No	No (option)	Yes	No
Multichannel system	No	No	4 (8) per receiver	1 per receiver	1 per receiver
Reader Service Number	1216	1217	1218	1219	1220

Manufacturer	HM Electronics			Lectrosonics	Micron Audio	
	Model Series	# 42/420 (25/25RA)	# 87/870 (85/850)	# 82/820 (58/580)	◆Freedomike series	TX503/MDS2
Audio response	± 1dB 100-12k	± 3dB 50-15k	± 3dB 50-15k	± 3dB 50-15k	± 1dB 50-18k	< ± 2dB 40-15k
S/N ratio	> 60dB A-wtd	115dB dynamic range	115dB dynamic range	115dB dynamic range	109dB A-wtd	> 75dB (115dB TX503)
Distortion, system	1%	0.3%	0.3%	0.3%	< 1% (0.7% typical)	< 0.3%
Modulation control	Compression	.....	.....	.....	Compression	Yes
Companding function	No	Yes	Yes	Yes	.....	CNS system
Transmitter model	TX425/TV (WM250/TV)	TX872/TV (TX852/TV)	TX822/TV (TX580/TV)	M 185	M 185	TX503
Transmitter packaging	Pocket (hand-held)	Hand-held	Pocket (hand-held)	Bodypack	Bodypack	Handheld
RF output level	50mW	50mW	50mW	50mW	50mW	50mW
Carrier deviation	± 15kHz	± 15kHz	± 15kHz	± 15kHz	± 15kHz	± 15kHz
Microphone type	Electret or (dynamic)	Electret [or dynamic]	Electret or (dynamic)	Any type	Any type	AKG electret
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc alkaline	9Vdc alkaline	9Vdc
Operating weight	4.5 oz (16 oz)	15 oz	4.5 oz (15 oz)	5.3oz	5.3oz	11 oz
Receiver model	WM125 [WM300A]	RX722 (RX752)	RS722/752	R185/185D (CR185/33)	R185/185D (CR185/33)	MDR4/MDR540
Sensitivity for SNR	1µV 20[30]dB quieting	1µV 30dB quieting	1µV 30dB quieting	1µV 30dB quieting	0.5µV 20(35)dB quieting	1.5µV, 75dB
Spurious rejection	> 60dB	> 60dB (> 65dB)	> 60dB	> 60dB	< -60dB (-80dB)	< -80dB
Output connection	Act [xfmr] bal	Xfmr bal	Xfmr bal	XLR and (phone)	XLR and (phone)	XLR, Type D 600Ω
Audio output level	0dBm nominal	+ 18dBm (10dBm) & mic	+ 18dBm & mic level	Mic, line selectable	Mic, line selectable	Line level
Power requirement	10-30Vdc, 115Vac	12-30Vdc, 110Vac	12-30Vdc, 110Vac	110Vac 12Vdc (9Vdc)	110Vac 12Vdc (9Vdc)	110-220Vac, + 12Vdc
Metering	RF, AF, +V on WM125A	RF, AF, battery	RF, AF, battery	RF, AF, battery	RF, AF, battery	RF, AF, +Vdc
Panel indicators	+V, carrier	+Vdc, carrier	+Vdc, carrier	LEDs (& VU meter)	LEDs (& VU meter)	LED ladder/module
Antenna types	Whip furnished	Whip furnished	Whip furnished	Whip	Whip	3-element Yagi dipole
Diversity receiving	Option	Option	Option	Yes (No)	Yes (No)	Yes
Multichannel system	1 per receiver	1 per receiver	1 per receiver	No	No	To 8 channels
Reader Service Number	1221	1222	1223	1224	1224	1225

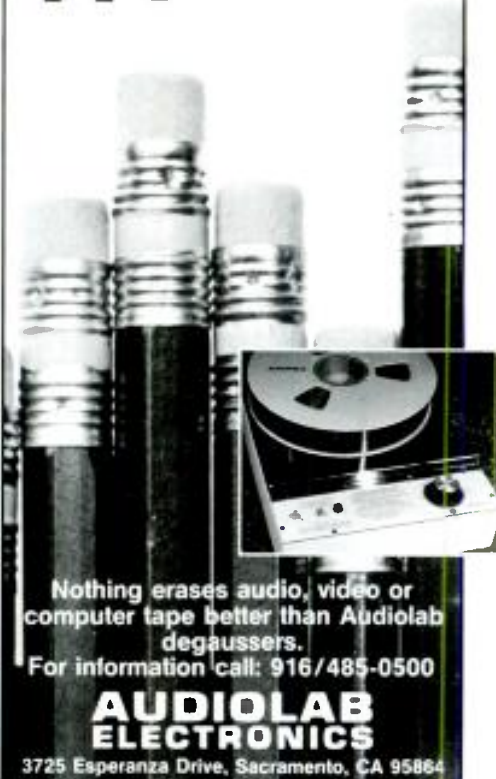
Manufacturer	Micron Audio		Nady Systems	RF Technology	Sennheiser Electronics
	Model Series	TX500/MDR530CNS	TX100/MR110	VHF 601/701 systems	★RM-102 (RM-100)
Audio response	± 2dB 50-15k	± 1dB, 50-15k	± 3dB, 25-20k	± 1dB 50-10k	70-20k
S/N ratio	> 115dB strong signal	> 80dB	.....	60dB unwt'd	> 96dB
Distortion, system	< 0.3%	< 0.3%	< 0.3%	1% w/AGC	< 1%
Modulation control	Yes	Yes	None	Soft limiting	Limiting
Companding function	CNS system	No	Yes	No	HiDyn system
Transmitter model	TX501 (TX502)	TX101 (TX102)	VHF 601/701LT	Standard Unit	SKM4031 (SKM4031-90)
Transmitter packaging	Pocket pack	Pocket pack	Pocket package	Pocket pack	Handheld
RF output level	50mW	50mW	50mV	50mW	10mW (30mW)
Carrier deviation	± 15kHz	± 15kHz	± 15kHz	± 50kHz	40-56kHz
Microphone type	Various	Various	Electret	External mic	Dynamic capsule
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	3 1.5V alk Mn cells

## Wireless Microphone Systems

Manufacturer	Micron Audio	Nady Systems	RF Technology	Sennheiser Electronics	
Model Series	TX500/MDR530CNS	TX100/MR110	VHF 601/701 systems	★RM-102 (RM-100)	
Operating weight	8.5oz (10.5oz)	10.5oz	2.6oz	12.5 oz	260gm
Receiver model	MDR530CNS	MR110 camera receiver	VHF 601/701R	RM-102 (RM-100)	EM1012-7 (EM1012-5)
Sensitivity for SNR	1.5μV, 75dB	<20μV, 80dB	1.5μV, 20dB quieting	.....	2μV
Spurious rejection	-80dB	<-80dB	-80dB	-70dB	.....
Output connection	XLR, phone bal	Bal, 5-pin connector	Bal, unbal/XLR, phone	.....	DIN or XLR bal
Audio output level	Mic, line levels	Mic level	Switchable mic/line	+8dBm on RM-100	Mic, line
Power requirement	110Vac, 12-18Vdc	12-18Vdc from camera	110Vac, 24Vdc	12Vdc, 115Vac	110-220Vac, 12-24Vdc
Metering	Vdc, RF, AF	RF, battery	AF, RF level, +Vdc, RF	.....	RF, AF, battery
Panel indicators	Led ladder	LED multifunction	LED ladders, points	Power, carrier	VU meter
Antenna types	Whip, 3-element Yagi	Whip on BNC	Whip furnished	Furnished	Whip
Diversity receiving	Yes	No	No	Yes	Available
Multichannel system	No	No	No	1/rcvr (5 RM-100)	5 frequencies
Reader Service Number	1226	1227	1228	1229	1230

Manufacturer	Sennheiser Electronics	Shure Brothers	Sony Broadcast	Swintek Enterprises	
Model Series	SK2012/EM1001	W10BT/W25DR	VHF systems	★UHF systems	
Audio response	20-20k	±1dB 50-15k	±2.5dB 100-15k	±2dB 75-13k	±1dB 20-12k
S/N ratio	>73dB (90dB)	>90dB	>60dB	60dB	96dB
Distortion, system	<3%	<0.5%	<0.7% ±15kHz	2%	1%
Modulation control	Switchable limiting	Compressor	.....	.....	Compression
Companding function	HiDyn system	.....	Yes	.....	Yes
Transmitter model	SK2012-6 (SK2012-90)	W10BT	WRT210/WRT220	WRT27/27A	Mark 50A-dbs
Transmitter packaging	Pocket pack	Pocket, body pack	Hand-held	Body pack	Body, pocket pack
RF output level	<10mW (ca 30mW)	50mW max	50mW into 50Ω	6mW	50mW
Carrier deviation	±8-10kHz (±40-55kHz)	±12kHz	±1.9kHz -64dB	±150kHz	±10kHz
Microphone type	Electret	WM98, WL83 lav electret	Various	Electret	SM87, ECM-50
Power requirement	3 1.5V alk Mn cells	9Vdc, 8.4V Nicad	3Vdc	9Vdc	9Vdc
Operating weight	200gm	6 oz w/battery	14 oz	6 oz	6 oz
Receiver model	EM1001 (EM1001-90)	W25DR (W20R)	WRR210/WRR220	WRR27/37/57	Mark 2L-RFSD
Sensitivity for SNR	3μV (1.5μV)	<0.5μV, 12dB SINAD	>65μV 20dB quieting	20dBμ, 30dB	0.2μV, 20dB quieting
Spurious rejection	.....	>80dB	<-70dB	<-80dB	<-80dB
Output connection	Bal DIN 20Ω (XLR 10Ω)	Mic 200Ω, line 600Ω	.....	Xfmr bal	Balanced
Audio output level	Mic and (line)	+13.5dB max line	-58dBm mic level	-20dBm	-40, +0dBm

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## Wireless Microphone Systems

Manufacturer Model Series	Sennheiser Electronics -SK2012/EM1001	Shure Brothers W108T/W25DR	Sony Broadcast		Swintek Enterprises ◆Mark 2L-RFSD/50A
			VHF systems	★UHF systems	
Power requirement	110-220Vac, 12-24Vdc	13.5Vdc 200mA	9Vdc 6-AA cells	9Vdc, 120Vac	12Vdc, 115Vac
Metering	HF, audio	AF, RF levels	RF, AF levels	RF, AF levels	RF, AF, battery
Panel Indicators	LED display	LED ladder	.....	+V, carrier, channel	Carrier presence
Antenna types	Whip	1/4-wave whips	Whip furnished	Furnished	Whip furnished
Diversity receiving	No	Diversiphase W25DR	Option	Option	Yes
Multichannel system	No	No	2 per receiver	1 per receiver	2 per receiver
Reader Service Number	1231	1232	1233	1234	1235

Manufacturer Model Series	Telex Communications			
	HT-400/FMR-4	WT-400/ENG-4	WT-50/FMR-2	WHM/FMR50
Audio response	50-15k	±1dB 100-15k	±2dB 50-15k	±1dB, 50-15k
S/N ratio	102dB w/comparing	104dB companded	>90dB ultimate	98dB A-wtd
Distortion, system	<0.5%	<1%	<0.3%	<0.5%
Modulation control	Compression	Compression	Compression	Compressor
Companding function	Yes	Yes	Yes	Yes
Transmitter model	HT-400 series	WT-400	WT-50 (WT-50G)	WHM410/WHM500
Transmitter packaging	Handheld	Pocket/body pack	Pocket/body pack	Handheld
RF output level	45mW	50mW max, 45mW typical	50mW	15mW max
Carrier deviation	±12kHz	±12kHz	±12kHz	±12kHz
Microphone type	Dynamic, condenser	Dynamic, electret	Various	Dynamic/condenser
Power requirement	9Vdc, 8.4Vdc Nicad	9Vdc	8.4V Nicad, 9Vdc	9Vdc
Operating weight	14.8-16.4oz	5.5oz	5.4oz	16oz/14oz
Receiver model	FMR-4	ENG-4	FMR-2 (FMR-2G)	FRM-50
Sensitivity for SNR	<0.5µV 12dB SINAD	0.5µV 12dB SINAD	<0.5µV, 12dB SINAD	<0.5µV, 12dB SINAD
Spurious rejection	<-70dB	<-70dB	<-70dB	<-75dB
Output connection	Bal XLR 8/600/10kΩ	XLR bal 600Ω	XLR bal 8/600/10kΩ	XLR bal 200Ω
Audio output level	Mic, line selectable	Mic, line selectable	Mic, line selectable	Mic level
Power requirement	110-220Vac	12-24Vdc	110Vac, 13.6Vdc	110-220Vac, 13.6Vdc
Metering	RF, AF, Freq	RF, AF, battery	AF, RF	RF presence, AF
Panel indicators	LED ladder	Meter	LED ladder	LED ladder, point
Antenna types	1/4, 1/2-wave whips	Whip	Whip	Single whip
Diversity receiving	Pos-I-Phase	No	Pos-i-Phase	No
Multichannel system	To 4 channels	4-channel	No	No
Reader Service Number	1236	1237	1238	1239

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# RF/ Test and measurement specs

## Remote Pickup Systems

These remote aural program transport systems include transmitters and receivers operating in 450-470MHz and 148-174MHz (unless marked with a dagger †) spectra. They are all 2-channel systems with a carrier tolerance of  $\pm 0.00025\%$ . All receivers are of dual conversion design and provide a balanced audio signal output. In audio frequency range, Hz is understood

Manufacturer	Marti Electronics			Moseley Associates
Model/Series	RPT-2/AR-10	RPT-15/CR-10	RPT-30/CR-10	RPL-4C
Typical range	6 miles	15 miles	25 miles	.....
Audio response	$\pm 1.5\text{dB}$ 50-15k	$\pm 1.5\text{dB}$ 50-15k	$\pm 1.5\text{dB}$ 50-15k	$\pm 1.5\text{dB}$ 30-15k
S/N ratio (system)	55dB 100% mod unwt'd	55dB 100% mod unwt'd	55dB unwt'd 100% mod	55dB 100% mod
Harmonic distortion	<0.2% 100% mod	<0.2% 100% mod	<0.2% 100% mod	<2%
Transmitter No.	RPT-2	RPT-15	RPT-30	RPL-4C
RF output level	2.5W	15W	45W	10-13W
Carrier deviation	$\pm 10\text{kHz}$	$\pm 10\text{kHz}$	$\pm 10\text{kHz}$	$\pm 12.5\text{kHz}$
Modulation control	Compressor/limiter	Compressor, limiter	Compressor, limiter	Limiter
Auto relay encoder	27Hz	27Hz	27Hz	.....
Integral audio mixer	2-channel	2-channel	4-channel	3-channel
Active unbal	Active unbal	Active bal	Balanced	.....
Metering functions	RF, dcV, compression	RF, dcV, compression	RF, dcV, compression	AF, RF-F/R, dcV, drive
Power requirements	115Vac, 13Vdc	120Vac, 13Vdc	115Vac, 13Vdc	240Vac, 13Vdc
Operating weight	5 lbs	9 lbs	12 lbs	16 lbs
Receiver No.	AR-10	CR-10	CR-10	RPL-4C
Sensitivity	0.5 $\mu\text{V}$ 28dB quieting	0.5 $\mu\text{V}$ 28dB quieting	0.5 $\mu\text{V}$ 28dB quieting	1.5 $\mu\text{V}$ 20dB quieting
Spurious signal reject	90dB below carrier	90dB below carrier	90dB below carrier	65dB below carrier
AF output level	4dBm	10dBm	10dBm	10dBm
Power requirements	115Vac, 13Vdc	120Vac, 13Vdc	115Vac, 13Vdc	240Vac
Metering functions	AR, RF, decode	AF, RF, dcV, decode	AF, RF, dcV, decode	AF, RF, dcV
Auto relay decoder	27Hz	27Hz	27Hz	Yes
Reader Service Number	1497	1498	1499	1500

## AM Radio Transmitters

Radio transmission equipment based on amplitude modulation for operation in the broadcast band (550-1650kHz) or in shortwave service on international broadcast frequencies. A diamond (♦) indicates tube-type IPA driver stages; all others are solid-state. Auto recycling is standard on 1kW or greater output systems, as is a 50 $\Omega$  monitoring connection. Request information on stereo applicability for those noted for broadcast use.

Manufacturer	Comtys		Varian Continental TVT		
Model Series	♦EB-KV/70 (EB-2VK/70†)	♦EB-VD/70 (EB-DT/70)	315-R1	419F-2	♦420B
Service band	Broadcast	Broadcast	Broadcast	Shortwave	Shortwave
RF output rating	10kW (20kW)	5kW (2kW)	5kW	250kW	500kW
RF connector (in.)	1 $\frac{1}{2}$ 50 $\Omega$	50 $\Omega$ unbal	1 $\frac{1}{2}$	9 EIA, 75/300 $\Omega$	9 EIA 75/300 $\Omega$
Carrier stability	$\pm 5\text{Hz}$	$\pm 5\text{Hz}$	$\pm 5\text{Hz}$	$\pm 1 \times 10^6 \text{Hz}$	$\pm 1 \times 10^6 \text{Hz}$
Carrier shift	.....	.....	2%, 100% mod	<5%, 100% mod	<5%, 100% mod
Modulation (max)	125%	125%	125%	100%	100%
AF input connection	Bal, 600 $\Omega$	Bal, 600 $\Omega$	Active bal	Bal, unbal	Bal, unbal
AF response	$\pm 1\text{dB}$ 40Hz-8.5kHz	$\pm 1\text{dB}$ 100Hz-9kHz	1, 20Hz-20kHz, 95% mod	1dB, 50Hz-7.5kHz	1dB, 50Hz-7.5kHz
THD distortion	<1.5% 100% mod	<2% 95% mod	<2%, 100% mod	<3%, 90% mod	<4%, 95% mod
AM noise figure	<-65dB	<-60dB	<-60dB unwt'd	<-55dB	<-55dB
Final amp device	2- 3CX2500F3 (2 prs)	3CX2500F3	3CX3000F7	4CV250.000B	4CM400.000
Modulator final device	2- 4CX3000A (2 prs)	2- 5CX1500A	3CX3000F7	2-4CV250.000B	4CM400.000
Floor space required	16'Wx37D	67'Wx34D (63'Wx31D)	35'Wx34D	35m <sup>2</sup>	42m <sup>2</sup>
Separate power rack	No	No	No	Yes	Yes
Input ac power required	220Vac 3 $\phi$	220Vac 3 $\phi$	208-250Vac 3 $\phi$	480V, 3 $\phi$	4160V, 3 $\phi$
Power factor	>0.94	>0.92	>0.92	0.9	0.9
Power consumption	54kVA for 20kW	15.6kW (6kVA)	12.8kVA	625kVA	1075kVA
System efficiency	80% final/40% modulator	... (80% final)	>55%	60%	70% typical
Fault logic architecture	Solid-state, relay	Solid-state, relay	Relay	Relay	$\mu\text{P}$ system
$\mu\text{P}$ diagnostics	No	.....	No	No	Yes
Reader Service Number	1336	1337	1338	1339	1340

Manufacturer	Varian Continental TVT			CSI Electronics
Model Series	♦418D-2	316F-1	317C-3	♦T-100-A1
Service band	Shortwave	Broadcast	Broadcast	Broadcast, shortwave
RF output rating	100kW	10kW	50kW	110kW
RF connector (in.)	6 EIA, 75/300 $\Omega$	1 $\frac{1}{2}$	3 $\frac{1}{2}$ EIA female	L/C, type N
Carrier stability	$\pm 1 \times 10^6 \text{Hz}$	$\pm \text{Hz}$	$\pm 5\text{Hz}$	$\pm 5\text{Hz}$
Carrier shift	<5%, 100% mod	<2%, 100% mod	<2%	0.5% @ 100% mod
Modulation (max)	100%	125%	125%	125%
AF input connection	Bal, unbal	Active bal	Active bal	Active bal
AF response	1dB 50Hz-7.5kHz	1.5, 30Hz-15kHz	0.5dB, 10H-7.5kHz	$\pm 1\text{dB}$ , 20Hz-12kHz
THD distortion	<3%, 90% mod	<3%, 100%	<2%, 100% mod	<2%, 100% mod
AM noise figure	<-60dB below 100% mod	<-60dB unwt'd	>-60dB unwt'd	<-60dB unwt'd
Final amp device	4CV100.000C	4CX15000A	4CX35000C	Solid-state
Modulator final device	2-4CV100.000C	Solid-state	3CX000A	Solid-state
Floor space required	20m <sup>2</sup>	67'Wx26D	144'Wx54D	22'Wx26D
				237'Wx55D

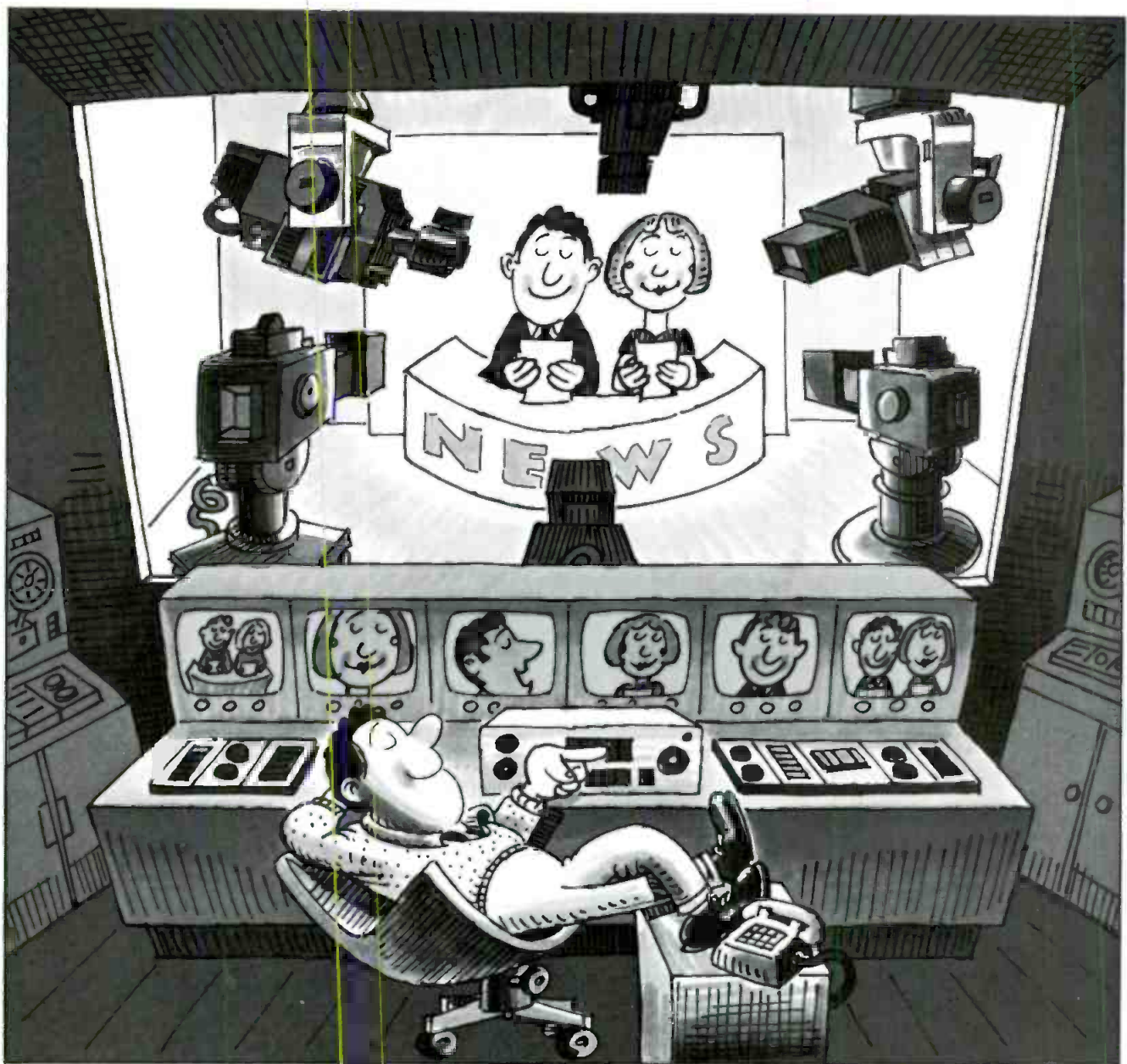
# AM Radio Transmitters

Manufacturer	Varian Continental TVT				CSI Electronics
Model Series	418D-2	316F-1	317C-3	314F solid-state	T-100-A1
Separate power rack	Yes	No	24Wx46D	No	Yes
Input ac power required	480Vac, 3 $\phi$	208-230Vac 3 $\phi$	460Vac, 3 $\phi$	180-250Vac 1 $\phi$	460Vac 3 $\phi$
Power factor	0.9	0.93	0.95	.....	0.89
Power consumption	275kVA	28.4kW 100% mod	118kVA	2.6kW, 100% mod	295kW
System efficiency	55%	53%	60% 100% mod	> 57%, 100% mod	64%
Fault logic architecture	Relay	Relay	Relay	Digital relay	Relay
$\mu$ P diagnostics	No	No	No	Option	No
Reader Service Number	1341	1342	1343	1344	1345

Manufacturer	CSI Electronics	Eicom Bauer		Harris Broadcast	
Model Series	T-10-A1†	725 (715C★)	710C	SX-5A	SX1A
Service band	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast	Broadcast
RF output rating	12kW	25kW (15kW)	10kW	5kW	1kW
RF connector (in.)	1 %	.....	1 %	7/8	Type N
Carrier stability	$\pm$ 5Hz	$\pm$ 5Hz	$\pm$ 5Hz	$\pm$ 20Hz	$\pm$ 20Hz
Carrier shift	3%, 100% mod 400Hz	3%, 100% mod, 400Hz	3%	2%	2%
Modulation (max)	125%	125%	125%	.....	.....
AF input connection	Xfmr bal	.....	Xfmr bal	Balanced	Balanced
AF response	$\pm$ 1.5dB, 50Hz-10kHz	$\pm$ 1dB, 50Hz-7.5kHz	$\pm$ 1dB, 50Hz-10kHz	$\pm$ 0.5dB, 20Hz-12.5kHz	$\pm$ 0.5dB, 20Hz-12.5kHz
THD distortion	2.5% 95% mod	< 2.5%	< 2% 95% mod	1%	1%
AM noise figure	-55dB unwt'd	-60dB unwt'd	-60dB unwt'd	-60dB	-60dB
Final amp device	3CX10000A3	4CX20000B/8990	4CX15000	Solid-state	Solid-state
Modulator final device	4CX3000A	4CX20000B/8990	4CX5000A	Solid-state	Solid-state
Floor space required	76.5Wx34D	140Wx30D	70Wx31D	28Wx30D	28Wx30D
Separate power rack	No	Yes	No	No	No
Input ac power required	240Vac 3 $\phi$	380-450Vac 3 $\phi$ (220Vac)	208-240Vac 3 $\phi$	200Vac 1 $\phi$	220Vac 1 $\phi$
Power factor	0.89	0.9	0.9	.....	.....
Power consumption	27kW	56kW 100% mod (28kW)	25kW	11.6kW	1.5kW
System efficiency	56%	54%	54%	65%	66%
Fault logic architecture	Relay	Relay	Relay	$\mu$ P	$\mu$ P
$\mu$ P diagnostics	No	No	No	No	No
Other models	†1.1kW/3kW/6kW	★uses 4CX15000A final 4CX5000A for mod	701B, 1kW 705C, 5kW		
Reader Service Number	1346	1347	1348	1349	1350

Manufacturer	Harris Broadcast	ITAME	LPB Inc	Marconi Comm.	
Model Series	DX-10	Tauro-S series	AM series	B6127 (B6126)	B6034
Service band	Broadcast	Broadcast	Broadcast	Shortwave	Broadcast
RF output rating	10kW	10kW (5/2kW)	25/30/50/100/150W	500kW (300kW)	1kW
RF connector (in.)	1%	1%	SD-230 UHF	300 $\Omega$ bal/50-75 $\Omega$ unbal	7/16
Carrier stability	$\pm$ 10Hz	$\pm$ 5Hz	$\pm$ 10Hz	< $\pm$ 10Hz	$\pm$ 10Hz
Carrier shift	2%	3%	2% 100% mod	< 5% 100% mod 400Hz	< 5%
Modulation (max)	.....	125%	110-120%	100%	100%
AF input connection	Balanced	Balanced	Xfmr bal	600 $\Omega$ bal	600 $\Omega$ bal
AF response	$\pm$ 0.5dB, 50Hz-12.5kHz	1dB, 20Hz-10kHz	$\pm$ 1dB, 20Hz-15kHz	$\pm$ 1dB, 50Hz-6kHz	$\pm$ 2dB, 40Hz-10kHz
THD distortion	1%	2%	.....	< 4% 90% mod	< 3% 90% mod
AM noise figure	-60dB	< -60dB	-55dB	< -56dB	-60dB unwt'd
Final amp device	Solid-state	3CX10000A†	Solid-state	TH558 Hypervatron	Solid-state modules
Modulator final device	Solid-state	4CX15000A	Solid-state	4CW25000A water cooled	Solid-state
Floor space required	72Wx30D	45Wx37D	Rack, wall mount	181Wx189D	32Wx22D
Separate power rack	No	Yes	No, 25/30W	314Wx433D	No
Input ac power required	220Vac 3 $\phi$	220-380Vac 3 $\phi$	110Vac 1 $\phi$	308-415Vac 3 $\phi$	230Vac 3 $\phi$
Power factor	.....	.....	.....	> 0.9	> 0.9
Power consumption	19kW	23.5kVA (13.5, 5.5)	0.7kVA for AM-50	.....	3.9kVA
System efficiency	75%	.....	25%	62%	48%
Fault logic architecture	$\mu$ P system	.....	Relay	MOS/TTL, relay	CMOS/TTL
$\mu$ P diagnostics	No	.....	No	Yes	No
Other models		†3000F7/1200A7 for 5/2kW mod and final			
Reader Service Number	1351	1352	1353	1354	1355

Manufacturer	Marconi Communications		Nautel		Radio Systems
Model Series	B6034†	B6040	AMPFET-25 (-50)	AMPFET-10 (-5, P400)	TR-20
Service band	Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
RF output rating	50kW	10kW	25kW (50kW)	10kW (5kW, 400W)	20W
RF connector (in.)	3 %	Coaxial cable	3 %	1 % (1 %, Type N)	UHF SD-239
Carrier stability	$\pm$ 10Hz (hi stab opt)	$\pm$ 10Hz (hi stab opt)	$\pm$ 5Hz	$\pm$ 5Hz	$\pm$ 0.002%
Carrier shift	< 4%, 100% mod	< 5%	1%, 100% mod, 400Hz	< 3%	2%
Modulation (max)	125%	125%	125%	125%	100%
AF input connection	Xfmr bal	Active bal	Xfmr bal	Xfmr bal	Unbal
AF response	$\pm$ 1dB, 30Hz-6kHz	$\pm$ 1dB, 50Hz-6kHz	$\pm$ 1dB, 30Hz-10kHz	$\pm$ 0.5dB, 50Hz-10kHz	1dB, 20Hz-15kHz
THD distortion	< 3%, 90% mod	< 3%, 90% mod	< 2%, 90% mod	< 2%, 95% mod	2%
AM noise figure	-58dB unwt'd	-58dB unwt'd	-60dB unwt'd	-60dB unwt'd	-60dB
Final amp device	2 4CX35000C tetrode	2 4CX1500A tetrode	Solid-state modules	Solid-state	Solid-state
Modulator final device	2 4CX1500B tetrode	Solid-state	Solid-state	Solid-state	Solid-state
Floor space required	144Wx61D	65Wx33D	90Wx24D (135Wx30D)	25Wx24D	Rack-mount
Separate power rack	No	Yes	Yes	No	No
Input ac power required	380-415Vac 3 $\phi$	380-415Vac 3 $\phi$	208-480Vac 3 $\phi$	208-480Vac 3 $\phi$ †	110Vac 1 $\phi$
Power factor	> 0.9	> 0.9	0.98	0.95	.....
Power consumption	< 129kVA	< 33kVA	50kW (100kW)	20kVA (< 10kVA, 0.9kVA)	0.1kVA
System efficiency	52% at carrier	42%	> 75%	> 75% (> 75%, > 65%)	.....
Fault logic architecture	CMOS, TTL, relay	CMOS, TTL, relay	CMOS, TTL	CMOS/TTL	.....
$\mu$ P diagnostics	No	No	No	No	No
Other models	†Also 100kW, 200kW			Also 1kW, 2.5kW ‡P400, 110Vac 1 $\phi$	
Reader Service Number	1356	1357	1358	1359	1360



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# FM Radio Transmitters

This equipment includes transmission systems for operation in the 88-108MHz (CCIR band II) spectrum with frequency modulation. Intermediate power amplifiers are solid-state unless the model number is marked with a diamond (◆). All models are capable of operating in FM stereo service, with each manufacturing providing appropriate exciters and generators. All include an auto-recycle feature.

Manufacturer	Broadcast Electronics				Comtys
	.AEG/Bayly	FM-10A	FM 35A	FM-3.5A	
Model Series	S-3152 (S-3168)				EF-5KX/80 (10KX/20KX)
RF output power	10kW (3kW)	10kW	35kW	3.5kW	5kW (10kW/20kW)
Output connector (in.)	.....	3 1/4	3 1/4	1 1/4	1 1/4 (1 1/4, 3 1/4)
Modulation capability	<100kHz	±200kHz	±200kHz	±200kHz	±150kHz
Final amp device	Tetrode	4CX7500A tetrode	4CX20000C tetrode	4CX35000A tetrode	YL-1631 cer. tetrode
AF input connection	Unbalanced	Bal 600Ω	Bal 600Ω	Bal/unbal resistive	Bal/unbal 600Ω, 1kΩ
AF response	±0.2dB 40Hz-43kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB 40Hz-15kHz
THD distortion	<0.4%	0.08%	<0.08% THD/IMD	0.08%, 100% mod	<0.25%
Pre emphasis	Any std value	Switch selected	Switch selected	75μs	25/50/75μs
AM noise figure	<-50dB unwt'd	-45dB	-55dB	-40dB	<-55dB
FM noise figure (mono)	<-62dB unwt'd	-72dB 75μs deemp	-72dB 400Hz	-75dB 75μs deemp	-70dB unwt'd
Floor space (in.)	23.6Wx39.4D	33.7x37.2	56.5x31.5	34.5x37.25	48.7x35
Separate power rack	No	Yes	Yes	No	No
Input ac power	380Vac 3φ (110/220)	240V 3φ	240V 3φ	240V 1φ	220-380Vac 3φ
Typical power factor	.....	>0.90	>0.94	>0.9	>0.93
Power consumption	20kVA (5.5kVA)	17.2kW	51kW	6.8kW	.....
System efficiency	.....	.....	.....	.....	.....
Fault logic architecture	.....	μP system	μP control	μP system	CMOS
μP diagnostics	.....	Yes	Yes	No	.....
Reader Service Number	1301	1302	1303	1304	1305

Manufacturer	Varian Continental TVT				
	816-2A◆ (817R-2A)◆	817A	816R-5 (817R-5)	814R-1 (814B/815A)	814C solid-state
Model Series					
RF output power	20kW (40kW)	60kW	35kW (70kW)	2.4kW (4.3/5kW)	3.8kW
Output connector (in.)	3 1/4, 6 1/4	6 1/4 EIA male	3 1/4 (6 1/4)	1 1/4 EIA male	1 1/4 EIA
Modulation capability	±150kHz	±150kHz	±150kHz	±150kHz	±150kHz
Final amp device	4CX15,000A	4CX40,000G	9019/YC130 (2 tubes)	5CX1500B (4CX3500A)	Solid-state
AF input connection	Active bal	Active bal	Active bal	Active bal	Active bal
AF response	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz
THD distortion	0.08%	0.08%	0.2%	0.08%	0.08%
Pre emphasis	25/50/75μs	25/50/75μs	25/50/75μs	25/50/75μs	25/50/75μs
AM noise figure	-55dB	-55dB	-55dB	-40dB (-50dB)	.....
FM noise figure (mono)	-75dB unwt'd (-72dB)	-72dB unwt'd	-72dB (-75dB)	-75dB	.....
Floor space (in.)	72(160)Wx28D	128Wx40D	72(160)Wx28D	35Wx24D (x34D)	35Wx34D
Separate power rack	No	No	Yes	No	No
Input ac power	200-250Vac 3φ	200-250Vac 3φ	200-250Vac 3φ	200-250Vac 1φ	200-250Vac 1φ
Typical power factor	>0.92	>0.95	>0.92	>0.94 (>0.92/.....)	.....
Power consumption	33.5 (67.3)kVA	99kVA	57kVA (114kVA)	4.9kVA (7.6kVA/9.7kVA)	.....
System efficiency	58% (57%)	64%	66%	57% (55%/.....)	.....
Fault logic architecture	Relay	μP based	Relay	Relay	Solid-state
μP diagnostics	No	No	No	No	No
Reader Service Number	1306	1307	1308	1309	1310

◆816-3 rated 25kW, 816-4 rated 27.5kW, 817R-1 rated 50kW, 817R-4 rated 55kW

Manufacturer	CSI Electronics		Elcom-Bauer		
	T-25-F◆	◆610A (625A/610C)	6100 (6300)	61000	605-FAT◆ (605C/603)
Model Series					
RF output power	27.5kW	10kW (25/10kW)	100W (300W)	1kW	5kW (5/3kW)
Output connector (in.)	3 1/4 EIA female	3 1/4	Type N	7/8	1 1/4
Modulation capability	±150kHz	±150kHz	±200kHz	±200kHz	±200kHz (±150kHz)
Final amp device	3CX15000A7	3CX10000A7 (15000A7)‡	Solid-state	Solid-state modules	4CX3500A (3CX3000A7)†
AF input connection	Balanced	Bal 600Ω, unbal 10kΩ	Bal, unbal, 10kΩ	Bal, unbal, 10kΩ	Bal 600Ω, unbal 10kΩ
AF response	±0.5dB 30Hz-15kHz	±0.1dB 30Hz-100kHz	±0.1dB 30Hz-100kHz	±0.1dB 30Hz-100kHz	±0.1dB 30Hz-100kHz
THD distortion	0.5%	0.25%	0.08%, 0.1%IMD	0.08%, 0.1% IMD	0.08% (0.1% IMD)
Pre emphasis	75μs std	75μs	25, 50, 75μs	75μs	25, 50, 75μs
AM noise figure	-55dB	-50dB	-50dB sync, -70dB sync	-60dB	-40dB sync, -50dB nsync
FM noise figure (mono)	-65dB	<-65dB	-72dB	<-72dB	<-75dB
Floor space (in.)	76.5Wx37.8D	70Wx30D	Rack mount	23Wx30D	23Wx34D (35Wx30D)
Separate power rack	No	(34Wx26D 625 only)	No	No	No
Input ac power	190-460Vac 3φ	208-240Vac 3φ	110-220Vac 1φ	110-220Vac 1φ	440 or (220)Vac 3φ
Typical power factor	.....	0.9	>0.9	0.9	0.9
Power consumption	36kW	21kW (38kW)	250W (600W)	2.7kVA	8.2kW (8.9/7.1kW)
System efficiency	.....	80% final amp	.....	.....	.....
Fault logic architecture	Relay/resistor	Relay	Solid-state	CMOS/TTL	Solid-state
μP diagnostics	No	No	.....	No	DTMF rmt ctl (No)
	Models for 1kW, 10kW	‡4CX7500A for 610C		Fluonert coolant	†4CX3500A for 603
Reader Service Number	1311	1312	1313	1314	1315

Manufacturer	Energy/Onix			Harris Broadcast	
	MK 15	MK 1.5	MK 30	FM 5K1	◆FM 25K1
Model Series					
RF output power	15kW	1.5kW	30kW	5kW	25kW
Output connector (in.)	1 1/4	1 1/4	3 1/4	1 1/4	3 1/4
Modulation capability	±200kHz	±200kHz	±200kHz	±133%	±75kHz
Final amp device	3CX10000A7 triode	3CX3000A7 triode	3CX20000A7 triode	4CX3500A	4CX20000A
AF input connection	Balanced	Balanced	Balanced	Balanced	Balanced
AF response	0.2dB, 30Hz-100kHz	0.2dB, 30Hz-100kHz	0.2dB, 30Hz-100kHz	0.5dB, 30Hz-15kHz	0.5dB, 30Hz-15kHz
THD distortion	0.2%	0.2%	0.2%	0.2%	0.2%
Pre emphasis	75μs	75μs	75μs	25/50μs	25/50μs
AM noise figure	-60dB	-60dB	-60dB	.....	-50dB
FM noise figure (mono)	-70dB	-70dB	-70dB	-80dB	-80dB
Floor space (in.)	58x32.5	38.75x32.5	58x32.5	33Wx34D	33Wx30D
Separate power rack	Yes	No	Yes	No	Yes
Input ac power	230V 3φ	230V 1φ	230V 3φ	240Vac 3φ	240Vac 3φ
Typical power factor	.....	.....	.....	.....	0.95



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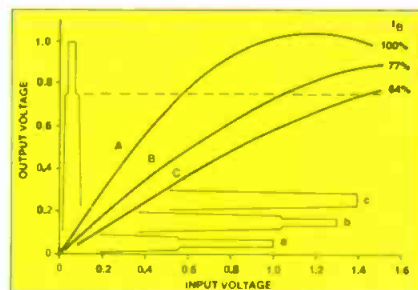
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## FM Radio Transmitters

Manufacturer	Energy/Onix			Harris Broadcast	
	Model Series	MK 15	MK 1.5	MK 30	FM 5K1
Power consumption	24kW	3.1kW	48kW	10kW	40kW
System efficiency	.....	.....	.....	.....	.....
Fault logic architecture	μP	μP	μP	μP	μP
μP diagnostics	No	No	No	No	.....
Reader Service Number	1316	1317	1318	1319	1320

Manufacturer	ITAME		ITELCO	LDL Comm./Larcam	Marconi Comm.
	Model Series	Tauro 30kW	Europa 600BT (100/300)	T-294 (T-234)	◆ FMT25L
RF output power	30kW	600W (100/300W)	55kW (12.5kW)	25kW	10kW (20kW)
Output connector (in.)	3 1/2	Type N	.....	3 1/2	3 1/2 EIA
Modulation capability	> ± 75kHz	> ± 75kHz	± 75kHz	± 200kHz	± 75kHz
Final amp device	Tetrode	Solid-state	Solid-state modules	9011 tetrode	8986 (9011 tetrode)
AF input connection	Balanced	Unbalanced	600Ω balanced	Balanced	Xfmr bal
AF response	0.5dB, 40Hz-15kHz	0.5dB, 40Hz-15kHz	0.2dB 20Hz-15kHz	± 0.1dB, 30Hz-15kHz	± 0.5dB 40Hz-15kHz
THD distortion	0.5%	0.5%	< 0.05% ± 75kHz dev.	0.1%	< 0.4% 100% mod
Pre emphasis	50μs	50μs	50/75μ jumper	75μs	0/50μs switchable
AM noise figure	< -65dB	< -65dB	< -70dB	-55dB	-50dB
FM noise figure (mono)	< -70dB	< -70dB	< -84dB CCIR wtd	-75dB	-70dB de-emph unwtd
Floor space (in.)	68x39	Rack-mount	86Wx32D (43Wx32D)	47.75Wx32.5D	24Wx40D (42Wx40D)
Separate power rack	No	Integral circuit	No	No	No
Input ac power	220-380Vac 3φ	220Vac 1φ	208/380Vac 3φ	240Vac 3φ	380/415V 3φ
Typical power factor	.....	.....	.....	.....	> 0.9
Power consumption	43kW	1.2kW (220W, 650W)	96kVA (19kVA)	37kVA	< 19kVA (< 37kVA)
System efficiency	.....	.....	.....	.....	60% (61%)
Fault logic architecture	μP	TTL, solid-state	μP	μP	CMOS/TTL & relay
μP diagnostics	Yes	.....	.....	Yes	No
Reader Service Number	1321	1322	1323	1324	1325

Manufacturer	DEI Corporation			Rohde & Schwarz	Thomson-LGT
	Model Series	695T30kW	FMQ-3500	FMQ-10000	NU-421
RF output power	30kW	3.5kW	10kW	20kW	5kW
Output connector (in.)	3 1/2	1- 1/2	1 1/2	Air line 25/58	EIA type
Modulation capability	.....	.....	.....	.....	> ± 75kHz
Final amp device	3CX15000A7 triode	3CX3000A7 triode	YU148 triode	Tetrode	Solid-state
AF input connection	.....	Balanced	Balanced?.....	5kΩ bal/unbal	Balanced
AF response	.....	.....	.....	± 0.1dB, 40-43k	± 0.2dB, 40Hz-15kHz
THD distortion	.....	0.025%	0.025%	< 0.4% ± 40kHz dev	< 0.5%
Pre emphasis	0.025%	.....	.....	50, 75	50 (75 opt)
AM noise figure	.....	-55dB	-55dB	.....	< -52dB
FM noise figure (mono)	.....	-75dB	-75dB	68dB ± 40kHz dev	< -60dB
Floor space (in.)	772F generator	24x30	24x30	70Wx29D	23Wx30D
Separate power rack	48x30	No	.....	No	No
Input ac power	240V 3φ	240V 1φ	240V 1φ	220-380V, 3φ	120/240Vac
Typical power factor	.....	.....	.....	> 0.95	.....
Power consumption	50kW	6.4kW	17kW	42kVA	6.5kW
System efficiency	.....	.....	.....	.....	.....
Fault logic architecture	.....	CMOS/TTL	CMOS/TTL	Yes	CMOS/TTL
μP diagnostics	No	No	No	.....	No
Reader Service Number	1326	1327	1328	1329	1330

Manufacturer	TTC/Wilkinson Div	Varian Continental TVT	
	Model Series	LDM-1233 (-1236)	LDM-1239 (-1238)
RF output power	5kW	10kW (27.5kW)	1kW (0.5kW)
Output connector (in.)	1 1/2	1 1/2 (3 1/2)	Type N (1 1/2)
Modulation capability	75kHz deviation	± 100kHz	± 100kHz
Final amp device	Tube	TH-339 (TH-374)	Solid-state
AF input connection	Xfmr balanced	Bal, unbal	Bal, unbal
AF response	± 0.5dB, 25Hz-100kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz
THD distortion	0.5% at 100% mod.	0.3%, ± 75kHz dev	0.3%, ± 75kHz
Pre emphasis	75μs	Any std value	Switch selectable
AM noise figure	-58dB	-65dB	-65dB
FM noise figure (mono)	-80dB, 75μs deemp	-75dB	-75dB
Floor space (in.)	24.5x38	44Wx23D (43Wx37D)	22Wx29D
Separate power rack	.....	Yes	No
Input ac power	240V 3φ	220Vac 3φ	220V 1φ
Typical power factor	.....	> 0.9	> 0.9
Power consumption	9.5kWh	18.5kVA (50kVA)	2.1kVA (1.3kVA)
System efficiency	.....	55% (55.5%)	48%
Fault logic architecture	Relay	CMOS/TTL	CMOS/TTL
μP diagnostics	No	No	No
Reader Service Number	1331	1332	1333

## Television Transmitters, VHF

These transmitter systems operate on CCIR VHF bands I/III (ch 2-6/7-13). All systems use IF level modulation and have solid-state IPA stages unless marked with a diamond (◆). Forced air cooling is standard. All systems are capable of multichannel sound. Those with a star (★) are designed for a European dual aural channel system. Modulation capability is >97% or <3%, or marked with a bullet (•) ≥90% or ≤10%. In general, audio response covers a frequency span of 30Hz-15kHz.

Manufacturer	Acrodyne	Comark/Thomson-LGT	Harris Broadcast		
	Model/Series	FL30KL(KH) series	CIT-V-30L (-50H)	TV 30H	TV 20L
Frequency band	CCIR I(III)	CCIR I(III)	CCIR III	CCIR I	CCIR III
Visual peak power	30kW	30kW (50kW)	30kW	22.5kW	50kW
Carrier level regulation	3%	.....	3%	2%	2%
Response vs brightness	± 0.75dB	± 0.75dB	± 0.75dB	± 0.75dB	± 0.75dB



## Television Transmitters, VHF

Manufacturer	Acrodyne	Comark/Thomson-LGT	Harris Broadcast
Model/Series	FL/30KL(KH) series	CTT-V-30H (-50H)	TV 30H
ICPM uncorrected	± 2°	± 1.5°	± 1.5°
Diff phase, gain	± 1.5°, 3%	2°, 5%	± 1°, 3%
LF linearity	0.5dB	5%	10%
S/N ratio	.....	55dB RMS	.....
K factor 2T, 12.5T	2%, 5%	2%, 5%	1%
Harmonics below visual	-70dB	<-65dB	-80dB
Visual PA device	Tetrode	Solid-state (1-tube)	Tetrode
Aural power output	3kW	3kW (5kW)	3kW
Carrier deviation	± 75kHz	± 50kHz	± 25kHz
AF response	± 0.1dB 30-50k	± 0.5dB per std curve	± 0.5dB
Harmonic distortion	0.5%	0.3%	0.5%
AM, FM noise	-52dB, -58dB	-56dB, -60dB unwt'd	-55dB, -60dB
Aural PA device	Tube or solid-state	Solid-state	Tetrode
Input ac power	480Vac, 3φ	.....	240V-230Vac 3φ
Power consumption	83kW	.....	61kW
Other models	From 1kW-50kW	From 5kW-50kW	.....
Reader Service Number	1385	1386	1387

Manufacturer	Information Transmission	LDL Comm/Larcan	Marconi Comm
Model/Series	ITS-10/15	◆TTC 50LM	◆B7532 (B7536)
Frequency band	CCIR I/III	CCIR III	CCIR III
Visual peak power	10W	50kW	5kW (25-30kW)
Carrier level regulation	2%	3%	± 1%
Response vs brightness	± 0.2dB	± 0.75dB	± 0.5dB
ICPM uncorrected	± 2°	± 1°	± 4°
Diff phase, gain	± 1°, 5%	± 2°, 0.5dB	± 3°, 0.4dB
LF linearity	2%	-0.5dB	90%
S/N ratio	58dB	55dB	60dB
K factor 2T, 12.5T	2%, 4%	2%, 5%	2%, 2%
Harmonics below visual	-60dB	-80dB	-60dB
Visual PA device	Solid-state	Tetrode	Tetrode
Aural power output	0.02W	10kW	0.5kW (3kW)
Carrier deviation	± 150kHz	± 200kHz	± 50kHz
AF response	0.5dB	± 0.5dB 50-15k	± 1dB
Harmonic distortion	0.5%	0.75%	<0.5dB
AM, FM noise	-60dB, -60dB	-50dB, -60dB	-50dB, -60dB
Aural PA device	Solid-state	Solid-state	Solid-state
Input ac power	120Vac 1φ	480Vac 3φ	380-415Vac 3φ
Power consumption	0.7kW	120kVA, black	<18kVA (<66kVA)
Power factor	.....	0.95	>0.9
Visual PA efficiency	.....	.....	34% (56%)
Reader Service Number	1390	1391	1393

Manufacturer	NEC	PESA	Rohde & Schwarz	Thomson-LGT
Model/Series	PCN 1435AH/1	◆TT-4823	◆VU series	◆E 10000S (-5000S)
Frequency band	CCIR I/III	CCIR III	CCIR III	CCIR I/III
Visual peak power	35kW	2kW or 6kW	1-5kW	10kW (5kW)
Carrier level regulation	2%	.....	1%	.....
Response vs brightness	± 0.5dB	<0.1%	<0.1%	<0.7dB
ICPM uncorrected	± 3°	.....	.....	< ± 1°
Diff phase, gain	± 3°, 3%	± 2°, 2%	± 3°, 5%	± 3°, 3%
LF linearity	2%	<1%	5%	0.5%
S/N ratio	>50dB	>50dB	54dB	60dB
K factor 2T, 12.5T	1.5%	.....	1%	2%, 2%
Harmonics below visual	-60dB	<-60dB	-60dB	-60dB
Visual PA device	8984 tetrode	TH-361 tetrode	Tetrode, solid-state	TH-361 tetrode
Aural power output	3.5kW	0.2kW or 0.6kW	10% of visual	0.2-2kW range
Carrier deviation	± 100kHz	± 25kHz	± 25kHz	± 50kHz
AF response	± 0.5dB	± 3dB	0.2dB 50-15k	< ± 1dB
Harmonic distortion	0.5%	<2%, ± 30kHz dev	0.5%, -60dB IMD	0.4%
AM, FM noise	-50dB, -60dB	-65dB, -65dB	-60dB, -60dB	<-36dB, <-56dB
Aural PA device	Solid-state	Diplexed	Multiplexed or tetrode	Solid-state
Input ac power	240Vac 3φ	220-380Vac 3φ	220-380Vac 3φ	220-380Vac 3φ
Power consumption	70kW, black	20kVA, 6kW no mod	.....	52kVA for 20kW
Power factor	≥0.9	>0.9	0.9	>0.9
Visual PA efficiency	>78.4%	.....	.....	.....
Reader Service Number	1395	1396	1398	1399

Manufacturer	Townsend	Varian Continental TVT
Model/Series	TA15TH/L	◆LDM-1761
Frequency band	CCIR I/III	CCIR III
Visual peak power	15kW	10kW
Carrier level regulation	3%	.....
Response vs brightness	± 0.75dB	± 0.5dB
ICPM uncorrected	.....	± 4°
Diff phase, gain	± 2°, 2%	± 3°, 0.3dB
LF linearity	1dB	90%
S/N ratio	50dB	55dB
K factor 2T, 12.5T	2%, 5%	2%, 2%
Harmonics below visual	-60dB	-70dB
Visual PA device	Triode	YL1610 tetrode
Aural power output	1.5kW	1kW
Carrier deviation	± 75kHz	± 100kHz
AF response	± 0.5dB	± 0.5dB
Harmonic distortion	0.5%	0.5%
AM, FM noise	-55dB, -58dB	-50dB, -60dB
Aural PA device	Solid-state	Solid-state
Input ac power	230Vac 3φ	220V
Power consumption	35kVA	25kVA
Power factor	0.9	0.9
Visual PA efficiency	.....	70%
Reader Service Number	1400	1401

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**John Hoffman  
Net Administrator  
76703, 1036**

# TV Transmitters, UHF

These UHF systems are for the CCIR IV/V bands, channels 14-69. All support stereo aural transmissions. Those marked with a diamond (♦) are designed for a European two aural carrier system. IPA sections are solid-state unless marked with a star (★). IF level modulation is common to all. AF response is generally 30Hz-15kHz.

Manufacturer	Acrodyne		Comark/Thomson		
Model/Series	TRU 10 KVC	TRU 30 KV	CCT-U-60SK SK-series	CCT-U-10T T-series	CCT-U-60SE S-series
Visual peak power	10kW	30kW	60kW	10kW	60kW
Carrier level regulation	± 3%	± 3%	3%	3%	3%
Modulation capability	3%	3%	97%	97%	97%
Response vs brightness	± 0.75dB	± 0.75dB	± 0.75dB	± 0.5dB	± 0.75dB
ICPM uncorrected	± 2°	± 2°	.....	.....	.....
Diff phase, gain	± 2°, 5%	± 2°, 5%	± 3°, 0.5dB	± 2°, 3% max	± 3°, 0.5dB
LF linearity	5%	5%	1dB or better	± 2% max	< 1dB
S/N ratio (AM)	.....	.....	> 55dB	> 55dB	55dB
K factor 2T, 12.5T	2%, 5%	2%, 5%	2%, 5%	2%, 5%	2%, 5%
Harmonics below visual	-60dB	-60dB	< -60dB	< -60dB	< -60dB
Visual PA device	Tetrode	Tetrode	Klystrode, klystron	Tetrode	Klystron
Aural power output	1kW	1kW	6kW	1kW	6kW
Carrier deviation	.....	.....	± 25kHz, ± 50kHz	± 75kHz	> ± 25kHz
AF response	± 1dB 10-15k	± 1dB 10-15k	± 0.5dB	± 0.5dB	± 0.5dB
Harmonic distortion	.....	.....	0.5% max, ± 50kHz	0.5dB, ± 25kHz dev	0.5%, ± 50kHz dev
AM, FM noise	-52dB, -60dB	-50dB, -60dB	< -50dB, < -60dB	< -50dB, < -60dB	-50dB, -60dB
Aural PA device	Diplexed	Multiplexed	Klystrode, klystron	Tetrode	Klystron
Cooling system	Vapor-phase	Vapor-phase	Water	Air	Water, air
Input ac power	230Vac 3	230Vac, 3	480Vac 3φ	240Vac 3φ	460-500Vac 3φ
Power consumption	26kVA	55kW	.....	36kW black	.....
Visual PA efficiency	.....	.....	.....	.....	> 70% beam
Other models	.....	.....	Also 30/120/240kW	1kW, 2kW, 5kW	Also 10/30/120/240kW
Reader Service Number	1363	1364	1365	1366	1367

Manufacturer	EMCEE		Harris Broadcast		Information Transmission
Model/Series	TU-1000EP/U	★ TTU-5000DP (100DP)	UX series	TVE-60S (-120S)	ITS-230
Visual peak power	1kW	5kW (0.1kW)	60kW, 120kW	60kW (120kW)	1kW
Carrier level regulation	2%	2%	< 3%	< 2%	2%
Modulation capability	2%	2%	0%	0%	1%
Response vs brightness	± 0.5dB	± 0.5dB	± 0.75dB	± 0.75dB	± 0.5dB
ICPM uncorrected	± 2°	± 2°	± 2° corrected	± 4°	± 2°
Diff phase, gain	± 3°, 0.5dB	53°, 5%	± 3°, 0.5dB	< ± 3°, < 0.5dB	± 1°, 5%
LF linearity	5%	5%	≧ 1dB	< 1dB	5%
S/N ratio (AM)	55dB	55dB	55dB	55dB	55dB
K factor 2T, 12.5T	2%, 2%	2%	1%, < 3%	2%, 5%	2%, 2%
Harmonics below visual	-60dB	-60dB	-60dB	-70dB	-60dB
Visual PA device	Solid-state	TH-382 tetrode	Klystron, ext cav	Klystron, int cav	Tetrode
Aural power output	0.1kW	0.5kW (0.01kW)	6-12kW, 12-24kW	12kW (24kW)	0.1kW
Carrier deviation	± 100kHz	> ± 25kHz	> ± 100kHz	± 120kHz	± 75kHz
AF response	± 0.5dB, 20Hz-100kHz	± 0.2dB, 30Hz-110kHz	± 0.5dB,	± 0.5dB,	± 0.5dB,
Harmonic distortion	0.1%	0.15%	0.5dB	0.5%, 100% mod	0.5%
AM, FM noise	-55dB, -60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -60dB
Aural PA device	Diplexed	Diplexed	Klystron, ext cav	Klystron, int cav	Diplexed
Cooling system	Forced air	Forced air	Air, glycol-vapor	Vapor phase	Forced air
Input ac power	220Vac 3	230Vac 3 (115Vac 1)	480Vac 3φ	480Vac 3φ	240Vac 1
Power consumption	5.5kW	20kVA (10kW)	135kW, 245.W	135kW (245kW)	5kW
Power factor	0.98	0.95	> 0.95	> 0.95 (> 0.9)	.....
Visual PA efficiency	53%	45%	> 63%	65%	.....
Reader Service Number	1368	1369	1370	1371	1372

Manufacturer	Information Transmission	NEC	PESA	Rohde & Schwarz
Model/Series	ITS-242	PCU-930HC	TR-series	♦★ NT414A1 (424/425A1)
Visual peak power	10kW	30kW	5kW	10kW (20kW)
Carrier level regulation	2%	2%	1% or better	± 0.3%
Modulation capability	1%	0%	.....	> 75%
Response vs brightness	± 0.5dB	± 0.5dB	< 5%	< 0.3dB
ICPM uncorrected	± 2°	< ± 3°	± 3°	.....
Diff phase/gain	± 1°, 5%	± 3°, 0.5dB	± 3°, ≤ 5%	± 3°, 5%
LF linearity	5%	5%	1dB	> 0.9
S/N ratio (AM)	55dB	60dB	> 60dB wtd	> 63dB wtd
K factor 2T, 12.5T	2%, 4%	1.5%	1.5%, 5%	< 2%, 20T pulse
Harmonics below visual	-60dB	-80dB	< -60dB	< 20mW, < -60dB
Visual PA device	Tetrode	Klystron	Tetrode	Tetrode (tel/klystron)
Aural power output	1kW	6kW	0.5kW	1kW (2kW)
Carrier deviation	± 75kHz	± 100kHz	> ± 50kHz	± 30kHz
AF response	± 0.5dB, 50Hz-15kHz	± 0.5dB,	± 0.2dB	< ± 1dB,
Harmonic distortion	0.5%	0.5%	< 0.5%	< 0.4%, 50kHz dev
AM, FM noise	-55dB, -60dB	-50dB, -60dB	< 3dB, < 3dB	-46dB, -56dB unwt
Aural PA device	Tetrode	Klystron	Diplexed	Tetrode (tel/klystron)
Cooling system	Vapor-phase	Vapor phase	Forced air	Air (air/vapor)
Input ac power	240Vac 1φ/3φ	480Vac 3φ	220-380Vac 1/2/3φ	220-380Vac 3φ
Power consumption	26kW	.....	.....	28kVA (60/78kVA)
Power factor	.....	> 0.9	0.9	> 0.9
Visual PA efficiency	.....	75%	> 0.9	.....
Reader Service Number	1373	1374	1376	1377

Manufacturer	Rohde & Schwarz	Thomson-LGT	Townsend	TTC/Television Technology	
Model/Series	★ NT325A1 (NT354A1)	♦★ UHF 10000S (-5000S)	TA 60TA	UHF 60S Silverline	XL 1000U
Visual peak power	2kW (5kW)	10kW (5kW)	60kW	60kW	1kW
Carrier level regulation	± 0.3dB	.....	2%	< 4%	.....
Modulation capability	75%	100%	1%	.....	95%
Response vs brightness	< 0.3dB	0.7dB, 0.5dB	± 0.1dB	.....	0.5dB
ICPM uncorrected	.....	± 1°	± 2°	.....	± 2°
Diff phase gain	± 3°, 5%	± 3°, 0.3dB	± 3°, 5%	± 4°, 0.5dB	± 2°, 0.25dB
LF linearity	.....	0.5dB	10%	1.5dB	1dB
S/N ratio (AM)	> 63dB wtd	> 60dB	55dB	.....	.....

## TV Transmitters, UHF

<b>Manufacturer</b> .....	<b>Rohde &amp; Schwarz</b>
<b>Model/Series</b> .....	<b>★NT325A1 (NT354A1)</b>
K factor 2T, 12.5T .....	<2% for 20T pulse
Harmonics below visual .....	-60dB
Visual PA device .....	Tetrode
Aural power output .....	0.2kW (0.5kW)
Carrier deviation .....	±30kHz
AF response .....	1dB
Harmonic distortion .....	0.4%
AM, FM noise .....	-46dB, -56dB
Aural PA device .....	Multiplexed
Cooling system .....	Forced air
Input ac power .....	220Vac 3φ
Power consumption .....	12kVA (25kVA)
Power factor .....	>0.9
Other models .....	
<b>Reader Service Number</b> .....	<b>1378</b>

<b>Thomson-LGT</b>
◆EUHF 1000S (-5000S)
2%, 2%
-60dB
TH-382 tetrode
1kW (500W)
±75kHz (±100kHz)
±0.5dB
<0.5%
-50dB, -60dB
Diplexed
Forced air
220-380Vac 3φ
24kW (19kW)
>0.95
<b>1379</b>

<b>Townsend</b>
TA 60TA
2%, 5%
-60dB
Klystron
6kW
±100kHz
±0.5dB
-54dB THD/IMD
-50dB, -58dB
Klystron
Water
480Vac, 3φ
130kW
0.9
<b>1380</b>

<b>TTC/Television Technology</b>
UHF 60S Silverline
XL1000U
.....
-65dB
Klystron
6kW
±25kHz
+1dB
1%
-55dB, -55dB
Klystron
Vapor-phase
480Vac 3φ
.....
Also 120kW, 240kW
<b>1381</b>
2%
-80dB
TH-347 tetrode
100W
±40kHz
±0.5dB
0.5%
-55dB, -55dB
Diplexed
Forced air
230Vac 1φ
4.8kVA
0.9
<b>1382</b>

<b>Manufacturer</b> .....	<b>Varian Continental TVT</b>
<b>Model Series</b> .....	<b>LDM-1791 (1791/90)</b>
Visual peak power .....	60kW (120kW)
Carrier level regulation .....	100%
Modulation capability .....	100%
Response vs brightness .....	±0.5dB
ICPM uncorrected .....	±4°
Diff phase gain .....	±3°, 0.5dB
LF linearity .....	90%
S/N ratio (AM) .....	60dB
K factor 2T, 12.5T .....	2%, 2%
Harmonics below visual .....	-70dB
Visual PA device .....	2-KY1265 klystron
Aural power output .....	5.5kW
Carrier deviation .....	±100kHz
AF response .....	±0.5dB
Harmonic distortion .....	0.5% 100% mod 1kHz
AM, FM noise .....	-50dB, -60dB
Aural PA device .....	Klystron
Cooling system .....	Vapor-phase
Input ac power .....	226V 3φ
Power consumption .....	135kVA
Power factor .....	0.9
Visual PA efficiency .....	65%
Other models .....	Also 180kW, 240kW
<b>Reader Service Number</b> .....	<b>1383</b>

<b>LDM-1780 (1781)</b>
5kW (10kW)
100%
100%
-80.5dB
±4°
±3°, 0.5dB
90%
60dB
2%, 2%
-70dB
TH-382 tetrode
0.5kW (1kW)
±100kHz
±0.5dB
0.5%
-50dB, -60dB
Diplexed (tetrode)
Forced air
220Vac
21kVA (23kVA)
0.9
75%
<b>1384</b>

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- Automatic RF Power Output Control
- Automatic SWR Circuit Protection
- SWR Output Power Foldback
- Remote Control Interface
- AC Power Failure Recycle
- Grounded Screen Amplifier
- Internal Diagnostics

Continental's New Type 816R-5 is a high performance FM transmitter that uses the Type 802A exciter to deliver a crisp, clean signal. The power amplifier uses an EIMAC 9019/YC130 Tetrode specially designed for Continental, to meet stringent FM service requirements at 35kW.

The 816R-5 is an outgrowth of Continental's popular 816R Series of 10, 20, 25 and 27.5 kW FM transmitters. It uses husky components and is built to give many years of reliable, dependable service.

For brochure and operating data, call (214) 381-7161. Continental Electronics, a Division of Varian Assoc., Inc. PO Box 270879 Dallas, Texas 75227.

Transmitters 1 to 50 kW AM and to 60 kW FM FM Intennas Studio & RF equipment ©1986 Continental Electronics 6210



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# Aural STL Systems

These systems consist of transmitter and receiver units, designed for transporting the aural program material from the studio to the transmitter. Operation is in the 900MHz spectrum. Those systems providing a hot standby capability are marked with a diamond (◆). In audio frequency ranges, Hz is understood.

Manufacturer	.ITAME	Marti	Moseley Associates
Model/Series	◆UHF-900A	STL-10	◆PCL-600/C (PCL-600)
System type	Composite	Dual	Composite stereo (mono)
Audio response	±0.1dB 30-15k	±0.3dB 20-15k	< ±0.2dB 30-53k
Distortion	1% 40-70k	0.3% 20-15k THD	<0.2% 30-7.5k
S/N ratio	70dB 100% mod	73dB 100% mod	>75dB typical
Crosstalk	.....	.....	<-50dB
Stereo separation	.....	.....	>50dB 50-15k
Transmitter No.	UHF-900A	STL-10	PCL-600/C
RF power output	20W	10W	7W max 890-960MHz
RF output connector	Type N	UG-58	Type N 50Ω
Frequency stability	<5 part/million	±0.00025%	<0.00025%
AM noise rating	<-70dB spur/harmonic	<-60dB spurious	<-60dB below carrier
Audio level	12dBm/3.5V 22kΩ	8dB, 600Ω	3.5Vp-p 6kΩ
Metering	RF, rev, dcV	RF, final/driver I, dcV	Fwd/rev power, FM lock
Receiver No.	UHF-900A	R-10	PCL-600/C
Signal conversion	Dual	Dual	Dual
Sensitivity	30μV, 65dB S/N	4μV, 50dB S/N	<140μV, 60dB SNR
Bandwidth	3dB IF BW 280kHz	>200kHz FM stereo	±125kHz 3dB IF bw
Metering	RF, baseband, dcV	RF, LO, subcarrier, dcV	RF input, system status, Pgm/subcarrier level
Reader Service Number	426	427	429

Manufacturer	Moseley Associates	TFT
Model/Series	◆PCL-606/C† (PCL-606)	◆Model 8600
System type	Composite stereo (mono)	Composite
Audio response	±0.1dB 30-53k	±0.2dB 30-15k
Distortion	≤0.2% 30Hz-7.5kHz	≤0.2% at 1kHz THD
S/N ratio	>70dB below 100% mod	65dB 100% mod wtd
Crosstalk	<-53dB	.....
Stereo separation	>50dB 50-15k	.....
Transmitter No.	PCL-606/C	8600
RF power output	10W (890MHz-1.71GHz)	6W
RF output connector	Type N 50Ω	Type N 50Ω
Frequency stability	>0.00025%	±0.0001%
AM noise rating	<-60dB below carrier	<-60dB spurious/harmonic
Audio level	3.5Vp-p 6kΩ unbal	1.24V 3kΩ/0.775V 1kΩ
Metering	RF, final/driver I, main, multi, AFC, mux, dcV	RF, Main ch mod, dcV
Receiver No.	PCL-606/C	8601
Signal conversion	Triple	Triple
Sensitivity	150μV, 60dB SNR	14μV, 55dB S/N
Bandwidth	±450kHz 60dB IF BW	60B to 125kHz
Metering	RF, AF, AFC, LO, multi dcV, subcarrier	LO, AF levels, Mux dcV
Reader Service Number	431	432

Manufacturer	Moseley Associates	TFT
Model/Series	◆Model 8300	◆Model 7700B
System type	Composite	Composite
Audio response	±0.1dB 30-53k	±0.5dB 50-75k
Distortion	0.2%, 30Hz-75kHz	0.25% 30Hz-75kHz
S/N ratio	75dB 100% mod	>72dB 100% mod
Crosstalk	-50dB main-sub/sub-main	<-60dB, sub-main 150kHz
Stereo separation	+45dB	60dB sub-main
Transmitter No.	8300	7700B
RF power output	14W	12W
RF output connector	Type N, 50Ω	Type N, 50Ω
Frequency stability	±0.0001%	±0.0001%
AM noise rating	<-65dB spurious/harmonic	-65dB
Audio level	3.5V 10kΩ/1.5V 10kΩ	1.24V 10kΩ/0.53V 10kΩ
Metering	RF, Main ch/Mux mod dcV, Rev RF	RF, main ch mod, dcV
Receiver No.	8301	7707
Signal conversion	Triple	Triple
Sensitivity	40μV, 60dB S/N	40μV, 60dB S/N
Bandwidth	±3dB IF BW ±200kHz	320kHz 3dB BW
Metering	dcV, Mux1, Mux2	Pgm, Mux1, Mux 2
Reader Service Number	433	434

# Audio Distortion Analyzers

These systems determine total harmonic distortion (THD) and, with some models, intermodulation distortion (IMD). On those marked with a diamond (◆), an AM detector is available. Those with a bullet (•) include video or X-Y scope display capability. A dagger (†) designates a port to drive an X-Y plotter or printer. Systems marked with a star (★) include specific functions for audio recording systems. In audio frequency ranges, Hz is understood.

Manufacturer	Amber Electro Design	ASACA/ShibaSoku	Audio Precision	Boonton Electronics
Model/Series	◆3501	◆5500	System One†★	1120 analyzer†
Frequency range	10-100k 4-range	10-100k	10-100k	10-140k
Input level	30mV-100V, 100kΩ	30mV-100V, 100kΩ	100μV-140V, 100kΩ	3mV-300V, 100kΩ
Input connection	Active bal	Active bal	Active bal	Differential bal
Fundamental reject	>100dB 1kHz	>100dB 1kHz	>90dB	Resid THD + noise-10dB
Minimum THD figure	0.0008%	0.001%	0.0003%	0.003%
THD accuracy	±1dB	±1dB	±5%	±1dB
IMD measurement	Opt SMPTE/DIN	Opt SMPTE/DIN	Opt SMPTE/DIN	No IMD measurement
IMD accuracy	±1dB	±1dB	±10%	.....
Minimum IMD	0.001%	0.001%	0.0001%	.....
ac Volts/accuracy	-100, +40dBm, ±1%	-100, +40dBm, ±1%	-114, +45dBm ±1%	3mV-300V ac/dc
Audio noise range	-120dBm	-120dBm	-114dBm	S/N & SINAD
Signal generator range	10-100k +28dBm	10-100k +30dBm	10-204k 30dBm	10-140k
Generator output	Xfmr, bal/unbal	Xfmr, bal	Xfmr bal	.....
Frequency counter	Option	Yes	Yes	5-200k
Meters/displays	True RMS movement	LED readout	On-CRT bar graph	LED displays
Digital design	No	Yes	PC base/software	Yes
Automated measurements	.....	GPIB, RS-232	On PC bus	IEEE-488
Reader Service Number	1402	1403	1405	1406

Manufacturer	Hewlett Packard	Leader Instruments	Panasonic Industrial	Potomac Instruments
Model/Series	8903B/8903E†	LDM-170	VP-7722P†	◆AA-51 analyzer★
Frequency range	20-100k	20-20k	10-110k/to 10th harm	20-20k
Input level	425V peak, 100kΩ	0.35-30Vrms	0.05-100Vrms, 100kΩ	2mV-15.5V, 300kΩ
Input connection	Balanced, BNC	.....	BNC, floating	Balanced
Fundamental reject	>100dB	.....	>140dB	>80dB overall
Minimum THD figure	<-90dB, 0.003%	0.01%	0.001%	0.1% fs
THD accuracy	±1dB, 20-20k	.....	< ±2%	±5% fs

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## Audio Distortion Analyzers

Manufacturer	Hewlett Packard	Leader Instruments	Panasonic Industrial	Potomac Instruments
Model/Series	8903B/8903E†	LDM-170	VP-7722P†	♦AA-51 analyzer-★
IMD measurement	No	No	SMPTPE	SMPTPE
IMD accuracy	.....	.....	± 1dB	± 5% fs
Minimum IMD	.....	.....	0.01%	0.1%
ac Volts/accuracy	0.3mV-300V ± 2%	100 $\mu$ V-300Vrms	0.316mV-100V	1mV-100Vrms
Audio noise range	-85dB (17 $\mu$ V) 80kHz BW	To 70dB SNR	0-130dB SNR	(Signal + noise)/noise
Signal generator range	20-100k for 8903B	.....	10-110k	20-20k
Generator output	0.6mV-6V open circuit	.....	BNC floating	Xfmrless bal, unbal
Frequency counter	± 0.004% + 1 digit	No	Yes	No
Meters/displays	Digital readout	.....	LED displays	VU movement
Digital design	Yes	.....	Yes	No
Automated measurements	HP-IB	.....	GPIB	No
Reader Service Number	1407	1408	1409	1411

Manufacturer	.RE Instruments	Rohde & Schwarz	Schmid Telecomm. Zurich
Model/Series	RE201 dual channel★	UPA analyzer†★	SIAT/short interval test★ SZ-340†
Frequency range	1-25k	10-100k(to 300k)	40-15k/400 THD
Input level	2mV-15.5V, 300k $\Omega$	12mV to 400Hz, 1.2mV	-70, +21dBm 600 $\Omega$
Input connection	Active bal	Bal(600 $\Omega$ ), unbal(10k $\Omega$ )	.....
Fundamental reject	105dB, 20-12.5k	.....	.....
Minimum THD figure	0.006%	0.003%	.....
THD accuracy	± 2.5dB, THD-70dB	± 1dB to 100kHz	.....
IMD measurement	SMPTPE, DIN	.....	SMPTPE
IMD accuracy	± 2.5dB, IMD-50dB	.....	.....
Minimum IMD	<-87dB	.....	.....
ac Volts/accuracy	-51.8, +25.7dBm ± 3%	10 $\mu$ V-300V unb (35V bal)	-70, +21dBm
Audio noise range	-99dBm	0-120dB SNR	W/stereo crosstalk
Signal generator range	1-25k, 24.2dBu	UPA-B6 opt (10-100k)	40-15k programmable
Generator output	Active bal	Bal, unbal	.....
Frequency counter	Yes	8-250k	.....
Meters/displays	CRT alphanumeric	LCD displays	LED displays, printer
Digital design	Yes	Yes	Yes
Automated measurements	GPIB	IEEE-488/IEC 625-1	Remote via RS-232
Reader Service Number	1412	1413	1415

Manufacturer	Sound Technology	Technical Projects	Tektronix
Model/Series	1510A†★	3100A/3200A†	MJS401D/MD404B-★ AA5001†
Frequency range	20-40k	10-110k	5-105k
Input level	0.1mV-40V, 100k $\Omega$	0.03mV-110V, 200k $\Omega$	1mV-100V, 200k $\Omega$
Input connection	Active bal	Active bal	Active bal
Fundamental reject	100dB, 1kHz	>100dB 1kHz	110dB
Minimum THD figure	0.01%	0.002%	0.001%
THD accuracy	± 5% of full scale	± 10%	± 10%
IMD measurement	No	Opt SMPTPE/DIN	Opt SMPTPE/DIN
IMD accuracy	.....	± 4%	± 4%
Minimum IMD	.....	0.0025%	± 2%
ac Volts/accuracy	-0.2, +0.2dBm, ± 1%	± 0.2dBm ± 2%	0.001%
Audio noise range	-79dBm	-103dBm	± 0.02%
Signal generator range	20-40k, 30dBm	10-110k + 26dBm	-107, +40dBm, ± 0.1dB
Generator output	Active bal	Active bal	<-115dBm, 30kHz bw 600 $\Omega$
Frequency counter	No	No	10-300k, +30dBm
Meters/displays	Bargraph, CRT	RMS, AVG, PEAK	Active bal/unbal
Digital design	Yes	No	Yes
Automated measurements	GPIB	.....	Multistandard movement
Reader Service Number	1417	1418	In part

Manufacturer	Tektronix	Wandel & Gottermann
Model/Series	AA501	NFA-1†★
Frequency range	10H-100k	15-200k (receiver)
Input level	60mV-200V, 100k $\Omega$	140nV-30V, 600 $\Omega$ , 100k $\Omega$
Input connection	Balanced	Bal, unbal, BNC/XLR/CF
Fundamental reject	10dB†	90dB at 1kHz
Minimum THD figure	0.0025%	0.003% typical
THD accuracy	± 10%	± 0.003% absolute
IMD measurement	Opt SMPTPE/DIN	Program for any
IMD accuracy	± 10%	± 0.01%
Minimum IMD	0.0018%	0.01%
ac Volts/accuracy	-108, +48dBm ± 2% fs	-135dB, +30dB
Audio noise range	-108dBm	-100dBm A-wtd, <-90 CCIR
Signal generator range	10-100k, 28dBm	10-50k, full level
Generator output	Balanced	Bal, unbal, BNC/XLR/CF
Frequency counter	No	Yes w/SNR > -10dB
Meters/displays	LED displays	CRT graph/numeric
Digital design	Yes	Yes
Automated measurements	No	GPIB/IEEE, IEC
Reader Service Number	1422	1423

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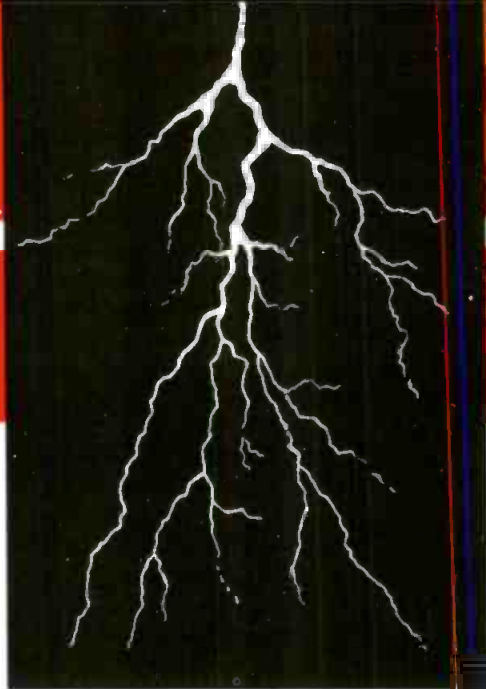
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## AM Modulation Monitors

These systems include AGC circuitry and internal calibration facilities. They are ATS compatible.

Manufacturer	Belar Electronics Labs	Boonton Electronics	Broadcast Electronics	Harris Broadcast	TFT
Model Number	AMM-3 (AMM-2B)	8200 analyzer†	AM-90	AS-10 stereo	753/754
Frequency range	200k-160MHz	100k-2GHz(2.5G opt)	450k-30MHz	530-1620kHz	500k-4MHz
Off-air RF input	100 $\mu$ V w/pre-amp	-47dBm/2.3mV	.....	500mV-15Vrms	100 $\mu$ V
Direct input	5Vrms 50 $\Omega$	10mVrms AM band	1Vrms 50 $\Omega$	.....	1-10Vrms 50 $\Omega$
Modulation range	-99, +199% (± 133%)	To 99%	-100, +140%	0-133%	-100, +125%



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– 277Y	8664
– 480D	9560

larger transients. The second stage consists of "brute force" MOV technology which reacts rapidly to absorb the brunt of the strike. Field-proven MOV technology has been protecting major installations for many years.

#### **YOU WON'T WORRY ABOUT DOWNTIME**

A catastrophic hit can damage a protector. Most protectors must then be removed from the line and sent to the manufacturer for repair or replacement. This leaves your equipment vulnerable until the unit is returned.

Surge Masters not only provide quality protection, it's insured it with triple redundancy. There are 3 heavy-duty suppression modules on each phase. Even in the unlikely event that one module fails, the system still retains 80% of its protection capability on all phases. **Protection is always present.**

#### **YOU'LL LIKE ITS FAST & SIMPLE INSTALLATION**

One of the major attractions of MCG Surge Masters is that they can be installed without breaking the power line. Whether your power is single phase or three phase, the unit is connected across the lines, in parallel rather than in series. This is because the Surge Master protects against overvoltages not by blocking them, but



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#### **FRONT PANEL INDICATORS ELIMINATE GUESSWORK**

Comprehensive, front panel monitoring indicates the exact status of the unit at all times. The green light indicates that all systems are "go." The yellow signifies that the Surge Master has suppressed a transient; simply reset to green. In the event that a transient was severe enough to damage the Surge Master, a red light indicates that there is an internal fault.

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## AM Modulation Monitors

Manufacturer	Belar Electronics Labs	Bocnton Electronics	Broadcast Electronics	Harris Broadcast	TFT
Model Number	AMM-3 (AMM-2B)	8200 analyzer <sup>1</sup>	AM-90	AS-10 stereo	753/754
Input attenuator	Yes	Yes	No	Yes	Yes
Peak modulation indicator	Yes (adjustable)	Peak hold	Programmable	Adjustable	Adjustable
Peak flasher accuracy	0.5% (2%) 25kHz	1% of peak	± 1% 1kHz	.....	± 2% 400kHz
Audio output level	+ 10dBm	1Vrms 600Ω	+ 10dBm	0dBm L/R/L + R/L-R	0dBm
Audio connection	Unbalanced	Balanced	Bal or unbal	Xfmr/act bal/unbal	.....
Audio response/mono	± 0.5dB 20-25k	.....	-0.5dB 20-20k	L/R act bal 600Ω	± 0.5dB 20-25k
Distortion/mono	0.25% 25kHz	< 0.1%	0.15%	.....	0.05% 10kHz
S/N ratio/mono	75dB	0.05% res. AM	75dB unwt'd 100% mod	.....	75dB unwt'd
Meter/display	Analog meter	Digital display	LED bar graph	Dual meters, LEDs	Analog meter
Oscilloscope output	Yes	From detector	Yes	No	No
Remote meter output	Yes	No	Yes	Yes	Yes
Failure alarms	Carrier	None	Carrier, mod	.....	Carrier, mod
<sup>1</sup> Instrument designed for AM, FM, φM measurement in maintenance show.					
Reader Service Number	1424	1425	1426	1427	1428

## FM Modulation Monitors

These units include remote metering outputs and are ATS compatible. An internal calibration circuit and carrier failure indication are standard.

Manufacturer	Belar Electronics Labs	QEI	Rohde & Schwarz	TFT
Model Number	FMM-2	Model 691	FKD, FKDL	Model 844
FM channel selector	Crystal	Pre-selector switch	Tuned PLL	Pre-selector/crystal
Off-air input	100μV, opt pre-amp	5mV	3.16mV	200μV
Direct input	1Vrms 50Ω	0.2-10Vrms 50Ω	0.5-2Vrms 50Ω	1-10Vrms 50Ω
AGC circuitry	No	No	.....	Yes
Modulation range	± 133%	± 133%	77.5kHz(2.5kHz LED)	-100, + 133%
Input attenuator	Yes	Yes	No	Yes
AF response (meter)	± 0.1dB 50-75k	± 0.2dB 30-75k	± 0.5dB 40-65k	± 0.5dB 30-120k
Peak mod adjustment	199%	199%	None	199%
Peak flasher accuracy	2%	± 2% 5kHz	5%	± 2%
Residual AM monitor	Integral	Integral	.....	.....
Audio output	+ 10dBm	+ 10dBm	6dBm	0dBm
Audio connection	Active bal	Xfmr	Bal 600Ω L-R	Unbalanced
Audio response	± 0.01dB 50-15k	± 1dB 30-15k	0.05dB 40-65k	± 0.5dB 30-120k
Audio distortion/mono	0.01%	0.05%	< 0.5% 30-15k	0.1%
S/N ratio/mono	90dB unwt'd	75dB wtd 100% mod	> 68dB wtd	80dB unwt'd
Composite output	1.5Vrms	2Vrms 100% mod	6dBm ± 40kHz dev	5Vrms 10kΩ
Metering display	Analog movement, LEDs	Analog movement	Dual 32-LEO bar graphs	Analog meter, LEDs
Oscilloscope output	Yes	Yes	No	Yes
Modulation alarm	None	Yes	Yes	Yes
Stereo monitor	FMS-2	Integral	Integral	Integral
SCA monitor	SCM-1, SCM-2	Single, dual opt	Integral	TFT-730A, 845
Reader Service Number	1429	1430	1431	1432

## TV Aural Modulation Monitors

All models include remote metering output and internal calibration facilities. Peak modulation indicators are adjustable; peak flasher accuracy is ± 1%.

Manufacturer	Belar Electronics Labs	TFT
Model Number	TVM-1	701 (702)
Frequency range	Single channel	Any TV channel
Off-air input level	100μV/RFA-3 pre-amp	100mV-5Vrms composite
AGC circuitry	Yes	.....
Modulation range	± 133% ± 25kHz dev	133%, 100% ± 73kHz
Meter frequency response	± 0.5dB 50-75k	± 0.1dB 30-50k
Audio output	10dBm xfmr bal	10dBm bal, 5V unbal
Audio response/mono	± 0.5dB 50-15k	± 0.01dB 30-50k
Audio distortion/mono	0.1%	0.01%
S/N ratio/mono	70dB	80dB
Composite output	1V 2kΩ	1.5V/Pro/SAP/SCA
Meter/displays	Analog meter	Meter & LEDs
Oscilloscope output	Yes	Yes
ATS compatible	Yes	Yes
Carrier alarms	None	90% power
Modulation alarm	None	None
Stereo monitor	.....	TVM-200/210/220
SCA monitor	SCM-1/SCM-2	SCM-1/SCM-2
Reader Service Number	1433	1434

Manufacturer	TFT
Model Number	Model 850
Frequency range	Any TV channel
Off-air input level	20μV 50Ω
AGC circuitry	No
Modulation range	100% ± 25kHz
Meter frequency response	± 0.2dB 50-120k
Audio output	6dBm active bal
Audio response/mono	± 0.2dB 50-15k
Audio distortion/mono	0.1% 1kHz
S/N ratio/mono	78dB de-emphasized
Composite output	3Vrms 75Ω
Meter/displays	Meter & LEDs
Oscilloscope output	Yes
ATS compatible	Yes
Carrier alarms	Reduced power
Modulation alarm	Relay closure
Stereo monitor	Integral
SCA monitor	TFT855, TFT851
Reader Service Number	1435

## Vectorscopes

Equipment for measurement and display of the relative phase angles of color information in the video signal. Those models marked with a diamond (◆) provide component video inputs. Models marked with a bullet (•) are battery operated. All units are available in rack-mount or bench case configurations.

Manufacturer	B&K Precision	Electronic Visuals/BVS†	Hitachi Denshi	Leader Instruments
Model/Series	Model 1270	EV4021	V-069 (V-068)	V-089 (V-088)
Display size	6" rect	8x10cm rect	6" rect	3.5"
Grabcule	Internal	Internal	Internal	External
Waveform monitor mode	No	Waveform only	Vector only	Vector only
Function control from	Manual	Manual	Manual	Manual
Standards	NTSC	NTSC, PAL/-M	NTSC (PAL)	NTSC (PAL)
Integral calibrator	Yes	No	Yes	Yes
Composite video inputs	A, B	A, B	A, B	A, B
Subcarrier input	Yes	Yes	Blackburst	Composite sync
Composite sync input	Yes	.....	Blackburst	Composite sync
Display references	A or B	A, B, ext	A, B, ext	A, B
Off phase, gain mode	.....	1°, 1%	2°, .....	± 1°, ± 1%
VITS line selector	No	No	No	No
Luminance measurements	None	No	None	No
Reader Service Number	1481	1482	1483	1484



## Vectorscopes

Manufacturer	Magni Systems	Phillips T&MI	Snell & Wilcox
<b>Model/Series</b>	<b>VS 530 (VS 531)</b>	<b>◆VS 560 (VS 561)</b>	<b>PM 5667, PM 5668</b>
Display size	8x10cm	8x10cm	8x10cm rect
Graticule	Internal	Internal	Internal
Waveform monitor mode	Vectors, audio phase	Vectors, audio phase	SC/H PM 5668
Function control from	Manual, rmt†	Manual, rmt†	Manual, remote
Standards	NTSC (PAL)	NTSC/CAV (PAL/CAV)	NTSC, PAL/-G/-M/-N
Integral calibrator	Yes	Yes	Yes
Composite video inputs	3 inputs	2 inputs w/3 channels	A, B
Subcarrier input	Yes	Yes	Yes
Composite sync input	Yes	Yes	Yes
Display references	Int. ext	Int. ext	A, B, ext
Diff phase, gain mode	<1°, <1%	<1°, <1%	<1°, <1%
VITS line selector	From WFM530/531	From WFM560/561	No
Luminance measurements	No	No	None
<b>Reader Service Number</b>	↑From WFM530, RS-232 <b>1486</b>	↑From WFM560, RS-232 <b>1487</b>	<b>1488</b>
<b>Manufacturer</b>	<b>.System Video</b>	<b>Tektronix</b>	<b>Thomson-CSF</b>
<b>Model/Series</b>	<b>Model 1225</b>	<b>◆1720</b>	<b>R520A series</b>
Display size	10x10cm	5½"	5"
Graticule	Internal	Internal	Internal, ext
Waveform monitor mode	X-Y display mode	Stereo audio phase	Component waveforms
Function control from	Manual	μP control	Manual
Standards	NTSC, PAL/-M	NTSC, PAL	NTSC, PAL/-M
Integral calibrator	Yes	Yes	Yes
Composite video inputs	A, B	A, B	A, B
Subcarrier input	Yes	Ext ref	No
Composite sync input	Yes	Yes	Yes
Display references	A, B, ext	Int. ext	A, B, ext
Diff phase, gain mode	2°, 2%	≤2°, ≤2%	<1°, <1%
VITS line selector	Lines 15-21	From 1730 WFM	Lines 15-21
Luminance measurements	No	No	No
<b>Reader Service Number</b>	<b>1491</b>	<b>1492</b>	<b>1493</b>
<b>Manufacturer</b>	<b>Thomson-CSF</b>	<b>Thomson-CSF</b>	<b>Videotek</b>
<b>Model/Series</b>	<b>◆TTV 8300</b>	<b>◆TTV 8300</b>	<b>VSM-60</b>
Display size	8x10cm	8x10cm	8x10cm
Graticule	External	External	Internal
Waveform monitor mode	Waveform	Waveform	None
Function control from	Manual	Manual	Manual
Standards	None	None	NTSC, PAL/-M
Integral calibrator	SECAM	SECAM	Yes
Composite video inputs	Yes	Yes	A, B, alternate
Subcarrier input	No	No	Yes
Composite sync input	Yes	Yes	No
Display references	Yes	Yes	A, B, ext
Diff phase, gain mode	.....	.....	≤1°, ≤1%
VITS line selector	.....	.....	No
Luminance measurements	.....	.....	None
<b>Reader Service Number</b>	<b>1494</b>	<b>1494</b>	<b>1495</b>

## Video Waveform Monitors

Video monitoring equipment for assessment of visual signal components and signal quality. This equipment is ac-operated, but models marked with a bullet (•) may be battery operated. All units come in bench or rack-mount cabinets. A diamond (◆) indicates a test probe feature; a star (★) indicates an oscilloscope test mode.

Manufacturer	B&K Precision	Electronic Visuals/Broadcast Video Systems	Hitachi Denshi
<b>Model/Series</b>	<b>1265</b>	<b>EV4050 component</b>	<b>EV4061 combo</b>
Display size	8x10cm	8x10cm	8x10cm
Graticule	Internal	External	External
Available for	NTSC	CAV	NTSC, PAL/-M, SECAM
Internal calibrator	Yes	.....	Yes
Vertical Response	Flat, chroma	Flat, LP, chroma	Flat, LP, chroma
Timebases	•6G, LP 2H, 2V 2V-mag	linear V, 2V, 3V, H, 2H, 3H, mag 1-line to 100ns/8 div	..... V, 2V, 2V mag H, 2H, 2H mag V, 2V, 2V mag Blanking in 9cm
Magnification factors	x10	AB, ABC parade	Yes
RGB/YRGB displays	Yes	Individual restoration	No (RGB or component)
dc restore	Back porch	No	Back porch
VITS line select	Lines 13-22	No	No (Lines 7-22)
Programmable	No	No	No
Remote controllable	No	No	No
Composite inputs	Yes	No	1-input
Component inputs	No	Y, Cr, Cb	No
Line strobe pulse	No	No	No
Vectorscope function	No	Yes	No
Waveform comparison	No	Superimposed	No
<b>Reader Service Number</b>	<b>1456</b>	<b>1457</b>	<b>1458</b>
<b>Manufacturer</b>	<b>Hitachi Denshi</b>	<b>Leader Instruments</b>	<b>Magni Systems</b>
<b>Model/Series</b>	<b>V-099 (•V-098) portable</b>	<b>LBO-5860B (5865B)</b>	<b>WFM-530 (WFM-531)</b>
Display size	3.5" rect	8x10cm	8x10cm
Graticule	.....	Internal	Internal
Available for	NTSC (PAL)	NTSC, PAL/SECAM opt	NTSC (PAL)
Internal calibrator	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma	Flat, LP, chroma	Flat, chroma, LP
Timebases	•6G possible 2H, 2V, 1s/div 2V mag	•6G, transient 2H, 1s, 2V 2V mag	..... H, 2H, 2V, V mag
Magnification factors	x20	x20	x5
RGB/YRGB displays	No	Option	Yes
dc restore	Blanking	Back porch	Back porch
VITS line select	No	7-21 (525)	Any line
Programmable	No	No	16 memories
Remote controllable	No	No	RS-232
Composite inputs	A, B	A, B	2 inputs, 3 channels
Component inputs	No	No	2 sets
Line strobe pulse	No	Yes	Yes
Vectorscope function	No	No	Limited components use
Waveform comparison	No	No	Yes
<b>Reader Service Number</b>	<b>1461</b>	<b>1462</b>	<b>1463</b>
<b>Manufacturer</b>	<b>Hitachi Denshi</b>	<b>Phillips T&amp;MI</b>	<b>Rohde &amp; Schwarz</b>
<b>Model/Series</b>	<b>V-099 (•V-098) portable</b>	<b>◆V-099 (V-078)</b>	<b>WFM-560 (WFM-561)</b>
Display size	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	Internal
Available for	NTSC (PAL)	NTSC (PAL)	NTSC/CAV (PAL/CAV)
Internal calibrator	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma	Flat, LP, chroma	Flat, chroma, LP
Timebases	•6G possible 2H, 2V, 1s/div 2V mag	•6G, transient 2H, 1s, 2V 2V mag	..... H, 2H, 2V, V mag
Magnification factors	x20	x20	x5
RGB/YRGB displays	No	Option	Yes
dc restore	Blanking	Back porch	Back porch
VITS line select	No	7-21 (525)	Any line
Programmable	No	No	16 memories
Remote controllable	No	No	RS-232
Composite inputs	A, B	A, B	2 inputs, 3 channels
Component inputs	No	No	2 sets
Line strobe pulse	No	Yes	Yes
Vectorscope function	No	No	Limited components use
Waveform comparison	No	No	Yes
<b>Reader Service Number</b>	<b>1461</b>	<b>1462</b>	<b>1463</b>
<b>Manufacturer</b>	<b>Phillips T&amp;MI</b>	<b>Phillips T&amp;MI</b>	<b>Rohde &amp; Schwarz</b>
<b>Model/Series</b>	<b>★PM 5665</b>	<b>★PM 5662 combo</b>	<b>★OKF</b>
Display size	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	External
Available for	NTSC (PAL)	NTSC (PAL)	NTSC (PAL)
Internal calibrator	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma	Flat, LP, chroma	Flat, chroma, LP
Timebases	•6G possible 2H, 2V, 1s/div 2V mag	•6G, transient 2H, 1s, 2V 2V mag	..... H, 2H, 2V, V mag
Magnification factors	x20	x20	x5
RGB/YRGB displays	No	Option	Yes
dc restore	Blanking	Back porch	Back porch
VITS line select	No	7-21 (525)	Any line
Programmable	No	No	16 memories
Remote controllable	No	No	RS-232
Composite inputs	A, B	A, B	2 inputs, 3 channels
Component inputs	No	No	2 sets
Line strobe pulse	No	Yes	Yes
Vectorscope function	No	No	Limited components use
Waveform comparison	No	No	Yes
<b>Reader Service Number</b>	<b>1461</b>	<b>1462</b>	<b>1463</b>
<b>Manufacturer</b>	<b>Phillips T&amp;MI</b>	<b>Phillips T&amp;MI</b>	<b>Rohde &amp; Schwarz</b>
<b>Model/Series</b>	<b>★PM 5665</b>	<b>★PM 5662 combo</b>	<b>★OPF TV oscilloscope</b>
Display size	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	External
Available for	NTSC (PAL)	NTSC (PAL)	NTSC (PAL)
Internal calibrator	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma	Flat, LP, chroma	Flat, chroma, LP
Timebases	•6G possible 2H, 2V, 1s/div 2V mag	•6G, transient 2H, 1s, 2V 2V mag	..... H, 2H, 2V, V mag
Magnification factors	x20	x20	x5
RGB/YRGB displays	No	Option	Yes
dc restore	Blanking	Back porch	Back porch
VITS line select	No	7-21 (525)	Any line
Programmable	No	No	16 memories
Remote controllable	No	No	RS-232
Composite inputs	A, B	A, B	2 inputs, 3 channels
Component inputs	No	No	2 sets
Line strobe pulse	No	Yes	Yes
Vectorscope function	No	No	Limited components use
Waveform comparison	No	No	Yes
<b>Reader Service Number</b>	<b>1461</b>	<b>1462</b>	<b>1463</b>
<b>Manufacturer</b>	<b>Phillips T&amp;MI</b>	<b>Phillips T&amp;MI</b>	<b>Rohde &amp; Schwarz</b>
<b>Model/Series</b>	<b>★PM 5665</b>	<b>★PM 5662 combo</b>	<b>★ODF digital TV scope</b>
Display size	8x10cm	8x10cm	10x13cm
Graticule	Internal	Internal	Electronic

## Video Waveform Monitors

Manufacturer	Model/Series	Philips T&M	Rohde & Schwarz
	★ PM 5665	★ PM 5662 combo	★ OKF
Available for	NTSC, PAL/-M/-G/-N	NTSC, PAL/-G/-N/-M	PAL
Internal calibrator	Yes	Yes	Yes
Vertical Response	Flat, chroma, δG	Flat, luma, chroma δG, δ≤	LP, flat, noise δ staircase
Timebases	H, 2H, V, 2H	H, 2H, V, 2H	V, 2V, H, 2H 5H, 12H, 30H
Magnification factors	Mag	Mags	.....
RGB/YRGB displays	x10	x10 H, x20 V	.....
dc restore	Yes	Yes	4-field display
VITS line select	Back porch	Back porch	Black
Programmable	1-263/1-262, 1-625	1-263, 1-262, 1-625	4-623 & VBI
Remote controllable	No	No	No
Composite inputs	Yes	Yes	No
Component inputs	A, B	A, B	A, B
Line strobe pulse	No	No	No
Vectorscope function	.....	Yes	Z-unblank
Waveform comparison	No	With SC/H ≤	No
Reader Service Number	No	No	No
	1466	1467	1468
	1469		
Manufacturer	Model/Series	System Video Ltd	Tektronix
	★ Snell & Wilcox MW 200 multiscope	1254 (1258)	★ 1480 series
Display size	8x10cm	10x10 (8x10) cm	◆ 1740 series combo
Graticule	Electronic	Internal	1730 series
Available for	NTSC, PAL/-M/-N	PAL/-M, NTSC	
Internal calibrator	Yes	Yes	
Vertical Response	Flat, LP	Flat, LP, linearity chroma	
Timebases	.....	Flat, chroma, LP IRE, δG	
Magnification factors	2H, 2V	H, 2H, V, 2V	
RGB/YRGB displays	.....	H mag	
dc restore	Back porch	x12.8	
VITS line select	No	Yes	
Programmable	No	Yes	
Remote controllable	No	Yes	
Composite inputs	Any line, 16-line μP control system	Yes	
Component inputs	Multistandard A, B, C	A, B	
Line strobe pulse	No	No	
Vectorscope function	Yes	Companion unit	
Waveform comparison	No	Parade only	
Reader Service Number	Also NTSC-4.43, SECAM		
	1471	1472	1473
			1474
			1475
Manufacturer	Model/Series	Tektronix	VideoTek
	★ WFM-300 component	1750 series combo	TSM-60
Display size	8x10cm	8x10cm	TSM-50
Graticule	Electronic	Internal	◆ TVM-620 combo
Available for	525/60, 625/50, RGB	NTSC (PAL)	
Internal calibrator	Yes	Yes	
Vertical Response	"Lightning", bowtie displays	Flat, IRE (luma) chroma	
Timebases	1H, 2H, 2V and 2F mag	H, 2H, 2H mag V, 2V, 2V mag	
Magnification factors	x20	x2, x10, x20, x50	
RGB/YRGB displays	Yes	Yes	
dc restore	Yes	Back porch or sync	
VITS line select	Any line	8-23 (6-21, 319-334)	
Programmable	.....	All functions	
Remote controllable	Yes	Yes	
Composite inputs	No	A, B	
Component inputs	1 input set	No	
Line strobe pulse	.....	Yes	
Vectorscope function	Yes	SC/H ≤ measurements	
Waveform comparison	Overlay, parade Transcoders for YIQ, Y/R-Y/B-Y available	Simul vector/waveform	
Reader Service Number	1476	1477	1478
			1479
			1480

## TV Demodulators

TV receiving equipment for signal monitoring and examination. Inputs are typically 50/75Ω. At least two video outputs are rated 75Ω.

Manufacturer	Model Series	Barco Industries	Philips T&M	Rohde & Schwarz
	VSD 1000BG	PMS560M	EMFT series	KDF2D (EKF2)
Service band	VHF/UHF	IF/VHF/UHF	IF/VHF/UHF	IF/VHF/UHF/CATV
CCIR standards	B/G/M, others	B/G/M/I/D/K	B/G	M/B/G
Channel selection	Fixed, PLL-tuned	Thumb-wheel PLL	Tunable, crystal	Tune & crystal
Direct input level	.....	1Vrms ± 6dB w/AGC	0.1-30mV, 1-100mV	20mV-1.5V
Off air input level	-30mV, +30mV	100mV ± 6dB w/AGC	250μV-5mV	250μV-300mV
IF input level	10-40dBmV	70mV ± 3dB 50Ω	5mV-100mV	5mV-100mV
Input level indicator	LED display	Vision & IF meters	Panel meter	Meter
Intercarrier input	No	Yes	.....	.....
Split carrier mode	No	Yes	Yes	Yes
Zero carrier reference	Int	Int, ext	Line 15 or ext	Int, ext
Envelope detection	Yes	Yes	Yes	Yes
Synchronous detection	Yes	Yes	Yes	Yes
Quadrature detection	No	Yes	Yes	.....
Aural signal reject	Yes	Yes	Yes	Yes
SAW filter design	.....	Nyquist filter	Yes	.....
Aural deviation port	.....	+6dBm ± 25kHz	.....	0-50kHz
Audio line out	+6dBm	+6dBm/1.55V	+6dBm ± 30kHz	+6dBm ± 30kHz
Speaker output	8Ω	None	No	Yes
				AMF2
				IF/VHF/UHF
				B/G/I/D/K/M/N/K1
				Xtal or synthesizer
				0.2-0.7V or 0.7-2.2V
				.....
				0.12-0.6V
				Point LEDs
				.....
				Yes
				Auto, manual
				Yes
				Yes
				.....
				Yes
				.....
				+6dBm ± 25kHz
				+6dBm
				.....

# WATTS UP?



**3.5KW**



**5KW**



**10KW**

**When-and-if you're ready to UP your transmitting power, will your FM transmitter be ready too? If it's one of the QEI "New Reliables" FMQ series, the answer is YES!**

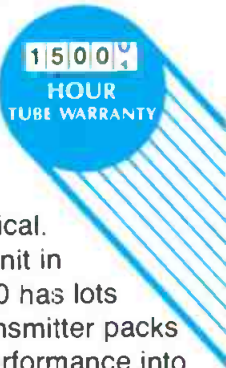
Our new 3.5KW, 5KW and 10KW transmitters were designed to give you a clear upgrade path to higher power. In just a few hours, your 3.5KW or 5KW QEI FM transmitter can be upgraded to a factory-equivalent 5KW or 10KW unit, right in the field. QEI's unique modular solid state drivers and interchangeable P.A. assembly make these power upgrades easy...and very economical.

If you're shopping for a 10KW unit in the first place, the QEI FMQ-10000 has lots to recommend it. No other FM transmitter packs this much power, reliability and performance into a single 24" wide rack cabinet. And the FMQ-10000 is designed to operate on single-phase power, so there's no need to pay for installing new three-phase electric service.

What's more, for upgrades to power levels beyond 10KW, each of these FMQ series

transmitters can serve as the driver section for QEI's 20, 30 or 60KW transmitters, again resulting in major cost savings.

Every QEI "New Reliables" FM transmitter is built to deliver ultra-dependability and performance. So—whether your station is thinking of upping its power down the road, or if the power you start with is the power you stay with—you'll be glad you chose QEI. Call us toll-free at (800) 334-9154 for the full story.



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## TV Demodulators

<b>Manufacturer</b> . . . . .	<b>Barco Industries</b>
<b>Model Series</b> . . . . .	<b>VSD 1000BG</b>
Video clamp on . . . . .	Back porch
Modulation fail alarm . . . . .	No
Stereo aural type . . . . .	German system
<b>Reader Service Number</b> . . . . .	<b>1445</b>

<b>Philips T&amp;M</b>	
<b>PM5560M</b>	
0 IRE active or VBI . . . . .	No
.....	.....
<b>1446</b>	

<b>Rohde &amp; Schwarz</b>		
<b>EMFT series</b>	<b>KDF2D (EKF2)</b>	<b>AMF2</b>
Sync, blanking . . . . .	Sync, blanking	Sync, blanking
.....	No	Sync failure LED
Dual carrier Std B/G . . . . .	.....	For German system
<b>1447</b>	<b>1448</b>	<b>1449</b>

<b>Manufacturer</b> . . . . .	<b>Tektronix</b>
<b>Model Series</b> . . . . .	<b>1450-1</b>
Service band . . . . .	IF, VHF, UHF
CCIR standards . . . . .	M/B/G/I
Channel selection . . . . .	Fixed & crystal
Direct input level . . . . .	80mV-5V
Off.air input level . . . . .	80mV-5V
IF input level . . . . .	80μV-22mV
Input level indicator . . . . .	LED display
Intercarrier input . . . . .	Yes, 50Ω
Split carrier mode . . . . .	Yes
Zero carrier reference . . . . .	Int, ext
Envelope detection . . . . .	Yes
Synchronous detection . . . . .	Yes
Quadrature detection . . . . .	Yes
Aural signal reject . . . . .	Yes
SAW filter design . . . . .	Yes
Aural deviation port . . . . .	50mV/kHz, 600
Audio line out . . . . .	.....
Speaker output . . . . .	Yes
Video clamp on . . . . .	Sync, blanking, other
Modulation fail alarm . . . . .	.....
Stereo aural type . . . . .	BTSC/US
<b>Reader Service Number</b> . . . . .	<b>1450</b>

<b>4500-B1 (-B2)-F1]</b>	
VHF (UHF) . . . . .	.....
Fixed channel, xtal . . . . .	300μV-30mV
.....	.....
None	
.....	.....
Internal	
No	
.....	.....
Yes	
.....	.....
+3dBm 600Ω	
Yes	
.....	.....
No	
No	
<b>1451</b>	

<b>Telemet</b>	
<b>4501-B</b>	
VHF, UHF . . . . .	M
Fixed down converter . . . . .	50-500mV
.....	5-50mV
No	
Detector out, LED . . . . .	Yes
.....	Yes
Internal	
Yes	
w/4504B1 . . . . .	w/4504B1
.....	Yes
BNC	
Winchester M7 . . . . .	Yes
.....	.....
Loss of video out . . . . .	BTSC/US
BTSC/US . . . . .	.....
<b>1452</b>	

<b>3713-A1 (-A2)</b>	
VHF (UHF) . . . . .	M
Fixed channel . . . . .	50mV-10V
.....	5mV-1V (5mV-50mV)
.....	.....
LEDs . . . . .	No
.....	No
Quasi-parallel . . . . .	Yes
Int, ext . . . . .	Yes
.....	Yes
Yes	
.....	.....
Yes	
.....	.....
Shown on LEDs . . . . .	+8dBm
.....	8Ω, headphone
.....	.....
Yes	
BTSC/US . . . . .	.....
<b>1453</b>	

<b>Videolek</b>	
<b>DM-140S</b>	
VHF, UHF, CATV . . . . .	M
.....	Varacter/synthesized
.....	-15dBmV min
No	
No	
No	
No	
No	
Yes	
.....	.....
No	
Yes	
No	
XLR Bal, unbal L/R . . . . .	Yes
.....	L & R
No	
BTSC/US . . . . .	.....
<b>1454</b>	

## Automatic TV Test Systems

<b>Manufacturer</b> . . . . .	<b>Magni Systems</b>
<b>Model Series</b> . . . . .	<b>2015 generator</b>
Controlling computer . . . . .	MS PC-DOS
Video signal generator . . . . .	Multistandard
System control mode . . . . .	IBM-PC/compatible
Programmable . . . . .	Yes
Standards . . . . .	NTSC/PAL/CAV/HDTV
External data storage . . . . .	Yes
Auto logging mode . . . . .	No
Waveform plotting . . . . .	Yes
Parameter limits . . . . .	No...
Out of tolerance alarm . . . . .	No...
Carrier failure alarm . . . . .	No...
Modulation loss alarm . . . . .	No...
Measurements per . . . . .	Any reference
Tests made on line . . . . .	Any line
<b>Reader Service Number</b> . . . . .	<b>1437</b>

<b>Marconi Instruments</b>	
<b>TF2914A analyzer</b>	
.....	
TF2913 system . . . . .	.....
No	
NTSC, PAL . . . . .	Possible
.....	Yes
Yes	
.....	.....
Defined by TF2915 . . . . .	Aural & printer
.....	.....
NTC-7/FCC . . . . .	Individual lines
.....	.....
<b>1438</b>	

<b>PESA Electronica</b>	
<b>SWAT</b>	
Proprietary . . . . .	Uses program video
.....	.....
NTSC, PAL . . . . .	Printout or PC
.....	RS-232 link
Yes	
Yes	
Per programming . . . . .	Per programming
.....	CCIR/RS-170A
Total signal . . . . .	.....
<b>1439</b>	

<b>Philips T&amp;M</b>	
<b>PM5578</b>	
Proprietary . . . . .	External
.....	Yes
.....	.....
NTSC/PAL . . . . .	Possible
.....	Yes
On CRT only . . . . .	RS-232
.....	Set via jumpers
Yes	
VITS low LED . . . . .	Yes
.....	CCIR/NTC-7
Lines 17/18, 2-field . . . . .	.....
<b>1440</b>	

<b>Rohde &amp; Schwarz</b>	
<b>UVF video analyzer</b>	
Proprietary . . . . .	Bar, dot only
.....	Yes
.....	.....
PAL . . . . .	Yes
.....	Yes
IEC-625/IEEE-488 . . . . .	EEPROM, user defined
.....	Blinking LED
No	
CCIR-569-1 . . . . .	Individual lines
.....	.....
<b>1441</b>	

<b>Manufacturer</b> . . . . .	<b>Tektronix</b>
<b>Model Series</b> . . . . .	<b>1980 ANSWER</b>
Controlling computer . . . . .	Proprietary
Video signal generator . . . . .	External (TEK1910)
System control mode . . . . .	Manual
Programmable . . . . .	No
Standards . . . . .	NTSC
External data storage . . . . .	Yes
Auto logging mode . . . . .	Yes
Waveform plotting . . . . .	Yes
Parameter limits . . . . .	User defined
Out of tolerance alarm . . . . .	Printer
Carrier failure alarm . . . . .	No
Modulation loss alarm . . . . .	No
Measurements per . . . . .	RS170A/NTC-7/CCIR-569
Tests made on line . . . . .	Any VBI line
<b>Reader Service Number</b> . . . . .	<b>1442</b>

<b>VM7000</b>	
Motorola 68020 . . . . .	No
Manual, programmable . . . . .	Yes
.....	Yes
NTSC . . . . .	Also internal
.....	Via RS-232C
Raster scan display . . . . .	User programmable
.....	No
No	
No	
RS-170A . . . . .	Any line
.....	.....
<b>1443</b>	

<b>Thomson-CSF</b>	
<b>TTV8400 Thom-CAT</b>	
Apple . . . . .	Yes
TTV8410 Prodigie . . . . .	Yes
.....	Yes
NTSC, PAL . . . . .	Floppy disk
.....	Yes
Yes	
User defined . . . . .	Printer, CRT
.....	None
CCIR-569 . . . . .	1-line, 1-field
.....	.....
<b>1444</b>	

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# Video Recorders, Types B & C

These reel-to-reel systems use 1" media for recording and reproduction of composite video signals. A capstan-pinch roller tape pull system is used except those marked with a dagger (†), which are air/vacuum assisted. Transport and electronics control involves one or more microprocessors. Most systems include individual meters for each audio channel; video metering includes tracking. Luminance bandwidth is ±0.5dB, 0-4.2MHz, except those specifically for PAL and SECAM, where bandwidth extends to ≥5MHz. In audio range figures, Hz is understood.

Manufacturer	Ampex AVSD			Ampex/Nagra	BTS
	Model/Series	VPR-80	VPR-3†	VPR-6	VPR-5
S/N ratio L/C	46dB L, 46dB C	47dB w/Zeus processor	46dB L, 46dB C	46dB L	>44dB
Diff phase/gain	4°/4%	4°/4% max	4°/4%	4°/4%	<4°/ <4%
K factor 2T	1%	1% max	1%	1%	<20ns
Video confidence	No	Yes	Yes	Yes	Yes
No. of audio channels	3	3 NTSC, 4 PAL	3 NTSC, 4 PAL	3	3 or 2 audio, 1 TC
AF response	±2dB, 50-15k	±2dB, 50-18k	±2dB, 50-18k	±2dB, 50-15k	-3, +2dB 40-18k
AF S/N ratio	56dB 8dBm out	56dB 18dBm out	56dB unwt'd 8dBm out	56dB 8dBm out	>57dB w/o Dolby/Telcom
AF distortion	1% 8dBm 1kHz	1% 8dBm 1kHz	1% 8dBm 1kHz	1% 8dBm	<3% 1kHz 284nWb/m
LTC read/gen	Integral equipment	Integral equipment	Integral equipment	Yes	Integral
VITC read/gen	External unit	Integral equipment	Integral equipment	Integral equipment	.....
TC displays	Yes	Yes	Yes	External unit	Yes
Integral editor	Full feature	Full feature	Full feature	Partial feature	Full feature
Diagnostic software	Yes	Yes	Yes	Yes	Yes
Remote control type	RS-422	RS-422	RS-422	Simple remote	RS423, EBU/SMPTE, BTS
System TBC preference	External required	External Zeus	External	External required	W/4-field framestore
Nonstandard tracking	-1x, +3x	-1, +3x play	-1x, +3x	No	.....
Slow motion mode	No	No	No	No	-¼, +1x play
Single frame mode	No	Yes	No	No	No
Reel size/Time (min)	11.75", 124 min.	14", 190 min	11.75", 124 min.	9", 60 min.	12.5" 2.5 hr
Weight	145 lb	270 lb	150 lb	15 lb	484 lbs
Portable, rack mount	19"	19"	19"	With adapter kit	52 console, 53 rack
Color standards	N/P(-M)/S	N/P(-M)/S	N/P(-M)/S	N/P(-M)/S	PAL
Reader Service Number	841	842	843	844	845

Manufacturer	BTS Broadcast TV Systems		Hitachi Denshi	Sony Broadcast	
	Model/Series	BCN-51 (B format)	BCN-21 portable Type B	HR-230	BVH-3000/-3010†
S/N ratio L/C	47dB	47dB NTSC, 43dB PAL	48dB	49dB unwt'd V1-K tape	47(47)dB
Diff phase/gain	<4°/ <4%	<4°/ <4%	3°/3%	<4°/ <4%	4°/4% (6°, 6%)
K factor 2T	>1.5%	>1.5%	>1%	>1% TBC output	1% (2%)
Video confidence	Yes	.....	Yes	Video and audio	Yes
No. of audio channels	3	3 AF or 2 AF/1 TC	3	4 (LTC tr-3/sync tr-4)	3
AF response	-3, +2dB, 40-14k	-3, +2dB, 40-14k	-3, +1.5dB, 50-15k	-3, +1.5dB, 50-15k	-3, +1.5dB 70-15k
AF S/N ratio	57dB	57dB NTSC/54dB PAL	56dB unwt'd, 8dBm out	>56dB 3% THD, Ch 1/2	>56dB
AF distortion	<3%	<3% 1kHz	≤1% 1kHz	<0.1%	1% 1kHz 0dBm
LTC read/gen	Integral equipment	µP controlled generator	Integral option	LTC & cue Audio Ch 3	Generator
VITC read/gen	External available	.....	Integral option	Available	Generator
TC displays	Yes	W/user bits	Yes	Display panel or video	Yes
Integral editor	Full feature	Assemble, inserts	Full feature	Full feature	Backspace edits
Diagnostic software	No	No	Yes	Yes	Yes
Remote control type	RS-423 & simple remote	Standard functions	RS-422, RP-113	RS422, 232 opt, parallel	RS-422
System TBC preference	Integral equipment	No	Integral or ext opt	BKH-3010, BKH-3050	BVT-2700
Nonstandard tracking	-½x, +½x	No	-1x, +3x	With BKH-3050	In Type C mode
Slow motion mode	No	No	No	-1, +3x play; time mod.	-1x, +3x
Single frame mode	Yes	No	No	No	Dual mode VTR
Reel size/Time (min)	12", 196 min.	To 9" for 60 min	14", 180 min	11.75" (126 min)	11.75"/126 (42)
Weight	.....	20 obs	198 lb VTR/661 console	148 lbs	.....
Portable, rack mount	Includes rack	.....	Yes	Or self-contained	19"
Color standards	N/P(-M)/S	N/P(-M)/S	NTSC	NTSC	NTSC
13x standard record speed for ½x slow motion playback.					
Reader Service Number	846	847	848	849	850

Manufacturer	Sony Broadcast			Thomson Video
	Model/Series	BVH-500A	BVH-2000 (2180)	BVH-2500 Delta-Time
S/N ratio L/C	47dB p-pV/RMS noise	48dB unwt'd	48dB unwt'd	>44dB unwt'd
Diff phase/gain	<4°, <4%	<±4°, <4%	<4°, <4%	<4°, <4%
K factor 2T	<1%	<1%	<1%	<1%

## Video Recorders, Types B & C

Manufacturer	Sony Broadcast			Thomson Video
	Model/Series	BVH-500A	BVH-2000 (2180)	BVH-2500 Delta-Time
Video confidence	Yes	Yes	Yes	.....
No. of audio channels	3	3 analog	3 analog	3 AF, 1 TC/AF
AF response	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k
AF S/N ratio	56dB 3% THD	56dB	56dB ch 1/2	>56dB
AF distortion	1% 1kHz 0dBm	1% 1kHz 0dBm	1% 1kHz	<1%
LTC read/gen	Integral	Integral opt	Integral	Integral
VITC read/gen	Integral	Integral opt	Integral	Integral
TC displays	Yes	Yes	Yes	Yes
Integral editor	Assemble only	Full feature	Full feature	Full feature
Diagnostic software	None	Yes	Yes	Yes
Remote control type	Simple rmt ctl	RS-422	RS-422	RS-422
System TBC preference	External required	Integral	External required	BKH-2300 int
Nonstandard tracking	No	Yes	Still, step, slow	Yes
Slow motion mode	.....	-1x, +3x	-1x, +3x	-1x, +3x
Single frame mode	No	No	Yes	No
Reel size/Time (min)	9" 62 min	11.75(14")/126(188)min	11.75"/126 min	14"
Weight	35 lbs	.....	.....	.....
Portable, rack mount	No	14" (24") rack	19"	19"
Color standards	NTSC	NTSC	NTSC	PAL/SECAM
<b>Reader Service Number</b>	<b>851</b>	<b>852</b>	<b>853</b>	<b>854</b>

## Small Format VCRs

These video recorders use 1/2" cassettes and Betacam or M-II recording format. Typically, studio units include full metering with possible switching for video input/tracking and time code monitoring. RS-422 remote control and full feature editing are available on studio systems. Back space editing is typical on portable units. Betacam SP and M-II models offer two channels of AFM audio which is recorded with video by the scanner heads. Dolby C noise reduction is standard unless marked with a diamond (◆).

Manufacturer	Ampex AVS		BTS Broadcast Television Systems		Hitachi Denshi
	Betacam	Betacam SP	Betacam	Betacam SP	M format
Models					
Docking units	CVR-1A	CVR-5	BCB-5	BCB-5	.....
Recorder units	CVR-25 portable CVR-40 studio editor	CVR-35 portable CVR-75 studio	BCB-25 portable BCB-40 studio editor	BCB-35 portable BCB-75 studio	◆HR-50 portable
Play only units	CVR-10/15 studio CVR-21 portable	.....	BCB10/15 BCB-21 portable		
Video parameters					
Luma response	-6, +0.5dB 4.1MHz	-6, +0.5dB 5.5MHz	-6, +0.5dB 4.1MHz	-6, +0.5dB 5.5MHz	-3dB 3.6MHz
Chroma response	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-1dB 1MHz
Video S/N ratio	48dB N, 46dB P/S	51dB N, 50dB P	48dB N, 46dB P/S	51dB N, 50dB P	>47dB L/>48dB C
Composite	NTSC, PAL, SECAM	NTSC, PAL	NTSC, PAL, SECAM	NTSC, PAL	NTSC
Component	YCrCb, Y-C	YCrCb, Y-C	YCrCb, Y-C	YCrCb, Y-C	YIQ
Audio parameters					
Response	±3dB 50-15k	-3, +1.5dB 50-15k	±3dB 50-15k	-3, +1.5dB 50-15km	±3dB 50-15k
S/N ratio	>50dB w/o NRS	>53dB w/o NRS	>50dB w/o NRS	>53dB w/o NRS	>50dB
Distortion	<2%	<1% 1kHz	<2%	<1% 1kHzm	.....
No. of tracks	2	2 analog/2 AFM	2	2 analog/2 AFM	2 analog
Variable tracking	CVR-15	CVR-75	CVR-15/ CVR-15/40	CVR-75	No
TBC facilities	CVR-15/40	CVR-75		CVR-75	No
<b>Reader Service Number</b>	<b>856</b>	<b>857</b>	<b>858</b>	<b>859</b>	<b>860</b>

Manufacturer	JVC Company	Panasonic Broadcast	Sony Broadcast		Thomson Video
	M-II	M-II	Betacam	Betacam SP	Betacam
Models					
Docking units	KR-X200U	AU-400	BVW-1A	BVW-5	MA1611A
Recorder units	KR-X400U portable KR-X800U studio KR-Z800U editor	AU-500 AU-600/650 studio AU-620 editor	BVW-25 portable BVW-40 studio editor	BVW-35 portable BVW-75 studio	TTV3625 (3626) TTV3635
Play only units		AU-505 portable	BVW-10/15 studio BVW-21 portable		TTV3615 (3616)
Video parameters					
Luma response	-3, +0.5dB 4.5MHz	-3, +0.5dB 4.5MHz	-6, +0.5dB 4.1MHz	-6, +0.5dB 5.5MHz	-6, +0.5dB 4.4MHz
Chroma response	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz	-3, +0.5dB 1.5MHz
Video S/N ratio	50dB L, 50dB C	50dB L, 50dB C	48dB N, 46dB P/S	51dB N, 50dB P	48dB N, 46dB P/S
Composite	NTSC out	NTSC out	NTSC, PAL, SECAM	NTSC, PAL	N/P/S (P/S)
Component	YCrCb, Y-C	YCrCb, Y-C	YCrCb, Y-C	YCrCb, Y-C	YCrCb, Y-C

## Small Format VCRs

Manufacturer	JVC Company	Panasonic Broadcast	Sony Broadcast	Thomson Video	
Format	M-II	M-II	Betacam	Betacam SP	
Audio parameters					
Response	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k	±3dB 50-15k	-3, +1.5dB 50-15k	±3dB 50-15k
S/N ratio	56dB unwt'd	56dB unwt'd	>50dB w/o NRS	>53dB w/o NRS	>50dB w/o NRS
Distortion	1% 8dBm 1kHz	1% 8dBm 1kHz	<2%	<1% 1kHz	<2%
No. of tracks	2 analog, 2 AFM	2 analog, 2 AFM	2	2 analog/2 AFM	2
Variable tracking	.....	AU-650	BVW-15	BWV-75	(3616)
TBC facilities	.....	Integral	BVW-10/15/40	.....	3615(16)/3635
Reader Service Number	861	862	863	864	865

## Videocassette Recorders, 3/4" U-matic

These videocassette systems use 3/4" or 19mm cassette tape media. A reference input of sync and subcarrier may be used. Luminance resolution is approximately 340 TVL, while chroma resolution is 260 TVL. All require an external TBC for on-air or production system applications. A time code track is standard. Models listed are NTSC standard. When applicable for PAL, a bullet (•) is used; for SECAM, a star (★). Studio units include full metering and full editing facilities, while portable units typically provide switchable metering and backspace editing only.

Manufacturer	JVC Company	Sony Broadcast	Thomson Video Equipment
Format	Standard	Standard	SP
Models			
Portable units	CR-4900U	•★BVU-50/110	•★TTV3905S/P
Player units	CP-5200U/5550U		
Record units	CR-600U/6650U		•★TTV3901 portable
Editing units	CR-850U/8250U	•★BVU-800/820	•★TTV3915/3916
Video parameters			
Response C/L	260 TVL C/340 L	260 TVL C/340 L	340TVL
S/N ratio	49dB L, 47dB C	49dB L, 47dB C	>50dB L, >47dB C
AGC control	Yes	Yes	Yes
Audio parameters			
Input connection	Bal, 600/10kΩ	Xfmr bal, 3k/10kΩ	Bal 3k/10kΩ
Output connection	Bal, low Z	600Ω (not -50)	Bal low-Z
Output level	0dBs	+4dBm (not -50)	+4dBm
S/N ratio	>48dB	48dB, 3% THD	>52dB, 3% THD
Distortion	<3%	<2.5%	<2%
LTC modules	External units	Integral 800/820	Integral
VITC modules	No	External required	External
Remote control format	RS-422/45-pin	RS-422	RS-422
Reference input	Sync, subc	Sync, subc	Sync, subc
System TBC	External	External	External
RF Y-C dub in/out	Yes	Yes	Yes
Variable tracking	No	On 820	No
Reader Service Number	704	705	706

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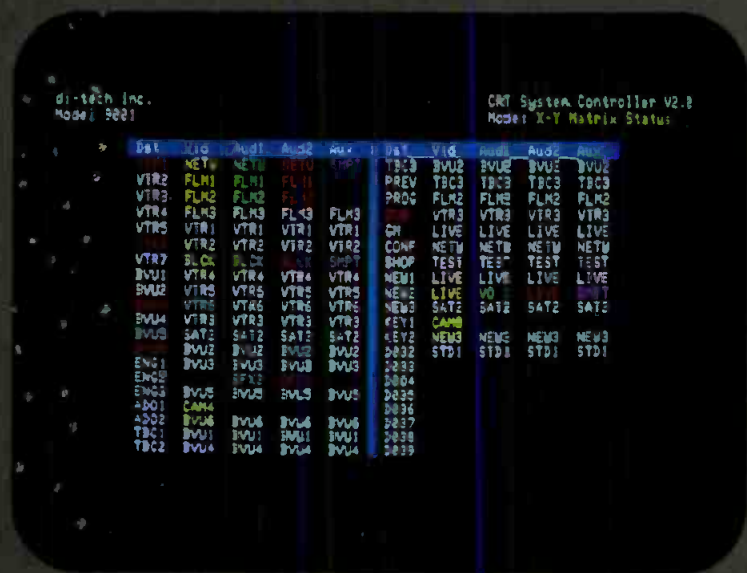
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Ampex Corp. (MTD)	60	202	415/367-2911	Lamp Technology Inc.	108	58	516/454-6464
Aphex Systems Ltd.	203	126	818/765-2212	Leitch Video of America	35	18	804/424-7290
Applied Research & Technology	88	46	716/436-2720	Lenco Electronics	53	28	314/243-3147
Arrakis Systems, Inc.	93	203	303/224-2248	MCG Electronics	233	151	516/586-5125
Audio Precision	98	50	800/231-7350	Magna-Tech Electronics Co., Inc.	199	122	212/586-7240
Audio Technologies Inc.	200	123	215/443-0330	Magni Systems, Inc.	69	35	503/626-8400
Audio-Video Engineering Co.	159	101	516/546-4239	Microtime, Inc.	151	98	
Audiolab Electronics	217	140	916/485-0500	Midwest Communications Corp.	1	3	800/543-1584
Barco Industries Inc.	131	76	408/370-3721	Mikrolab	217	143	213/306-0120
Barcus-Berry Electronics	43	225	800/233-8346	Moseley Associates Inc.	81	42	806/968-9621
Basys	77	39	800/847-0653	Nakamichi USA Corp.	189	114	213/538-8150
Belden Wire and Cable	125	72	800/BELDEN4	Nautel	100	51	902/823-2233
Berc	153	99	818/841-3000	Neve, Inc.	169	207	203/744-6230
Bogner Broadcast Equipment Corp.	89	47	516/997-7800	Northstar	109,214	138	206/885-4730
Boonton Electronics Corp.	39	20	201-584-1077	Nortronics Co., Inc.	201	125	800/328-5640
Broadcast Services Co.	106		919/934-6869	Nova Systems, Inc.	141	84	203/677-5252
Broadcast Video Systems Ltd.	122	69	416/764-1584	Nova Systems, Inc.	142	85	203/677-5252
BTS Broadcast Television Systems	23	12	801/972-8000	Nova Systems, Inc.	143	93	203/677-5252
Caig Laboratories, Inc.	210	132	619/743-7143	Odetics, Inc.	187	113	800/243-2001
Calhoun Satellite Communications	212	135	800/652-6789	Omicron Video	159	100	818/700-0742
Camera Mart, Inc.	58	31	212/757-6977	Opamp Labs Inc.	142	86	213/934-3566
Canare Cable, Inc.	207	130	818/840-0993	Orban Associates Inc.	7	6	800/227-4498
Canon USA Inc., Broadcast Lens	44-45	23	516/488-6700	Osborne, Alan	106	56	805/495-8420
Canon USA Inc., Broadcast Lens	183	111	516/488-6700	Paco Electronics	211	133	213/747-6540
Capitol Magnetics	197	121	213/461-2701	Perrott Engineering	229	148	703/532-0700
Cemtyx S.A.	85	44		Pesa Electronica S.A.	65	33	800/872-7372
Centro Corp.	27	14	619/560-1578	Philips Test and Measuring Instruments	139	82	201/529-3800
Cetec Vega	196	120	818/442-0782	Pinnacle Systems, Inc.	163	102	408/970-8787
Christie Electric Corp.	205	127	800/421-2955	Polyline Corp.	215	141	312/297-0955
Cipher Digital, Inc.	120	67	301/695-0200	Polyphaser Corp.	212	134	800/325-7170
Circuit Research Labs, Inc.	13	7	800/535-7648	QEI	237	152	800/334-9154
Clear-Com Intercom Systems	207	129	415/861-6666	Racal-Decca	167	104	416/457-8720
CMX/Chyron	66,67	34	800/932-3400	Ramsa/Panasonic	9	200	
Comark	19	10	215/822-0777	Rank Cintel	99	38	312/297-7720
Conex Electro Systems	42	22	206/734-4323	Rank Cintel	193	118	312/297-7720
Continental Electronics, Div. of Varian	229	149	214/381-7161	Richardson Electronics Ltd.	83	43	800/323-1770
Continental Video Brokers	168	105	800/663-6211	ROH	215	142	800/262-4671
Cottonwood Communications, Inc.	95,127	74	800/826-7025	ROH	209	128	800/262-4671
Current Technology Inc.	105	55	214/238-5300	Russo	217	144	209/291-5591
Datatek, Inc.	25	13	201/654-8100	Scip Electronics Systems	209	131	213/454-1889
Datum Inc.	123	71	714/533-6333	Sescom, Inc.	143	90	800/634-3457
Delta Electronics	21	11	703/354-3350	Shively Labs	108	59	207/747-3327
DiTech Inc.	IBC	2	516/867-8300	Siemens-Neve	169	207	203/744-6230
Dialight Corporation	73	37	201/223-9400	Skotel Corp.	188	106	514/465-8990
Digital Video Systems Div.	115	64	416/299-6888	Solid State Logic Ltd.	173	107	212/315-1111
DYMA Engineering	214	139	800/222-3962	Sound Technology	10	201	408/378-6540
Dynatech Data Systems	101	52	800/368-2210	Spectrum Communications	213	136	215/631-1710
EEV, Inc.	231	150	914/592-6050	Standard Tape Laboratory, Inc.	142	87	415/786-3546
Emcor Products	51	27	507/289-3371	Studer Revox America Inc.	29	15	615/254-5651
ESE	107	57	914/592-6050	Surcom Associates Inc.	133	79	619/722-6162
Evertz Microsystems Ltd.	94	204	416/335-3700	Swintek Telecommunications Div.	200	124	408/378-8091
Fairlight Instruments	37	19	213/470-6280	Tamron Industries, Inc.	87	45	516/883-8800
Faroudja Laboratories Inc.	119	66	408/245-1492	TASCAM Div. TEAC Corp. of America	170	208	213/726-0303
For-A Corp. of America	129	75	213/402-5391	Tektronix Inc.	219	209	800/452-1877
Fostex Corp. of America	177	108	213/921-1112	Tektronix Inc.	220	210	800/452-1877
Fujinon Inc.	55	29	914/472-9800	Telemet	104	54	516/842-2300
Gentner	191	117	801/268-1117	Television Technology Corp.	63	32	303/465-4141
Gentner RF Technology	218	145	408/926-3400	Tentel	146	95	800/538-6894
GML America Inc.	145	94	703/790-0101	Thomson Video Equipment	33	17	
Grass Valley Group, Inc.	5	5	916/273-8421	Total Spectrum Manufacturing, Inc.	57	30	914/358-8820
Grass Valley Group, Inc.	126	73	916/273-8421	TTE, Inc.	213	137	213/478-8224
Grass Valley Group, Inc.	117	65	916/273-8421	UREI	71	36	818/893-8411
Grass Valley Group, Inc.	133	80	916/273-8421	Ultimate Corp.	132	77	818/345-5525
Gray Engineering Laboratories	147	96	912/883-2121	United Ropeworks (U.S.A.) Inc.	80	41	215/855-8450
Hannay Reels	179	109	518/797-3791	Utah Scientific Inc.	47		800/453-8782
Hedco	110	62	916/273-9524	Utah Scientific Inc.	48-49	26	800/453-8782
Hitachi Denshi America Ltd.	3	4	800/645-7510	Varian	239	153	415/592-1221
HM Electronics	79	40	619/578-8300	Vid Video	109	60	800/826-2035
Hotronic, Inc.	135	81	408/292-1176	Videotek, Inc.	114	63	602/997-7523
Howe Technology	97	48	800/525-7520	Ward-Beck Systems Ltd.	BC		416/438-6550
Hubbard Communications, Inc.	41	21	813/577-7759	Western Electronics Products Co.	132	78	714/492-4677
				Yamaha International Corp.	30-31	16	

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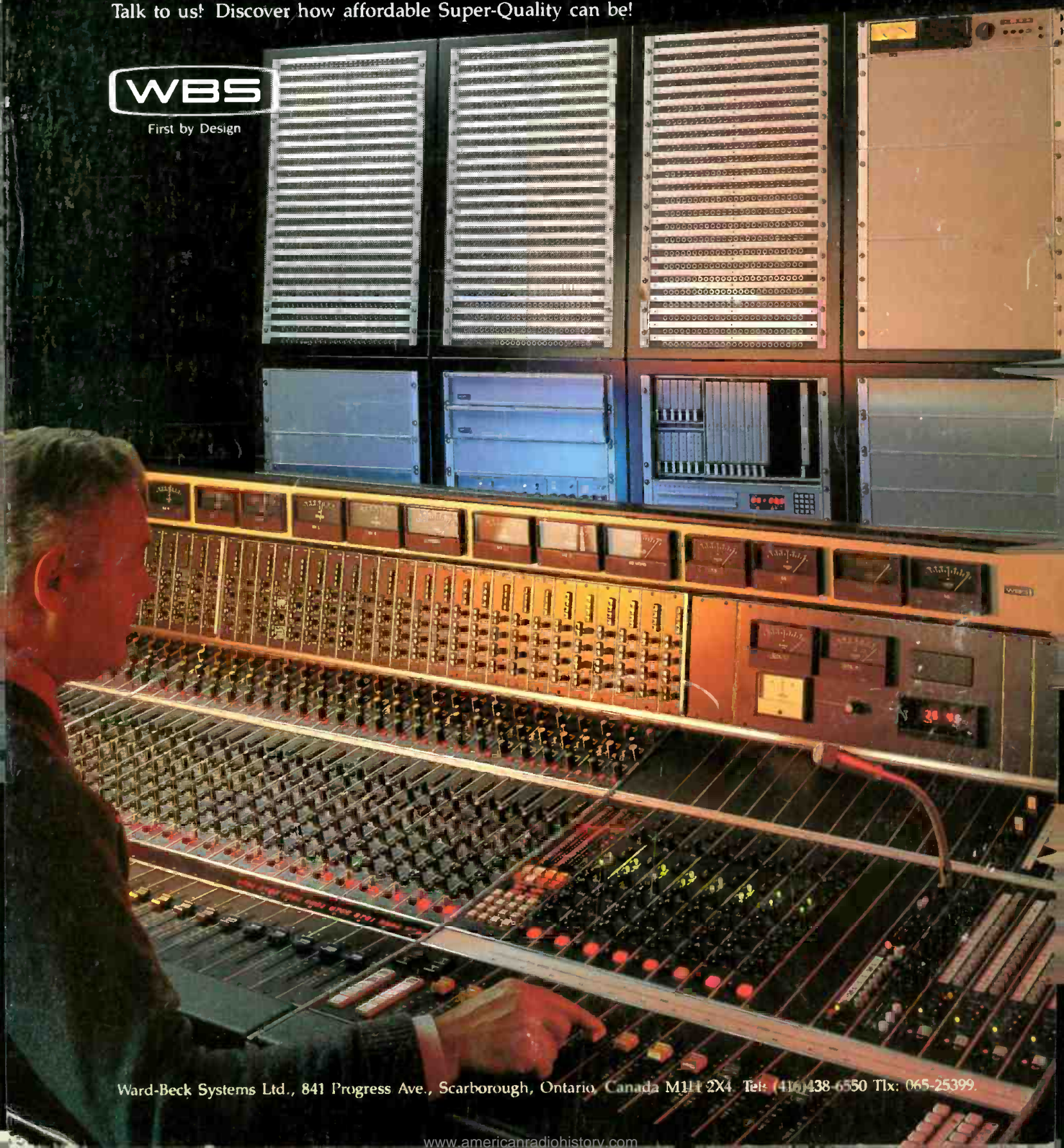
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