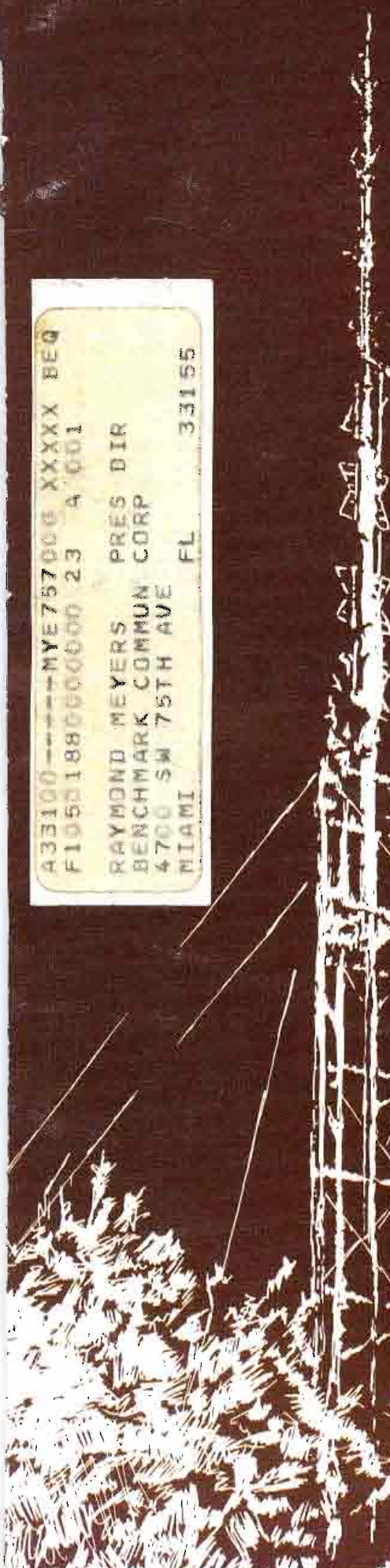
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AN INTERTEC PUBLICATION

1989 Annual Issue/$20

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1989 Buyers' Guide/ Spec Book

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Standard on ours is "N/A" on theirs.



Every recorder in the C270 Series comes *loaded* with professional features that aren't available—not even as options—on "comparable" machines from other manufacturers . . .

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- **Seamless and gapless punch-in and punch-out**
- **Integral scrape-flutter filter in head assembly**
- **Constant tape tension on both spooling motors**
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- **Fully modular audio electronics allowing quick interchange of individual circuit elements**
- **Front access to all audio electronics, even when rack-mounted**
- **Plug-in record and reproduce equalizers for optimal performance and easy speed pair conversion**
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- **Adjustable Mute-to-Play time of audio output from 50 to 990 msec**
- **Built-in variable speed allows −33% to +50% range**
- **Selectable library wind and record inhibit**
- **Optical End-of-Tape Sensor**
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Plus, other features *standard* on the C270 Series that are available *only* as options on other machines . . .

- **Fader start circuitry**
- **RS 232 serial port allows full control of *all* machine functions**
- **Rack mount adapters**

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But one feature built into the C27 Series no one else has *ever* been able t offer . . . the Studer Revox 40-year reputa tion for reliability and unequale performance.

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SPECIAL ISSUE: BUYERS' GUIDE/SPEC BOOK
1989 BG/SB Volume 30 Number 13

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BUYERS' GUIDE

11 **Product directory**
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If you ever need the address and/or telephone number to contact a company, this directory provides the most up-to-date information.

95 **Dealers/distributors**
This directory puts you in close contact with the dealers and distributors within particular states that carry the equipment you need.

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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.)

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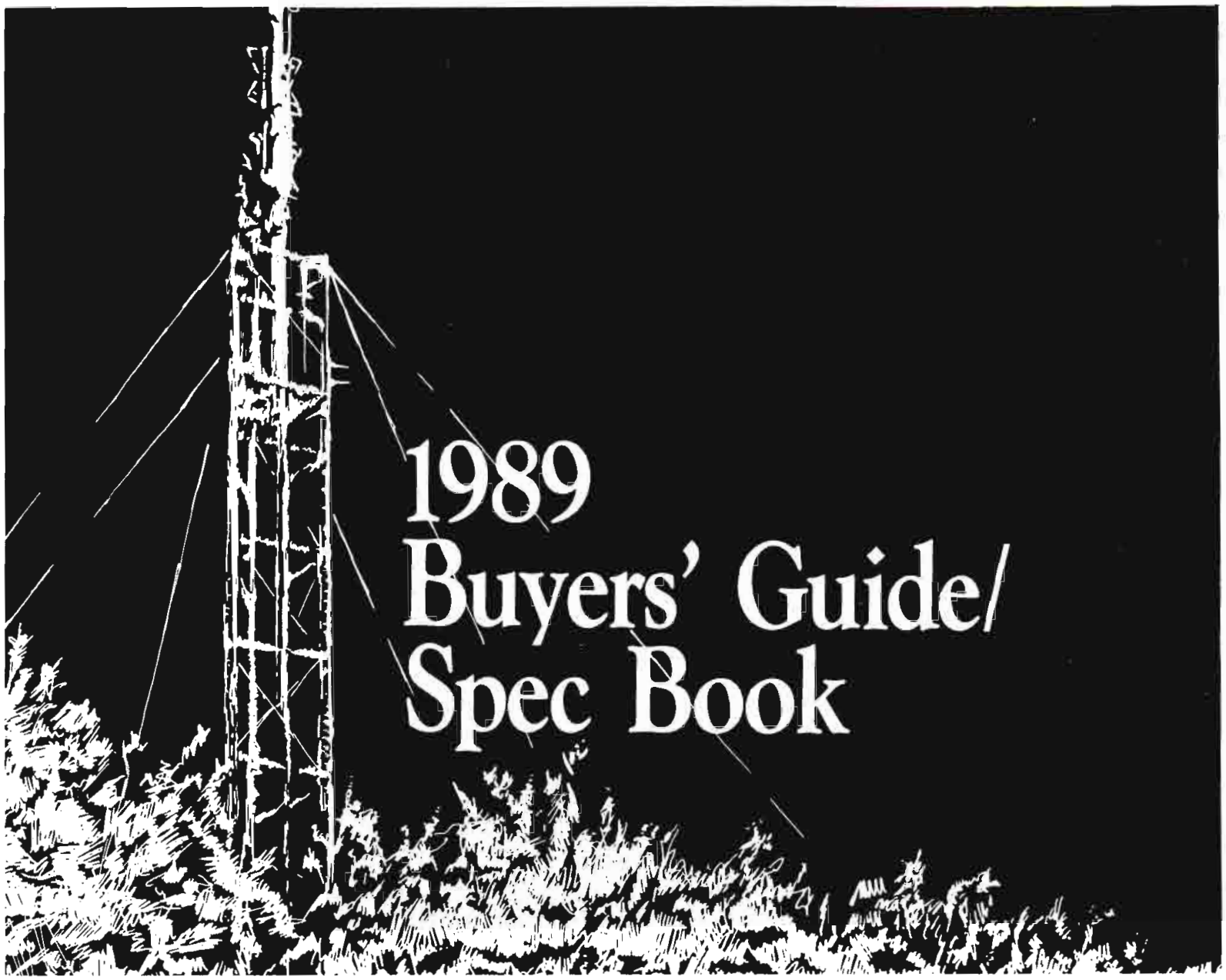
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1989 Buyers' Guide/ Spec Book

With this 1989 **Broadcast Engineering** Buyers' Guide/Spec Book, we bring you the latest information about the numerous companies and their products supplying the broadcast community. The dynamic nature of the industry makes this particular issue a challenge. We have been tracking new product line introductions as well as company relocations, name changes, new phone numbers and names to contact. Our later publication date did allow us to keep information lines open longer.

This volume is divided into several sections. Fold-out tabs aid in the quick location of:

•Product Listings—These are listings of manufacturers for each type of equipment. In order to locate products easier, categories are broken into seven general areas: audio equipment, video equipment, RF equipment, monitoring equipment, automation/computer products, miscellaneous equipment and services.

•Manufacturers' Addresses—With these addresses and phone numbers you can make direct contact with the companies. There are more than 1,100 included in our directory this year.

•Dealers/Distributors—This is a convenient way to locate a source of equipment close to your location for many of your needs. Dealers and distributors are listed by states with generic product categories.

•The Spec Book section—a means to compare specifications between numerous products in selected categories of video, audio, RF and test & measurement.

A few words about Spec Book are in order. First, more than 40 different product types are included, with major specifications presented side-by-side to allow simple comparisons. A wide range of equipment is presented, 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 additional models that will more closely fit your needs and budgets. Reader Service Numbers for each of the products will bring you material about the products you select, and you may elect to have the manufacturers contact you to discuss your needs. The names of advertisers in this issue are highlighted in blue. The advertisements may offer other information about your equipment needs.

Spec Book is presented as a place to start your search for new or replacement equipment. Make your final decisions only after you have discussed your needs with the manufacturers. Every effort has been made to present accurate information, but we suggest you check with manufacturers for possible changes resulting from equipment upgrades. For numerous reasons, pricing information cannot be included.

As you are aware, many digital products have been introduced into this industry in the last year. Because of the nature of digital products, comparison of their specifications with traditional designs often appear irrational. For that reason, many of those digital products are not included in this issue. However, be advised that Spec Book will be undergoing a major redesign before the 1990 edition to encompass digital and other product areas.

As always, the staff of **Broadcast Engineering** appreciates the chance to bring you this annual reference issue. If you have questions or suggestions, you will find the staff ready to listen and to offer a hand in locating additional information whenever possible. The purpose of our publication is to serve this industry, of which you are the most important part. Our goal is to assist you in continuing to be an active member of the world of broadcasting.

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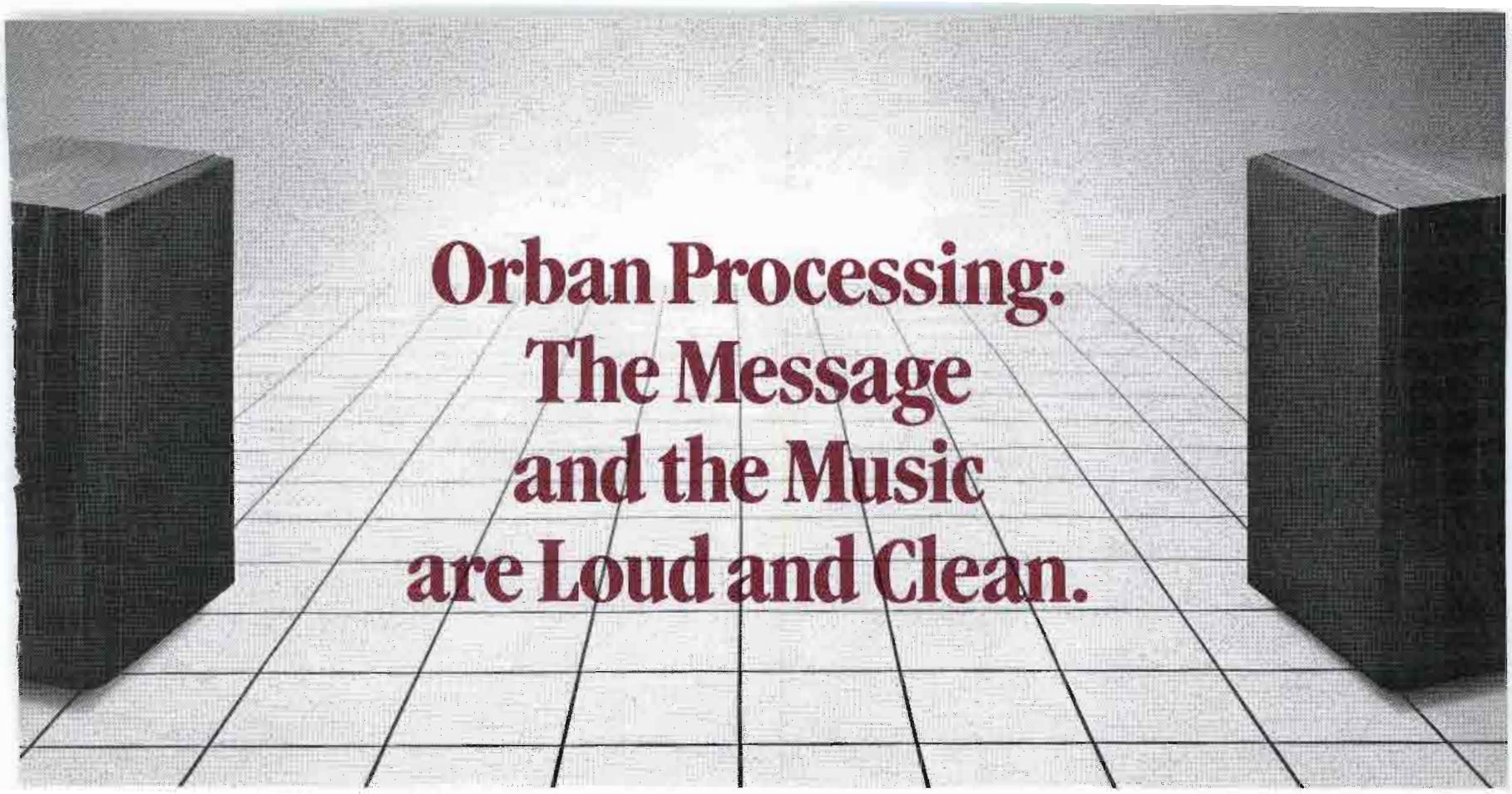
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Kingston, PA 18704
717-283-1041

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

Lake Systems Company
287 Grove St.
Newton, MA 02166
617-244-6881
FAX 617-527-3159

Landy Associates
1890 Marlton Pike
Cherry Hill, NJ 08003
609-424-4660

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

Lerro
3127 N. Broad St.
Philadelphia, PA 12132
215-223-8200

Lowel-Light Mfg.
475 Tenth Ave.
New York, NY 10018
212-947-0950

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

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

Markertek Video Supply
145 Ulster Ave.
Saugerties, NY 12477
914-246-3036

Matthews Studio Equipment
2405 Empire Ave.
Burbank, CA 91504
818-843-6715

McCurdy Radio Industries
346 Colfax St.
Palatine, IL 60067
312-358-3330

MCG Electronics
12 Burt Drive
Deer Park, NY 11729
516-685-5125

MicroAudio
4438 S.W. Hewett
Portland, OR 97221
503-292-8896

Micron Audio
210 Westlake Drive
Valhalla, NY 10595
914-761-6520

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

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Edgewood, KY 41017
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(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
4121 Redwood Ave., #215
Los Angeles, CA 90066
213-306-0120

Modular Audio Products
One Roned Road
Shirley, NY 11967
516-345-3100

Mohawk Wire & Cable
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Leominster, MA 01453
508-537-9961

Multidyne Electronics
P.O. Box 528
Locust Valley, NY 11560
516-671-7278

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Halifax County, Nova Scotia
Canada B0J 3J0
902-823-2233
(Bangor ME)
207-947-8200

Nortronics
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Minneapolis, MN 55427
612-540-8671

Nova Systems
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Canton, CT 06019
203-693-0238

NTSC Productions
3208 Cahuenga Blvd. W., #333
Hollywood, cA 90068
818-505-9430

NURAD
2165 Druid Park Drive
Baltimore, MD 21211
301-462-1700

O'Connor Engineering
100 Kalmus Drive
Costa Mesa, CA 92626
714-979-3993

Omega International
2691 Richter, #116
Irvine, CA 92714
714-553-0564

Omicron Video
22251 Roscoe Blvd.
Canoga Park, CA 91304
818-700-0742

Opamp Labs
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Los Angeles, CA 90038
213-934-3566

Orban Associates
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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

Otari
378 Vintage Park Drive
Foster City, CA 94404
415-341-5900

Periphex
149 Palmer Road
Southbury, CT 06488
203-264-3985

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

PI Rod Inc.
P.O. Box 128
Plymouth, IN 46563-0128
219-936-4221

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

Pro Video Sales
1001 Sussex Blvd
Broomall, PA 19008
215-328-7448

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Williamstown, NJ 08094
609-728-2020

Quanta
2440 S. Progress Drive
Salt Lake City, UT 84119
801-974-0992

Radio Systems
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Edgemont, PA 19028
215-356-4700

RAM Broadcast Systems
346 W. Colfax St.
Palatine, IL 60067
312-358-3330

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

RANE Corporation
10802 47th Ave. W.
Everett, WA 98204-3400
206-355-6000

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

ROH
913 W. 223rd St.
Torrance, CA 90502
213-533-1498

Rohde & Schwarz
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Lanham, MD 20706
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(Munich, W. Germany)
089-4129-2230

Ross Video
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Iroquois, Ontario
Canada K0E 1K0
613-652-4886

RTS Systems
1100 West Chestnut St.
Burbank, CA 91506
818-840-7119

S.C.A. Data Systems
3000 Ocean Park Blvd., #3002
Santa Monica, CA 90405
213-452-2506

S.W.R.
RD 3, Route 77
North Weare, NH 03281
603-529-2500

Sennheiser Electronics
6 Vista Drive
Old Lyme, CT 06371
203-434-9190

Sescom
2100 Ward Drive
Henderson, NV 89015
702-565-3400

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36 Harrison Road
Bridgton, ME 04009
207-647-3327

Sony Magnetic Tape
One Sony Drive
Park Ridge, NJ 07656
201-930-6087

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

Stanton Magnetics
Terminal Drive
Plainview, NY 11803
516-349-0235

Studer Revox America
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415-930-9866
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Oceanside, CA 92054
619-722-6162

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Plymouth Meeting, PA 19462
215-825-4990

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214-550-0525
(Washington, DC)
301-948-7151

Telemetrics
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Hawthorne, NY 07506
201-423-0347

Telepak
4783 Ruffner St.
San Diego, CA 92111
619-268-8559

Television Technology/TTC
P.O. Box 1385
Broomfield, CO 80020-8385
303-665-8000

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

Thomson Video Equipement
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F-95000 Cergy
St. Christophe, France
Phone (1) 34 20 70 00
Telex 204780 F

Thomson-CSF/LGT
1 rue de l'Hautil, BP 150
F-78702 Conflans-St. Honorine
Cedex France
Phone 331 34 90 31 00
Telex LGT 696 833 F

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

Townsend Broadcast
79 Mainline Drive
Westfield, MA 01085
413-568-9581
(Austin, TX)
512-836-2016

Townsend Test & Measuring Group
8927 J.M. Keynes Drive, #305
Charlotte, NC 28213
704-547-TEST
Fax 704-547-8829

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

United Media
4075 Leaverton Court
Anaheim, CA 92807
714-630-8020

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

Varian—Eimac
301 Industrial Way
San Carlos, CA 94070
415-592-1221

Vega/Mark IV
9900 Baldwin Place
El Monte, CA 91731
818-442-0782

Video Display
5530 E. ponce de Leon Ave.
Stone Mountain, GA 30086
404-938-2080

Videomedia
211 Weddell Drive
Sunnyvale, CA 94089
408-745-1700

Videoquip Research
595 Middlefield Road, Unit 4
Scarborough, Ontario
Canada M1V 3S2
416-293-1042

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

Vimen Equipment
275-C Marcus Blvd.
Hauppauge, NY 11788-2001
516-273-9750
(Bury St. Edmunds, England)
Phone 0284-2121

Ward-Beck Systems
941 Progress Ave.
Scarborough, Ontario
Canada M1H 2X4
Phone 416-438-6550
Telex 065-25399

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New Westminster, BC
Canada V3L 5B5
604-526-3214

Wohler Technologies
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International Music Co.
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Penny & Giles
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Pacific Recorders & Eng. Corp.
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Spectra Sonics
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Connectronics Corp.
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Philip Drake Electronics Ltd.
EELA Audio
Electro-Voice Inc.
Electronic Systems Labs, Inc.
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Howe Technologies Corp.
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Scantex Labs Inc.
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Seem Audio A.S.
Siemens
Solid State Logic
Sonosax SA
Sony Communications Products Co.
Sound Workshop Pro Audio Products
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Toshiba Corp.
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Broadcast Devices Inc.
Harris Corp. Broadcast Div.
Howe Technologies Corp.
Kintek Inc.
McCurdy Telecommunications Products
Scip Electronic Systems
Titus Technological Labs

DIGITAL AUDIO DISC SYSTEMS

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Apogee Electronics Corp.
Ariel Corp.
Audio Export Georg Neumann & Co. GmbH
Denon America, Inc.
Discrete Technology Labs, Inc.
EMT-Franz GmbH
E-mu Systems, Inc.
Fairlight Instruments, Inc.
Gotham Audio Corp.
Integrated Media Systems
Leonardo Software
Mitsubishi Int'l. Corp. Electronic Equipment Div.
Optical Disc Corp.
Panasonic Industrial Co. AV Systems Group
Ram Broadcast Systems 101
Ramsa/Panasonic 9
Schafer World Communications Corp.
Sono-Mag Corp.
Sony Communications Products Co.
Symetrix Inc.
TASCAM
3M Optical Recording

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Adams-Russell Electronics Co. ARVIS Div.
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Yamaha Music Corp., USA Pro Audio Div. 127

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UREI JBL Professional
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Brabury International
Brabury Porta-Pattern Inc.
Canford Audio plc
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Atlas/Soundolier
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Audio Export Georg Neumann & Co. GmbH
Beyer Dynamic Inc. 81
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Birns & Sawyer Inc.
Black Audio Devices
Countryman Associates Inc.
Electro-Voice Inc.
Alan Gordon Enterprises Inc.
Gotham Audio Corp.
Karl Heitz, Inc.
International Music Co.
Lee Dan Communications, Inc.
LTM Corp. of America
Micron Audio Products Ltd.
Peavey Electronics Corp.
Professional Sound Corp.
Raymer Div. University Sound
Schoeps/Posthorn Recordings
Sony Communications Products Co.
Spectra Sonics
Ultimate Support Systems

MICROPHONES, HAND-HELD/MOUNTED

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AMS/Calrec (AMS Industries Inc.)
Audio Export Georg Neumann & Co. GmbH
Audio Marketing Group
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Lee Dan Communications, Inc.
Milab Microphones
Panasonic Industrial Co. AV Systems Group
Peavey Electronics Corp.
Ramsa/Panasonic 9
Raymer Div. University Sound
Sanken Microphone Co., Ltd. c/o Pan Communications, Inc.
Schoeps/Posthorn Recordings
Schoeps Schalltechnik
Sennheiser Electronic Corp. 173
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Raymer Div. University Sound
R-Columbia Products Co., Inc.
Schoeps/Posthorn Recordings
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Swintek Enterprises, Inc.
Telex Communications, Inc.

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Sennheiser Electronic Corp. 173
Sony Communications Products Co.
Spectra Sonics
Swintek Enterprises, Inc.
Systems Wireless Ltd.
Telex Communications, Inc.
TOA Electronics, Inc.
Vega, a Mark IV Co. 202

MUSICAL INSTRUMENTS/MIDI

Akai Professional
Audio Marketing Group
Countryman Associates Inc.
Eventide Inc.
Fairlight Instruments, Inc.
Korg USA
Nady Systems Inc.
Peavey Electronics Corp.
TRW LSI Products Inc.
WaveFrame Corp.
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ADM Technology, Inc.
AEG Bayly Inc.
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PREAMPLIFIERS, MICROPHONE

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Audio Export Georg Neumann & Co. GmbH
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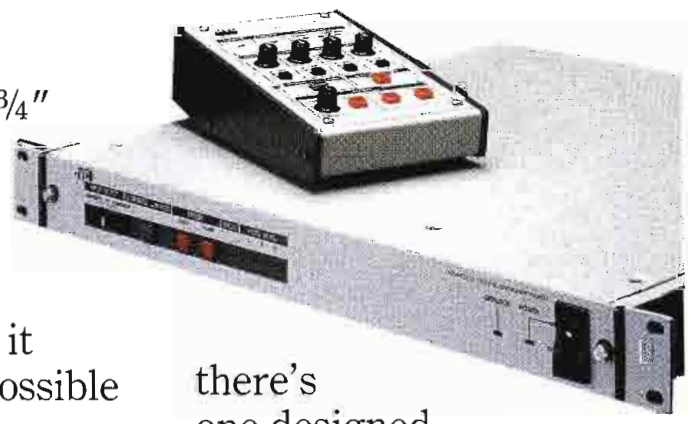


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Digitec S.A.
Discrete Technology Labs, Inc.
D&R Electronica b.v.
EDCOR
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Akai Professional
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Pacific Recorders & Eng. Corp.
Sono-Mag Corp.
Telectro Systems Corp.

REPRODUCERS, DIGITAL AUDIO, RANDOM ACCESS

AMS/Calrec (AMS Industries Inc.)
Ariel Corp.
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Brabury International
Broadcast Electronics, Inc.
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Lexicon Inc.
MEI Electronics/Microprobe
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Telectro Systems Corp.
WaveFrame Corp.

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SPEAKERS/ENCLOSURES/ HARDWARE

AMR (Audio Media Research)
Atlas/Soundolier
Audix/Digital Designs
Auernheimer Labs & Co.
Bag End Loudspeakers by Mitek
Bogen Communications, Inc.
Canford Audio plc
Carvin Corp.
Cetec Gauss
Court Acoustics Sales Ltd.
Electro-Voice Inc.
Gotham Audio Corp.
International Music Co.
JBL Professional
Klark-Teknik 151
Lee Dan Communications, Inc.
Logitek Electronic Systems, Inc.
Micro-Trak Corp.
Omnimount Systems
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Peerless Sales Co.
Ramsa/Panasonic 9
Raymer Div. University Sound
Spectra Sonics
Tannoy Ltd.
Technical Audio Devices Div. of Pioneer Electronics
Telectro Systems Corp.
TOA Electronics, Inc.
UREI JBL Professional
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Wohler Technologies, Inc. 110
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SWITCHERS, ROUTING AUDIO

A-C-E
Adams-Russell Electronics Co. ARVIS Div.
Adrienne Electronics Corp.
A.G.A.P.
Akai Professional
Arrakis Systems Inc. 21, 93
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Audio Export Georg Neumann & Co. GmbH
AVS (Audio-Visuel Systems)
R. Barth KG
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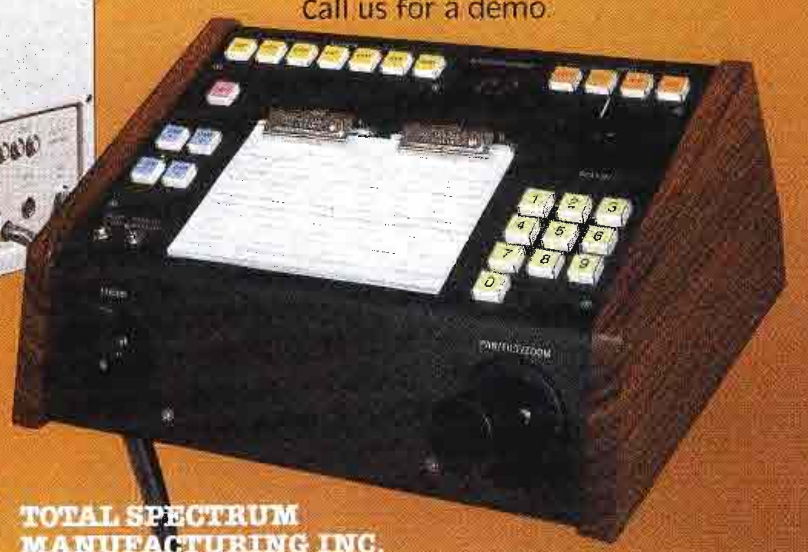
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Auditronics consoles help your hands-on people do their best work

Whether you're doing the late news or a multi-track major studio production, Auditronics consoles can change the audio mix from a chore to a pleasure.

Laid out for operator efficiency, our consoles are easy to use. With all the controls and functions the working mixer needs and no gimmicks.

200 Series
For The Small To Large Radio Broadcaster

For radio on-air and production, Auditronics 200 series consoles are supplied with six, twelve, eighteen, or twenty-four input positions. This allows the 200 to fulfill all requirements from a single newsroom operation to a multi-studio facility.

Modular construction allows a wide variety of functions to be performed by standard plug-in units that include: three band sweep equalizer, voice equalizer, compressor/limiter/noise gate, telephone interface, digital clock, event timer, remote controls for tape recorders and numerous others.

310 Series
For Television Broadcast Production/On-Air

Auditronics 310 console is an entirely new concept in console layout and construction developed specifically to meet the needs of program producers. Controls are arranged and marked for ease of use and require minimum learning time. Every needed control and function is available in a user-programmable system that interfaces live mike feeds, sound effects, VTR's, switchers, editors and other functional blocks. The 310 is an expandable system with many types of standard modules that allow you to select the exact system you need now and modify it later when desired.

400 Series
For The Major Radio Broadcaster

The 400 series is a high-performance console designed for multi-track tape production. Additionally, it may be configured as a very flexible on-air console by selecting the appropriate group of plug-in modules.

Standard mainframes are available for 12, 18 or 24 input positions, and are designed to fit into a desk-top cut-out. All the accessory functions of the 200 series are available, in addition to LED light bar metering with choice of conventional VU or peak ballistics. Complete machine control logic is standard.

1000 Series
For The Small Radio Broadcaster

Auditronics 1000 Stationmaster consoles offer all the signal quality of our larger units, but in a small package with conventional rotary knob controls and a minimum price.

Models are available from 6 to 12 mixing positions. All include illuminated push-button switching, quick-change, plug-in circuit boards and many other features usually offered only in much more expensive consoles, such as machine control logic.

200 Series



310 Series



400 Series



1000 Series



For complete information about the consoles that make audio mixing a pleasure instead of a chore, contact:

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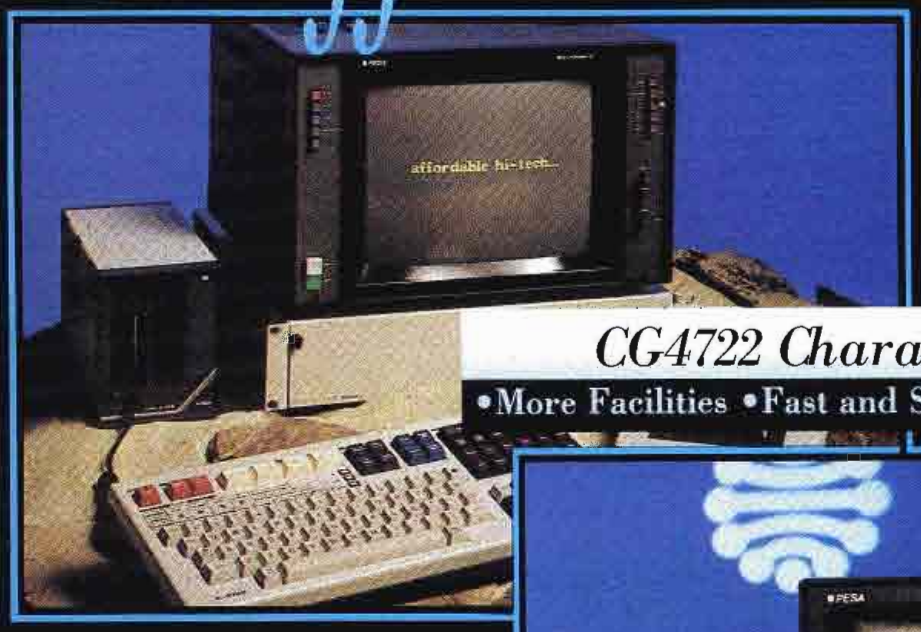
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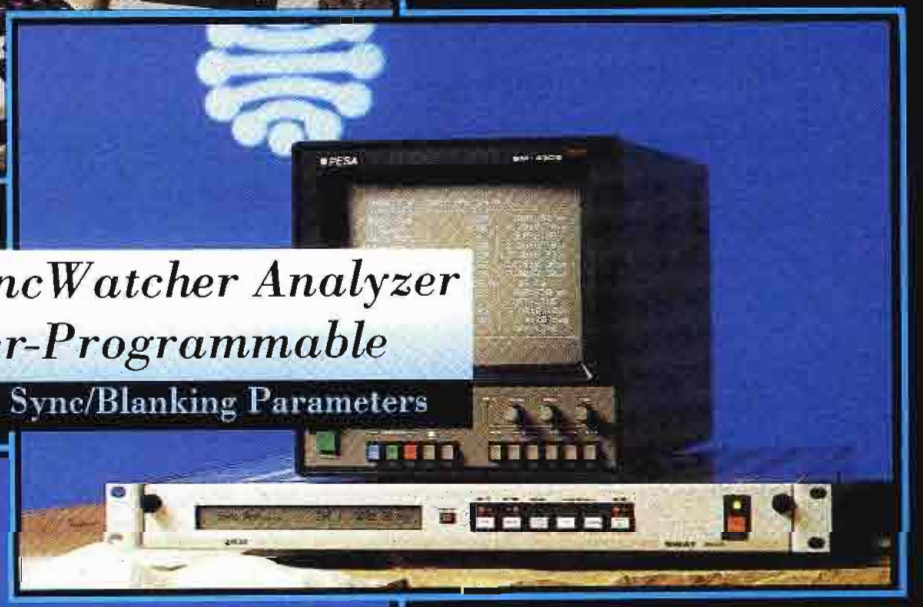
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LAMPS, STUDIO LIGHTING

Apollo Audio Visual
AVAB America Inc.
Brabury International
Walter Brewer Corp.
CAE Inc.
Cool Light Co.
Desmar Corp.
GE Lighting
GTE Sylvania Lighting U.S. Lighting Div.
Lamp Technology Inc.
Lee Colortran, Inc.
Mole-Richardson Co.
L E Nelson Sales Corp.
Packaged Lighting Systems, Inc.
Strand Century
Tekno Inc.
Thorn-EMI Studio & Theatre Lamps L. E. Nelson Sales Corp.
Times Square Stage Lighting Co., Inc.
Toshiba Corp.
VDO-PAK Products

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Tamron Industries Inc.
VMI-Visual Methods Inc.

LIGHT DIMMERS/CONTROLS

AVAB America Inc.
R.R. Beard Ltd.
Walter Brewer Corp.
CAE Inc.
Cam-Lok Inc.
Celco, Inc.
Cinemills Corp.
Cool Light Co.
Desmar Corp.
The Great American Market
Kliegl Bros. Lighting
Lee Colortran, Inc.
Lighting Methods Inc.
Lighting & Shadows A Div. of Phoebus
LTM Corp. of America
Lumitrol, Ltd.
Mole-Richardson Co.
Packaged Lighting Systems, Inc.
Siemens
Strand Century
The Superior Electric Co.
Teatronics Inc.
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LIGHT MASKING

Kliegl Bros. Lighting
Times Square Stage Lighting Co., Inc.

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Arriflex Corp.
AVAB America Inc.
R.R. Beard Ltd.
Walter Brewer Corp.
Cinemills Corp.
Cool Light Co.
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Toshiba Corp.
VDO-PAK Products

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Birns & Sawyer Inc.
Walter Brewer Corp.
Cine 60, Inc.
Cinemills Corp.
Comprehensive Video Supply Corp.
Desmar Corp.
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Colorado Video Inc.
D.O. Industries, Inc. Navitar AV Div.
World Video Inc.

PROJECTION SCREENS

Apollo Audio Visual
Bretford Mfg., Inc.
Da-Lite Screen Co., Inc.
Rosco Labs Inc.
The Screen Works, Ltd.
Sony Communications Products Co.
Theatre Service & Supply Corp.

PROJECTOR LAMPS/ACCESSORIES

Apollo Audio Visual
GTE Sylvania Lighting U.S. Lighting Div.
Kalart Victor Corp.
Piclear, Inc.
VDO-PAK Products

PROJECTORS, FILM/SLIDE

Apollo Audio Visual
D.O. Industries, Inc. Navitar AV Div.
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American Laser Systems, Inc.
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Brabury International
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Crow Broadcast Systems Ltd.
Diamond Electronics, Inc.
Nalpak Video Sales Inc.

TEST TAPES, VIDEO

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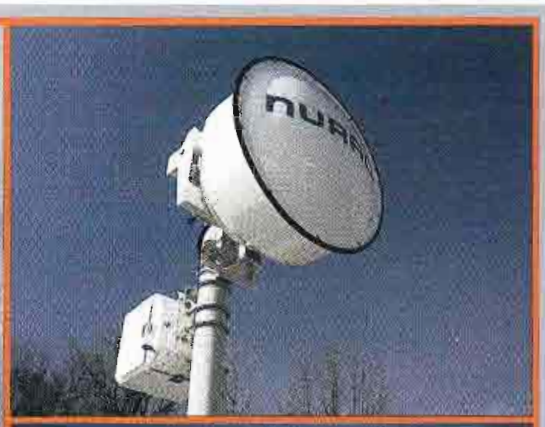
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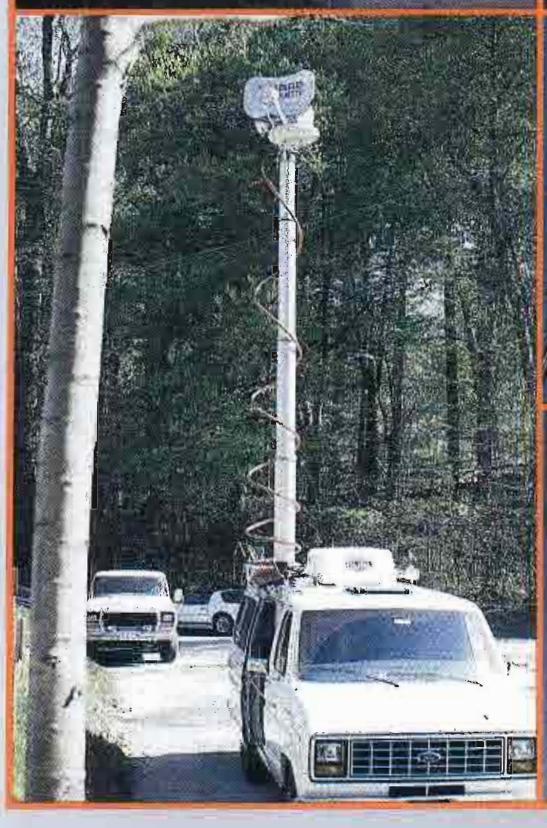
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Dynetic Systems Co. Div. MN River Aviation, Inc.
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ANTENNAS, REMOTE PICKUP

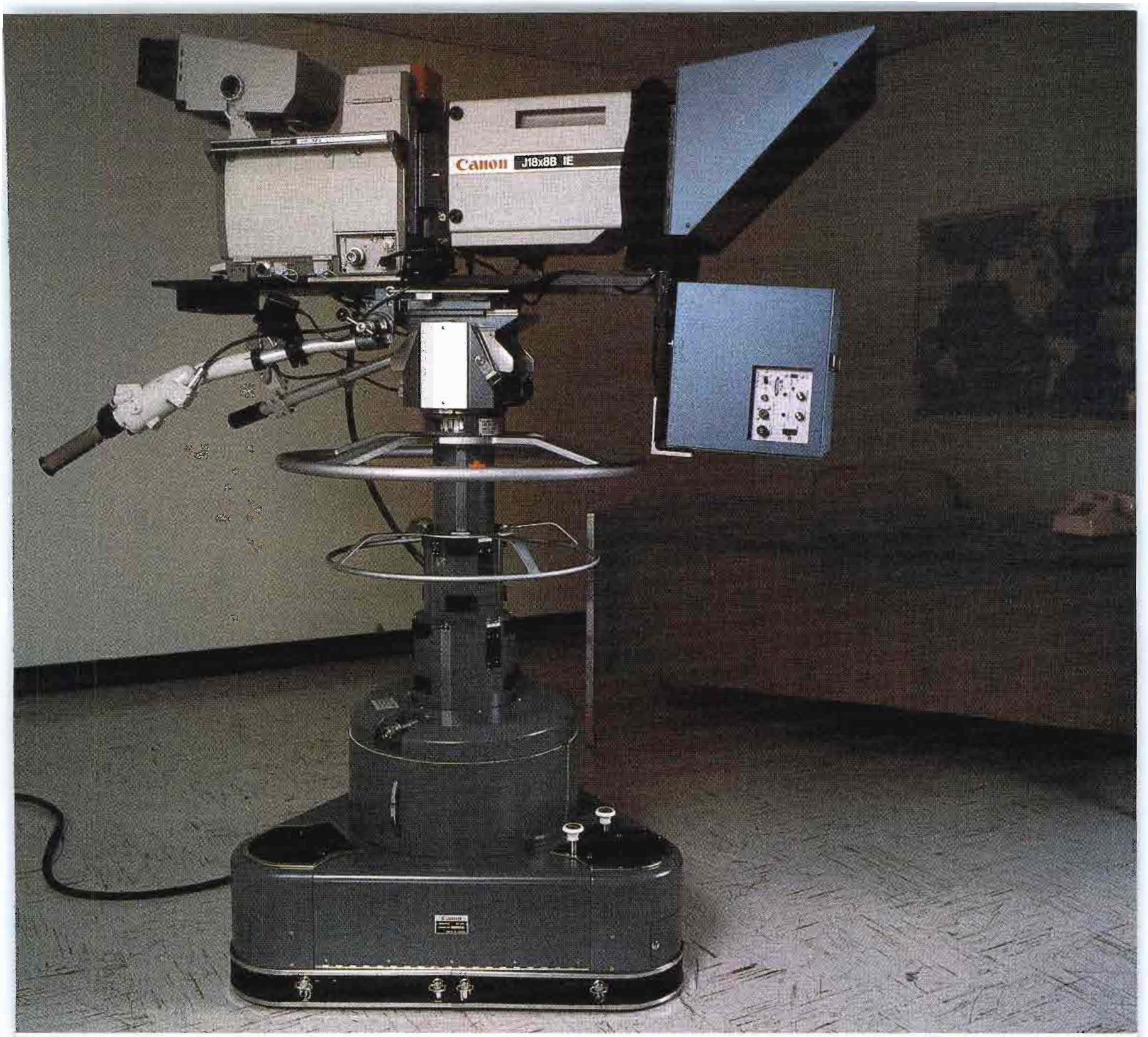
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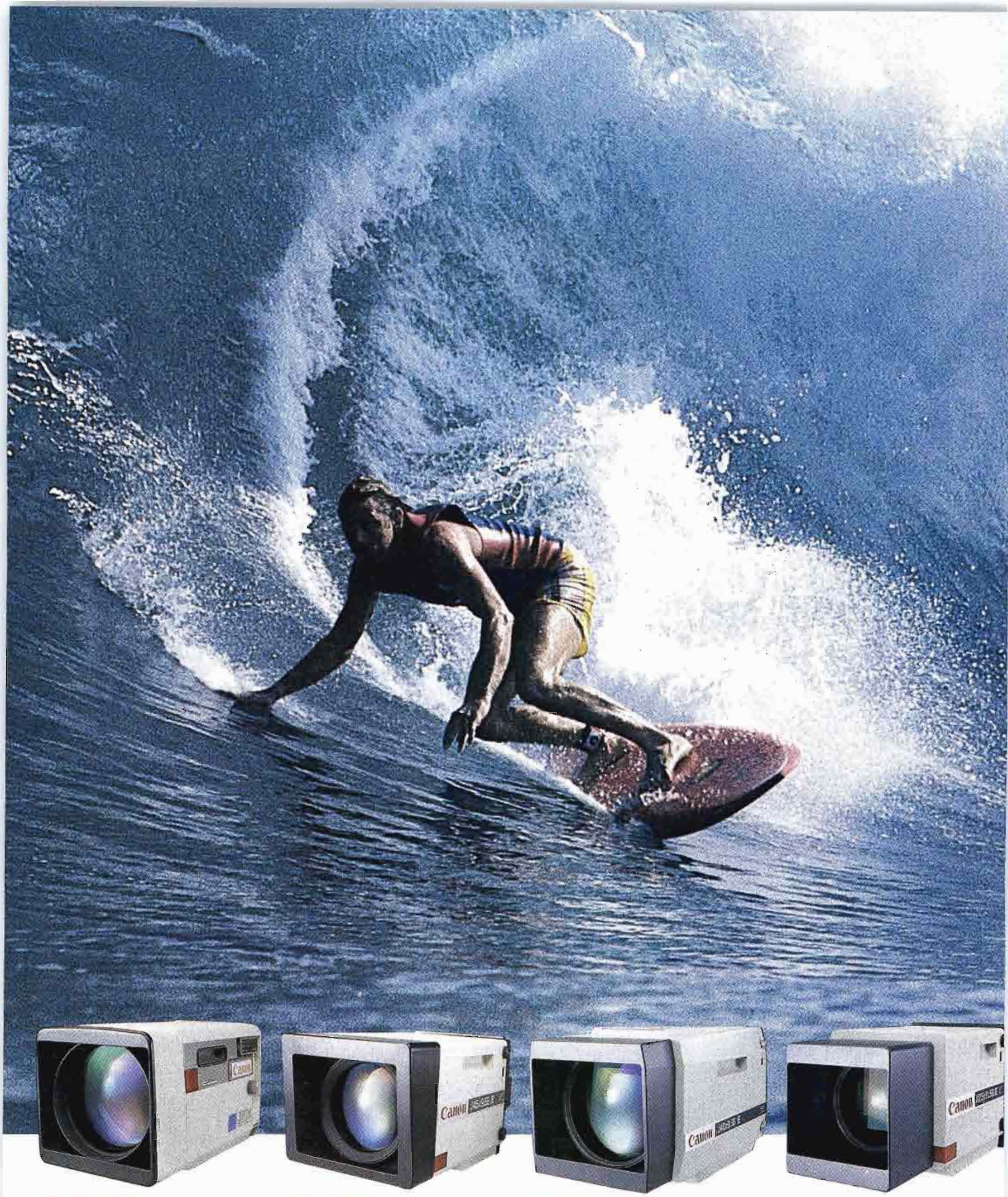
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J50X9.5BIE
for 2/3" cameras.

The ultimate lens for sports and outdoor field production events, the J50 features a powerful 50X zoom with built-in 2X extender and macrofocusing as close as 20 inches. Special J50 model featuring high-speed rotary shutter is available.

Focal length: 9.5-475mm
(19-950mm w/2X extender)
Max. Relative Aperture: 1:1.4 through 202mm
1:3.0 at 475mm

J45X9.5BIE
for 2/3" cameras.

An affordable alternative to the J50 offering a 45X zoom and a fast f/1.7 aperture. Perfect for sports and all outdoor E.F.P. applications.

Focal length: 9.5-430mm
(19-860mm w/2X extender)
Max. Relative Aperture: 1:1.7 through 201mm
1:3.0 at 430mm

J40X9.5BIE
for 2/3" cameras.

A high-resolution design featuring a super-fast f/1.2 maximum aperture and 40X reach.

Focal length: 9.5-380mm
(19-760mm w/2X extender)
Max. Relative Aperture: 1:1.2 through 190mm
1:2.0 at 380mm

J25X11.5BIE
for 2/3" cameras.

Greater flexibility—a 25X zoom lens that's equally at home in the studio or in the field. Features built-in 1.5X and 2X extenders.

Focal length: 11.5-288mm
(23-576mm w/2X extender)
Max. Relative Aperture: 1:1.6 through 220mm
1:2.1 at 288mm

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J18X8.5B4 IRS

for 2/3" cameras.

Features the longest focal length range for an ENG lens, extremely light weight, a very fast aperture and flourite glass for enhanced image reproduction.

Focal length: 8.5-153mm
(17-306mm w/2X extender)
Max. Relative Aperture: 1:1.7 through 113mm
1:2.3 at 153mm



J15X9.5IRS

for 2/3" cameras.

A lightweight that delivers like a heavyweight, the J15 offers a high M.T.F., low distortion and is CCD compatible. A high-performance model featuring a rugged, rain-proof drive unit is available.

Focal length: 9.5-143mm
(19-286mm w/2X extender)
Max. Relative Aperture: 1:1.8 through 121mm
1:2.1 at 143mm

Canon



J14X8B IRS

for 2/3" cameras.

The high-quality wide angle studio lens in an ENG package, the J14 produces excellent pictures under low light conditions.

Focal length: 8-112mm
(16-224mm w/2X extender)
Max. Relative Aperture: 1:1.7 through 91mm
1:2.1 at 112mm



J13X9B IRS IIA

for 2/3" cameras.

The portable standard—used by cameramen around the world under all conditions, the J13X9BIE IRS IIA is a proven performer with superior sharpness and sensitivity.

Focal length: 9-117mm
(18-234mm w/2X extender)
Max. Relative Aperture: 1:1.6 through 99mm
1:1.9 at 117mm



J8X6B IRS

for 2/3" cameras.

An amazing wide angle lens offering internal focusing to reduce lens size and make attaching lens accessories trouble-free.

Focal length: 6-48mm
(12-96mm w/2X extender)
Max. Relative Aperture: 1:1.7 through 33mm
1:1.9 at 48mm





J20X8.5BIE

for 2/3" cameras.

The perfect, lightweight yet flexible lens for studio and outdoor broadcast assignments offering the powerful reach of a 20X zoom.

Focal length: 8.5-170mm
(17-340mm w/2X extender)
Max. Relative Aperture: 1:1.6 through 130mm
1:2.1 at 170mm

J18X8BIE

for 2/3" cameras.

Offering a super-fast f/1.2 maximum aperture, unmatched edge-to-edge sharpness, 1.5X and 2X extenders, the J18X8 sets the new standard for 2/3" studio/field cameras.

Focal length: 8-144mm
(16-288mm w/2X extender)
Max. Relative Aperture: 1:1.2 through 123mm
1:1.4 at 144mm

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Cablewave Systems
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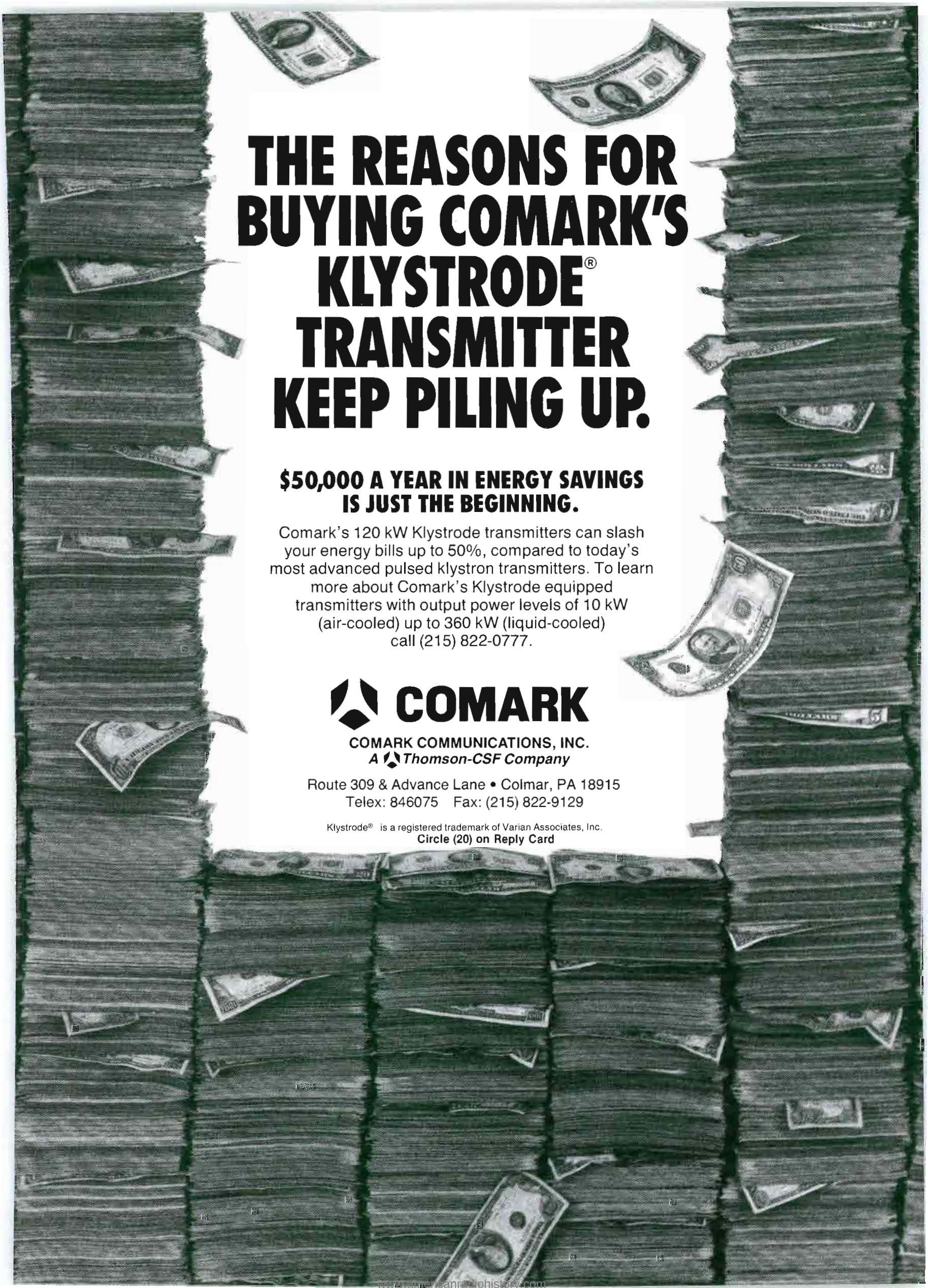
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Kahn Communications, Inc.
Lee Dan Communications, Inc.
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Potomac Instruments, Inc.
Toshiba Corp.

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Toshiba Corp.

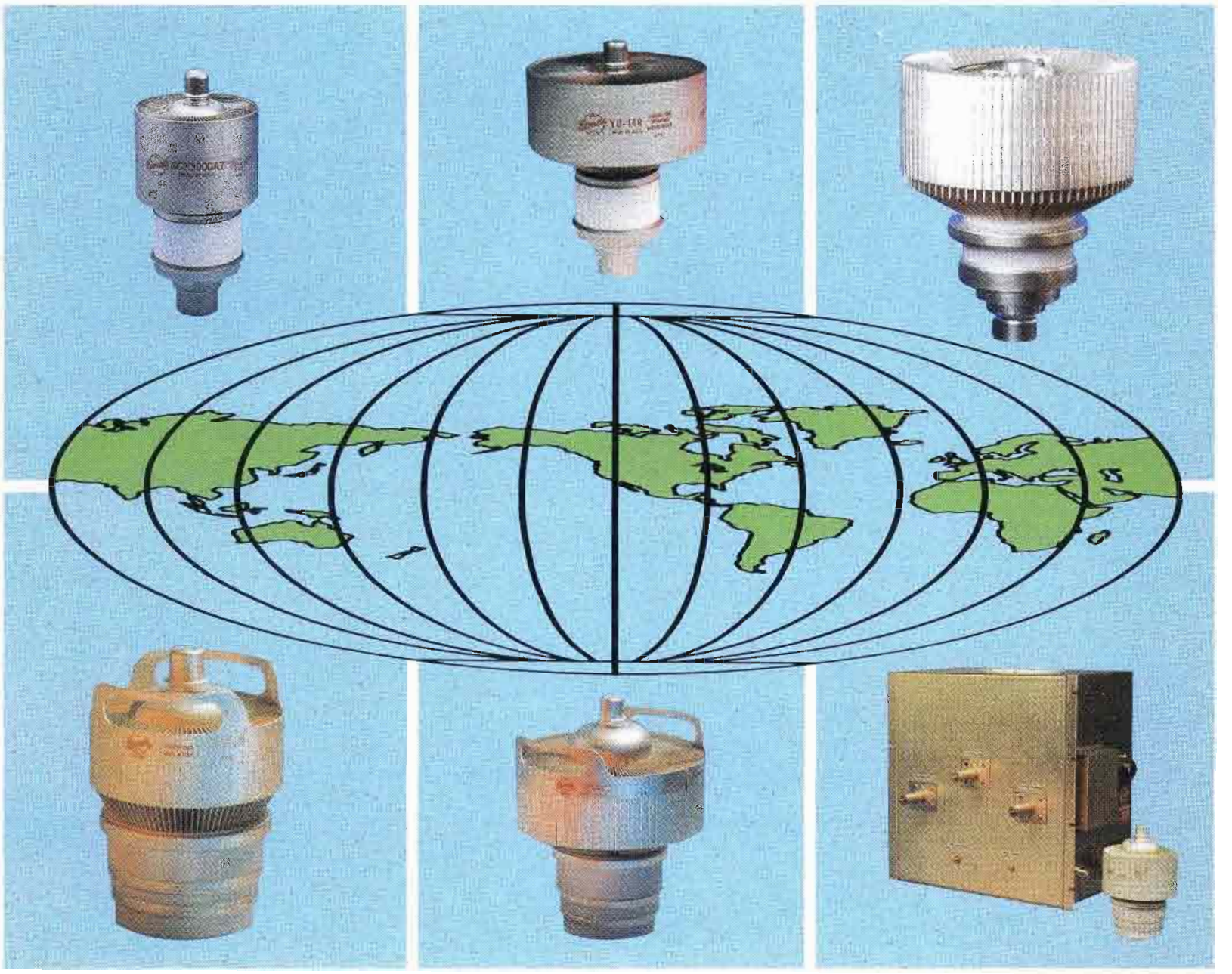
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NTP Elektronik A/S
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Schoeps/Posthorn Recordings
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Sescom, Inc.
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Ward-Beck Systems Ltd. ..... BC

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Adams-Russell Electronics Co. ARVIS Div.
A.F. Associates, Inc. 159
Amber Electro Design Inc.
Asaca/Shibasoku Corp.
Audio Precision 179
John Fluke Mfg. Co., Inc.
Gentner RF Products Div of Gentner Electronics
Hewlett-Packard Co.
Ortofon Inc.
Rohde & Schwarz 77
Schmid Telecommunication
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Tektronix Inc. 227, 228
Tennaplex Systems Ltd.
Wandel & Goltermann GmbH & Co.

BLANKING INTERVAL

Boland Communications 206
Crow Broadcast Systems Ltd.
Scientific-Atlanta

COMPARATORS, VIDEO

Anritsu America, Inc.
Avitel Electronics Ltd.
AVS (Audio-Visuel Systems)
Television Equipment Associates

COUNTERS, FREQUENCY

Anritsu America, Inc.
Audio Precision 179
Beckman Industrial Corp.
B & K Precision Maxtec International Corp.
Black Star Ltd.
Coaxial Dynamics
EIP Microwave, Inc.
John Fluke Mfg. Co., Inc.
Hewlett-Packard Co.
Leader Instruments Corp.
Marconi Instruments
Philips Professional Television
Sencore Inc.
Simpson Electric
Tektronix Inc. 227, 228
Townsend Test & Measuring Group 153

DEMODULATORS, TV

Asaca/Shibasoku Corp.
Barco Industries Video
Blonder-Tongue Labs, Inc.
Catel Telecommunications, Inc.
Comark Communications, Inc. A Thomson-CSF Co. 35
Crow Broadcast Systems Ltd.
Heynen International
ISS Engineering
LNR Communications, Inc.
Modulation Sciences, Inc.
Nexus Engineering Corp.
Philips Professional Television
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Tektronix Inc. 227, 228
Telemet Div. A Geotel, Co.
Townsend Test & Measuring Group 153
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DETECTORS, MICROWAVE

Holaday Industries, Inc.
Microwave Development Labs, Inc.
The Narda Microwave Corp.

DETECTORS, RF

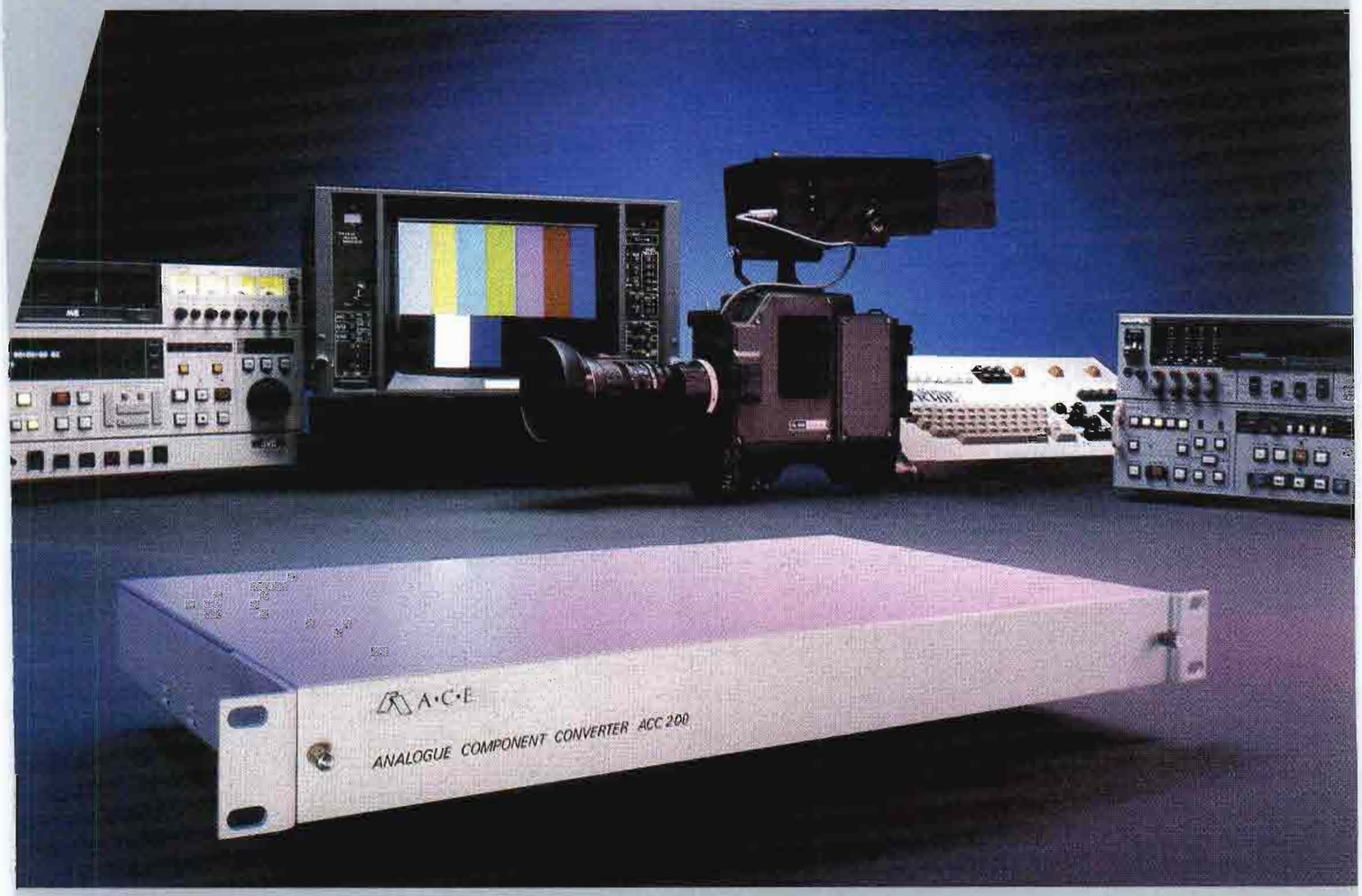
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Coaxial Dynamics
Delta Electronics Inc. 51
Holaday Industries, Inc.
ITAME, S.A.
Leader Instruments Corp.
The Narda Microwave Corp.
Potomac Instruments, Inc.
Wide Band Engineering Co., Inc.

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the SOURCE

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DETECTORS, VIDEO PRESENCE

Adams-Russell Electronics Co. ARVIS Div.
AVS (Audio-Visuel Systems)
Catel Telecommunications, Inc.
Di-Tech Inc. ..... IBC
Leightronix, Inc.
Video Accessory Corp.

DIAGNOSTIC SYSTEMS, DIGITAL LOGIC

John Fluke Mfg. Co., Inc.
Pinzone Communications Products Inc.
Wandel & Goltermann GmbH & Co.

DIFFERENTIAL PHASE/GAIN MEASUREMENT SETS

Anritsu America, Inc.
Asaca/Shibasoku Corp.
Audio Precision 179
R. Barth KG
Crow Broadcast Systems Ltd.
Kintek Inc.
Magni Systems 235
Multidyne Electronics Inc. 220
Schmid Telecommunication
Tektronix Inc. 227, 228
Telemet Div. A Geotel, Co.
Townsend Broadcast Systems Inc. 245
Wandel & Goltermann GmbH & Co.

DUMMY LOADS, RF

AEG Bayly Inc.
AEG Olympia AG Transmitter Systems
Altronic Research Inc.
Bird Electronic Corp.
Coaxial Dynamics
Dielectric Communications A Unit of General Signal
Electro Impulse Lab, Inc.
Harris Corp. Broadcast Div.
ITAME, S.A.
ITELCO
Jampro Antennas Inc. 99
The Narda Microwave Corp.
North Hills Electronics, Inc.
Tennaplex Systems Ltd.
Trompeter Electronics, Inc.
Wide Band Engineering Co., Inc.

ENVELOP DELAY MEASUREMENT EQUIPMENT

Anritsu America, Inc.
Asaca/Shibasoku Corp.
Rohde & Schwarz 77
Tektronix Inc. 227, 228
Telemet Div. A Geotel, Co.
Wandel & Goltermann GmbH & Co.

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Anritsu America, Inc.
Bird Electronic Corp.
B & K Precision Maxtec International Corp.
Blonder-Tongue Labs, Inc.
Coaxial Dynamics
Heynen International
Jampro Antennas Inc. 99
Johnson Electronics Inc.
Leader Instruments Corp.
The Narda Microwave Corp.
Potomac Instruments, Inc.
Sencore Inc.

FLUTTER/WOW

Asaca/Shibasoku Corp.
Audio Precision 179
Bruel & Kjaer Instruments, Inc.
EMT-Franz GmbH
Gotham Audio Corp.
Kikusui International
Leader Instruments Corp.
Lenco Inc. Electronics Div.
Potomac Instruments, Inc.
Rohde & Schwarz 77
Sound Technology 10
Wandel & Goltermann GmbH & Co.

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GENERATORS, AF SIGNAL

Amber Electro Design Inc.
Ariel Corp.
Asaca/Shibasoku Corp.
Audio Precision 179
Black Star Ltd.
Boonton Electronics Corp. 121
Digitec S.A.
Hewlett-Packard Co.
Jasoni Electronics
Leader Instruments Corp.
Marconi Instruments
MEI Electronics/Microprobe
Modular Audio Products Unit of Modular Devices, Inc. 222
Potomac Instruments, Inc.
Rohde & Schwarz 77
Schmid Telecommunication
Sescom, Inc.
Sound Technology 10
TRW LSI Products Inc.
Wandel & Goltermann GmbH & Co.
White Instruments

GENERATORS, CROSS PULSE

Asaca/Shibasoku Corp.
Boland Communications 206
Sigma Electronics, Inc.

GENERATORS, RF SIGNAL

Anritsu America, Inc.
Asaca/Shibasoku Corp.
AVCOM of Virginia, Inc.
B & K Precision Maxtec International Corp.
Broadcast Technology of Colorado 92
Delta Electronics Inc. 51
John Fluke Mfg. Co., Inc.
Hewlett-Packard Co.
Kay Elemetrics Corp.
Leader Instruments Corp.
Marconi Instruments
MCL, Inc.
RE Instruments Corp.
Rohde & Schwarz 77
Sencore Inc.
TRW LSI Products Inc.

GENERATORS, VIDEO TEST PATTERN

Acron Ltd.
Anritsu America, Inc.
Asaca/Shibasoku Corp.
B & K Precision Maxtec International Corp.
Black Star Ltd.
Brabury International
Digital Processing Systems
DSI Products Inc.
John Fluke Mfg. Co., Inc.
Hamlet Video Int'l. Ltd.
Leader Instruments Corp.
Leitch Video 45
Lenco Inc. Electronics Div.
Magni Systems 235
Marconi Instruments
Multidyne Electronics Inc. 220
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Philips Professional Television
Scientific-Atlanta
Sencore Inc.
Sierra Video Systems
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VG Electronics Ltd.
Video Accessory Corp.
World Video Inc.

HEAD ALIGNMENT/TIP PROJECTION GAUGES

Fidelipac Corp.
Nortronics Co., Inc. 211
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LIGHT/PHOTOGRAPHIC

EG&G Inc.
Lamp Technology Inc.

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Minolta Corp. Industrial Meter Div.
Osram Corp.
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Ultimate Support Systems

LINE SELECTORS, TV HORIZONTAL

Asaca/Shibasoku Corp.
Broadcast Video Systems, Ltd. 224
Tektronix Inc. 227, 228

LOAD RESISTORS

Altronic Research Inc.
Bird Electronic Corp.
Coaxial Dynamics
Electro Impulse Lab, Inc.
ITAME, S.A.
Kikusui International
Leader Instruments Corp.

MODULATION MONITORS, AM

Belar Electronics Lab, Inc. 249
Broadcast Electronics, Inc.
Delta Electronics Inc. 51
Harris Corp. Broadcast Div.
ITAME, S.A.
Motorola Inc. AM Stereo
TFT Inc.

MODULATION MONITORS, FM

Belar Electronics Lab, Inc. 249
Broadcast Electronics, Inc.
Broadcast Technology of Colorado 92
Modulation Sciences, Inc.
QEI Corp. 233
Rohde & Schwarz 77
Tektronix Inc. 227, 228
TFT Inc.

MODULATION MONITORS, TV

Belar Electronics Lab, Inc. 249
Boland Communications 206
Heynen International
Modulation Sciences, Inc.
Sharp Electronics Corp. Professional Products Div.
Tektronix Inc. 227, 228
TFT Inc.

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BBC-Metrawatt/Goerz
Karl Heitz, Inc.
Kikusui International
Philips Professional Television
Tektronix Inc. 227, 228
Townsend Test & Measuring Group 153

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BBC-Metrawatt/Goerz
Electronic Visuals Ltd.
Kikusui International
Leader Instruments Corp.
Pegacom Ltd.
Schoeps/Posthorn Recordings
Sencore Inc.
Techni-Tool Inc. 223
Tektronix Inc. 227, 228

OSCILLOSCOPES, TEST

BBC-Metrawatt/Goerz
Beckman Industrial Corp.
B & K Precision Maxtec International Corp.
Black Star Ltd.
John Fluke Mfg. Co., Inc.
Hewlett-Packard Co.
Hitachi Denshi America, Ltd. 3
Kikusui International
Leader Instruments Corp.
Philips Professional Television
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Sencore Inc.
Simpson Electric

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A.W. Sperry Instruments
Techni-Tool Inc. 223
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Townsend Test & Measuring Group 153

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Audio Precision 179
Boland Communications 206
Bruel & Kjaer Instruments, Inc.
B.S.S. Audio
D&R Electronica b.v.
Electronic Systems Labs, Inc.
Gorman-Redlich Mfg. Co.
Kintek Inc.
McCurdy Radio/Ram Broadcast 187-194
Portland Instrument
Potomac Instruments, Inc.
Ram Broadcast Systems 101
Schoeps/Posthorn Recordings
Selco Products Co.
Sonifex Ltd.
Sound Technology 10
The Superior Electric Co.

POWER, AC

Fiskars Electronics Corp. AC Power Div
Furman Sound, Inc.
Kikusui International
LEA Dynatech, Inc.
Lyncole XIT Grounding
Sencore Inc.
The Superior Electric Co.

POWER, RF/WATT

Bird Electronic Corp.
Coaxial Dynamics
Electro Impulse Lab, Inc.
General Microwave Corp.
Hewlett-Packard Co.
Selco Products Co.

POWER SUPPLIES, TEST BENCH

Aydin Radar & EW Div.
B & K Precision Maxtec International Corp.
Current Technology Inc.
Fiskars Electronics Corp. AC Power Div
Hewlett-Packard Co.
Kikusui International
Leader Instruments Corp.
Plastic Capacitors, Inc.
Sorensen Co., Div. of Switchcraft A Raytheon Co.
Techni-Tool Inc. 223
Tungstone Batteries Inc.

PROBES, OSCILLOSCOPE/TEST

Aydin Radar & EW Div.
BBC-Metrawatt/Goerz
Beckman Industrial Corp.
B & K Precision Maxtec International Corp.
Black Star Ltd.
Kikusui International
Leader Instruments Corp.
Philips Professional Television
The Superior Electric Co.
Techni-Tool Inc. 223
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RECORDER TENSION CONTROLS/GAUGES

Inovonics Inc. 248
Tentel 219
Wandel & Goltermann GmbH & Co.

RF RADIATION

Anritsu America, Inc.
Bird Electronic Corp.
General Microwave Corp.
Holaday Industries, Inc.
Jampro Antennas Inc. 99

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AUDIO FOLLOWS VIDEO?
The AMEK Solution

Vector TV, Stockport, UK.

For a long time manufacturers of edit controllers have been telling you that their unit allows you to have remote control of the audio mixer.

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Additionally the ESM32 can be programmed to work with FOR-A and Grass Valley systems.

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AMEK/TAC US Operations: 10815 Burbank Blvd, North Hollywood, CA 91601. Telephone: 818/508 9788. Telex: 662526 AMEK USA. Fax: 818/508 8619.

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The Narda Microwave Corp.

SC/H PHASE AND DISPLAY/BURST PHASE

Grass Valley Group 5
Hamlet Video Int'l. Ltd.
Leader Instruments Corp.
Leitch Video 45
Lenco Inc. Electronics Div.
Magni Systems 235
Sigma Electronics, Inc.
Tektronix Inc. 227, 228
World Video Inc.

SETUP AND MATCHING, VIDEO

Asaca/Shibasoku Corp.
Lenco Inc. Electronics Div.
Tektronix Inc. 227, 228
Video Accessory Corp.

SPINDLE HEIGHT GAUGES

Crow Broadcast Systems Ltd.
Techni-Tool Inc. 223
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TEST INSERTER/READER, VITS

Anritsu America, Inc.
Asaca/Shibasoku Corp.
AVS (Audio-Visuel Systems)
Leitch Video 45
Marconi Instruments
Rohde & Schwarz 77
Tektronix Inc. 227, 228

TEST SYSTEMS, TAPE RECORDER

Amber Electro Design Inc.
Apogee Electronics Corp.
Asaca/Shibasoku Corp.
Audio Precision 179
Jasoni Electronics
Multidyne Electronics Inc. 220
Sound Technology 10
Wandel & Goltermann GmbH & Co.

TESTERS, SEMICONDUCTOR

Beckman Industrial Corp.
B & K Precision Maxtec International Corp.
Leader Instruments Corp.
Sencore Inc.
Triplett Corp.

TIME DOMAIN REFLECTOMETERS (TDR)

Anritsu America, Inc.
Biddle Instruments
Heynen International
Riser-Bond Instruments
Tektronix Inc. 227, 228

VIDEO LEVEL/NOISE

Anritsu America, Inc.
Asaca/Shibasoku Corp.
AVS (Audio-Visuel Systems)
FM Systems, Inc.
Leader Instruments Corp.
Rohde & Schwarz 77
Selco Products Co.
Tektronix Inc. 227, 228
Telecommunication Products Corp.
Titus Technological Labs
Video Accessory Corp.
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VOLTMETER TEST SETS (All Types)

Audio Precision 179
Beckman Industrial Corp.
B & K Precision Maxtec International Corp.
Black Star Ltd.
John Fluke Mfg. Co., Inc.
FM Systems, Inc.
Jasoni Electronics
Kikusui International
Leader Instruments Corp.
LSI Jennings A Lear Siegler Co.
Rohde & Schwarz 77
Sencore Inc.
Sescom, Inc.
Sound Technology 10
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Hallikainen & Friends, Inc.
Harris Corp. Broadcast Div.
Logica CES Ltd. Broadcast & Media Group
Merlin Engineering Works
Potomac Instruments, Inc.
QEI Corp. 233
Reliance Electric Co.
Soll, Inc.
Transimage International

AUTOMATION, BUSINESS SYSTEMS

Adams-Russell Electronics Co. ARVIS Div.
CBSI-Custom Business Systems, Inc.
Connolly Systems
Dalsat Inc.
Generic Computer Systems
Jasmin Electronics PLC
Logica CES Ltd. Broadcast & Media Group
The Management
Reliance Electric Co.
Summit Software Systems Inc.
Systemation Corp.

AUTOMATION, NEWSROOM SYSTEMS

Basys, Inc.
Broadcast Developments Ltd. Autoscript
BTS Broadcast Television Systems, Inc. 123
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Computer Prompting Corp.
DKW Systems Inc. 209
Dynatech NewStar, Inc.
Elicon
IGM Communications 110
Media Computing, Inc.
Roscor Corp.
Twentier Systems

AUTOMATION, PROGRAM LOGGING

Adams-Russell Electronics Co. ARVIS Div.
A.G.A.P.
Alamar Electronics USA, Inc.
Asaca/Shibasoku Corp.
Broadcast Electronics, Inc.
BTS Broadcast Television Systems, Inc. 123
CCI
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Connolly Systems
DKW Systems Inc. 209
Grass Valley Group 5
Hallikainen & Friends, Inc.
IGM Communications 110
Logica CES Ltd. Broadcast & Media Group
The Management
Pegacom Ltd.
Rational Broadcast Systems
Schafer World Communications Corp.
Sono-Mag Corp.
Sony Communications Products Co.
Systemation Corp.
Utah Scientific, Inc. 54-55
Video Data Systems
Videomedia, Inc. 168
Voodoo Technology

AUTOMATION, TAPE DECK CONTROL

Adams-Russell Electronics Co. ARVIS Div.
Adrienne Electronics Corp.
ADX Systems, Inc. 221
A.G.A.P.
Alamar Electronics USA, Inc.
Amherst Electronic Instruments, Inc.
AMS/Calrec (AMS Industries Inc.)
Asaca/Shibasoku Corp.
Audio Kinetics Ltd.
Automation Associates Inc.
AVS (Audio-Visuel Systems)
Basys, Inc.
Broadcast Electronics, Inc.
CCI
Century 21 Programming Inc.
Channelmatic, Inc.
Concept Productions
Connolly Systems
Diaquest, Inc.
DKW Systems Inc. 209
Dynatech NewStar, Inc.
EECO/Convergence A subsidiary of EECO, Inc.
The Engineering Lab, Inc.
GENERIC Designs, Inc.
Hubbard Communications, Inc.
IGM Communications 110
Leightronix, Inc.
Logica CES Ltd. Broadcast & Media Group
The Management
Matco Mfg. & Test Co., Inc. dba Matco Control Products
MEI Electronics/Microprobe
Merlin Engineering Works
Mycomp Technologies Corp. (MTC)
NTSC Productions 244
Pegacom Ltd.
Schafer World Communications Corp.
Sentry Systems
Sono-Mag Corp.
Sony Communications Products Co.
Systemation Corp.
Tandberg of America, Inc.
Telecommunication Products Corp.
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Advanced Micro-Dynamics, Inc.
Broadcast Electronics, Inc.
Cat Systems Inc.
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Gentner RF Products Div of Gentner Electronics
Hallikainen & Friends, Inc.
Harris Corp. Broadcast Div.
Heynen International
Logica CES Ltd. Broadcast & Media Group
Potomac Instruments, Inc.
Schafer World Communications Corp.
Soll, Inc.

AUTOMATION, VIDEO DISPLAY TERMINALS AND TOUCH SCREENS

Adams-Russell Electronics Co. ARVIS Div.
Asaca/Shibasoku Corp.
Cat Systems Inc.
Concept Productions
Gentner RF Products Div of Gentner Electronics
Grass Valley Group 5
Hallikainen & Friends, Inc.
IGM Communications 110
Jasmin Electronics PLC
The Management
MicroTouch Systems
Schafer World Communications Corp.
Sono-Mag Corp.

BAR CODE EQUIPMENT

Asaca/Shibasoku Corp.
AVS (Audio-Visuel Systems)
Merlin Engineering Works
Motorola Communications & Electronics Inc.
Multidyne Electronics Inc. 220
Sony Communications Products Co.
United Ad Label Co., Inc.
Voodoo Technology

CLOCKS, DIGITAL/LOGIC

Autogram Corp.
Broadcast Aids, Inc.
CCI
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Leightronix, Inc.
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Time Service Systems Inc.
Torpey Controls & Eng. Ltd.

COMMERCIAL INSERTION SYSTEMS

Adams-Russell Electronics Co. ARVIS Div.
A.F. Associates, Inc. 159
A.G.A.P.
Alamar Electronics USA, Inc.
Asaca/Shibasoku Corp.
CCI
Channelmatic, Inc.
Concept Productions
Connolly Systems
The Engineering Lab, Inc.
Grass Valley Group 5
Grumman Aerospace Corp. Broadcast Systems Group
IGM Communications 110
ISS Engineering
Logica CES Ltd. Broadcast & Media Group
The Management
Matco Mfg. & Test Co., Inc. dba Matco Control Products
MEI Electronics/Microprobe
Merlin Engineering Works
Monroe Electronics, Inc.
Panasonic Broadcast Systems Co.
Panasonic Industrial Co. AV Systems Group
Pegacom Ltd.
Schafer World Communications Corp.
H. A. Solutec Ltd.
Sono-Mag Corp.
Sony Communications Products Co.
Systemation Corp.
Telecommunication Products Corp.
Transimage International
Video Data Systems
Videomedia, Inc. 168

COMPUTER HARDWARE/PERIPHERALS

Accu-Weather, Inc.
Adams-Russell Electronics Co. ARVIS Div.
Adrienne Electronics Corp.
Audio Precision 179
Aydin Controls

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LEITCH DOES



Leitch equipment is found in most of the major studios around the world. Our reputation is for never compromising on quality yet staying competitive on price. Leitch also offers you outstanding reliability and a worldwide sales and service network for our equipment: **1.** PAL and NTSC SCH Monitors **2.** Video Test Signal Generators **3.** PAL and NTSC Video Processing Equipment **4.** PAL and NTSC Sync Pulse Generators **5.** Frame Synchronizers **6.** State-of-the-art clock systems **7.** Audio and Video Distribution Amplifiers.

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Cat Systems Inc.
CBSI-Custom Business Systems, Inc.
Cipher Digital, Inc. 103
Columbine Systems, Inc.
Comprehensive Video Supply Corp.
Computer Concepts Corp.
Computer Friends, Inc. 225
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Current Technology Inc.
Dalanco Spry
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Digitec S.A.
IGM Communications 110
ISS Engineering
Jem-Fab Corp.
Lazerus/NCD
Lenco Inc. Electronics Div.
Leonardo Software
Logica CES Ltd. Broadcast & Media Group
The Management
Media Computing, Inc.
Merlin Engineering Works
MicroTouch Systems
New England Digital Corp.
Recortec, Inc.
Richmond Sound Design, Ltd.
Shintron Co. Inc.
Soll, Inc.
Stellar Computer Inc.
Systemation Corp.
3M Magnetic Media Div.
Titus Technological Labs
Vertigo Systems International
Video Associates Labs
Voodoo Technology

COMPUTER SOFTWARE

Accu-Weather, Inc.
Adams-Russell Electronics Co. ARVIS Div.
A.G.A.P.
Alamar Electronics USA, Inc.
Alias Research Inc.
Audio Precision 179
Automation Associates Inc.
Aydin Controls
Basys, Inc.
Beacon Software, Inc.
Cat Systems Inc.
CBSI-Custom Business Systems, Inc.
Century 21 Programming Inc.
Columbine Systems, Inc.
Comprehensive Video Supply Corp.
Comprompter, Inc.
Computer Concepts Corp.
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Computer Prompting Corp.
Concept Productions
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Cubicomp Corp.
Dalanco Spry
Datacount, Inc.
Diaquest, Inc.
Digital Arts
Digitec S.A.
DKW Systems Inc. 209
Dynatech NewStar, Inc.
EDX Engineering, Inc.
Generic Computer Systems
Interactive Motion Control
Jefferson Pilot Data Systems
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Lazerus/NCD
Leonardo Software
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Media Computing, Inc.
Merlin Engineering Works
New England Digital Corp.
OrCad Systems Corp.
Pinzone Communications Products Inc.
Radiotechniques Engineering Corp.
Richmond Sound Design, Ltd.
Soll, Inc.
Stellar Computer Inc.
Summit Software Systems Inc.
Systemation Corp.
Telecommunication Products Corp.
United Ad Label Co., Inc.
Vertigo Systems International
Video Design Pro
Visionics Corp.
VIZ Mfg. Co.
Voodoo Technology
Wavefront Technologies

CONTROLLERS, TONE ACTIVATED EQUIPMENT

Adams-Russell Electronics Co. ARVIS Div.
A.G.A.P.
Alamar Electronics USA, Inc.
BSM Systems Inc.
Cat Systems Inc.
CCI
Channelmatic, Inc.
Connect Systems Inc.
GENERIC Designs, Inc.
Hubbard Communications, Inc.
IGM Communications 110
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F2.1 (16.5-223mm); F2.7 (280mm)

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F1.6 (12.5-170mm); F2.0 (215mm)
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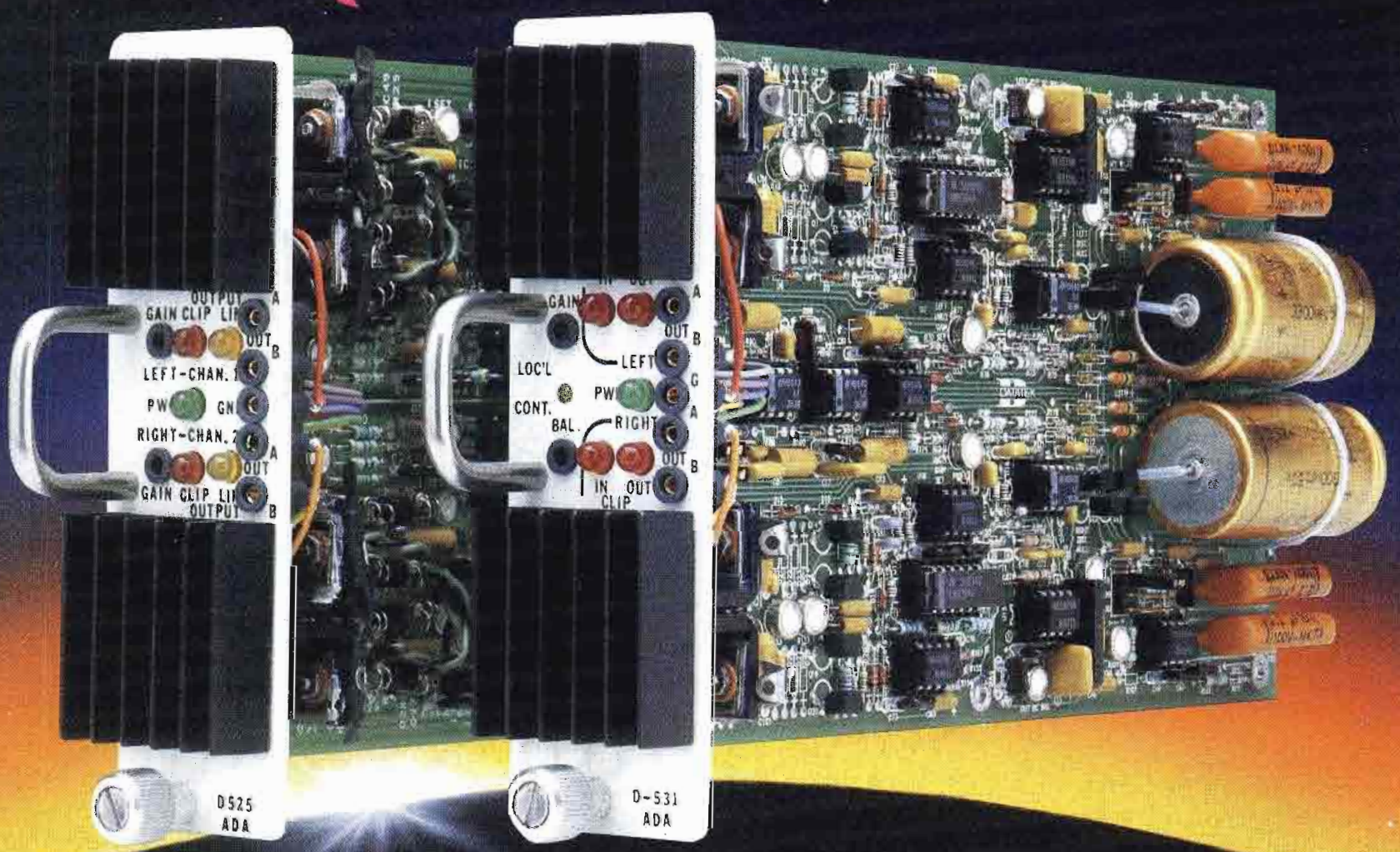
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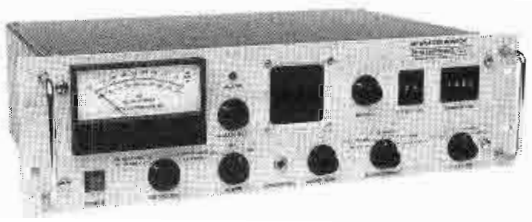
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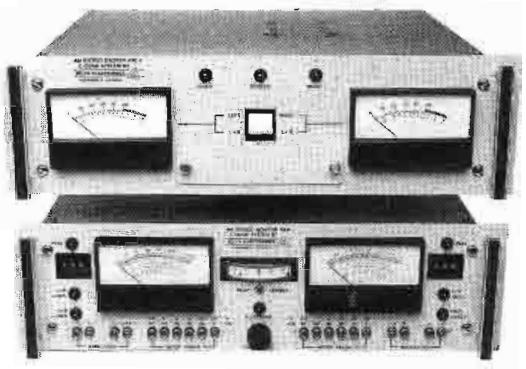
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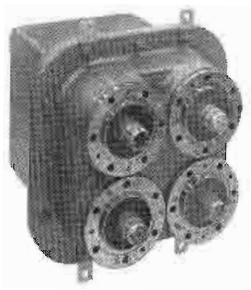
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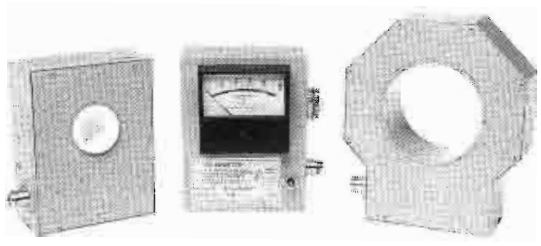
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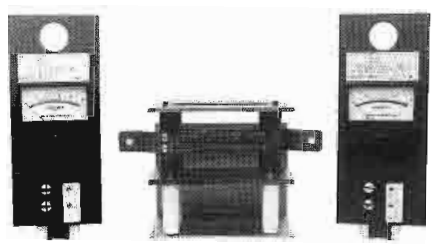
High Power Pulse Reflectometer—Strong interfering fields that would destroy time domain reflectometers are virtually ignored by the PRH-1. This instrument can handle up to 1,000 watts of induced power on an intermittent basis as it locates faults on transmission lines. Provides a visual representation of the transmission or sample line, STL coax, or antenna, using your oscilloscope.



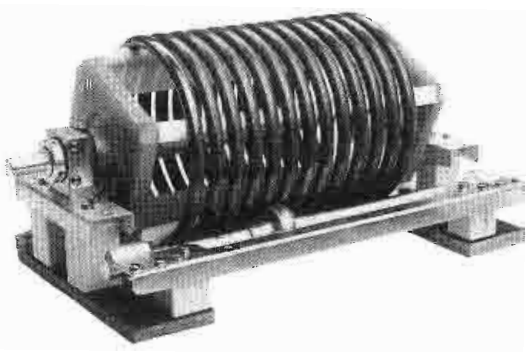
Coaxial Transfer Switches—These 1⅝" and 3⅛" motorized four port switches are designed to switch between antennas, transmitters, or dummy loads both quickly and efficiently. The switches can also be operated manually and are fully interlocked.



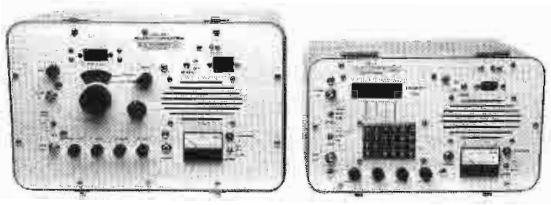
RF Ammeters and Sampling Toroids—Precision toroidal current transformers (TCTs) provide stable antenna monitor sampling while eliminating the problems associated with loops. TCTs also work well in supplying additional modulation monitor or test sample RF outputs. The transformer coupled ammeter (TCA)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



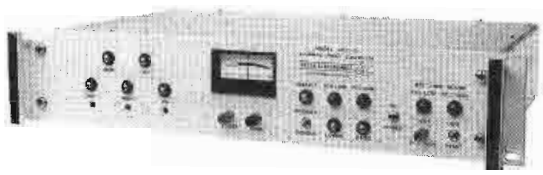
Low Power RF Ammeters—When every milliamp of current counts, depend on the accuracy of the TCA-Jr. This portable RF ammeter is designed to plug into either a Delta MJ-50 Meter Jack (pictured above), or a standard J-plug jack. Two current ranges are available: 0.2 to 1.0 Ampere, or 0.4 to 2.0 Amperes.



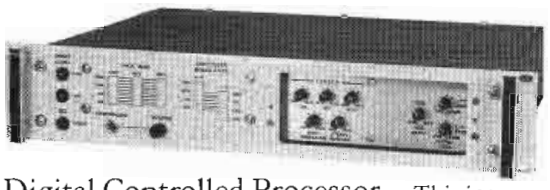
Rotary Variable Inductor—Where long life and high reliability are required, specify the RVI. Designed to provide long life, even under continuous rotation, the RVI is available in either 12 μH or 10 μH versions (maximum inductance). Other values by special order.



RF Receiver/Generator—A rugged, high output (2 watts) generator and correlation detector receiver virtually eliminate false nulls caused by interfering signals. The RG-3A operates from 0.5 to 1.65 MHz, and the expanded range of the RG-4 generates signals from 100 kHz to 30 MHz.



Transmitter Power Controller—Your insurance against over- and under-power citations. Continuously monitors transmitter power levels, compensating for AC power line sag by adjusting the transmitter to 100% power.



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



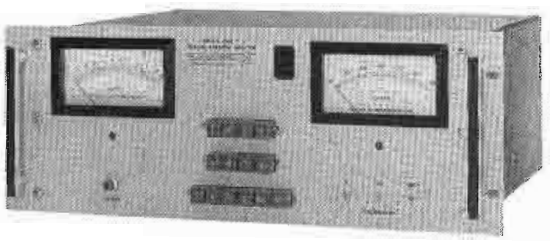
Impedance Bridges—At last, a means of measuring your impedance under full power. Both portable and in-line bridges are available, with a variety of features, for both AM broadcast and HF applications. The in-line Common Point Bridge can be supplied with a TCA RF Ammeter to permit precise current and impedance measurements.

The Above Standard Industry Standards.

DELTA ELECTRONICS

Delta Electronics, Inc. • 5730 General Washington Dr.
P.O. Box 11268 • Alexandria, VA 22312 • U.S.A.
Telephone: 703-354-3350
FAX: 703-354-0216 • Telex: 90-1963

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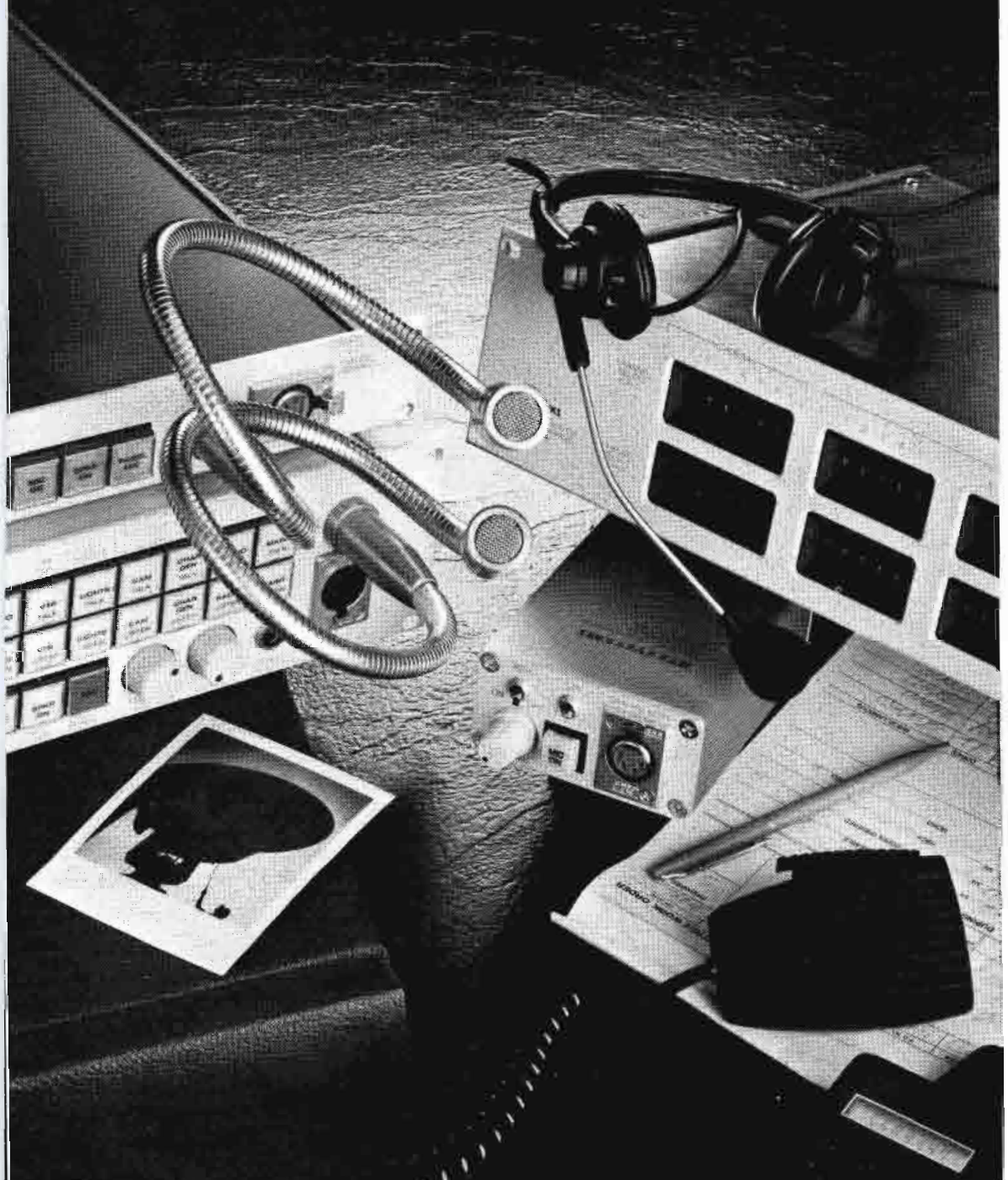


AM Antenna Monitors—These are true ratio monitors which deliver a ratio reading without the need to continually reset the reference tower to 1.000. This simple operation reduces errors by non-technical personnel and makes tuning an array easier.

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Good Reasons To Call RTS When You Need High-Performance Intercom Systems.



Professional intercom systems from RTS—a great way to keep in touch, no matter what the application.

Our Series 800 features multi-channel intercom products ranging from sophisticated *microprocessor-assisted* to simple and direct. And our TW Intercom offers a wide array of two-channel system components.

RTS Systems intercom—for all the right reasons. Please call or write for descriptive literature.

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MISCELLANEOUS PRODUCTS

See Adv. Page

Theatre Service & Supply Corp.

TAPE LOADERS, CARTRIDGE/CASSETTE

Audico, Inc.
Broadcast Electronics, Inc.
COARC Video
Marathon Products Co.
Neumade Products Corp.
Otari Corp. 170
Recortec, Inc.

TAPE RECORDING ACCESSORIES

AMR (Audio Media Research)
R.B. Annis Co., Inc.
Automation Associates Inc.
Black Audio Devices
Canford Audio plc
Fidelipac Corp.
Fostex Corp. of America 199
Otari Corp. 170
RTI-Research Tech. Int'l.
Sony Communications Products Co.
3M Magnetic Media Div.
Transimage International
Videomagnetics, Inc.

TOOL KITS/HAND TOOLS

Bi-Tronics, Inc.
Black Audio Devices
Chemtronics Inc. 249
Contact East
Dialight Corp.
HMC-Hub Material Co.
Jensen Tools Inc.
Karl Leister Electro-Geratebau
Nu-Concept Systems, Inc.
Paladin Corp.
Panduit Corp.
Sony Communications Products Co.
Techni-Tool Inc. 223
3M Electrical Products Div.
Weller WTCPS/Cooper Tools
Western Electronic Products Co.
Brian R. White Co., Inc.

VANS, ENG/EFP/SNV

AVEC
AVS (Audio-Visuel Systems)
BAF Communications Corp.
Brabury International
Calhoun Satellite Communications, Inc.
Centro Corp. 15
Dalsat Inc.
E-N-G Corp.
GE Systems Integration 50
Gray Communications Consultants, Inc.
Harris Corp. Broadcast Div.
Hubbard Communications, Inc.
Markertek Video Supply
Midwest Communications Corp. 1, 41
Mobile-Cam Products
Peirce-Phelps, Inc.
Radio Systems Inc. 87
Roscor Corp.
Shook Electronics USA, Inc.
Vizcom

SERVICES

ANTENNA/TOWER/ INSTALLATION/ MAINTENANCE

Adelphon, Inc.
AEG Olympia AG Transmitter Systems
Aries Antennas, Inc.
Broadcast Communications
Central Tower Inc.
Comad Communications Ltd.
Dalsat Inc.
DYMA Engineering, Inc.

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FULL COVERAGE











STUDIOS
POST PRODUCTION
MOBILE UNITS
MASTER CONTROL

If your plans include an individual component, a turnkey system, or something in between, we can develop your ideas into a complete television facility.

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CORPORATION
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215 - 223-8200

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Wouldn't it be great if somebody built fully-integrated systems for all your distribution, control, and automation requirements (including digital routing), using standard, expandable equipment?

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UTAH SCIENTIFIC.

ROUTING SYSTEMS



ROUTING SYSTEMS. Utah Scientific routing systems perform to the best specs in the industry. Reliability, easy system expansion and long-term stability have been proven in more than 500 installations around the world. Controlling the router is easy with the industry's broadest selection of control panels, computer interface equipment, and automatic control systems, all of which are user reprogrammable to ensure that your system continues to accommodate your changing requirements.

AUTOMATION SYSTEMS. As the need to automate more and more of your facility's operations becomes important, Utah Scientific is ready to help you with a fully integrated system, designed to meet your current needs *and* expand easily as your requirements grow.

From a simple routing switcher event programmer, to a fully integrated on-air automation system for a broadcast network, Utah Scientific has the products, and the experience, to meet all of your automation needs.

DIGITAL SYSTEMS



DIGITAL SYSTEMS. Now there's a single-source supplier for all your switching requirements including DIGITAL video. Our new DVS-1 Digital Video Routing Switcher offers 10-bit performance and maximum reliability. Available in a wide variety of configurations, the DVS-1 handles either the D-1 (component) or D-2 (composite) signal format. Of course, like all Utah Scientific products, the DVS-1 can operate as a stand-alone system or be integrated with other components.

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AUTOMATION
SYSTEMS



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EMCEE Broadcast Products
Express Tower Co.
Gabriel Electronics, Inc.
Horizon Towerz, Inc.
J. Boyd Ingram & Associates
Jampro Antennas Inc. 99
Kline Towers
LDL Communications, Inc.
Micro Communications, Inc.
Microflect Co., Inc.
Motorola Communications & Electronics Inc.
Northern Power Systems
Fred A. Nudd Corp.
Radio Systems Inc. 87
ROHN
S.G. Communications Inc.
Stainless Construction Co.
Steiger, Hurray & Associates Inc. Broadcast Tech. Consultants
Teletech, Inc.
Tenco Tower Co.
Tennaplex Systems Ltd.
Thomson-LGT 239
Transmission Structures, Ltd.
Trylon Mfg. Co. Ltd.
Vizcom

CALIBRATION, INSTRUMENT

Bird Electronic Corp.
John Fluke Mfg. Co., Inc.
J. Boyd Ingram & Associates
Newman-Kees Measurements Engineering & Installations
RAG Electronics, Inc.
Tektronix Inc. 227, 228
Wandel & Goltermann GmbH & Co.

EDITING/TELEPRODUCTION FACILITIES

Allied Film & Video/DC

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Allied Film & Video/IL
B&B Systems, Inc.
The Camera Mart, Inc. 97
Capitol Satellite Communications Systems
Comsat Video Enterprises
East Coast Video Systems
GE Systems Integration 50
Johnson-Nyquist Productions Inc.
Liberty Broadcasting Network
METROPOST
Roscor Corp.
The Truck-Mobile Audio
Videomedia, Inc. 168
Wold Communications

EMPLOYMENT SERVICES

James Lloyd Group
Vizcom

ENGINEERING CONSULTING, DESIGN/PLANS

Adelphon, Inc.
John P. Allen Airspace Consultant
Alpha Tower Design, Inc.
Eric Neil Angevine, P.E.
Audio Service Corp.
AVEC
AVS (Audio-Visuel Systems)
R. Barth KG
John H. Battison, P.E.
B&B Systems, Inc.
R.R. Beard Ltd.
Blair Benson Engineering Consultant
BFE AG
Walter Brewer Corp.
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BTS Broadcast Television Systems, Inc. 123
Richard W. Burden Associates

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The Camera Mart, Inc. 97
Cat Systems Inc.
Centro Corp. 15
Chips Davis Lede Designs, Inc.
Cipher Digital, Inc. 103
Communication Marketing & Consulting Ltd.
Component Video, Inc.
Comsat Video Enterprises
Continental Electronics A Div. of Varian Associates, Inc.
Crow Broadcast Systems Ltd.
Dataworld
John J. Davis & Associates Consulting Engineers
DeSantis Associates
DICSA-Delay TV Ingenieurs-Conseils SA
Digitec S.A.
Discrete Technology Labs, Inc.
DSI Communications, Inc.
DYMA Engineering, Inc.
Dynamic Technology Ltd.
East Coast Video Systems
EDX Engineering, Inc.
Equipto Electronics Corp.
Ethereum Scientific Corp.
Evans Associates Consulting Telecom, Engineers
The Express Group
GE Systems Integration 50
GEE Broadcast Systems Ltd.
R.J. Grandmaison, P.E.
Gray Communications Consultants, Inc.
Harris Corp. Broadcast Div.
HN Engineering Inc.
J. Boyd Ingram & Associates
Jamieson & Associates, Inc.
Jem-Fab Corp.
Jenel Systems & Design Corp.
Johnson Electronics Inc.
Knudson-Benson Associates Inc.
Lakeside Associates Inc.

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Lightning Eliminators & Consultants, Inc.
LPL Communications Inc.
Lumitrol, Ltd.
Lyncole XIT Grounding
D. L. Markley & Associates, Inc. Consulting Engineers
Kenneth R. Meades
Lawrence L. Morton Associates Lawrence L. Morton, P.E.
Motorola Communications & Electronics Inc.
Newman-Kees Measurements Engineering & Installations
Nexus Engineering Corp.
The Nissen Group, Inc.
Fred A. Nudd Corp.
Omega International 71
Peirce-Phelps, Inc.
Penstock, Inc.
Priestley & Shearman
Radio Engineering Consultants
Radio Systems Inc. 87
Radiotechniques Engineering Corp.
RF Services, A Div. of RF Specialties of Washington, Inc.
A.D. Ring & Associates
R.O. Associates, Ltd.
Roscor Corp.
Rosner TV Systems, Inc.
Scientific-Atlanta
Seem Audio A.S.
Sellmeyer & Kramer, Inc.
Robert Slye Electronics
Smith & Powstenko
H. A. Solutec Ltd.
Stainless Construction Co.
Standard Frequency Measuring Service
Steiger, Hurray & Associates Inc. Broadcast Tech. Consultants
Teknimax Telecommunications
Teletech, Inc.
Tennaplex Systems Ltd.

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Portable Partnership



When you're on the scene, you're on the air–with a cellular phone and a Comrex. Our PLXmicro converts telephone quality to program quality around town or around the world.

The PLXmicro is the tiniest extender we've ever built. Just about pocket size, it stows-and goes-almost anywhere.

Yet despite its size, it's packed with features: the Comrex frequency extender is built in, along with interface for cellular telephone or standard dial line. There are microphone and tape inputs and automatic send level control.

A monitor decoder, hybrid circuitry and headphone output allow full duplex operation.

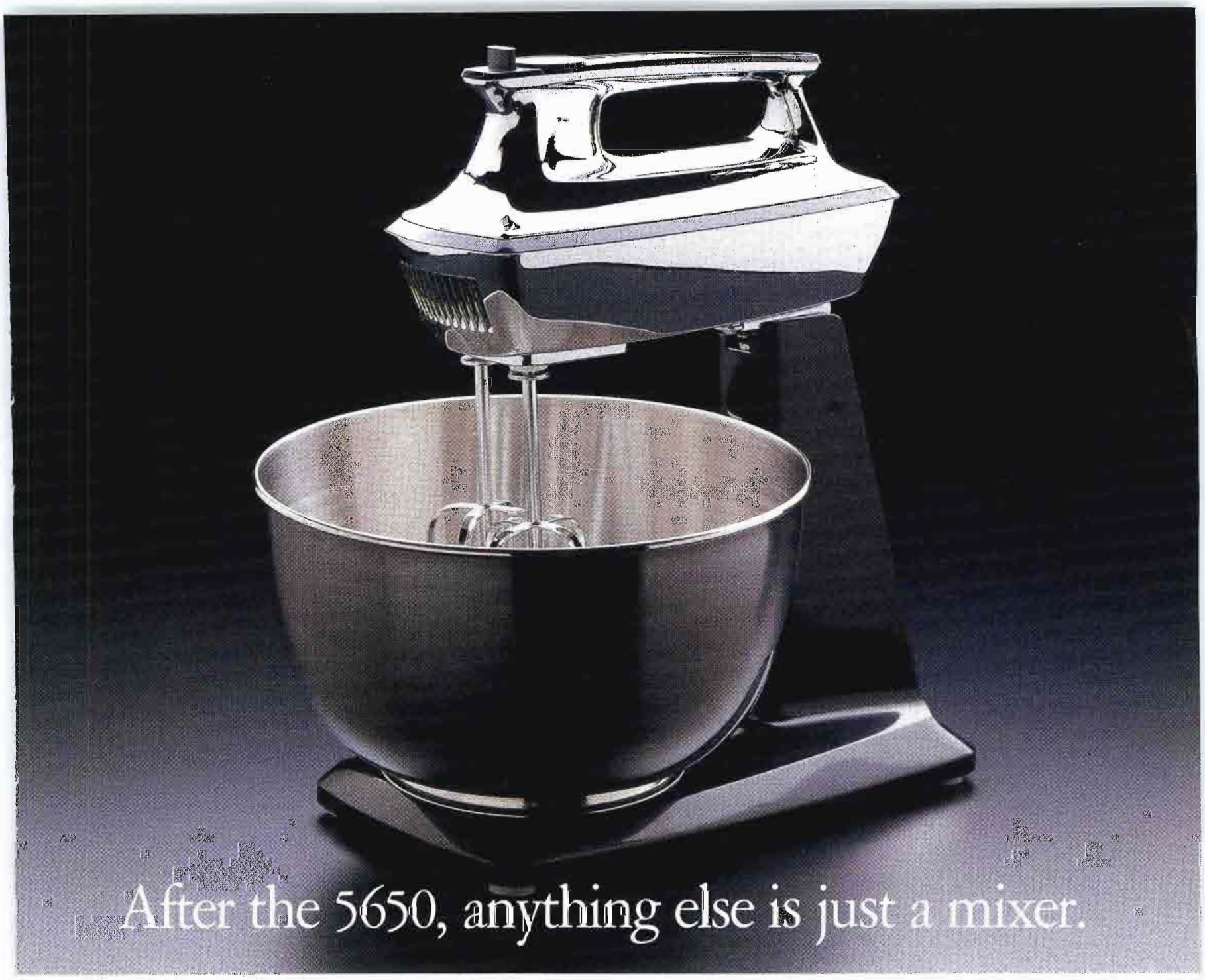
Call or write for a demo tape of the difference that a Comrex can make.

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508-263-1800 **1-800-237-1776**
Comrex UK, Ltd., 171–175 Uxbridge Road,
London W139AA 01-579-2743

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Once you try the 5650 component digital mixer from Thomson, you risk to see your current mixer in a slightly different light. Not just because the 5650 is the first real time, multi-level component digital 4 : 2 : 2 mixer that allows you multi-processing and multi-generations. Nor because it offers you full component digital post production capabilities. The real reason to get really excited about the 5650 is much simpler :

FREEDOM.

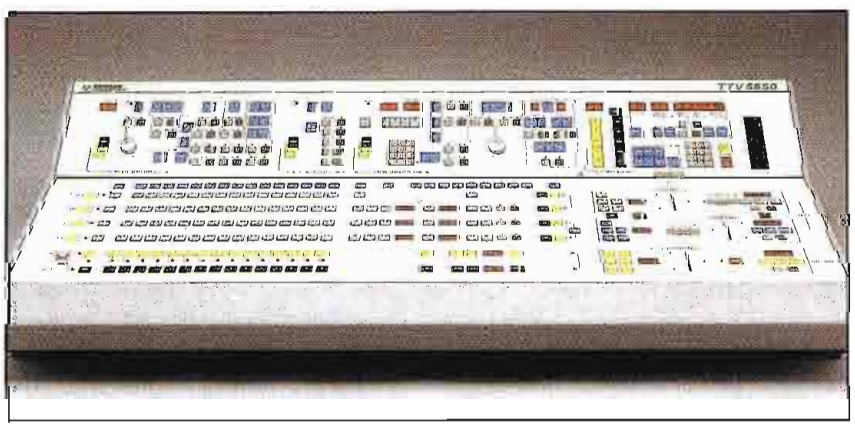
And lots of it. Freedom to create exactly what's in your head, without the headache of lost picture quality. Plus the freedom (and pleasure !) of multi-level mix/effects. And freedom to work with any and all of your current and new generation equipment while taking full advantage of its unique digital architecture.

THE SECRET?

Multi-format input/outputs in both analog and digital standards. And above all, open system to provide full integration in diverse and evolving environments.

What's more, each level of the mix/effect has the same possibilities. That means you'll be free to create without specialized buses and forced integration. Indeed, the only thing you're forced to accept with the 5650 is plenty of wide, open potential !

Chroma Key ? Feel free with three dedicated chroma key buses at your service. And the 5650 keeps you free from maintenance problems with a built-in test bus and automatic diagnostic system. All that at a price that's very reasonable. Take it for a spin !



We think you'll be very impressed with the 5650. But beware : the unlimited freedom you'll experience may make your current mixer seem like, well, just another mixer.

THOMSON VIDEO EQUIPEMENT

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Titus Technological Labs
Tower Design & Fabrication, Inc.
Townsend Broadcast Systems Inc. 245
Transimage International
Transmission Structures, Ltd.
The Truck-Mobile Audio
Varian TVT a Div. of Varian Associates, Inc.
Video Design Pro
Videomedia, Inc. 168
Vir James Consulting Engineers
Vistek Electronics Ltd.
Vizcom
Westlake Audio Professional Products Mfg. Group
Wireworks Corp.

EQUIPMENT LEASING/RENTALS

Adelphon, Inc.
American Laser Systems, Inc.
Audio Service Corp.
BERC 115
Bexel Corp.
Biamp Systems
Buygroup Ltd.
Calhoun Satellite Communications, Inc.
The Camera Mart, Inc. 97
Computer Prompting Corp.
Comsat Video Enterprises
Continental Electronics A Div. of Varian Associates, Inc.
Conus Communications Satellite Services Div.
DICSA-Delay TV Ingenieurs-Conseils SA
Ethereum Scientific Corp.
Eventide Inc.
Harris Corp. Broadcast Div.
Johnson Electronics Inc.
LDL Communications, Inc.
Leasametric, Inc. Instrument Rental Div.
LPL Communications Inc.
Midwest Communications Corp. 1, 41
Moseley Associates, Inc.
Motorola Communications & Electronics Inc.
Musco Mobile Lighting, Ltd.
RAG Electronics, Inc.
Roscor Corp.
Solid Electronics Labs
Tekno Inc.
Tyler Camera Systems
U.S. Instrument Rentals
Video Design Pro
W. Vinten Ltd. Broadcast Systems Div.
Ward-Beck Systems Ltd. .... BC

EQUIPMENT SALES, USED/RECONDITIONED

American Laser Systems, Inc.
Audio Service Corp.
R. Barth KG
BFE AG
Broadcast Electronics, Inc.
The Camera Mart, Inc. 97
Component Video, Inc.
Crow Broadcast Systems Ltd.
Eventide Inc.
Harris Corp. Broadcast Div.
J. Boyd Ingram & Associates
Johnson Electronics Inc.
Leasametric, Inc. Instrument Rental Div.
Lumitrol, Ltd.
Maze Broadcast, Inc.
Merlin Engineering Works
Midwest Communications Corp. 1, 41
Newman-Kees Measurements Engineering & Installations
Old Dominion Broadcast Eng. Service
Pro Video & Film Equipment
RAG Electronics, Inc.
Roscor Corp.
Schneider Corp. of America
U.S. Instrument Rentals
Videomedia, Inc. 168

FILM CLEANING/ INSPECTION/PROCESSING

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Allied Film & Video/IL
Image Transform, Inc.

FILM-TO-TAPE TRANSFERS

Allied Film & Video/DC
Allied Film & Video/IL
Image Transform, Inc.
Johnson-Nyquist Productions Inc.
RADMAR, Inc.

FREQUENCY MEASUREMENTS

Broadcast Signal Lab
J. Boyd Ingram & Associates
Johnson Measurement Service
Phil McQuatters Frequency Measurement Service
Newman-Kees Measurements Engineering & Installations
Old Dominion Broadcast Eng. Service
Standard Frequency Measuring Service
Ziehl Electronic Service

HEAD REFURBISHING/RELAPPING

CMC Technology
GEE Broadcast Systems Ltd.
JRF Magnetic Sciences Inc.
Northern Magnetics, Inc.

LENS REPAIR

Canon USA Inc., Optics Div. 31, 32-33
Fujinon Inc. 47
TSM-Total Spectrum Mfg. 19

MAINTENANCE, AM/FM RADIO

Broadcast Electronics, Inc.
Broadcast Technology of Colorado 92
Evans Associates Consulting Telecom, Engineers
Harris Corp. Broadcast Div.
Horizon Towerz, Inc.
J. Boyd Ingram & Associates
D. L. Markley & Associates, Inc. Consulting Engineers
Micro Communications, Inc.
Newman-Kees Measurements Engineering & Installations
Old Dominion Broadcast Eng. Service
Omega International 71
Radio Systems Inc. 87
Radiotechniques Engineering Corp.
S.G. Communications Inc.
Steiger, Hurray & Associates Inc. Broadcast Tech. Consultants
Teletech, Inc.
Tenco Tower Co.

MAINTENANCE, MICROWAVE/EARTH STATION

Broadcast Technology of Colorado 92
Comwave Div. of Communication Microwave Corp.
Conus Communications Satellite Services Div.
Dalsat Inc.
Harris Corp. Broadcast Div.
Horizon Towerz, Inc.
Newman-Kees Measurements Engineering & Installations
Radiotechniques Engineering Corp.
Roscor Corp.
S.G. Communications Inc.
Teletech, Inc.
Tenco Tower Co.
Vizcom

MAINTENANCE, TV

AVEC
AVS (Audio-Visuel Systems)
BFE AG
Broadcast Aids, Inc.
Component Video, Inc.
Crow Broadcast Systems Ltd.

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Harris Corp. Broadcast Div.
Horizon Towerz, Inc.
Lunar Video Ltd.
D. L. Markley & Associates, Inc. Consulting Engineers
Micro Communications, Inc.
Newman-Kees Measurements Engineering & Installations
Radiotechniques Engineering Corp.
Roscor Corp.
S.G. Communications Inc.
Teletech, Inc.
Tenco Tower Co.
Thomson-LGT 239
Townsend Broadcast Systems Inc. 245
Varian TVT a Div. of Varian Associates, Inc.
Vizcom
VTR Associates, Inc.

PROGRAMMING SERVICES (Music, Sound Effects, Syndication Radio Formats, Jingles, IDs)

Associated Production Music
BFE AG
Capitol Production Music
CaVox Stereo Productions
Comsat Video Enterprises
Concept Productions
Leonardo Software
Kenneth R. Meades
Music Director Programming Service
The Musicworks, Inc.
Network Production Music, Inc.
Soper Sound Music Library Soper Sound Media Music
Tape-Athon Corp. Cavox Stereo Productions
Valentino, Inc.

REBUILDING/RECONDITIONING EQUIPMENT

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Bird Electronic Corp.
Comwave Div. of Communication Microwave Corp.
Dalsat Inc.
Discrete Technology Labs, Inc.
Econco Broadcast Service Inc.
Freeland Products, Inc.
Harris Corp. Broadcast Div.
J. Boyd Ingram & Associates
Jem-Fab Corp.
Lunar Video Ltd.
Media Optical Services
Merlin Engineering Works
Newman-Kees Measurements Engineering & Installations
Old Dominion Broadcast Eng. Service
Omega International 71
Radio Systems Inc. 87
Roscor Corp.
Townsend Broadcast Systems Inc. 245
Universal Fluid Heads (Aust.) Pty. Ltd.
W. Vinten Ltd. Broadcast Systems Div.
Vizcom
VTR Associates, Inc.
Ward-Beck Systems Ltd. .... BC

RELOADING, CARTRIDGE/CASSETTE

Audico, Inc.
Broadcast Cartridge Service
J. Boyd Ingram & Associates
Marathon Products Co.
National Video Service

SATELLITE PROGRAM DISTRIBUTION

Calhoun Satellite Communications, Inc.
Capitol Satellite Communications Systems
Comsat Video Enterprises
Conus Communications Satellite Services Div.
Cycle-Sat
GE American Communications

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Liberty Broadcasting Network
National Public Radio Satellite Services
Nexus Engineering Corp.
Scientific-Atlanta
Wold Communications

SATELLITE TRANSPONDER TIME BROKERS

BAF Communications Corp.
Calhoun Satellite Communications, Inc.
Capitol Satellite Communications Systems
Comsat Video Enterprises
Conus Communications Satellite Services Div.
GE American Communications
National Public Radio Satellite Services
Northstar Satellite Systems Inc.
Wold Communications

STANDARDS CONVERSION

Allied Film & Video/DC
Allied Film & Video/IL
METROPOST
RADMAR, Inc.
Voodoo Technology

TAPE RECORDING/DUPLICATING

Allied Film & Video/DC
Allied Film & Video/IL
CaVox Stereo Productions
Liberty Broadcasting Network
Media Concepts, Inc.
METROPOST
Music Director Programming Service
Mycomp Technologies Corp. (MTC)
RADMAR, Inc.
Roscor Corp.
Tape-Athon Corp. Cavox Stereo Productions
Video Masters, Inc.
Wold Communications
Zonal Ltd.

WEATHER DATA SERVICE

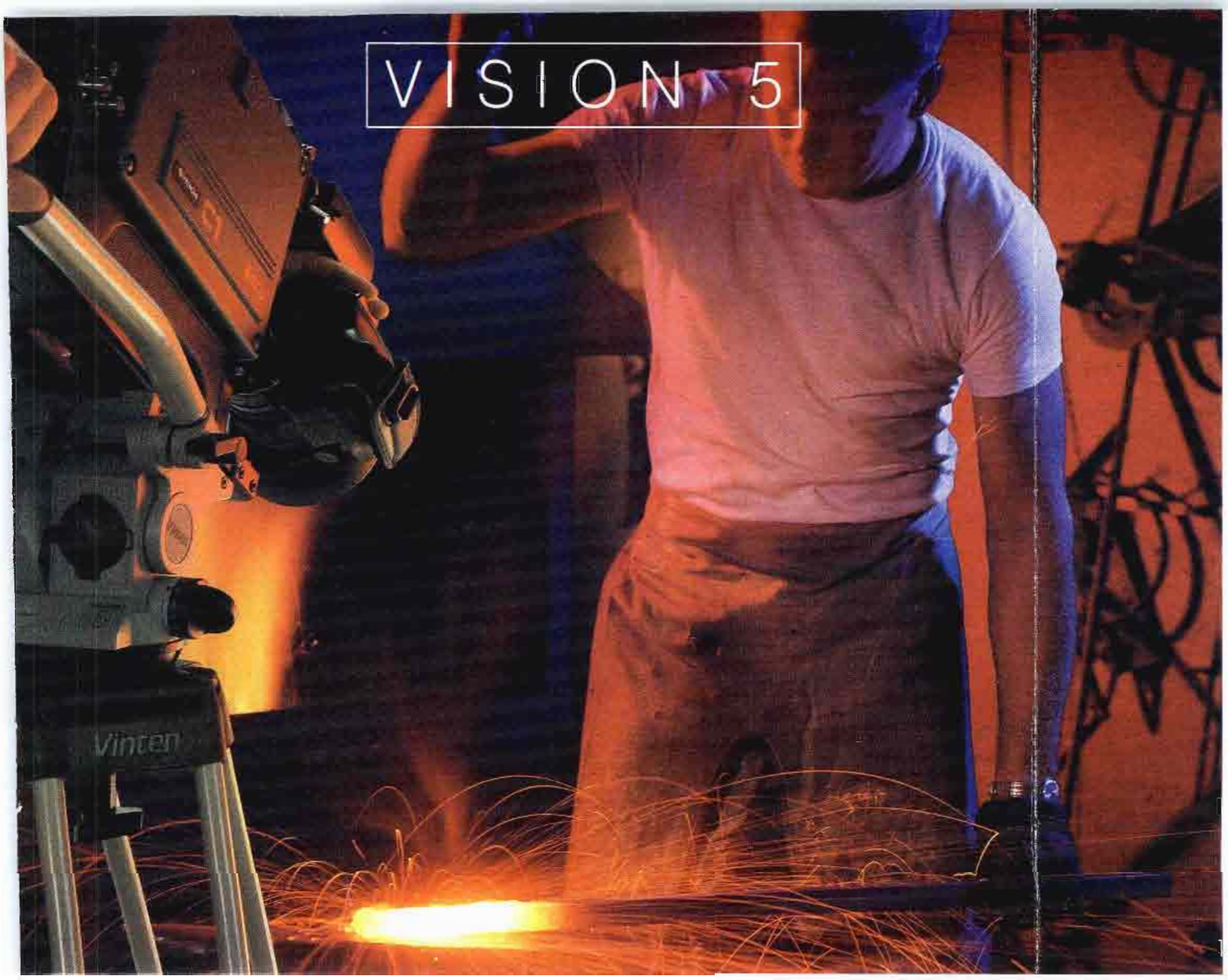
Accu-Weather, Inc.
ESD, Inc.
Kavouras Inc.
R/SCAN Corp.
Systemation Corp.
WSI Corp.

WIRING AND CABLING

Audio Accessories, Inc. 92
Audio Service Corp.
AVS (Audio-Visuel Systems)
R. Barth KG
Belden Wire & Cable 137
Berk-Tek, Inc.
BFE AG
Bi-Tronics, Inc.
C.A.E.
Component Video, Inc.
Crow Broadcast Systems Ltd.
DICSA-Delay TV Ingenieurs-Conseils SA
Dynamic Technology Ltd.
East Coast Video Systems
GE Systems Integration....50
Jem-Fab Corp.
Lakeside Associates Inc.
Markertek Video Supply
Newman-Kees Measurements Engineering & Installations
Old Dominion Broadcast Eng. Service
Omega International 71
Radio Systems Inc. 87
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Teletech, Inc.
Townsend Broadcast Systems Inc. 245
Ward-Beck Systems Ltd. .... BC
Western Electronic Products Co.
Wireworks Corp.

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England TW13 6DH
01-894-5622

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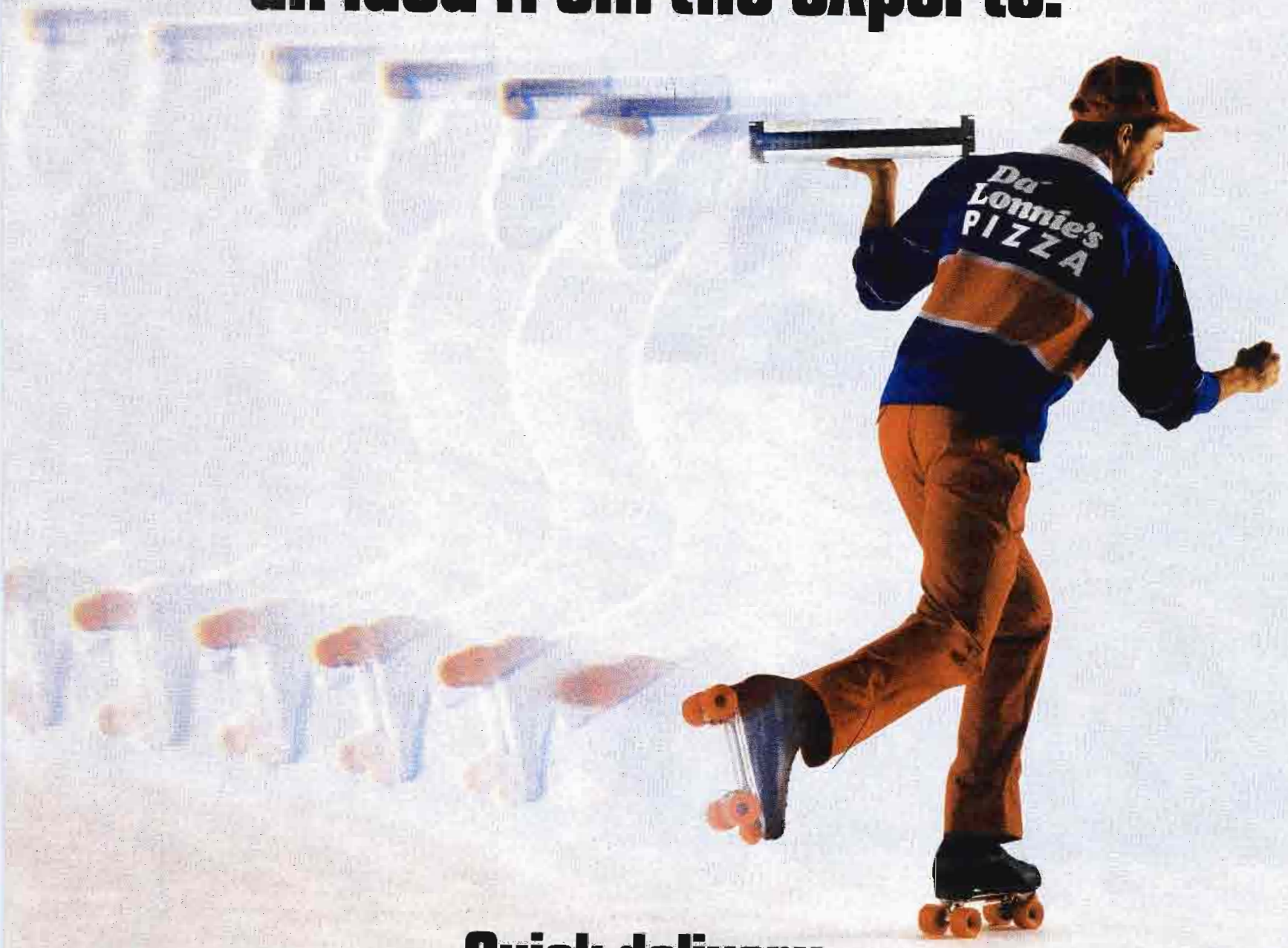
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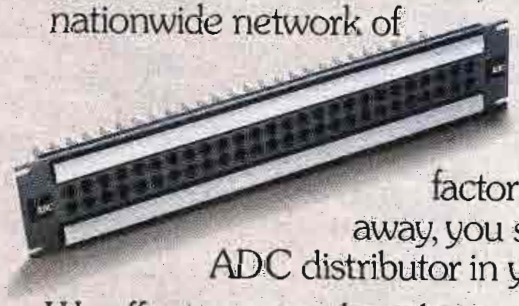
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203-381-7000

Dielectric Communications
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Raymond, ME 04071
207-655-4555

Digital Arts
7370-Q Opportunity Road
San Diego, CA 92111-2225
619-541-2055

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Santa Clara, CA 95054
408-727-8181

Digital Processing Systems
55 Nugget Ave., Suite 10
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Digital Services Corp.
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904-377-8013

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57 Boulevard de la Republique
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Digivision Ltd.
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Leicester, England LE4 0JP
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SF-00210 Helsinki, Finland
358-0-679271

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516-764-1121

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Deer Park, NY 11729
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DKW Systems Inc.
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02940-18014

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0707-333866

R.L. Drake Co.
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New York, NY 10025
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EMT-Franz GmbH
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07825 10 11

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317-897-7000

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Syracuse, NY 13221
315-456-3603

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Hickory, NC 28602
704-324-2200

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Butler, PA 16001
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St. Petersburg, FL 33702
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2162 Union Place
Simi Valley, CA 93065
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Brighton, MI 48116
313-227-2297

Image Transform, Inc.
4142 Lankershim Blvd.
No. Hollywood, CA 91602
818-985-7566

Image Video Ltd.
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416-438-3940

Industrial Acoustics Co.
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Bronx, NY 10462
212-931-8000

Industrial Research Products
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Elk Grove Village, IL 60007
312-439-3600

J. Boyd Ingram & Associates
P.O. Box 73
Batesville, MS 38606
601-563-4664

Innovative TV Equipment, Inc.
6445 De Soto Ave.
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818-888-9421

Inovonics Inc.
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NC, High Point, (919) 869-3335
TX, South Lake, (817) 481-7221
TX, Laredo, (512) 723-2525
VA, Williamsburg, (804) 253-0171
WA, Woodinville, (206) 788-5246
Canada, Ontario, (416) 635-9456
Canada, Vancouver, (604) 872-8525

Integrated Media Systems
1552 Laurel St.
San Carlos, CA 94070
415-592-8055

Intelliprompt
746 N. Cahuenga
Los Angeles, CA 90038
213-461-3113

Interactive Motion Control
8671 Hayden Place
Culver City, CA 90232
213-559-6146

Intergroup Technologies
2040 N.W. 67th Place
Gainesville, FL 32606
904-335-0901

International Electro-Magnetics
350 N. Eric Drive
Palatine, IL 60067
312-358-4622

International Microwave Corp.
65 Commerce Road
Stamford, CT 06902
203-323-5599

International Music Co.
1316 E. Lancaster
Fort Worth, TX 76102
817-336-5114

International Tapetronics, 3M Broadcasting & Related Products Dept.
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Bloomington, IL 61702-0241
309-828-1381

Intraplex, Inc.
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Littleton, MA 01460-2427
617-486-3722

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Menlo Park, CA 94025
415-853-0833

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Alfonso Pena Boeuf 15
28022 Madrid, Spain
1-7477444

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ITELCO
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I-05018 Orvieto, Italy
39.763.40136

ITI Electronics, Inc.
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Fairfield, NJ 07006
201-882-6405

ITS Corp.
375 Valley Brook Road
McMurray, PA 15317
412-941-1500

ITT Cannon
EMC Group World
10550 Talbert Ave.
Fountain Valley, CA 92708-6095
714-964-8299

J

Jamieson & Associates, Inc.
5200 Willson Road, Suite 300
Minneapolis, MN 55424
612-920-3770

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

Alex Perchevitch

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IL, Skokie, (312) 470-0303
IN, Richmond, (317) 962-8596
MD, Baltimore, (301) 859-1500
PA, Pittsburgh, (412) 733-1994
TX, Amarillo, (806) 358-4518
TX, Dallas, (214) 630-3600
WA, Federal Way, (206) 838-2705
WA, Seattle, (206) 363-7730
WY, Casper, (307) 235-1800
Canada, Richmond Hill, Ont., (416) 731-3697

Jasmin Electronics PLC
St. Matthews Way
Leicester, England LE1 2AA
0533-515515

Jasoni Electronics
2900 E. Charleston Blvd., Suite 197
Las Vegas, NV 89104
702-384-0081

JBL Professional
8500 Balboa Blvd.
Northridge, CA 91329
818-893-8411

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PA, Folsom, (215) 543-4677
TX, Bedford, (817) 540-3066

Jefferson Pilot Data Systems
501 Archdale Drive
Charlotte, NC 28210
704-529-3901

Jem-Fab Corp.
574 Sunrise Highway
Baldwin, NY 11510
516-867-8510

Jenel Systems & Design Corp.
10307 Bernardin
Dallas, TX 75243
214-680-0502

Jensen Tools Inc.
7815 South 46th St.
Phoenix, AZ 85044
602-968-6241

Jensen Transformers Inc.
10735 Burbank Blvd.
North Hollywood, CA 91601
213-876-0059

JFW Industries
5134 Commerce Square Drive
Indianapolis, IN 46237
317-887-1340

Johnson Electronics Inc.
4301 Metric Drive
Winter Park, FL 32793-4728
407-677-4030

Johnson Measurement Service
3497 Cornwall Drive, N.W.
Canton, OH 44708
216-477-0635

Johnson-Nyquist Productions Inc.
23854 Via Fabricante, Suite D-1
Mission Viejo, CA 92691
714-770-5777

J&R Film
6820 Romaine
Los Anglees, CA 90038
213-467-3107

JRF Magnetic Sciences Inc.
249 Kennedy Road
Greendell, NJ 07839
201-579-5773

JVC Professional Products Co.
41 Slater Drive
Elmwood Park, NJ 07407
201-794-7664

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GA, Norcross, (404) 447-0811
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TX, Houston, (713) 694-0666

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Kahn Communications, Inc.
425 Merrick Ave.
Westbury, NY 11590
516-222-2221

Kaitronics Corp.
890 Cowan Road
Burlingame, CA 94010
415-697-9102

Paul Tarrodaychik

Kalart Victor Corp.
Hultenius St.
Plainville, CT 06062
203-747-1663

Kalglo Electronics
6584 Ruch Road, E. Allen Twsp.
Bethlehem, PA 18017-9359
215-837-0700

Kathrein-Werke KG
P.O. Box 260
D-8200 Rosenheim, West Germany
08031-184319

Kavouras Inc.
6301 34th Ave. S.
Minneapolis, MN 55450
612-726-9515

Kay Elemetrics Corp.
12 Maple Ave.
Pine Brook, NJ 07058
201-227-2000

Kay Industries, Inc.
604 N. Hill St.
South Bend, IN 46617
415-656-8766

Keltec Florida, Inc.
P.O. Box 2917
Fort Walton Beach, FL 32549
904-224-0043

Keystone Metal Products, Inc.
2711 N. California St.
Burbank, CA 91504
818-846-9210

K&H Products-Porta-Brace
P.O. Box 246
North Bennington, VT 05257
802-442-8171

Kikusui International
19601 Mariner Ave.
Torrence, CA 90503
213-371-4662

Kinemetrics/Truetime
3243 Santa Rosa Ave.
Santa Rosa, CA 95407
707-528-1230

Kintek Inc.
224 Calvary St.
Waltham, MA 02154
617-894-6111

Kintronic Labs, Inc.
P.O. Box 845
Bristol, TN 37621-0845
615-878-3141

Klark-Teknik
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Farmingdale, NY 11735
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Harry Klane

REGIONAL SALES CONTACTS:
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IL, Mishawaka, (219) 256-2025
IL, Westmont, (312) 655-1180
MA, Avon, (617) 588-8043
MD, Fallston, (301) 893-0001
NY, Baldwinsville, (315) 638-1261
NY, Melville, (516) 367-8620
NC, Asheville, (704) 658-2291
PA, Erie, (814) 456-6435
TX, Dallas, (214) 348-9657
WA, Seattle, (206) 524-5170

Klark-Teknik
Walter Nash Road
Kidderminster Worch., England DY11 7HJ
0562-741515

Peter Tongue

Kliegl Bros. Lighting
5 Aerial Way
Syosset, NY 11791

Kline Towers
P.O. Box 1013
Columbia, SC 29202
803-251-8000

Knox Video
8547 Grovemont Circle
Gaithersburg, MD 20877
301-840-5805

Knudson-Benson Associates Inc.
80 Yesler Way
Seattle, WA 98104
206-343-7090

Korg USA
89 Frost St.
Westbury, NY 11590
516-333-9100

Kryptocom Inc.
3115 Kashiwa St., Suite 200
Torrance, CA 90505
213-539-8538

K-Systems of Texas, Inc.
11501 Rojas, Suite P
El Paso, TX 79936
915-598-9769

Kudelski S.A.
Route de Geneve 22
1033 Cheseaux, Switzerland
021 731 21 21

L

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

Lakeside Associates Inc.
1540 E. First St., Suite 243
Santa Ana, CA 92701
714-836-6494

Lamp Technology Inc.
1645 Sycamore Ave.
Bohemia, NY 11716
516-567-1800

D. N. Latus & Co., Inc.
P.O. Box 1720
Helena, MT 59624
406-442-3940

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2821 Ninth St.
Berkeley, CA 94710
415-845-1237

LBA Technology, Inc.
P.O. Box 8026
Greenville, NC 27835-8026
919-757-0279

LDL Communications, Inc.
14440 Cherry Lane Court
Suite 201
Laurel, MD 20707
301-498-2200

LEA Dynatech, Inc.
12516 Lakeland Road
Santa Fe Springs, CA 90670
213-944-0916

Leader Instruments Corp.
380 Oser Ave.
Hauppauge, NY 11788
516-231-6900

Leasametric, Inc.
Instrument Rental Div.
1164 Triton Drive
Foster City, CA 94404
415-574-4441

Lectrosonics, Inc.
P.O. Box 15900
Rio Rancho, NM 87174
505-892-4501

Lee Colortran, Inc.
1015 Chestnut St.
Burbank, CA 91506-9983
818-843-1200

Lee Dan Communications, Inc.
155 Adams Ave.
Hauppauge, NY 11788-3699
516-231-1414

Lee Filters Ltd.
Central Way
Walworth Industrial Estate
Andover, Hants, England SP10 5AN
0264-66245

Lee International
Ladbroke Hall, 85 Barlby Road
London, England W10 5HH
01-960-2111

Leightronix, Inc.
2490 Cedar St., Suite B
Holt, MI 48842
517-694-5589

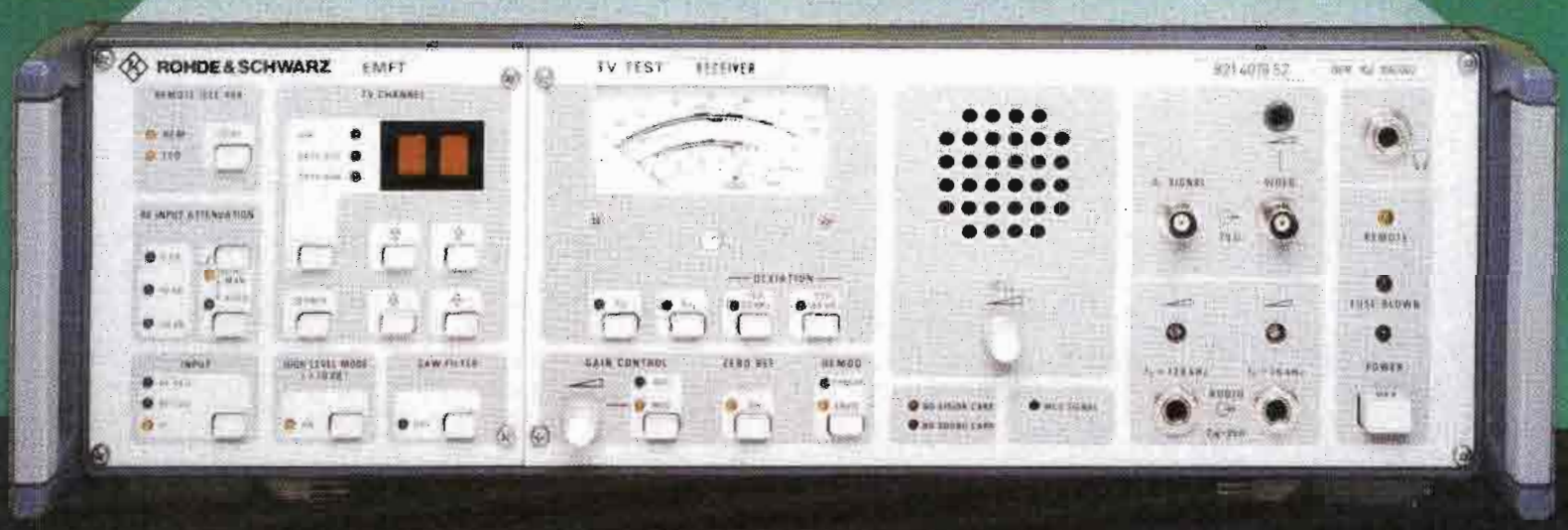
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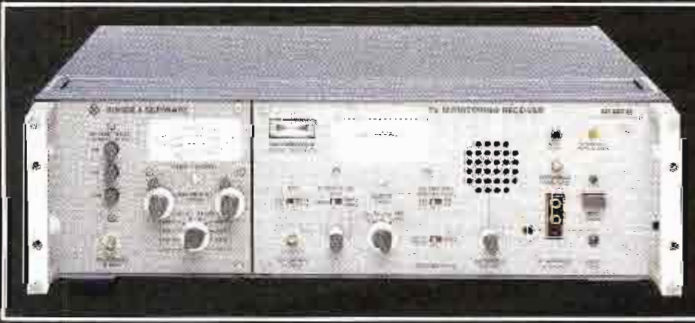
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707-578-8811

Lenco Inc.
Electronics Div.
300 N. Maryland St.
Jackson, MO 63755
314-243-3141

Leonardo Software
10378 Holman Ave.
Los Angeles, CA 90024
213-277-5161

Lexicon Inc.
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Waltham, MA 02154
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Liberty Broadcasting Network
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Lynchburg, VA 24514
804-845-4146

Lighting Methods Inc.
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Rochester, NY 14611
716-328-1020

Lighting & Shadows
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2800 Third St.
San Francisco, CA 94107
415-821-8100

Lightning Eliminators &
Consultants, Inc.
13007 Lakeland Road
Santa Fe Springs, CA 90670
213-946-6886

Lightning Prevention Systems
204-B Cross Keys Road
Berlin, NJ 08009
609-767-7209

Lightwave Communications, Inc.
650 Danbury Road
Ridgefield, CT 06877
203-438-3591

Lindburg Enterprises, Inc.
9707 Candida St.
San Diego, CA 92126
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Lipsner-Smith Co.
4700 Chase Ave.
Lincolnwood, IL 60646
312-677-3000

Listec Video Corp.
30 Oser Ave.
Hauppauge, NY 11788
516-273-3020

James Lloyd Group
P.O. Box 3
Ashland, OR 97520
503-488-1405

LNR Communications, Inc.
180 Marcus Blvd.
Hauppauge, NY 11788
516-273-7111

Logica CES Ltd.
Broadcast & Media Group
64 Newman St.
London, England W1A 4SE
44-1637-9111

Logitek Electronic Systems, Inc.
3320 Bering Drive
Houston, TX 77057
713-782-4592

Lowel-Light Mfg., Inc.
475 Tenth Ave.
New York, NY 10018
212-947-0950
Toni Pearl

LPB Inc.
28 Bacton Hill Road
Frazer, PA 19355
215-644-1123

LPL Communications Inc.
114 East 28th St., Suite 601
New York, NY 10016
212-262-2880

LSI Jennings
A Lear Siegler Co.
970 McLaughlin Ave.
San Jose, CA 95122
408-292-4025

LTM Corp. of America
11646 Pendleton St.
Sun Valley, CA 91352
818-767-1313

Lucas Semiconductors
Garretts Green Lane
Birmingham, England B33 0YA
021-784-6855

Lucasey Mfg. Co.
2744 E. 11th
Oakland, CA 94601
415-534-1435

Lumitrol, Ltd.
253 Merton St.
Toronto, Ont., Canada M4S 1A7
416-485-4817

Lunar Video Ltd.
138 East 26th St.
New York, NY 10010
212-686-4802

L-W Athena, Inc.
255 Easy St.
Simi Valley, CA 93065
805-522-3284

Lyncole XIT Grounding
22412 S. Normandie Ave.
Torrance, CA 90502
213-320-8000

Lyon-Lamb Video Animation
Systems
4531 Empire Ave.
Burbank, CA 91505
818-843-4831

Lyrec Mfg. A/S
Hollandsvej 12, Box 199
DK-2800 Lyngby, Denmark
452-876322

M

M/A-COM Mac, Inc.
5 Omni Way
Chelmsford, MA 01824
617-272-3100

Magnasync/Moviola Corp.
5539 Riverton Ave.
North Hollywood, CA 91603
213-467-3107

Magna-Tech Electronic Co., Inc.
630 Ninth Ave.
New York, NY 10036
212-586-7240

Magnefax International Inc.
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Rogers, AR 72756
501-925-1818

Magni Systems
9500 S.W. Gemini Drive
Beaverton, OR 97005
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The Management
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Fort Worth, TX 76136
817-625-9761

Marathon Products Co.
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West Boylston, MA 01583
508-853-0988

Marcom
P.O. Box 66507
Scotts Valley, CA 95066
408-438-4273

Marconi Communication Systems
Ltd.
Marconi House, New Street
Chelmsford Essex, England CM1 1PL
0245-353221

Marconi Instruments
3 Pearl Court
Allendale, NJ 07401
201-934-9050

Markertek Video Supply
145 Ulster Ave.
Saugerties, NY 12477
914-246-3036

D. L. Markley & Associates, Inc.
Consulting Engineers
2104 W. Moss Ave.
Peoria, IL 61604
309-673-7511

Marshall Electronics
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Culver City, CA 90230
213-390-6608

Marti Electronics
P.O. Box 661
Cleburne, TX 76031
817-645-9163

Matco Mfg. & Test Co., Inc.
dba Matco Control Products
427 Perrymont Ave.
San Jose, CA 95125
408-998-1655

Matthews Studio Equipment, Inc.
2405 Empire Ave.
Burbank, CA 91504
818-843-6715

Matthey Electronics
William Clowes St.
Burslem, Stoke-On-Trent, England
ST6 3AT
0782-577588

Maxell Corp. of America
22-08 Route 208
Fair Lawn, NJ 07410
201-794-5900

Maze Broadcast, Inc.
P.O. Box 100186
Birmingham, AL 35210
205-956-2227

MBI Broadcast Systems
69 Ship St.
Brighton, England BN1 1AE
44-273-24928

McCurdy Radio/Ram Broadcast
346 W. Colfax St.
Palatine, IL 60067
312-358-3330
Steve Gordoni
REGIONAL SALES CONTACTS:
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TN, Knoxville, (615) 689-3030

McCurdy Telecommunications
Products
60 Nably Court
Scarborough, Ont., Canada M1B 2K9
416-291-6449

Phil McQuatters
Frequency Measurement Service
601 S. Bunker Hill Drive
San Bernardino, CA 92410
714-884-1526

MCG Electronics, Inc.
12 Burt Drive
Deer Park, NY 11729
516-586-5125
Terry L. Persun

MCL, Inc.
501 S. Woodcreek Road
Bolingbrook, IL 60439-4999
312-759-9500

Kenneth R. Meades
P.O. Box 71098
Los Angeles, CA 90071
213-666-9570

Media Computing, Inc.
13951 N. Scottsdale Road
Suite 222
Scottsdale, AZ 85254
602-483-9045

Media Concepts, Inc.
559 49th St. S.
St. Petersburg, FL 33707
813-321-2122

Media Optical Services
10880 N.E. Sixth Ave.
Miami, FL 33161
305-751-0880

MEI Electronics/Microprobe
910 Sherwood Drive, Unit 19
Lake Bluff, IL 60044
312-295-2606

Melford Electronics Ltd.
Leigh Court, Leigh St.
High Wycombe, Bucks, England HP11
2QU
0494-25696

MERET, Inc.
1815 24th St.
Santa Monica, CA 90404
213-828-7496

Merlin Engineering Works
2440 Embarcadero Way
Palo Alto, CA 94303
415-865-0900

METROPOST
906 E. Fifth
Austin, TX 78702
512-476-3876

Micro Communications, Inc.
P.O. Box 4365 Grenier Field
Manchester, NH 03108
603-624-4351

Micro Controls, Inc.
P.O. Box 728
Burleson, TX 76028
817-295-0965

MicroAudio Inc.
4438 S.W. Hewett
Portland, OR 97221
503-292-8896

Microdyne Corp.
P.O. Box 7213
Ocala, FL 32672
904-687-4633

Microflect Co., Inc.
P.O. Box 12985
Salem, OR 97309-0985
503-363-9267

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Micron Audio Products Ltd.
210 Westlake Drive
Valhalla, NY 10595
914-761-6520

Microsonics Inc.
60 Winter St.
Weymouth, MA 02188-3336
617-337-4200

Microtime, Inc.
1280 Blue Hills Ave.
Bloomfield, CT 06002
203-242-4242

Nigel Spratling

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NJ, Lawrenceville, (609) 896-3716
TX, Richardson, (214) 644-0232
WI, Merrimac, (608) 493-2619

MicroTouch Systems
10 State St.
Woburn, MA 01801
617-935-0080

Micro-Trak Corp.
165 Front St., CBDC
Chicopee, MA 01013
413-594-8501

Microtran Co. Inc.
P.O. Box 236
Valley Stream, NY 11582
516-561-6050

Microwave Development Labs, Inc.
10 Michigan Drive
Natick, MA 01760
508-655-0060

Microwave Filter Co., Inc.
6743 Kinne St.
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315-437-3953

Microwave Radio Corp.
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Midwest Communications Corp.
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IN, South Bend, (219) 277-6710
KY, Louisville, (502) 491-2888
MD, Lanham, (301) 577-4903
MO, St. Louis, (314) 569-2240
OH, Cleveland, (216) 447-9745
VA, Norfolk, (804) 853-2600
WA, Seattle, (206) 455-2331

Mikrolab Video Inc.
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Los Angeles, CA 90066
213-306-0120

Milab Microphones
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Farmingdale, NY 11735
516-249-3660

Miles Air Products Ltd.
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416-690-4404

Miller Fluid Heads (USA) Inc.
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Lodi, NJ 07644
201-473-9592

Miller Professional Equipment, Inc.
10816 Burbank Blvd.
North Hollywood, CA 91601
818-766-9451

Minolta Corp.
Industrial Meter Div.
101 Williams Drive
Ramsey, NJ 07446
201-825-4000

Mitchell Camera Corp.
18750 Oxnard St., Suite 401
Tarzana, CA 91356
818-609-7733

Mitsubishi Int'l. Corp.
Electronic Equipment Div.
46305 Landing Parkway
Fremont, CA 94538
415-651-9931

Mitsubishi Pro Audio Group
Digital Entertainment Corp.
225 Parkside Drive
San Fernando, CA 91340
818-898-2341

Mobile-Cam Products
P.O. Box A-82108
San Diego, CA 92138
619-441-1295

Modular Audio Products
Unit of Modular Devices, Inc.
One Roned Road
Shirley, NY 11967
516-345-3100

Modulation Associates Inc.
897 Independence Ave.
Mountain View, CA 94043
415-962-8000

Modulation Sciences, Inc.
115 Myrtle Ave.
Brooklyn, NY 11201
718-625-7333

Mohawk Wire & Cable Corp.
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Leominster, MA 01453
508-537-9961

Mole-Richardson Co.
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Hollywood, CA 90037-2384
213-851-0111

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100 Housel Ave.
Lyndonville, NY 14098
716-765-2254

Montage Group, Ltd.
1 West 85th St., Suite 3A
New York, NY 10024
212-362-0892

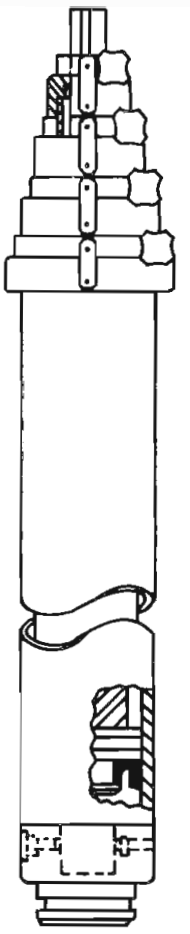
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MPO Videotronics
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808-499-8513

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2426 Linden Lane
Silver Spring, MD 20910
301-587-6087

Multidyne Electronics Inc.
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516-671-7278

Multiplex Technology
251 Imperial Highway
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714-680-5848

Musco Mobile Lighting, Ltd.
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Oskaloosa, IA 52577
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Music Director Programming Service
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413-783-4626

The Musicworks, Inc.
P.O. Box 111390
Nashville, TN 37211
615-790-1200

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San Clemente, CA 92672
714-498-2038

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Nady Systems Inc.
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415-652-2411

Nakamichi America Corp.
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Torrance, CA 90502
213-538-8150

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Nalpak Video Sales Inc.
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El Cajon, CA 92020
619-258-1200

The Narda Microwave Corp.
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516-231-1700

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Satellite Services
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0784-56456

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NE38 0AB
91 4173525

L E Nelson Sales Corp.
5451 Ukiah Circle
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12240 N.E. 14th Ave.
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Neotek Corp.
1154 W. Belmont
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802-295-5800

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Engineering & Installations
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Evansville, IN 47712
812-963-3294

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Photo/Electronic Imagine Products
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516-222-0200

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TX, Dallas, (214) 243-2564
WA, Seattle, (206) 525-5203

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714-979-3993

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Old Dominion Broadcast Eng. Service
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804-321-4506

Omega International
2691 Richter, Suite 116
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Omicron Video
21822 Lassen St., Suite L
Chatsworth, CA 91311
818-700-0742

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P

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Packaged Lighting Systems, Inc.
P.O. Box 285
Walden, NY 12586
914-778-3515

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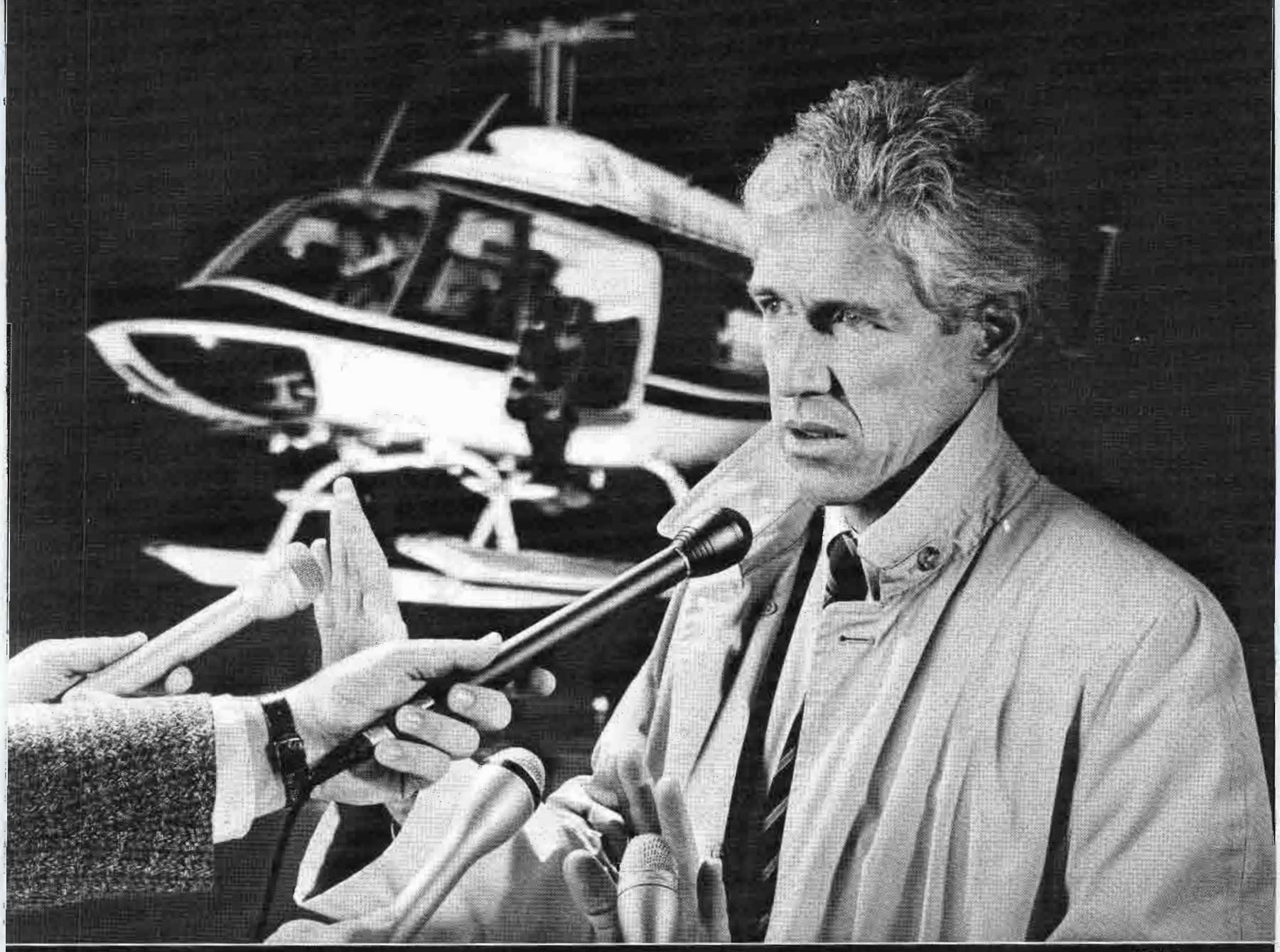
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Professional Sound Corp.
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Q

QEI Corp.
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R

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RAG Electronics, Inc.
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920-3939

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818-765-7265

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312-884-0770

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Nyack, NY 10960
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MI, Clarkston, (313) 625-6868
NY, Brooklyn, (718) 646-6300
NY, Rockville Centre, (516) 536-8868
TX, Dallas, (214) 239-3680
Canada, Brampton, Ont., (416) 458-5333
England, Leatherhead, Surrey, 0372-379414
England, Lincoln, 0522-42631
France, Colombes, 1 47.60.05 15
Italy, Firenze, 055 68.52.92
Spain, Madrid, 91 476 25 65
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Richmond Sound Design, Ltd.
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Hayden Lake, ID 83835
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ROH Div. of Anchor Audio
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Torrance, CA 90502
213-533-5984

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Rohde & Schwarz
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D-8000 Munich 80, West Germany
089-4129-2230

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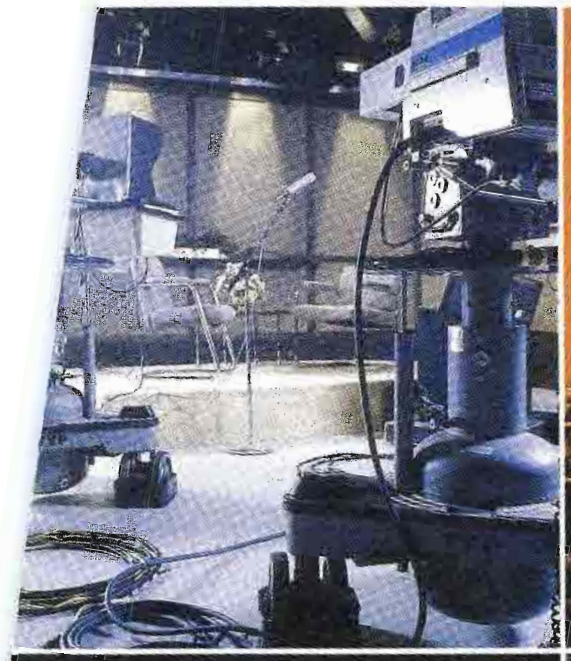
Sono-Mag Corp.
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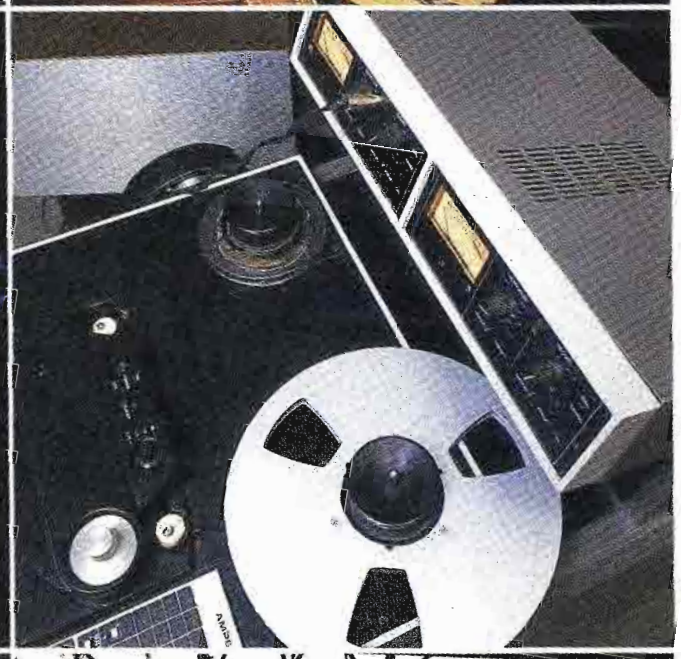
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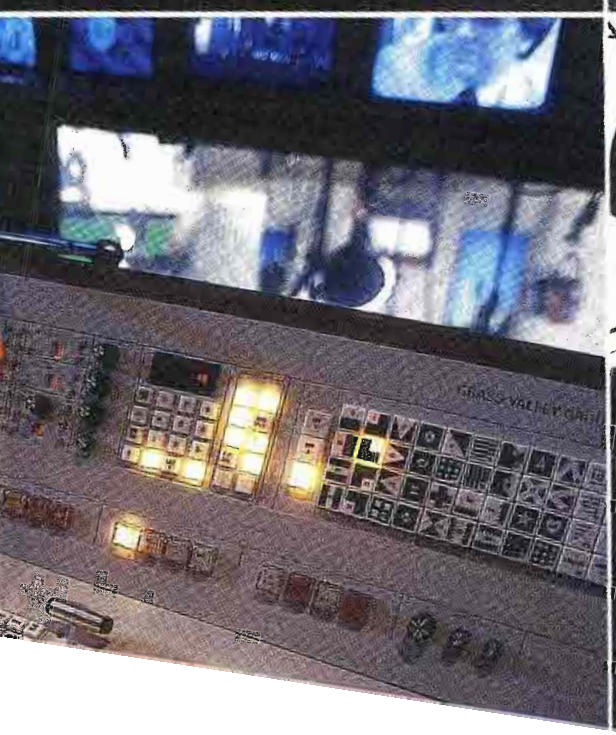
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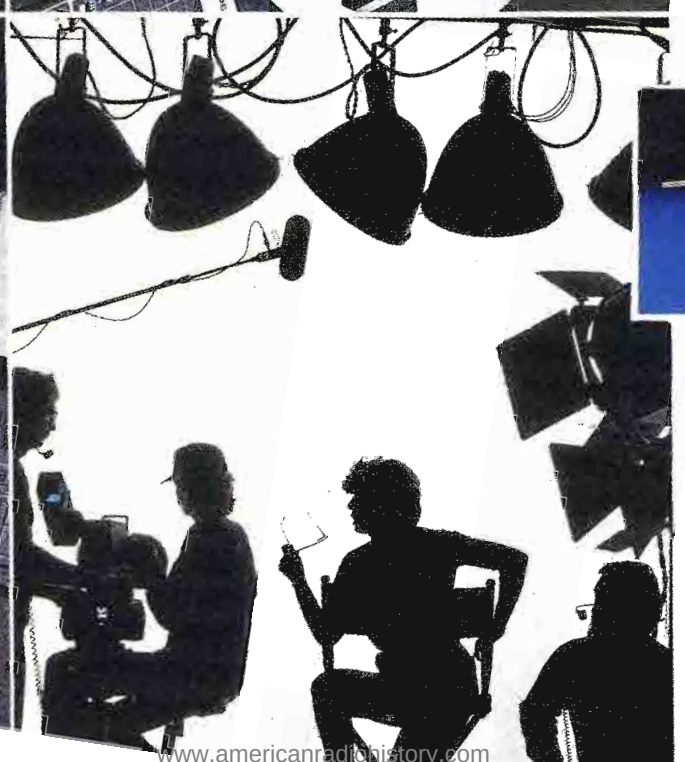












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I-40068 San Lazzaro di Savena,
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051-456148

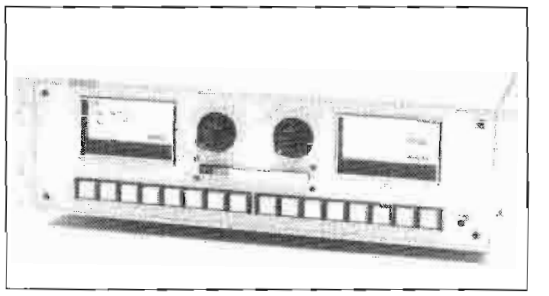
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604-589-1100

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TFT Inc.
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Santa Clara, CA 95052-8088
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Thermodyne International
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Long Beach, CA 90810
213-603-1976

Thomson Consumer Electronics Inc.
Distributor & Special Products
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Deptford, NJ 08096-2088
609-853-2356

Thomson-CSF
Electron Tube Div.
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Dover, NJ 07801
201-328-1400

Thomson-CSF
Div. Tubes Electroniques
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F-92102 Boulogne-Billancourt,
Cedex, France
33-1-46048175

Thomson-LGT
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78700 Conflans Ste.
Honorine, France
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Andre Comte
REGIONAL SALES CONTACTS:
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Thomson Video Equipment
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95801 Cergy Saint-Christopher,
France
34 207072
A. Fresco
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Belgium, Bruxelles, 322-648.64.85
England, Datchet, 44 753.681.122
Greece, Athens, 301 672.11.73
Italy, Rome, 396 638.01.43
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West Germany, Lahr, 49 78.25.10.11

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St. Paul, MN 55144-1000
800-328-1371

3M Broadcasting & Related Products Dept.
Building 223-55-08, 3M Center
St. Paul, MN 55119
612-736-6955

3M Electrical Products Div.
225-4N-01, 3M Center
St. Paul, MN 55144-1000
612-733-8019

3M Electronic Article Surveillance Surveillance/3M
223-3N-01 3M Center
St. Paul, MN 55144-1000
612-733-5050

3M Magnetic Media Div.
223-55-01, 3M Center
St. Paul, MN 55144-1000
612-733-1082

3M Optical Recording
223-5S-01, 3M Center
St. Paul, MN 55144-1000
612-733-6334

3M Static Control Systems Div.
Building A501, P.O. Box 2963
Austin, TX 78769-2963
800-328-1368

TIC General
P.O. Box 1
Thief River Falls, MN 56701
218-681-1291

Tiffen Mfg. Corp.
90 Oser Ave.
Hauppauge, NY 11788
516-273-2500

Time Service Systems Inc.
30 E. Beaver Creek Road, Suite 117
Richmond Hill, Ont., Canada L4B 1J2
416-764-7720

Times Square Stage Lighting Co., Inc.
Route 9W Holt Drive
Stony Point, NY 10980
914-947-3034

Titus Technological Labs
77 Kreiger Lane, Suite 914
Glastonbury, CT 06033
203-633-5472

TMD/The Will-Burt Co.
P.O. Box 900
Orrville, OH 44667-0900
216-682-7015

TOA Electronics, Inc.
480 Carlton Court
South San Francisco, CA 94080
415-588-2538

Toko America Inc.
1250 Feenanville Drive
Mount Prospect, IL 60056
312-297-0070

Topaz, Inc.
9192 Topaz Way
San Diego, CA 92123
619-279-0111

Torpey Controls & Eng. Ltd.
2220 Midland Ave. Unit 98
Scarborough, Ont., Canada M1P 3E6
416-298-7788

Toshiba America
2441 Michelle Drive
Tustin, CA 92680

Toshiba Corp.
1-1-1 Shibaura, Minata-Ku
Tokyo, Japan 105
03-457-3248

Total Audio Concepts (TAC)
Unit 17, Bar Lane Industrial Park
Basford, Nottingham, England NG6 0HU
0602-783306

Tower Design & Fabrication, Inc.
Route 1, Box 33AA
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512-836-2016

Townsend Test & Measuring Group
8927 J.M. Keynes Drive, Suite 305
Charlotte, NC 28213
704-547-TEST

Tracor Instruments Austin Inc. Industrial Instruments Div.
6500 Tracor Lane, Building 27-6
Austin, TX 78725-2100
512-929-2208

Transimage International
Transimage House,
245 Hanworth Road
Hounslow, Middlesex, England TW3 3UA
01-572-0100

Transmission Structures, Ltd.
P.O. Box 907
Vinita, OK 74301
918-256-7883

Transtector Systems Inc.
10701 Airport Drive
Hayden Lake, ID 83835
800-635-2537

Trimm Inc.
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Libertyville, IL 60048
312-362-3700

Triplett Corp.
1 Triplett Drive
Bluffton, OH 45817
419-358-5015

Trompeter Electronics, Inc.
P.O. Box 5069
Westlake Village, CA 91359-5069
818-707-2020

The Truck-Mobile Audio
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Just one of our many innovative telephone interface products, the Digital Hybrid is an auto-nulling telephone hybrid with precision filtering and noise reduction. Its digital signal processing circuitry stops leakage between receive and send audio giving you clean sonic performance.

The Digital Hybrid from Gentner, more powerful than traditional telephone interface systems, is one hot commodity that will pay you dividends for a long time to come.

GENTNER
TELEPHONE PRODUCTS

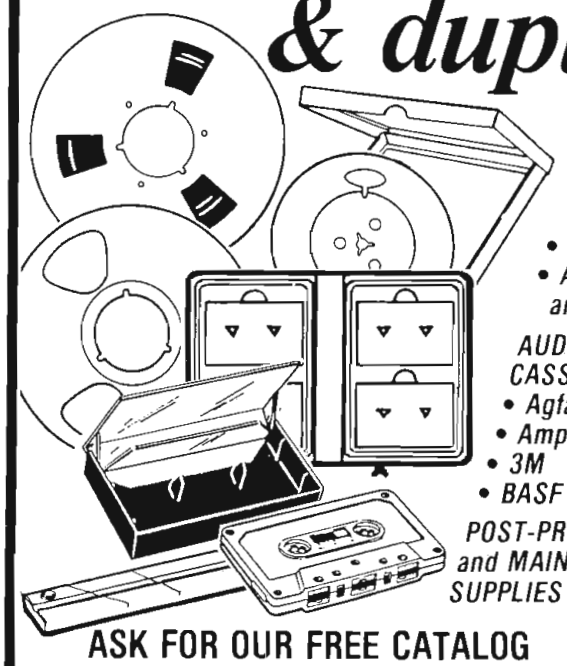
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619-457-1000

Trylon Mfg. Co. Ltd.
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519-669-5421

TSM-Total Spectrum Mfg.
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914-358-8820
Gary Rotondelli

TTE, Inc.
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Los Angeles, CA 90064
213-478-8224

Tungstone Batteries Inc.
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Sharon, MA 02067
617-784-8123

Twentier Systems
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Emeryville, CA 94608
415-654-1168

Tyler Camera Systems
14218 Aetna St.
Van Nuys, CA 91401
818-989-4420

U

Uher of America
7067 Vineland Ave.
North Hollywood, CA 91605
818-764-1120

Ultimate Support Systems
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Fort Collins, CO 80524
303-493-4488

ULTIMATTE Corp.
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Reseda, CA 91335
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Mary F. Zaller

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IA, Des Moines, (515) 282-4800
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NM, Albuquerque, (915) 833-2206
NY, New York, (212) 265-2195
NC, Charlotte, (704) 399-6336
OH, Cleveland, (216) 447-9745
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508-692-9505

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United Ad Label Co., Inc.
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714-990-2700

United Media, Inc.
4075 Leaverton Court
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714-630-8020

United Ropeworks (USA) Inc.
Phillystran Div.
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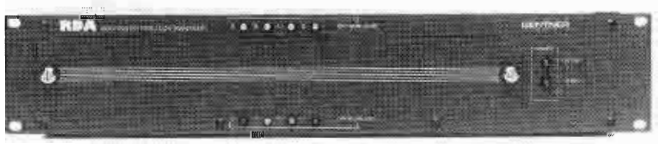
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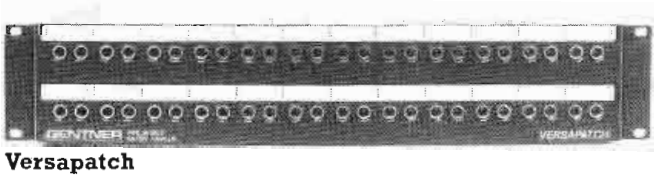
VRC 1000



Digital Hybrid



Routing Distribution Amplifier



Versapatch

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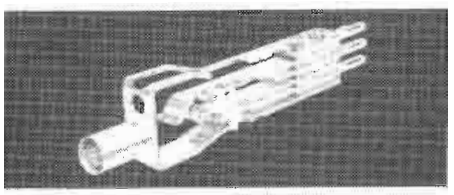
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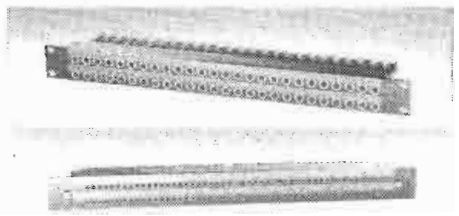
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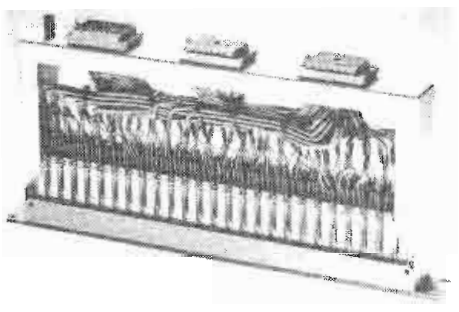
PATCH-BAY PRODUCTS



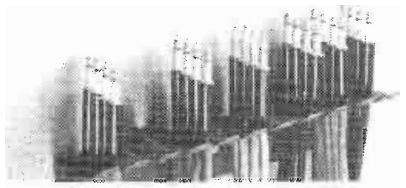
- 1/4" Long-frame and Mini Telephone Jacks



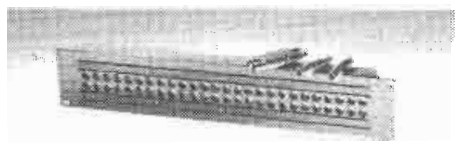
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VA, Lynchburg, (804) 384-7001

UTE Microwave, Inc.
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405-946-5551

V

Valentino, Inc.
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615-383-4737

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Electron Device Group
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Palo Alto, CA 94303
415-493-4000

Bob Woods

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IL, Park Ridge, (312) 825-6686
MD, Linthicum, (301) 850-5010
MA, Burlington, (617) 272-8532
NJ, Cranford, (201) 276-9050
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TX, Dallas, (214) 235-2385
VA, Arlington, (703) 522-8002

Varian TVT a Div. of Varian Associates, Inc.
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Dallas, TX 75227-0879
214-381-7161

Varian TVT Ltd.
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Cambridge, England CB1 3JU
0223-245115

VDO-PAK Products
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Port Orange, FL 32029
904-767-3400

Veam/Litton Systems, Inc.
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Watertown, CT 06795
203-274-9681

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516-231-4400

Video Design Pro
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D-3013 Barsinghausen, West Germany
49 05105 81144

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Kansas City, MO 64141
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Stan Sult

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England, London, 753-681-596

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201-469-9038

Videoquip Research Ltd.
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416-293-1042

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243 Shoemaker Road
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0284-2121

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Westwood, NJ 07675
201-666-3950

Voodoo Technology
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Scotts Valley, CA 95066
408-438-7412

VTR Associates, Inc.
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205-533-0571

W

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Wavefront Technologies
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805-962-8117

Wegener Communications Inc.
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Duluth, GA 30136
404-623-0096

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Apex, NC 27502
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800-523-7508

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Redhill, Surrey, England RH1 2NX
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Product Directory begins on page 11

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ALABAMA

Gray Communications Consultants, Inc., P.O. Box 590069, Birmingham, AL 35209-0069 (205-942-2824)

Gray Communications Consultants, Inc., 2866 Dauphin St., Suite F, Mobile, AL 36606 (205-476-2051) Entire Southeast, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Transmitters, Antennas & Transmission Systems

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Alaska Electronics Supply, Inc., 2020 E. Dowling Road Units 1 & 2, Anchorage, AK 99507 (907-563-3774) AK, Audio Equip.; Test & Measurement Equip.; Tape; Vacuum Tubes

Bennett Engineering, Alaska, 4632 Business Park Blvd., Anchorage, AK 99503 (907-346-2569) AK, Engineering Consultants-Electronic & Communications Systems; Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design

ARIZONA

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

Jensen Tools Inc., 7815 South 46th St., Phoenix, AZ 85044 (602-968-6231) Worldwide, Tools; Test Equip.; Shipping Containers

Penstock Desert States, 2111 E. Broadway Road, Suite 5, Tempe, AZ 85282 (800-255-6788) AZ, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

ROH'S Inc., 2922 N. Campbell Ave., Tucson, AZ 85719 (602-795-8573) AZ, NM, Audio & Video Equip.; Tape; System Design

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Vaughn Broadcast Rentals, Vaughn Duplication Service, 2929 North 44th Ave., Suite 110, Phoenix, AZ 85018 (602-840-1313) AZ, Audio, Video, Test & Measurement Equip.; Audio & Video Tape; Vacuum Tubes; Service & Repair; System Design; Used & Rental Equip.; Duplications

CALIFORNIA

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

Allied Broadcast Systems, 3901 MacArthur, Suite 200, Newport Beach, CA 92660 (714-752-0855) Worldwide, Audio Equip.; Transmitters, Antennas & Transmission Systems; System Design

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., 10639 Riverside Drive, North Hollywood, CA 91602 (818-980-9891; 800-228-4429) USA 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; Teleconference Systems; Audio/VHS Tape

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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

CMTV Inc., Affiliated with The Camera Mart, Inc., 1900 W. Burbank Blvd., Burbank, CA 91506 (818-843-2473) AZ, CA, CO, CT, IL, ME, MD, MA, MI, NV, NH, NJ, NM, NY, OH, PA, TX, VT, VI, Audio, Video, Test & Measurement Equip.; Tape; Film Equip.; System Design; Used Equip.

See advertisement on page 97

Component Video, Inc., P.O. Box 8185, Van Nuys, CA 91406 (818-997-6463) USA, Component Vision Systems; Application Engineering; Technical Services

COMWEST, P.O. Box 417992, Sacramento, CA 95841 (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.

Daily Electronics Corp., 909 N. Alameda St., Compton, CA 90224 (213-774-1255; 800-346-6667) Worldwide, Vacuum Tubes: Transmitting, Camera, Industrial Receivers; Tube Rebuilding

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.

ESP-Extraordinarily Superior Products Inc., 7210 Jordan Ave., Suite B-45, Canoga Park, CA 91303 (818-883-2138) AZ, CA, NV, NM, Audio-Video Router & Distribution Equip.; Audio for Video Mixers; Wide Band Fiber Optics, RGB or NTSC; Custom Cases-shipping, carrying & storage

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

Jensen Transformers, Inc., 10735 Burbank Blvd., North Hollywood, CA 91601 (213-876-0059) CA, Audio 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., 7657 Lasaine Ave., Northridge, CA 91325 (818-609-0143)

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; Head Cleaning Equip.; Accessories for A/V Duplication; Tape; High Density Storage Systems, Portable Video Playback

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Midwest Communications Corp., 324 Martin Ave., Santa Clara, CA 95050 (408-988-2968) CA, NV, Audio, Video, Test & Measurement Equip.; Tape Transmitters, Antennas & Transmission Systems; Vans & Accessories; Service & Repair; System Design

Mobile-Cam Products, P.O. Box A-82108, San Diego, CA 92138 (619-441-1295) Worldwide, Audio, Video & RF Products; Vans

Pacific Coast Marketing, 14125 Capri Drive, Los Gatos, CA 95030 (408-370-3505) CA, NV, Test & Measurement Equip.; Audio Equip.

Penstock Inc., 520 Mercury Drive, Sunnyvale, CA 94086-4018 (408-730-0300) AK, CA, ID, IL, IN, IA, KS, MI, MN, MO, MT, NE, NV, NJ, NY, ND, OH, OR, PA, SD, WA, WI, WY, BC, Alta., Yuk., RF & Microwave Active & Passive Components; Cable assemblies & Connectors; Connectors, Cable & Assemblies

RAG Electronics, Inc., 21418 Parthenia St., Canoga Park, CA 91304 (818-998-6500) Nationwide, Test & Measurement Equip.; Service & Repair; Used Equip.

RF Specialties of California, 3463 State St., Suite 229, Santa Barbara, CA 93105 (805-682-9429) AZ, CA, NV, Transmitters, Antennas & Transmission Systems; Test Equip.; Audio Equip.

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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, Installation & Sales

System Associates, 10375 Jefferson Blvd., Culver City, CA 90232 (213-836-1111) 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; Interactive Systems; Teleconferencing

Tenco Tower Co., 9723 Folsom Blvd., Suite A, Sacramento, CA 95827-1326 (916-638-8833) AK, AZ, CA, HI, NV, OR, WA, Transmitters, Antennas & Transmission Systems; Service & Repair

TVA/Television Associates, 2410 Charleston Road, Mountain View, CA 94043 (415-967-6040) Northern-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 & Sales

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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.

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Penstock Rocky Mountain, 9940 E. Costilla Ave., Suite L, Englewood, CO 80112 (303-792-0777) CO, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

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

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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

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Lauderdale Electronic Labs, 16 S.W. 13th St., Fort Lauderdale, FL 33315 (305-764-7755) USA 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., 8875 N.W. 23rd St., Miami, FL 33172 (305-592-5355) FL

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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

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Recording Studio Equipment Co., 229 Sunny Isles Blvd., North Miami, FL 33160 (305-945-9774) USA, Export to So. America, Europe, Caribbean, Professional Audio Equip.; Studio Design & Interface

RF Specialties of Florida, P.O. Box 397, Niceville, FL 32578 (904-678-8943) AL, FL, GA, SC, Transmitters, Antennas & Transmission Systems

Southeast Electronics, Inc., 1125 Rosselle St., Jacksonville, FL 32203 (904-356-3007) AL, FL, GA, Audio & Video Equip.; Transmitters; Tape; Service & Repair; System Design; Used Equip; Parts (Vacuum Tubes)

Stage Equipment & Lighting, Inc., 4602 S.W. 35th St., Orlando, FL 32811 (407-425-2010) AL, FL, GA

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; Service & Repair; Used Equip.; Film Equip.

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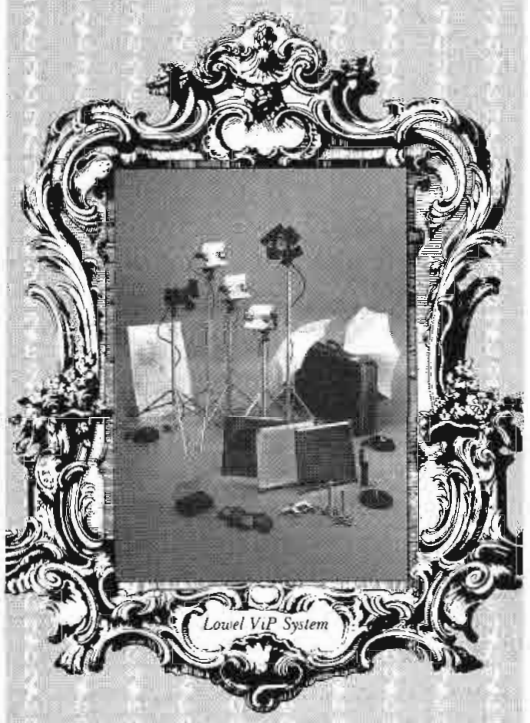
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Midwest Communications Corp., 522 Armour Circle, Atlanta, GA 30324 (404-875-3753) USA, GU, PR, VI, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design

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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

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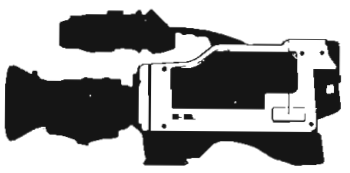
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Omega Pacific, 222 Kaelepulu Drive, Kailua, HI 96734 (808-263-4212) HI, Video Equip.; Transmitters, Antennas & Transmission Systems

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

Broadcasters General Store, Inc., 746 Cypress Lane, Carol Stream, IL 60188 (312-231-7120) USA, Audio Equip.; Transmitters, Antennas & Transmission Systems; Service & Repair; System Design; Tape; Test & Measurement Equip.

Columbia Audio/Video, The Columbia Building, 1741 Second St., Highland Park, IL 60035-3599 (312-433-8217) IL, IN, IA, MI, WI, Video Equip.; Tape

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

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

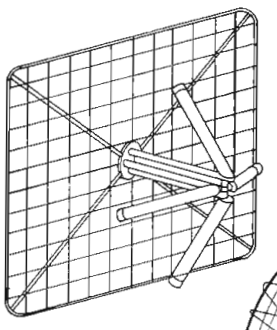
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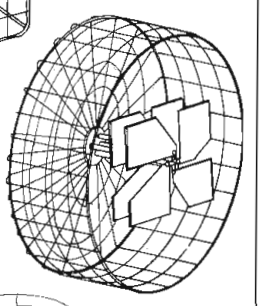
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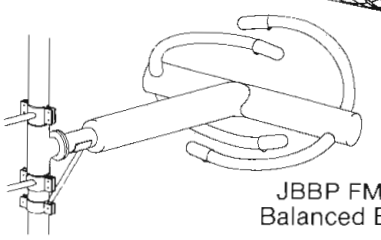
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Joseph Electronics, 8830 N. Milwaukee Ave., Niles, IL 60648 (312-297-4200; 800-323-5925) IL, IN, WI, National by Mail Order, Test Equip.; Tools; Cases; Wire; Connectors; Batteries; Camera Tubes; Hardware; Components; Chemicals; Cabinets; Solder & Equip.;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

Penstock, Midwest, 1250 W. Northwest Highway, Palatine, IL 60067 (312-934-3700) IL, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

Richardson Electronics, Ltd., 40W267 Keslinger Road, Lafox, IL 60147 (800-348-5580; 312-232-6400) Worldwide, Vacuum Tubes

See advertisement on page 149

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, Representing over 250 mfg. of pro. & industrial broadcast audio/video/data communications equip. Complete turnkey design/eng. (CAD), fabrication, integration, installation & follow-up service. Rental

Video Images-Chicago, 1121 Tower Lane, Bensenville, IL 60106 (312-766-1100) IL, Audio, Video, Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Vans & Accessories; System Design; Used Equip.; Service & Repair



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INDIANA

Allied Broadcast Equipment, 3712 National Road W., Richmond, IN 47374 (317-962-8596) Worldwide, Worlds largest independent distributor of Audio & RF Broadcast & Professional Equipment; Turnkey Systems a Specialty

Allied Broadcast Equipment, Satellite Div., 3712 National Road W., Richmond, IN 47375 (317-962-8596) USA, Independent distributor of satellite communcation equip. to broadcast industry for state-of-the-art commercial up & down link gear.

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

Penstock, Midwest, 4030 E. Southport Road, Suite 27, Indianapolis, IN 46237 (317-784-3870) IN, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

IOWA

Audiovisual Inc., 415 S.W. Eighth St., Des Moines, IA 50309 (515-282-4800) 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) USA, 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; Vacumm 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., 1410 S. Kansas Ave., Topeka, KS 66612 (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.

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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.; Fiber Optics & Transmission Systems

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

See Advertisements on page 1 and page 41

MARYLAND

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; Microphones

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

Radio Resources, 7483 Candlewood Road, Hanover, MD 21076 (301-859-1500; 800-547-2346) USA, Radio Broadcast Equip. & Supplies

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.

Theatre Service & Supply Corp., 1792 Union Ave., Baltimore, MD 21211 (301-467-1225) USA, Lighting Equip. for Studio & Location; Studio Curtains & Track Systems; Projection Screens; Dimming Equip. & Electrical Distribution; Motorized & Manual Rigging 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; 800-633-8223) 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., North Andover, MA 01845 (508-682-2000) USA, Precision hand tools, test instruments, tool kits, soldering supplies

HMC-Hub Material Co., 33 Springdale Ave., Canton, MA 02021 (617-821-1870) USA, Test Equip.; Tool Kits & Cases; Soldering Supplies

Lake Systems Corp., 287 Grove St., Newton, MA 02166 (617-244-6881) Worldwide, Turnkey design & construction of broadcast radio & TV stations. Production & Post Production Facilities; Teleconferencing Systems; Local Area Networks, Conference & Boardrooms

See advertisement on page 86

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 & Installation; Transmitters, Antennas & Transmission Systems, VTR's

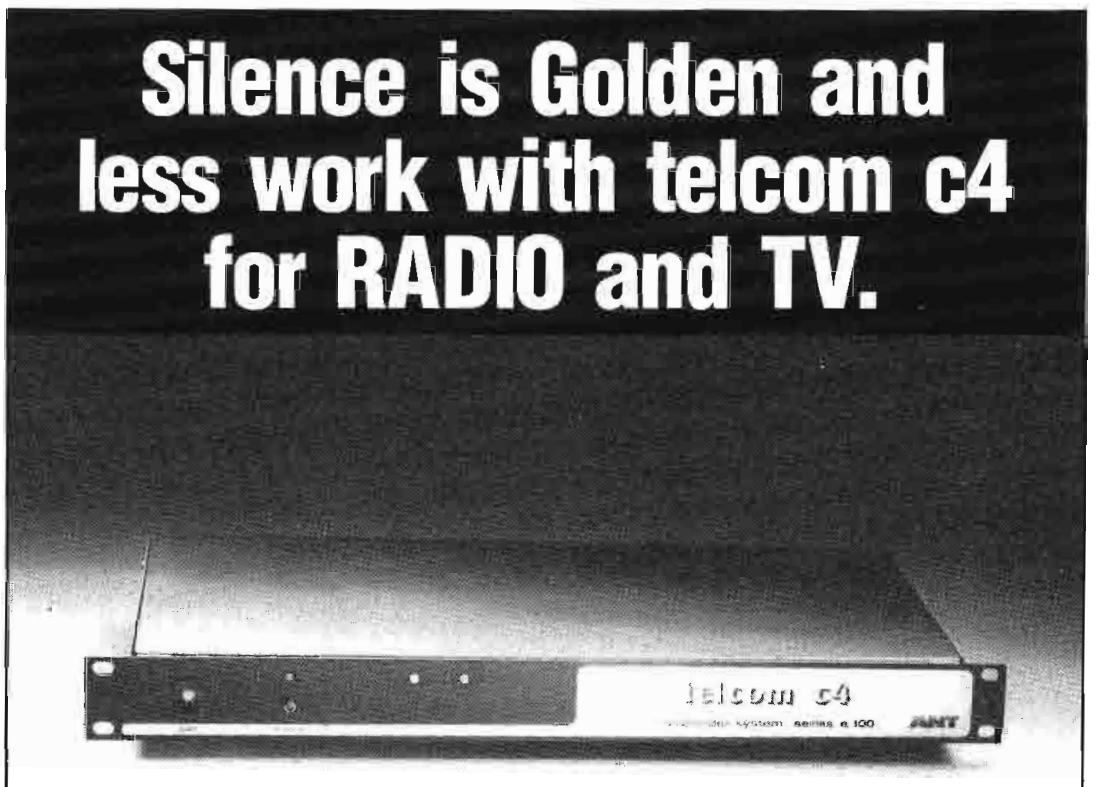
See advertisement on page 98

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) USA & Canada, Audio & Video Equip.; Test & Measurement Equip.: Transmitters, Antennas & Transmission Systems

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

CM Sales, 31700 W. 12 Mile Road, Suite 206, Farmington Hills, MI 48018 (313-553-8070) MI, Audio & Video 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.; Service & Repair;System Design; Installation and Sales

Victor Duncan, Inc., 23801 Industrial Park Drive, Suite 100, Farmington Hills, MI 48024 (313-471-1600) USA 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., 2982 Wixom Road, Milford, MI 48042 (313-685-2560) 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) USA, 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.

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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

T. R. Pitts Co., 501 W. Fifth St., Winona, MN 55987 (507-452-2629; 800-533-8092) USA, Complete equip. & supplies for the cable TV industry including some services. Satellite Equip.

Vaughn Communications, Video Midwest/AVC Systems, 7951 Computer Ave. S., Minneapolis, MN 55435 (612-831-2248) IL, IA, MN, SD; Rental & Duplication Nationwide, Audio & Video Equip.; Test & Measurement 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 39289-1331 (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

Lines Video Systems, 219 S. Jefferson, Springfield, MO 65806 (417-862-5533; Outside MO-800-641-4674) AR, IL, IA, KS,

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Television Engineering Corp., 580 Goddard Ave., Chesterfield, MO 63017 (314-532-4700) USA 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

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

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 (201-767-1201) Worldwide, Audio & Video Equip.; Test & Measurement Equip.; Vans & Accessories; System Design

Avtec Industries, Inc., 5 Audrey Place, Fairfield, NJ 07006 (201-882-9460) USA, Middle East, Audio & Video Equip.; Test Equip.; Tape; Film Equip.; Service & Repair; System Design

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; Degausers; Video Delay Systems; Intercoms

Comprehensive Video Supply Corp., 148 Veterans Drive, Northvale, NJ 07647 (201-767-7990) Worldwide, 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, Video & Audio Equip.; Test & Measuring Equip.; Film Equip.; Tape; & Accessories; Service & Repair; System Design & Installations; Transmitters, Antennas & Transmission Systems; VTR's

See advertisement on page 98

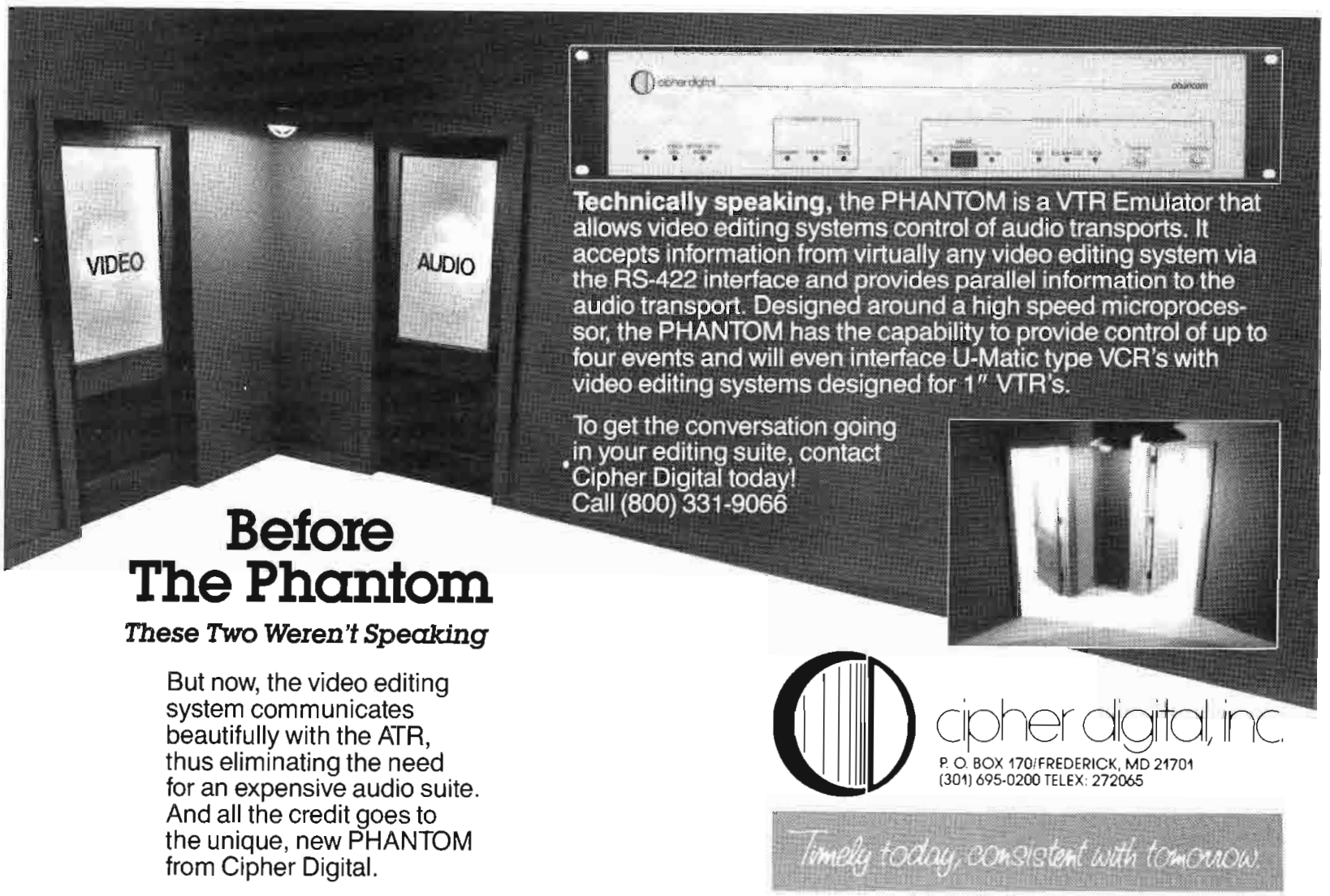
Penstock East, 180 North St., Teterboro, NJ 07608 (201-288-7313) NJ, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

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

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

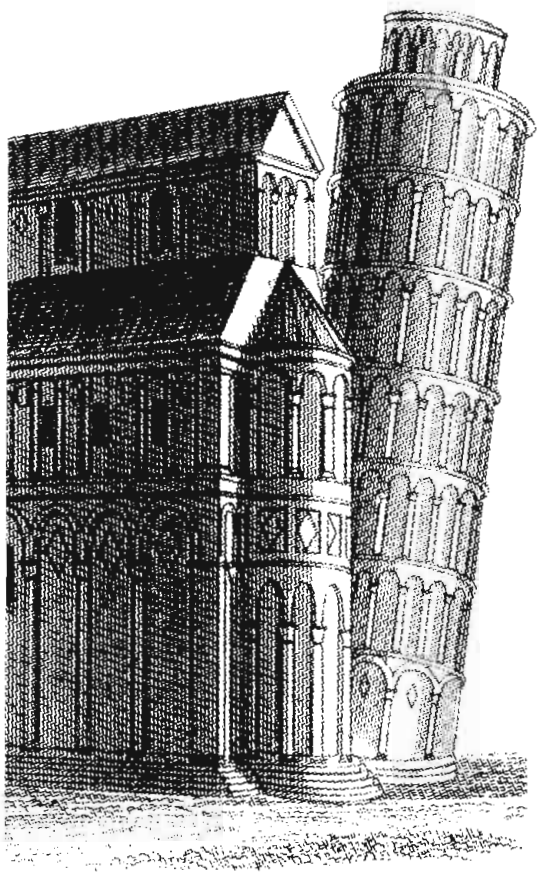
NEW MEXICO

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



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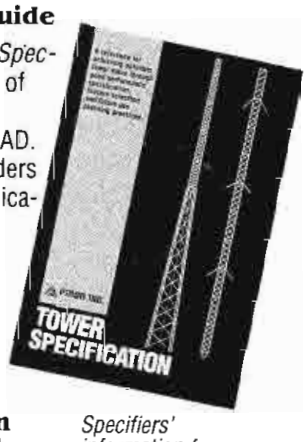


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Audiotechniques Inc., 1619 Broadway, 4th Floor, New York, NY 10019 (212-586-5989) CT, DE, DC, ME, MD, MA, NJ, NY, PA, RI, VT, VA, Audio Recording Equip.; Consoles; Test & Measurement Equip.; Tape; System Design; Used Equip.

Auteri Associates, Inc., 53 Foreston Circle, Manorville, NY 11949 (516-878-6421) 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) USA and Canada, Cable and Assemblies; Audio & Video Connectors For Japanese Equip.

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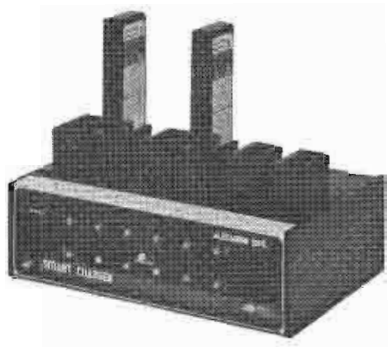
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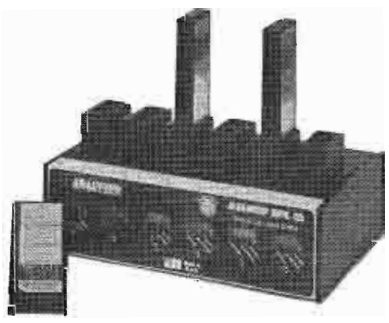
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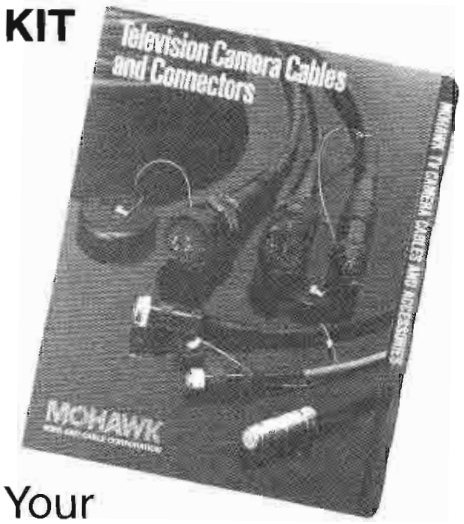
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BJM Electronics Ltd., 2008 Victory Blvd., Staten Island, NY 10314 (718-442-0223) Continental USA, Audio, Video, Test & Measurement Equip.; Vacuum Tubes; Audio/Video Accessories; Cables & Connectors; Transistors; Full line of electronic parts

See advertisement on page *213*

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, IN, MA, NV, NH, NJ, NY, PA, VT, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; System Design; Used Equip.

See advertisement on page 97

CeCo Div., Richardson Electronics, Ltd., 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, Amperex, GE

HGA, 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.; 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.

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) USA, 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.

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Miller Associates Ltd., L. Matthew, 48 West 21st St., 11th Floor, New York, NY 10010 (212-741-8011; 800-221-9328) USA, PR, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design; Rental; Used Equip.

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

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

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; SCR'S

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

Sharb Electronics, HPG Industries Inc., 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

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

Times Square Stage Lighting Co., Inc., Industrial Park, Route 9W Holt Drive, Stony Point, NY 10980 (914-947-3034) USA and Canada, Video Equip.; Lighting & Controls; System Design

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Broadcast Services Co., Route 3 Box 45-E, Four Oaks, NC 27524 (919-934-6869; VA 703-635-1413; Service Center 919-460-0939) DC, MD, NC, PA, SC, TN, VA, WV, Full Line of Broadcast Audio & Radio RF Equip.

See advertisement on page 105

EME, 4110 N. Main St., High Point, NC 27260 (919-869-3335) East-KY, NC, SC, East-TN, VA, WV, Mixers, Mics, Amps; Video Production Switchers, Monitors, Cameras, DA's; Analizers; Frequency Counters; Power Meters, Voltmeters; Test & Measurement Equip.; Distortion Analizers; STL DVES, CCD Cameras

Midwest Communications Corp., 2848 Interstate 85 S., Suite E, Charlotte, NC 28208 (704-399-6336) NC, SC

Midwest Communications Corp., 3033-2 Stonybrook Drive, Raleigh, NC 27604 (919-850-9811) NC, Audio, Video & Test Equip.; Tape; Vans; System Design; Service & Repair

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

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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

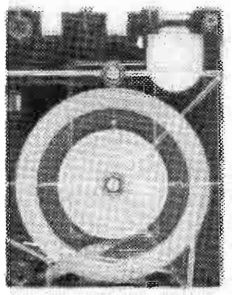
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Cartwright Communications Co., 7812 Red Sky Drive, Cincinnati, OH 45249 (513-489-1755; Outside OH-800-543-8614; OH-800-582-2641) USA, AK, HI, Antennas; Batteries; Duplexers; Power Suppliers; Remotes; RF Amps; Elec. Sirens & Lights; Tone Equip.; Transmission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

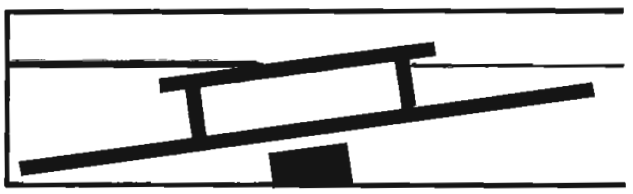
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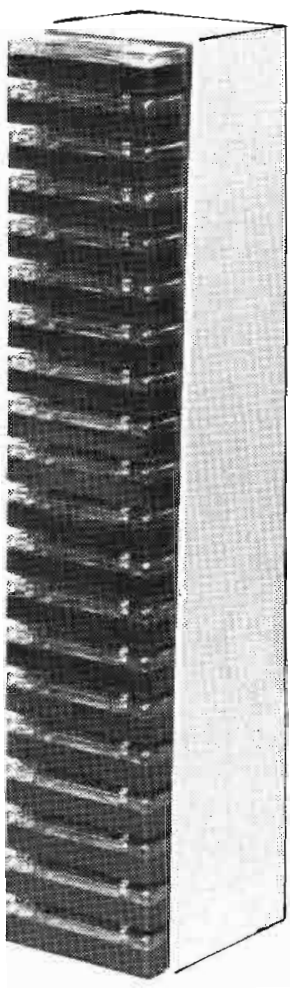
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Frontier Communications Corp., P.O. Box 750, Portland, OR 97207 (503-246-8080) AK, AZ, CA, CO, HI, ID, MT, NV, OR, UT, VI, WA, WY, Audio Equip.; Transmitters, Antennas & Transmission Systems; Service & Repair; Systems Design

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

PENNSYLVANIA

Alpha Video & Electronics Co., 200 Keystone Drive, Carnegie, PA 15106 (412-429-2000) 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) USA, 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

Comwave, Div. of Communication Microwave Corp., P.O. Box 69, Mountaintop, PA 18707 (717-474-6751) USA, Antennas; Diplexers & Other RF Products

Jerry Conn Associates, Inc., P.O. Box 444, Chambersburg, PA 17201 (717-263-8258) USA, Regional sales rep for top quality products and national distributor for all your distribution needs from drop materials to hand held electronics

The Lerro Corp., 3125 N. Broad St., Philadelphia, PA 19132 (215-223-8200) DE, MD, NJ, PA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design

See advertisement on page 53

LPB Inc., 28 Bacton Hill Road, Frazer, PA 19355 (215-644-1123) USA, Audio Equip.; Transmitters, Antennas & Transmission Systems; System Design

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; Reloaded 3/4' Cassettes

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Northeast Broadcast Lab, Inc., Mid-Atlantic Office, P.O. Box 565, Southhampton, PA 18966 (213-322-2227) DE, DC, GA, MD, NJ, NC, OH, PA, SC, VA, WV, Complete AM & FM systems including audio, transmitting & antenna equip.; Audio, Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design

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Pro Video Sales Co., 101 Sussex Blvd., Broomall, PA 19008 (215-328-7448; 800-225-4434) Audio, Video, Test & Measurement Equip.; Tape.
See advertisement on page 99

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

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; Audio Tape

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 and Audio Cassettes

Techni-Tool Inc., 5 Apollo Road, Plymouth Meeting, PA 19462 (215-825-4990) USA & Canada, Video & Static Control Products; Test Equip./Meters

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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
See advertisement on page 110

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

Victor Duncan, Inc., 6305 N. O'Connor, Irving, TX 75039 (214-869-0200) USA and Canada, Audio, Film & Video Equip.; Test & Measurement Equip.; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip. Over 300 Lines of Pro Equip.

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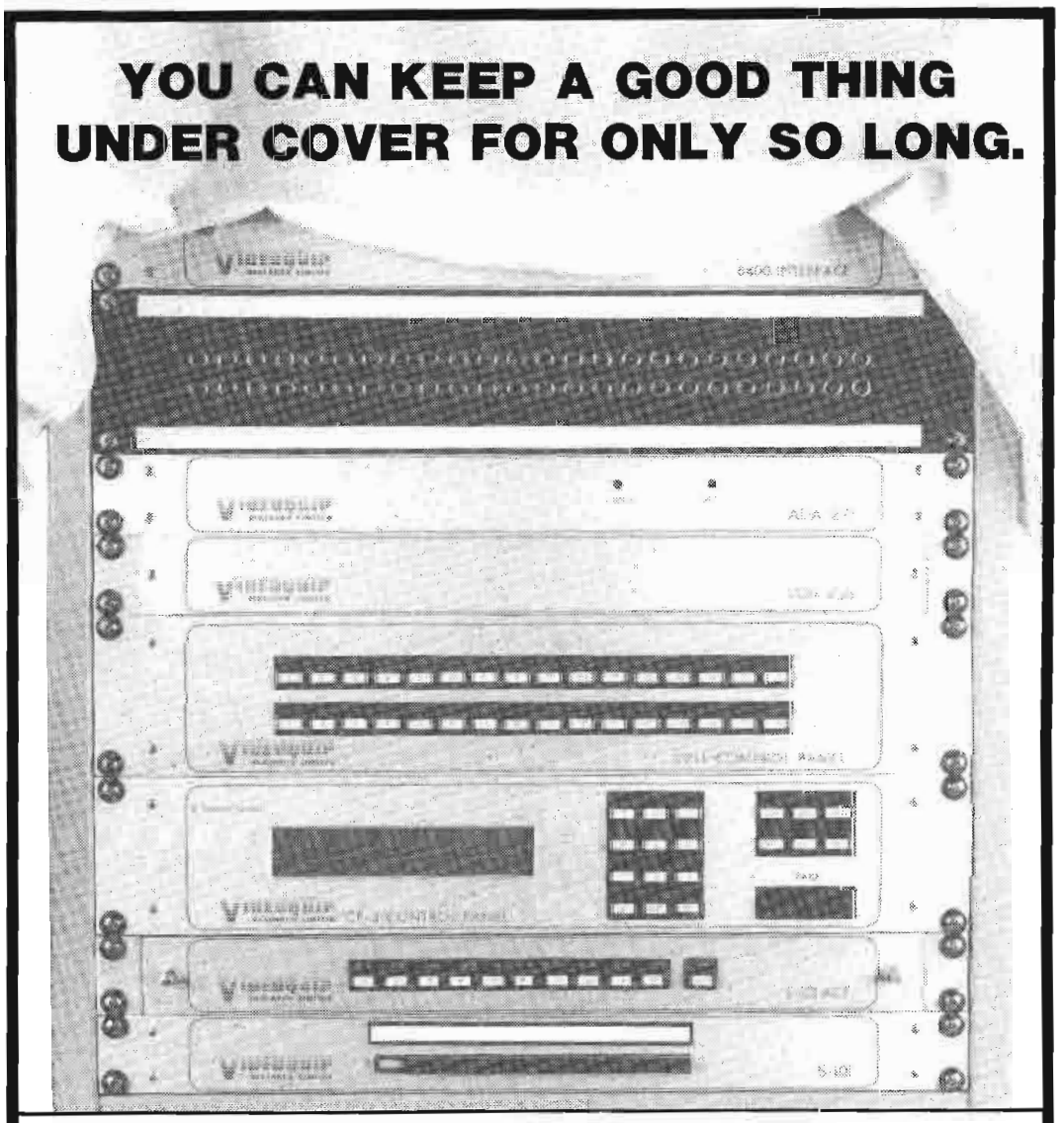
G.P. Enterprises, Inc., P.O. Box 912, Arlington, TX 76004-0912 (817-572-0132; 478-0050) AL, AZ, AR, CO, FL, GA, IA, KS, LA, MN, MS, MO, MT, NE, NM, NC, ND, OK, SC, SD, TN, TX, WI, WY, A/V, Test & Measurement, Film & Used Equip.; Monitors; Audio Lip Sync & Time Compression-/Expansion; 3D Graphics/Animation;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

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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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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

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Avec Electronics Corp., 711 Grandy St., Norfolk, VA 23510 (804-627-3502) DC, NC, VA

Avec Electronics Corp., 2002 Staples Mill Road, Richmond, VA 23230 (804-359-6071) DC, VA

Avec Electronics Corp., 2009 Williamson Road, Roanoke, VA 24012 (703-344-6288) NC, VA, WV, Audio, Video, Test & Measurement Equip.; Service & Repair, System Design; Tape

Broadcast Services Co., P.O. Box 309, 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.; Cellular Phones & Systems

Hall Electronics, P.O. Box 7732, Charlottesville, VA 22906 (804-973-8697) USA & Canada, Used & Rebuilt Equip.; Audio Equip., Transmitters, Antennas, Transmission Systems; Test & Measurement Equip.; New Equip. in Audio Category

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

Old Dominion Broadcast Eng. Service, 9505 Lakewater Court, Richmond, VA 23229 (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) USA, Alta, BC, Ont., Que, Audio Equip.

WASHINGTON

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

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

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., 14715 N.E. 95th St., Suite 100, Redmond, WA 98052 (206-885-4730) Worldwide, Ku Band Uplinking & Downlinking; Portable Video Production Studio; Microwave Equip.

Penstock Northwest, 10800 N.E. Eighth St., Suite 800, Bellevue, WA 98004 (206-454-2371) WA, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

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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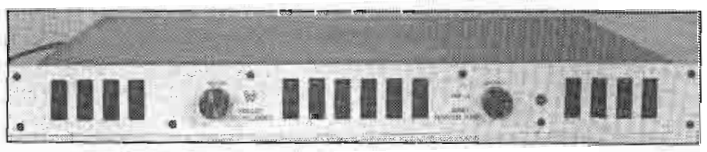
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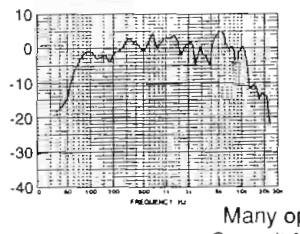
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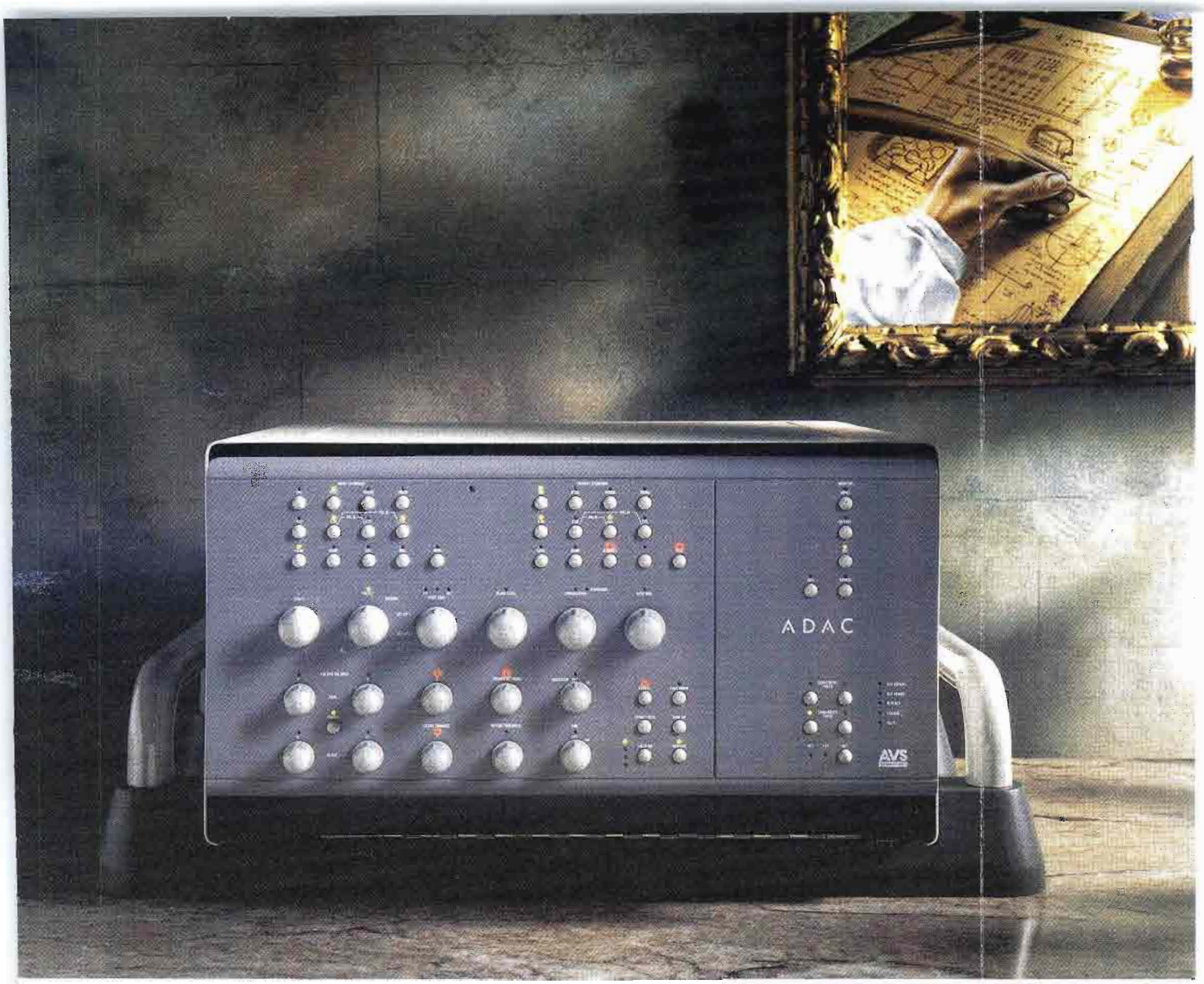
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Video equipment specs

Color Television Cameras

These cameras for broadcast and professional applications employ three pickup devices. Those marked with a dagger (†) include a shutter system to increase resolution. All models employ noise reduction processing involving comb filters, coring and slicing. Enhancement is developed from green and applied to all color channels; some may include enhancement based on red and blue. The optical system prism rating of f/1.4 applies to Maximum Sensitivity, unless noted otherwise. All models have B/W balance memories. Equiband color difference signals (R-Y, B-Y) are designated as YCrCb. Abbreviations used in cable types may include: Multi (multicore), FO (fiberoptic), CX (coax), TX (triax).

Manufacturer	Ampex AVSD				BTS Broadcast TV Systems
Model Series	**CVC3A (30)**	**CVC 5 w/CVR-505**	**CVC-7†**	**CVC-50†**	**KCF-1/KCB-1**
Application	ENG, EFP	ENG, EFP	ENG, EFP	ENG, EFP	ENG
Pickup devices	MF SAT (DG PbO)	CCD 510x492 pix NTSC	3-IT CCD	3-FIT CCD	LOC PbO
Optical format	⅔″	⅔″ 500x582 pix P/S	⅔″ spatial offset	⅔″	½″
Sensitivity 89.9%R	2000 lux f/4(4.5)	2000 lux f/5.6	2000 lux f/5.6 90%R	2000 lux f/5.6 90%R	700 lux f/2
Max sensitivity	30(25)lux 18dB	15 lux 18dB	15 lux f/1.7 18dB	15 lux f/1.4 18dB	85 lux 12dB
Resolution or % mod	650 TVL	550 TVL	700 TVL	550 TVL	40% mod 4MHz
Registration Z1, Z2, Z3	0.1, 0.15, 0.3%	0.05% fixed	0.05% all zones	0.05%	<40ns, 80ns, 120ns
S/N ratio	59dB N, 57dB P/S	58dB N, 55dB P	62dB	60dB NTSC, 57dB PAL	54dB N, 52dB P/S
ND filters	2 position	2 position	1/16, ¼	1/16, ¼	25% ND optic
Color correction	4 position	4 position	4-position	4-position filter	3 position optic
Color standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC	NTSC, PAL	NTSC, PAL/M, SECAM
Output signal forms	Composite, YCrCb	Composite, YCrCb	Composite, component	Betacam component	Encoded or component
CCU required or option	CCU-300 opt	Opt w/CA-3	CCU-350 opt	CA-50 w/CCU-350	CCU, RCU options
μP control	Single	No	Yes	Yes	No
Setup memories	Color, black, center	Balance, filters	2 B/W balance	B/W balance	Color balance
Auto centering	Yes	Fixed	Fixed	....	No
Auto registration	No	Fixed	Fixed	....	No
Auto cable compensation	No	....	....	....	No
Computer setup system	No	....	....	....	No
Diagnostic display	....	....	Viewfinder	Viewfinder	No
Cable types	26, 41-core	Coax	Various	Coax, 26-core	Multicore
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight	9.5 lbs	7 lbs w/VF	7.5 lbs	7.5 lbs	15 lbs w/lens, VF
Docking VCR	Betacam CVR-1A adapter	CVR-5 VTR, Beta SP	CVR-1A, CVR-5SP	CVR-1A, CVR-5SP	BCB-1 Betacam on KCB-1
Reader Service Number	**501**	**502**	**503**	**504**	**505**

Manufacturer	BTS Broadcast TV Systems				
Model Series	**LDK 90† (KCB590 SP)**	**LDK 900†**	**LDK 54A**	**LDK 6/6A (26A)**	**KCP 60 (KCA 110)**
Application	ENG	Studio, OB	ENG	Studio, field	Studio, OB (& ENG)
Pickup devices	CCD Frame Transfer	3 FT CCD	High Stability PbO	PbO	PbO (LOC DP PbO)
Optical format	610x492-pix NTSC	⅔″	⅔″	1″, 1¼″ (⅔″)	⅔″
Sensitivity 89.9%R	160 fc f/4	1750 lux f/4 90%R	900 lux f/3	70 fc f/2.8 60%R 1″	1250 lux f/2.8 60%R
Max sensitivity	2.5fc 18dB	54 lux f/1.4 12dB	24 lux 18dB	4.6fc f/1.6 12dB	40 lux 18dB
Resolution or % mod	40% 5MHz RGB	>650 TVL 45% 5MHz	>650 TVL	Adj to 400 TVL 100% mod	45% 5MHz (>750 TVL)
Registration Z1, Z2, Z3	<25ns (0.05%) overall	<0.1, 0.1, 1.5%	<30ns, 60ns, 100ns	<25ns, 40ns, 40ns	0.1/0.2% (<40/80/120ns)
S/N ratio	58dB N, 56dB P	58dB NTSC, 56dB PAL	59dB N, 57dB P	58dB N, 56dB P	52dB N, 50dB P (57/55)
ND filters	Electronic	12% ND optic	2-position	5-(3) position	Optic
Color correction	Electronic	3-position optic	#85B optic	#85B, clear, 3 blank	Optic (3-position)
Color standards	NTSC, PAL/M, SECAM	CCIR 625/50 2:1	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM	NTSC, PAL/M, SECAM
Output signal forms	RGB	Encoded, RGB, YPrPb	Y/U/V, encoded	RGB, composite	Encoded, RGB (& VTR)
CCU required or option	Opt RCU, EFP adapter	Options	Optional	Required	Suggested (in system)
μP control	For automatics	Of setup	....	4 (3) distributed	..... (Yes)
Setup memories	W/menus	w/menus	Color balance	2, 4 (2) lens, 6 ops	Color balance
Auto centering	Fixed	Fixed	....	Yes	Yes (Option)
Auto registration	Fixed	Fixed	Yes	49-point	....
Auto cable compensation	....	....	Yes	Yes	Yes
Computer setup system	....	....	....	Yes	No
Diagnostic display	Yes	In viewfinder	....	2 system & COACH	Limited, CCU & (VF)
Cable types	19p multicore	Triax, VCR cable	Multicore, triax	Triax to 6,560 ft	Multi Ka64 (multi/tri/FO)
Portable unit	Yes	No	Yes	No	No (Yes)
Camera head weight	9 (15) lbs	55 lbs w/VF	9.35 lbs	94.6 (79) lbs	50 lbs w/o lens (<15 lbs)
Docking VCR	Betacam (SP BCB5)	No	BCB-1 Betacam	No	No
Reader Service Number	**506**	**507**	**508**	**509**	**510**

Manufacturer	BTS Broadcast TV Systems		Hitachi Denshi		
Model Series	**KCM-125 (KCM-318)**	**KCH-1000[1]**	**FP-C1 (FP-C2)**	**Z31A (Z31SX)**	**SK-97 (SK-97D)**
Application	Studio, field, OB	Studio, OB	ENG	ENG, EFP	ENG, EFP
Pickup devices	LOC DG PbO	3 mixed-field tubes	3-CCD 574Hx499V-pixel	MS SAT (DG-LOC PbO)	MS DG SAT or PbO
Optical format	1″ f/1.5 (⅔″ HS PbO)	⅔″	⅔″	⅔″ w/bias	⅔″ w/bias
Sensitivity 89.9%R	630 (800) lux f/2.8	1000 lux	2000 lux f/6.7	2000 lux f/4(4.5)	2000 lux f/f4.5)
Max sensitivity	30(25) lux f/1.6 18dB	100 lux	20 lux f/1.7 18dB	40(30)lux f/1.6 18dB	18dB
Resolution or % mod	>700 TVL (60% 5MHz)	600 TVL 50% (16:9)	600 TVL	800 (660) TVL	700 SAT (650 PbO)
Registration Z1, Z2, Z3	μP corrected	0.04%	0.05% overall	0.1, 0.2, 0.4%	0.05, 0.1, 0.2%
S/N ratio	58dB N, 56dB P/S	47dB	56dB NTSC, 53dB PAL	60dB N, 57dB P (57dB N)	59dB N, 56dB P
ND filters	3-position optic	3 ND + Effects	⅛ ND	Internal ⅛ ND	6.3, 25, 100% int
Color correction	3 optic, electronic	4 position	3 filters	3 position optic	3 position int
Color standards	NTSC, PAL/M, SECAM	Software selected	NTSC, PAL	NTSC, PAL-B (NTSC)	NTSC, PAL (NTSC, PAL-B)
Output signal forms	Encoded, RGB	RGB, RGB/sync	Composite RGB	Composite	Composite, RGB, YtQ, YUV
CCU required or option	CCU suggested	Required	ROU available	RCU opt	BSU-97(D)/CCU-110(D) opt
μP control	Yes	Yes, lens correction	Yes	Yes	Multiple
Setup memories	Multifunction	Color balance	B/W balance	Color balance	Color balance, lens

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Manufacturer	BTS Broadcast TV Systems		Hitachi Denshi		
Model Series	**KCM-125 (KCM-318)**	**KCH-1000[1]**	**FP-C1 (FP-C2)**	**Z31A (Z31SX)**	**SK-97 (SK-97D)**
Auto centering	Yes	Yes	Knee & flare comp	Yes	Yes
Auto registration	Yes	Yes	N.A.	Yes	Yes
Auto cable compensation	Yes	Yes	....	Yew	Yes
Computer setup system	Yes	Yes	....	From opt CCU	BSU-79(D) to 6 cameras
Diagnostic display	Yes	at CCU	In viewfinder	In viewfinder	Viewfinder, CCU
Cable types	Multicore, triax	Multicore	Multicore	Multicore, coax, triax	Multicore, triax, coax
Portable unit	No	No	Yes	Yes	Yes
Camera head weight	73 (17.6) lbs	....	8.7 lbs (8.1 lbs)	10.8 lbs w/o lens, vf	15 lbs
Docking VCR	No	No	Betacam PF-C2 only	No	....
Reader Service Number	**511**	**512**	**513**	**514**	**515**

[1]Software selection allows programming for operation of the camera within the parameters of all proposed HDTV systems to date.

Manufacturer	Hitachi Denshi		Ikegami Electronics		
Model Series	**SK-970D (SK-971D)**	**SK-110D**	**HL-55†**	**HL-79E (HL-791)**	**HL-95B Unicam**
Application	Studio, OB	Studio, OB	ENG	EFP & (ENG)	ENG, EFP
Pickup devices	DG LOC PbO	DG LOC PbO	FIT CCD	DG/LOC PbO or SAT	PbO StaMag DG
Optical format	2/3" f/1.2 w/bias	1¼" f/1.8	2/3"	2/3"	2/3"
Sensitivity 89.9%R	2000 lux f/4.5	2000 lux f/5.6	2000 lux f/5.6	2000 lux f/5	2000 lux f/4.5
Max sensitivity	2fc f/1.2 21dB	....	....	≤20 lux f/1.4 18dB	≤15 lux f/1.6 24dB
Resolution or % mod	650 TVL	400 TVL 60% mod	700 TVL H/400 TVL V	650 TVL	650 TV
Registration Z1, Z2, Z3	0.05, 0.1, 0.2%	0.05% overall	Fixed by CCD	0.05, 0.1, 0.3%	0.05, 0.1, 0.2%
S/N ratio	60dB N, 57dB P-B	56dB N, 54dB P	>62dB	59dB (61dB)	60dB
ND filters	6.3, 25, 100% int	5 position filter	¼ ND, 1/16 ND	0, 0.6 (5/25/100%)	25%
Color correction	3 position	6 position	4-position optical	3 (4) pos optic	3 position optic
Color standards	NTSC, PAL-B	NTSC, PAL	NTSC	NTSC	NTSC
Output signal forms	Composite, RGB	Composite, RGB, key	Composite, Y/C, RGB	Composite, RGB	Composite, RGB
CCU required or option	BU-97D, CCU-110D opt	CCU-110D required	CA-95C, HL-95 equipment	TA/MA-79E, RDU-79E	MA-95/TA-95 adapters
μP control	Multiple	Multiple	Yes	Yes	Yes
Setup memories	Color/lens/scene/temp	Full setup	Color	Lens, color bal	Color balance
Auto centering	Yes	Yes	Fixed	Yes	Yes
Auto registration	Yes	Yes	Fixed	Yes	Yes
Auto cable compensation	Yes	Yes	No	Yes	....
Computer setup system	BU-97D to 6 cameras	SU-110D	No	w/ADC-79E setup control	Base station opt
Diagnostic display	CCU and viewfinder	CCU, VF	Yes	VF, CCU, hardcopy	Viewfinder
Cable types	Multicore, triax, coax	24-core	Coax, multicore	Multi, triax (fbr op)	Multicore, triax, coax
Portable unit	No	No	Yes	Yes	Yes
Camera head weight	55 lbs	88 lbs	6.8 lbs w/VF	13.2 (11) lbs w/VF	7 lbs w/o lens, bat
Docking VCR	No	No	Various	(w/adapters)	Adapts ¼", ½"
Reader Service Number	**516**	**517**	**518**	**519**	**520**

Manufacturer	Ikegami Electronics				
Model Series	**HC-230†**	**ITC-735**	**SC-500**	**CCD-770†**	**HK-323 (HK-323P)**
Application	Professional	ENG, EFP	Studio	ENG	Studio, OB, ENG, EFP
Pickup devices	CCD 485Vx670H pixels	HR SAT IV H4299	PbO or SAT	CCD (649x491 pixel)	DG PbO
Optical format	½"	2/3"	2/3"	2/3"	1" or (2/3")
Sensitivity 89.9%R	2000 lux f/4.5	2000 lux f/4	200 fc f/4	2800 lux f/4	2000 lux f/5.6 (4.5)
Max sensitivity	....	40 lux f/1.6 18dB	8fc f/1.6 12dB	80 lux f/1.6 18dB	10fc 6dB
Resolution or % mod	580 TVL	>750 TVL	700 center Saticon	480 TVL	700 (650)
Registration Z1, Z2, Z3	Fixed by CCD	0.1, 0.2, 0.3%	0.1, 0.2, 0.4%	≤0.05%, fixed	0.05%, 0.1%, 0.2%
S/N ratio	58dB	58dB N, 56dB P	57dB N	≥53dB	59dB 4.2MHz (60dB)
ND filters	⅛ ND	12.5%	ND8 (12.5%)	12.5%	4 (3) internal
Color correction	4-position optic	3 position optic	3 position optic	3-position filter	4 (3) pos optic
Color standards	NTSC	NTSC, PAL	NTSC	NTSC	NTSC
Output signal forms	Composite, S-VHS, other	Composite, RGB at CCU	RGB, composite	Composite	Composite, RGB
CCU required or option	Digital RCU available	CCU-735	Yes	No	Yes (Opt)
μP control	Yes	Single	Single	....	Multiple
Setup memories	Color	B/W bal, centering	Color balance	Color balance	Color bal, lens
Auto centering	Fixed	Yes	Yes	Fixed by CCD	Yes
Auto registration	Fixed	No	Yes	Fixed by CCD	Yes
Auto cable compensation	....	No, switchable	Yes	....	Yes
Computer setup system	No	No	No	No	Yes, to 40 cameras
Diagnostic display	In VF	No	Viewfinder	....	Yes, hardcopy opt
Cable types	Multicore	Multicore, coax	Multicore, coax	Coax	Triax, multi, fbr op
Portable unit	Yes	Yes	No	Yes	HK-323P
Camera head weight	8.37 lbs	10.6 lbs head only	30.9 lbs w/o VF	8.6 lbs	57.2 lbs -1" (15.4 lbs)
Docking VCR	Available	No	No	No	No
Reader Service Number	**521**	**522**	**523**	**524**	**525**

Manufacturer	Ikegami Electronics		JVC Company		
Model Series	**HK-322**	**EC-1125 HiVision**	**BY-110U**	**KY-210BU**	**KY-320U**
Application	Studio	HDTV	ENG	ENG, EFP, studio	ENG, EFP, studio
Pickup devices	PbO ACT, LOC, DG	MS HR PbO	ES focus EM defl SAT	HR EM SAT	SM PbO
Optical format	30mm std (25mm opt)	1¼"	½"	2/3"	2/3"
Sensitivity 89.9%R	1200 lux f/4	2000 lux f/5.6	2000 lux f/2.8	2000 lux f/2.8	2000 lux f/2.8
Max sensitivity	350 lux f/2.1 (30mm)	....	65 lux 12dB	32 lux 18dB	38 lux f/1.7 18dB
Resolution or % mod	400 TVL 60% 5MHz	1125 TVL HDTV	600 TVL	750 TVL	650 TVL
Registration Z1, Z2, Z3	0.05% overall	0.03% center, 0.045%	0.1, 0.4, 0.8%	0.1, 0.2, 0.4%	0.1, 0.2, 0.3%
S/N ratio	56dB (58dB 25mm)	47dB Y-channel 27MH bw	54dB	58dB	57dB
ND filters	6-position	3-position	25%	25%	25%
Color correction	6-pos electronic	4-position optic	3-position optic	3 position optic	3 position optic
Color standards	NTSC	2:1 interlace, 16:9	NTSC	NTSC	NTSC
Output signal forms	RGB, composite	Y/Cw/Cn, RGB	Composite	Composite	Composite
CCU required or option	Yes	Yes	RS-110U opt	FS-500U opt	RS-500U, RS-T900U opts
μP control	Multiple	Multiple, distributed	Yes	....	No
Setup memories	Lens, correction files	Lens, level correction	Color balance	Color balance	Color balance
Auto centering	Yes	Yes	Yes	Yes	Yes
Auto registration	Yes	Yes	Auto-shift	Auto-shift	Auto-shift
Auto cable compensation	Yes	Yes	No	No	No
Computer setup system	From CCU	Yes	No	No	No

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Manufacturer	Ikegami Electronics		JVC Company		
Model Series	**HK-322**	**EC-1125 HiVision**	**BY-110U**	**KY-210BU**	**KY-320U**
Diagnostic display	At CCU, printer	Yes	No	In viewfinder	In viewfinder
Cable types	TV24(81), triax	28-core	14-core, triax	Multicore, coax, triax	Multicore, triax
Portable unit	No	No	Yes	Yes	Yes
Camera head weight	55 lbs	33 lbs	8.2 lbs	7.8 lbs	9.2 lbs
Docking VCR	No	No	No	No	No
Reader Service Number	**526**	**527**	**528**	**529**	**530**

Manufacturer	JVC Company		NEC America		Panasonic Broadcast
Model Series	**KY-75 (KY-80)**	**KY-950BU (900BU)**	**SP-3A(SP-30)†**	**EP-3†**	**AK-400 CCD†**
Application	ENG, EFP	ENG, EFP, studio	ENG, EFP	ENG, EFP	ENG, EFP
Pickup devices	3 PbO	PbO (SAT) LOC DG	IFT CCD (1 each RGB)	IFT CCD spatial offset	3 FIT CCD
Optical format	⅔" f/1.4	⅔"	⅔" 2-G, 1-R/B	⅔" 2-G, 1-R/B	⅔" 574x494-pixel
Sensitivity 89.9%R	2000 lux f/4.5	2000 lux f/4.5	130 fc f/4 (2000 lux f/6.2)	2000 lux f/5.6	2000 lux f/5.6
Max sensitivity	38 lux f/1.7 18dB	38 lux f/1.7 18dB	<5fc f/1.4 12dB	15 lux 18dB	20 lux f/1.6 18dB gain
Resolution or % mod	700 TVL	700 TVL	550H/350V (700)	700 TVL	650 TVL
Registration Z1, Z2, Z3	0.05, 0.1, 0.3%	0.05, 0.1, 0.3%	Fixed	Fixed	0.05% overall
S/N ratio	58dB (59dB)	59dB	>58dB (60dB)	62dB	60dB
ND filters	25% (25%, 100%)	25%	Internal	Internal	4-position
Color correction	3 optical	3 position optic	Optic (4-position)	Optic	4-pos optic
Color standards	NTSC	NTSC	NTSC w/SP-1AD adapter	NTSC w/SP-1AD adapter	Per adapter
Output signal forms	Comp, Y/C, YCrCb	Composite	All component formats	NTSC, Y/R-Y/B-Y	Composite, YCrCb, RGB
CCU required or option	w/option KA-80 adaptor	RS-500U, RS-T900U opts	RCU-3 w/SP-3ADII adapter	RCU-3EP, TCU-3EP	AK-RC420 option
μP control	Of setup	Single	....	....	Single
Setup memories	Yes	Yes	Color balance	Color balance	B/W bal
Auto centering	Yes	Yes	Fixed	Fixed	Fixed
Auto registration	Yes	No	Fixed	Fixed	Fixed
Auto cable compensation	....	No	Option	w/RCU-3EP	....
Computer setup system	Yes	No	None	....	No
Diagnostic display	In Viewfinder	In Viewfinder	....	Viewfinder	In viewfinder
Cable types	Various	Multicore, triax	Triax, multi (26,41)	Triax, 41-core	Multicore, coax, triax
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight	10 lbs	10 lbs	10.2 lbs	7.3 lbs w/VF	7.51 lbs w/VF
Docking VCR	M-II with KA-M80U	No	8mm/Beta/M-II (26-pin)	Beta/M-II	AU-400 M-II & others
Reader Service Number	**531**	**532**	**533**	**534**	**535**

Manufacturer	Panasonic Industrial			Sharp Electronics	
Model Series	**AG-450 (AG-400P[1])†**	**WV-D5000†**	**WV-300CLE (-200CLE)†**	**XC-B20P (XC-B10)**	**XC-A1**
Application	ENG	ENG, EFP, studio	ENG, studio (ENG, EFP)	ENG, EFP, Studio	ENG, EFP, Studio
Pickup devices	CCD	1-CCD	3-CCD Interline transfer	DG LOC MF PbO (SAT)	MF DG LOC SAT
Optical format	½"	⅔"	⅔"	⅔"	⅔"
Sensitivity 89.9%R	....	140 fc f/4	2000 lux f/5.6	2000 lux f/4.5(f/4)	2000 lux f/4
Max sensitivity	10 lux (1 lux)	0.7fc f/1.4 18dB	25 lux f/1.7 18dB	24 lux 18dB	....
Resolution or % mod	400 TVL	380 TV	700 TVL (600)	660 TVL (750)	750 TVL
Registration Z1, Z2, Z3	Fixed	Fixed	0.05% overall fixed	<0.01, 0.02, 0.04%	0.1, 0.2, 0.5%
S/N ratio	45dB (43dB)	46dB	60dB (59dB)	57dB	57dB
ND filters	Internal	Internal	Internal	+12%	+12% internal
Color correction	Electronic	Optic (4-pos)	4-position	3 position optic	3 position optic
Color standards	NTSC	NTSC	NTSC	NTSC	NTSC
Output signal forms	S-VHS Y/C	Composite	Y/C S-VHS, composite	Encoded, RGB, Y/R-Y/B-Y	Composite, RGB
CCU required or option	None	WV-CR12 option	WV-RC36 option	XC-B10RP, XC-B10TRX	XC-A1RP, XC-A1TCP
μP control	....	Single	Single	Yes	Yes
Setup memories	Color balance	Color balance	Color balance	Color balance	Color balance, clock
Auto centering	Fixed	Fixed	Fixed	Yes	Yes
Auto registration	Fixed, auto focus	Fixed	Fixed	Auto knee, contrast	No
Auto cable compensation	No	No	....	No	No
Computer setup system	No	No	No	No	No
Diagnostic display	Viewfinder	In VF	Viewfinder	Viewfinder	Viewfinder
Cable types	....	Multicore, BNC, VCR	Multicore, VTR	300m triax opt	Multicore, VCR
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight	5.8 lbs (6.6 lbs)	7.6 lbs	11.9 lbs	9.2 lbs	9.8 lbs
Docking VCR	Integral S-VHS	No	M-II w/WV-VT10 adapter	Betacam/M-II adapters	No
Reader Service Number	**536**	**537**	**538**	**539**	**540**

[1]Includes digital image mixing effects capability.

Manufacturer	Sony Broadcast				
Model Series	**BVP-3A (BVP-30)**	**BVP-5/5P[1] (BVP-7†)**	**BVP-150, -150P**	**BVP-330A**	**BVP-350 (BVP-360)**
Application	ENG, EFP	ENG	ENG	ENG, EFP, studio	ENG, EFP (& studio)
Pickup devices	MF SAT (DG PbO)	3 IT CCDs	MF SAT	DG PbO	PS PbO (DG PbO)
Optical format	⅔"	⅔"	⅔"	⅔"	⅔" f/1.2
Sensitivity 89.9%R	200 fc f/4.5	200 fc f/5.6	200 fc f/4	200 fc f/4.5	2000 lux f/4.5 (200 fc)
Max sensitivity	3fc 18dB	1.5fc 18dB	3fc 18dB	2.5fc 18dB	10 lux f/1.2 24dB (1fc)
Resolution or % mod	650 TVL	550 TVL[2] (700[3])	650 TVL	650 TVL	700 TVL
Registration Z1, Z2, Z3	0.1, 0.15, 0.3%	0.05% fixed	0.1, 0.2, 0.4%	0.1, 0.2, 0.4%	Digital (0.05/.1/.15%)
S/N ratio	59dB N, 57dB P	58dB (62dB)	57dB N, 55dB P	58dB N	60dB
ND filters	Internal	....	Internal optic	Internal	2 position internal
Color correction	Optic, electronic	4 optic	Optic	Optic, electronic	4 pos optic (& elect)
Color standards	NTSC, PAL/M, SECAM	NTSC	NTSC, PAL	NTSC, PAL	NTSC (& PAL)
Output signal forms	Composite, YCrCb	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Composite (& RGB/YCrCb)
CCU required or option	CCU-300 option	Options	CCU-M3 suggested	CCU-300 suggested	CCU-360 triax opt(360H)
μP control	Single	Yes	Single	Yes	Single
Setup memories	Color, black, center	Balance, filters	Color, black, center	Color, black, center	Color balance (& lens)
Auto centering	Yes	Fixed	Yes	Yes	Yes
Auto registration	No	Fixed	Nos	No	Yes
Auto cable compensation	No	No	No	No	Yes
Computer setup system	No	No	No	No	w/CCU-360 (in head/CCU)
Diagnostic display	No	....(Viewfinder)	In viewfinder	No	Viewfinder (& CCU)
Cable types	Multicore, coax, triax	Coax (multicore)	Multicore	Multicore, coax, triax	Triax, multi (& coax)
Portable unit	Yes	Yes	Yes	Yes	Yes (No)
Camera head weight	10.1 lbs	19.5 lbs operational	9.2 lbs	11.9 lbs	<13.5 lbs (50 lbs w/VF)

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Manufacturer	Sony Broadcast				
Model Series	**BVP-3A (BVP-30)**	**BVP-5/5P[1] (BVP-7†)**	**BVP-150, -150P**	**BVP-330A**	**BVP-350 (BVP-360)**
Docking VCR	BVW-3A (BVW-30A)	BVW-105/507/550	No	No	No
Reader Service Number	**541**	542	**543**	**544**	**545**

[1]BVP-50, -50P are similar to BVP-5, but include a 7-speed electronic shutter.
[2]Based on 510Hx492V pixel array in NTSC.
[3]Based on 768Hx493V pixel array.

Manufacturer	Sony Broadcast		Thomson Video Equipement		
Model Series	**BVP-3000 SuperMotion**	**HDC-100**	**TTV 1530 (1532)**	**TTV 1525C (1525PC[3])**	**TTV 1640**
Application	EFP, slow motion	HDTV, 1125/60 only	Studio, OB	Studio, EFP	ENG, EFP
Pickup devices	MS PbO or MS SAT	Mix-field SAT	LOC DG PbO	3 LOC DG PbO	3-IL CCD
Optical format	⅔″	1″	⅔″	1″	⅔″ 510x493-pix
Sensitivity 89.9%R	200 fc f/4.5	200 fc f/3	130 fc f/4	87 fc f/4	1100 lux f/4
Max sensitivity	10fc 6dB	25fc f/1.6 6dB	2 fc 18dB	2.6fc f/1.5 12dB	12 lux 21dB
Resolution or % mod	500 TVL	1200 TVL	400 TVL 50%	>400 TVL	550 TVL
Registration Z1, Z2, Z3	0.1, 0.2, 0.4%	0.025, 0.05, 0.1%	0.05, 0.1, 0.1%	<20ns, 20ns, 40ns	0.05% overall fixed
S N ratio	51dB for system	....	58dB N, 57dB P	58dB NTSC	59dB N, 57dB P/S
ND filters	Int optic	Int optic	Internal	Internal w/effects	Internal
Color correction	Int optic	Int optic	Optic	Electronic	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	RGB, adapters
CCU required or option	Required[1]	Required[2]	TTV-1530/1532	Yes	w/CA-83 adapter opt
μP control	Yes	Distributed	182-point setup	Yes	Ops, status
Setup memories	....	Color, black, gamma	Color, centering	Lens, color, register	2 b/w bal per color set
Auto centering	Yes	Yes	Yes	Yes	Fixed
Auto registration	Yes	Yes	Yes	Yes	Fixed
Auto cable compensation	Yes	Yes	Yes	Yes	....
Computer setup system	In CCU	In CCU	External unit opt	Multiple	Opt
Diagnostic display	....	No	Yes	Viewfinder	Status, VF
Cable types	Multicore, fiber optic	Multicore, fiber optic	Multicore, triax	Multicore, coax, triax	Triax w/CA83 adapter
Portable unit	Yes	No	No	(1525 PC only)	Yes
Camera head weight	12 lbs	22 lbs	62 lbs	87 lb	7.7 lbs
Docking VCR	No	No	No	No	Betacam adapter
Reader Service Number	**546**	**547**	**548**	**549**	**550**

[1]Camera operation requires OCU-3000/DPU-3000 CCU equipment as well as BVH-2700 VTR and BFT-2700 TBC.
[2]HDCO-100 CCU, HDV-1000 VTR and HDT-1000 TBC are required for operation.
[3]Includes the 1624 head with CA73 adapter and triax cable.

Manufacturer	Thomson Video	Toshiba
Model Series	**TTV 1624**	**SC 821†**
Application	ENG, EFP	ENG
Pickup devices	LOC PbO	3-FIT CCD
Optical format	⅔″	⅔″
Sensitivity 89.9%R	....	2000 lux f/5.6
Max sensitivity	3 fc 18dB	30 lux 18dB
Resolution or % mod	650 TVL	700 TVL
Registration Z1, Z2, Z3	0.1, 0.2, 0.4%	0.05% overall
S/N ratio	58dB N	60dB
ND filters	Internal	1/16, ¼
Color correction	Optic	2-filter optical
Color standards	NTSC, PAL, SECAM	NTSC
Output signal forms	Composite, RGB, YCrCb	Composite, YCrCb
CCU required or option	Opt	Integral CPU adj
μP control	Distributed	Single
Setup memories	Color, centering	Color
Auto centering	Yes	Yes
Auto registration	Option	Fixed
Auto cable compensation	No	....
Computer setup system	From CCU, ext unit	Auto setup
Diagnostic display	Viewfinder	Viewfinder
Cable types	Multicore, coax, triax	Various w/adapter
Portable unit	Yes	Yes
Camera head weight	9.4 lbs	7.25 lbs
Docking VCR	TTV-3505 Betacam	Yes
Reader Service Number	**551**	**552**

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TV Camera Zoom Lenses

The following sections include zoom lens systems suitable for broadcast and professional television cameras of ½″, ⅔″, 1″ and 1¼″ optical formats. All products include focus, zoom and iris servos. The availability of a diascope feature for these units is denoted by a dagger (†). WA under extenders indicates availability of Wide-Angle attachments. A double dagger (‡) indicates a μP design. The applicability of any lens system specifically for CCD cameras should be discussed with the manufacturers before units are purchased for CCD-design applications.

TV Camera Zoom Lenses, ½″

Manufacturer	Angenieux			Schneider Optics
Model	**18x12.5HP†**	**14x6 (14x7)**	**40x14†‡**	**TV59.02 Apo-varon HM14X**
Application	Studio/OB	ENG/EFP w/CCD	EFP/sports	ENG/EFP
Zoom range (basic)	12.5-225mm	6-84mm (7-98mm)	14-560mm	6.5-91mm (4.5mm)
Aperture wide-tele	f/1.5-1.7	f/1.4-f/1.6	f/1.9-f/3	f/1.4-3
MOD distance	23.6″/0.6m	31″/0.8	0″ on front glass	31.5″/0.8m
MOD image area HxV	80x60mm	61x46mm (52x39mm)	55x41.5mm @ 8.2′/2.5m	53x40mm
Horiz angle wide-tele	54°-1.3°	58°-4.5° (52-4)	49.75°-1.33°	53°-4°, 27°-2.2°
Back focus distance	....	Adjustable	Manual, electronic	35.5mm
Clear apertures f-r	....	....	....	70.5mm, 30.5mm
Integral extenders	1.6, 2.5	2, WA	2.1 std, 1.45 opt	2
Macro focus feature	....	Yes	....	Yes
Maintenance access	Remove cover	Screwdriver adjust	Remove cover	Screwdriver adjusts
Assembly weight	....	4.2 lbs (3.3 lbs)	43 lbs	3.95 lbs/1.8 kg
Reader Service Number	**553**	**554**	**555**	**556**

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TV Camera Zoom Lenses, 2/3″

Manufacturer	Angenieux				Canon
Model	**14x6 (14x7)**	**15x9 (15x9.5)**	**20x8.5†‡**	**40x9.5†‡**	**J13x9BIE-II (IRS-IIA)**
Application	ENG/EFP w/CCD	ENG/EFP	Studio/OB	EFP/sports	ENG
Zoom range (basic)	6-84mm (7-98mm)	9-135mm (9.5-143mm)	8.5-170mm	9.5-380mm	9-117mm
Aperture wide-tele	f/1.4-1.6	f/1.5-1.9 (f/1.8-2.6)	f/1.3	f/1.3-2.1	f/1.6-1.9 (3.2-3.8)
MOD distance	31″/0.8m	31″/0.8m (24″/0.6m)	0″ front of glass	0″ (at front glass)	29.1″/0.8m
MOD image area HxV	61x46mm (52x39)	43x36mm (1.42x1.02″)	121.9x91.7mm (28x21)		
Horiz angle wide-tele	58°-4.5° (52-4)	51°-3.75° (63.5-5 diag)	55°-3°	49.75°-1.33°	52.1°-4.3° (27.5°-2.2°)
Back focus distance	Adjustable	Adjustable	Electronic, manual	Manual, electronic	22.1-48.3 cam.dep.
Clear apertures f-r	....	.. (64mm/13mm)	....	....	72.6mm, 31.7mm
Integral extenders	2, WAC41	2, 0.76, WA[2]	1.2, 1.4, 1.6[3]	2.1 std, 1.45 opt	2x available
Macro focus feature	To front of glass	....	No	....	Yes
Maintenance access	Screwdriver adjust	Screwdriver adjust	Remove cover	Remove cover	Cover removal
Assembly weight	4.2 lbs (3.1 lbs)	4.7 lbs (5.5 lbs)	39 lbs	43 lbs	3.2 lbs (2.84 lbs)
Reader Service Number	**557**	**558**	**559**	**560**	**561**

[1]Tele attachment & retrozoom available.
[2]1.66 tele attachment & retrozoom available. Detachable pistol-grip handle for 15x9.5.
[3]1.8 and 2.0 extenders also available.

Manufacturer	Canon				Fujinon
Model	**J18x9BIRS (x8.5IRS)**	**J40x9.5BIE (J45x9.5BIE)†**	**J50x9.5B IE†[1]**	**J15x9.5BIRS (-HP)(KRS)**	**A34x10ESM† (x20.5ESM)**
Application	ENG, EFP	OB, studio, sports	EFP	ENG/EFP	EFP
Zoom range (basic)	9-126 (8.5-153)	9.5-380 (9.5-430)	9.5-475mm	9.5-143mm	10-340mm (20.5-70)
Aperture wide-tele	1.7-2.4	1.4-2 (1.7-3)	f/1.4-3	f/1.8 (f/3.6)	f/1.6-2.4 (2.4-3.5)
MOD distance	35″/0.9m	8.2′/2.5m(70.9″/1.8m)	7.2′/2.2m	0.95m (1m)	1.8m (5m)
MOD image area HxV	45x34mm (49x36)	50x38mm (33x25)	3.6x2.7cm	5.4x4.1cm (5.7x4.3cm)	43x32mm (59x44)
Horiz angle wide-tele	52.1°-3.1° (54.7°-3.3°)	49.7°-1.3° (-1.2°)	49.7°-0.8°	49.7°-3.5°	47°30′x1°29′(24°14′x43′)
Back focus distance	40.6-48.6mm cam dep	48.9-41.7mm (48.3-42)	Adjustable	48mm, 58mm	Adjustable
Clear apertures f-r	82.8mm, 31.2mm	200mm, 37mm (146.8, 33)	....	72.5mm/26.9, 30.4mm	...
Integral extenders	2	2 (w/1.5 opt)	2	2 integral (No)	2
Macro focus feature	Yes	No	Yes	For 10mm MOD	....
Maintenance access	Remove cover	Remove housing	Remove cover	Screwdriver access	Remove cover
Assembly weight	3.75 (3.46 lbs)	66 (30.8) lbs	39.7 lbs, 18kg	3.53 lbs (3.3 lbs)	28 lbs (41 lbs)
Reader Service Number	**562**	**563**	**564**	**565**	**566**

[1]Lens system is available with and without a 3-speed shutter; the shutter cannot be added to a non-shutter unit.

Manufacturer	Fujinon				
Model	**A17x8.5ESM (A18x8.5ERM)†**	**A18x8ESM (A20x7ESM)†**	**A22x12.5ERM**	**A44x9.5ESM†**	**A15x8ESM†**
Application	EFP	EFP	ENG, EFP	Studio (EFP)	Studio
Zoom range (basic)	8.5-145mm	8-144mm (7-140mm)	12.5-275mm	9.5-420mm	8-120mm
Aperture wide-tele	f/1.2-1.4 (f/1.7-2.3)	f/1.5-1.9 (1.4-1.6)	f/2, f/2.8	f/1.2-2.1[1]	f/1.5-1.7
MOD distance	0.75m (0.9m)	0.7m (0.75)	1.8m	2.5m (2.2m)	0.7m
MOD image area HxV	59x44mm (49x37mm)	51x38mm (58x44mm)	54x41mm	50x37mm (42x32)	61x46mm
Horiz angle wide-tele	54°44′x3°29′(x3°17′)	57°37x30°30 (64°18x3°36)	38°47′x1°50′	49°42′x1°12′	57°37′-4°12′
Back focus distance	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Clear apertures f-r	....	....	....	....	....
Integral extenders	1.5, 2 (2)	2	2	2	2
Macro focus feature	....(Yes)	....	Yes	....	....
Maintenance access	Remove cover (screw adj)	Remove cover	Screw adjust	Remove cover	Remove cover
Assembly weight	44 lbs (3.4 lbs)	28.6 lbs (33 lbs)	8 lbs	55 lbs (32 lbs)	28.6 lbs
Reader Service Number	**567**	**568**	**569**	**570**	**571**

[1]The A44x9.5ESM is also available with a maximum aperture of f/1.7.

Manufacturer	Fujinon	Nikon		Schneider Optics	
Model	**A14x9ERM† (x8ERM)**	**TV Nikkor S15x85.B**	**TV Nikkor S13x9B**	**TP56 Apo-varon HM14X**	**TV85 Electronic Cam†‡**
Application	ENG, EFP	ENG/EFP	ENG/EFP	ENG/EFP	35x Tele, OB
Zoom range (basic)	9-112mm (8-126mm)	8.5-127mm	9-117mm	9-126mm	11-385mm
Aperture wide-tele	f/1.7-2.0 (-2.1)	f/1.7-2.2	f/1.7-2	f/1.7, f/4.2	f/1.4, f/2.6
MOD distance	0.8m (0.7m)	0.8m	0.8m	31.5″/0.8m	9.8′/3m
MOD image area HxV	52x39mm (47x63)	5.3x4.0cm	5.6x4.2cm	54x41mm	67.9x50.2mm
Horiz angle wide-tele	52.1°-4° (57.62°-4.5°)	54.7°-4.0°	52.1°-4.3°	52°-4°, 27°-2.2°	42.5°-1.4°
Back focus distance	Adjustable	Various	Various	42.5-47.6mm	44.12mm
Clear apertures f-r	...	....	....	72mm, 29.5mm	150mm, 31.8mm
Integral extenders	2	2	2	2	2, 1.5 opt
Macro focus feature	Yes	Yes	Yes	....	....
Maintenance access	Screw adjust	Screwdriver adj.	Screwdriver adj	Screwdriver adjusts	Remove covers
Assembly weight	5 lbs	2.86 lbs/ 1.3kg	2.42 lbs/1.1kg	3.96 lbs, 1.8 kg	50.6 lbs (23kg)
Reader Service Number	**572**	**573**	**574**	**575**	**576**

Manufacturer	Schneider Optics		Schwem Technology	Tamron Industries	
Model	**TV66**	**TV80**	**Gyrozoom 60/300 (FP-1)**	**466H (H14x9BI)**	**Model 47HD**
Application	EFP	Studio, OB	ENG/EFP/OB[1]	ENG	CCTV
Zoom range (basic)	8.8-130mm	8.5-150	60-300mm	9-126	8-16mm
Aperture wide-tele	f/1.4-3.4	f/1.4-4	f/6.2 (range to f/32)	1.6-1.9	1.6
MOD distance	17.7″/0.45m	27.5″/0.7m	10′/3.048m	39.37″/1m	39.37″/1m
MOD image area HxV	43x32mm	53x40mm	....	....	....
Horiz angle wide-tele	56°-4°, 28°-2°	55.5°-3.4°, 27.7°-1.7°	8.38-1.62°	52°6′-4°	57.62°-30.75°
Back focus distance	43.6mm	42.4mm	Adjustable	38.98mm	10.85mm
Clear apertures f-r	134mm, 35.8mm	133mm, 33mm	....	76.5mm, 24.8mm	26mm, 9.4mm
Integral extenders	2	2	....	No	No
Macro focus feature	....	....	....	Yes	No
Maintenance access	Remove covers	Remove covers	....	Screwdriver adjusts	Screwdriver adjusts
Assembly weight	41.8 lbs, 19 kg	33 lbs, 15 kg	7.25 lbs	3.33	0.21 lbs
Reader Service Number	**577**	**578**	**579**	**580**	**581**

[1]These products include a stabilization system to reduce vibrations greater than 4Hz by 98%, a 34dB attenuation. Pan-tilt rate of 6°/s for 60/300; 30°/s for FP-1.

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TV Camera Zoom Lenses, 1″

Manufacturer	Angenieux					Canon
Model	**14x7**	**14x8**	**14x9**	**40x14††**	**40x9.5††**	**PV18x11BIE**
Application	ENG/EFP	ENG/EFP	ENG/EFP	EFP/sports	EFP/sports	OB, studio
Zoom range (basic)	7-98mm	8-112mm	9-126mm	14-560mm	9.5-380mm	11-200mm
Aperture wide-tele	f/1.6-2	f/1.6-2	f/1.6-2	f/1.9-3	f/1.3-2.1	f/1.6-2
MOD distance	31″/0.8m	31″/0.8m	31″/0.8m	0″ (on front glass)	0″ (on front glass)	23.6″/0.6m
MOD image area HxV	72x54mm	61x46mm	52x39mm	55x41.5mm @ 8.2′	55x41.5mm @ 8.2′	49x37mm
Horiz angle wide-tele	64°-5°	58°-4.5°	52°-4°	49.75°-1.33°	49.75°-1.33°	60.4°-3.7°
Back focus distance	Adjustable	Adjustable	Adjustable	Manual, electronic	Manual, electronic	62.79mm
Clear apertures f-r	....	....	....	....	....	185.2mm, 42.4mm
Integral extenders	2, WA	2	2, WA[1]	2.1 std, 1.45 opt	2.1 std, 1.45 opt	1.5, 2
Macro focus feature	On front glass	On front glass	On front glass	....	....	No
Maintenance access	Screwdriver adjust	Screwdriver adjust	Screwdriver adjust	Remove cover	Remove cover	Remove housing
Assembly weight	5.5 lb	3.9 lbs	3.1 lbs	43 lbs	43 lbs	59 lb
Reader Service Number	**582**	**583**	**584**	**585**	**586**	**587**

[1]Also retrozoom and tele attachments.

Manufacturer	Canon	Fujinon			Schneider Optics
Model	**PV40x13.5BIE**	**R17x12.5ESM†**	**R20x10.5ESM†**	**R44x13.5ESM†**	**TV64†**
Application	OB, studio	BCTV, studio	BCTV, studio	BCTV	Studio, OB
Zoom range (basic)	13.5-540mm	12.5-215mm	10.5-210mm	13.5-600mm	13-190mm
Aperture wide-tele	f/1.7-2.8	f/1.6-2	f/1.6-2.1	f/1.8-3	f/1.7-3.4
MOD distance	8.2′/2.5m	0.75m	0.75m	2.5m	15.7″/0.4m
MOD image area HxV	53x40	58x44mm	58x44mm	50x37mm	43.3x32.5mm
Horiz angle wide-tele	50.7°-1.4°	54°13′x3°25′	62°44′x3°29′	50°44′x1°13′	54°-4°, 28°-2°
Back focus distance	62.8mm	Adjustable	Adjustable	Adjustable	71.6mm
Clear apertures f-r	200mm, 38.7mm	....	....	....	134mm, 43mm
Integral extenders	2	1.5, 2	1.5, 2	2	2
Macro focus feature	No	....	....	....	No
Maintenance access	Remove housing	Remove cover	Remove cover	Remove cover	Remove covers
Assembly weight	66 lbs	42 lbs	45 lbs	55 lbs	41.8 lbs, 19 kg
Reader Service Number	**588**	**589**	**590**	**591**	**592**

TV Camera Zoom Lenses, 1¼″

Manufacturer	Angenieux	Canon		Fujinon	
Model	**18x16.5HP†**	**P18x15BIE†**	**P40x18BIE**	**P17x16.5ESM†**	**P20x14ESM†**
Application	Studio/OB	Studio, OB	OB, EFP, sports	Studio, OB	Studio, OB
Zoom range (basic)	16.5-297mm	15-270mm	18-720	16.5-280mm	14-280mm
Aperture wide-tele	....	2.1-2.7	2.3-3.8	f/2.1-2.7	f/2.1-2.8
MOD distance	27.6″/0.6m	23.6″/0.6m	8.2′/2.5	0.75m	0.75m
MOD image area HxV	53x40mm	49x37mm	53x40mm	59x44mm	58x44mm
Horiz angle wide-tele	54°-1.3°	60.4°-3.7°	50.7°-1.4°	54.83°-3.5°	62.84°x3.5°
Back focus distance	Adjustable	75.3mm	75mm	Adjustable	....
Clear apertures f-r	....	185.2mm, 39.1mm	200mm, 36mm	....	....
Integral extenders	1.6, 2.5	1.5, 2	2	1.5, 2	1.5, 2
Macro focus feature	....	No	No	....	No
Maintenance access	Remove cover	Remove housing	Remove covers	Remove cover	Remove cover
Assembly weight	....	59 lbs	66 lbs	42 lbs	43 lbs
Reader Service Number	**593**	**594**	**595**	**596**	**597**

Manufacturer	Fujinon	Schneider Optics
Model Series	**P44x18ESM†**	**TV65†**
Application	EFP, OB	Studio, OB
Zoom range (basic)	18-800mm	16.5-240mm
Aperture wide-tele	f/2.4-4	f/2.2-6.4
MOD distance	2.5m	15.7″/0.4m
MOD image area HxV	50x37mm	45.3x34mm
Horiz angle wide-tele	50.75°x1.21°	54°-4.2°, 29°-2.1°
Back focus distance	....	71.5mm
Clear apertures f-r	....	134mm, 37.5mm
Integral extenders	2	2
Macro focus feature	....	....
Maintenance access	Remove cover	Remove covers
Assembly weight	55 lbs	41.8 lbs, 19 kg
Reader Service Number	**598**	**599**

Color Video Monitors

These products are suitable for display of standard, HDTV and graphic system video signals. All present a 4:3 aspect ratio, except those models marked with a bullet (•) which provide a 5:3 ratio or scan system appropriate for graphics. Those marked with a dagger (†) offer automatic setup capabilities. An H-V/Pulse Cross display is available on all models unless marked with a double dagger (‡). Color standards are abbreviated N (NTSC), P- (PAL), S (SECAM). Under video component inputs, YCrCb refers to equi-band R-Y/B-Y components in contrast to the unequal bandwidth I/Q forms. YCwCn are HDTV components. Models marked with a check (✓) include integral AF amp and speaker facilities.

Manufacturer	ASACA/ShibaSoku				Barco Industries
Model/Series	**CM23A (CM43A) [CM44A]**	**•CM22A6 (CM65A)**	**CMM11 series**	**CMM7 series**	**CVS series[1]†✓**
Application	Master, utility	Master, HDTV	Master control	Master, utility	Master control
CRT diagonal (Inches)	21 (15) [14]	20 (26)	20 (14, 26)	20 (14, 26)	14 (20)
Preferred CRT type	Inline dot, flat sq	Inline (delta) dot	Delta-dot	Inline dot (slot-26″)	Inline dot
Dot/stripe pitch	...	0.26mm (0.27)	0.31mm (0.37, 0.43)	0.31mm (0.38)	0.31mm
Beam feedback design	Yes	No	No	No	Yes

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Manufacturer	ASACA/ShibaSoku				Barco Industries
Model/Series	**CM23A (CM43A) [CM44A]**	**•CM22A6 (CM65A)**	**CMM11 series**	**CMM7 series**	**CVS series[1]†✓**
Resolution at center	550 TVL	500 TVL	<600	600	550
Luminance bandwidth	60Hz-7MHz	To 7MHz	<7MHz	To 7MHz	±1dB to 8MHz
Chrominance bandwidth	....	To 1.3	I-1.3, Q-0.5	1.3MHz	0.6 equiband
Aperture correction	0-8dB 2.8MHz/4MHz PAL	-10,0dB range	<10dB range	-10, 0dB	+6dB, 3MHz
Chrominance decoder	Comb filter	Comb filter	Comb filter	Comb filter	Comb filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	I, Q	R-Y, B-Y	R-Y, B-Y
X-Y display outputs	No	No	Yes	Yes	No
NTSC matrix test	No	No	Yes	No	No
Blue gun only test	No	No	No	No	Yes
Underscan	Yes	To 95%	To 95%	To 95%	Corners in
Available standards	N, P-/-B/G/I/D	N, P-	N, P-, S	N, P-, S	N, P, S
Multistandard unit	No	No	Switch selected	Switch selected	Auto selected
Composite inputs	A, B, C inputs	Yes	Yes	Yes	Yes
Component inputs	RGB, Y/C	RGB	RGB, Y/Cr/Cb forms	RGB	RGB, Y/Cr/Cb forms
VCR input output	8-pin	No	No	No	No
Reader Service Number	**611**	**612**	**613**	**614**	**615**

[1]Color analyzer available as optional equipment.

Manufacturer	Barco Industries		Brabury[1]	BTS Broadcast TV Systems
Model/Series	**CTVM 4 series**	**CM22 (CM33, CM51)✓**	**•HDTV series‡**	**MCM37B (MCM series)**	**LDH6200/6220‡(LDK7020‡)**
Application	Master control	Master, utility	...	Utility	Master, utility
CRT diagonal (Inches)	14 (20, 26)	9 (14, 19)	20, 26, 30, 40	14 (9, 20)	14/20(20)
Preferred CRT type	Delta or inline dot	Inline dot	Delta dot	In-line, black matrix dot	Inline (Dot mask)
Dot/stripe pitch	0.31mm	0.30mm (0.43)	0.34mm	0.31mm	0.65mm (0.40)
Beam feedback design	Yes	Yes	...	No	No
Resolution at center	710 (770)	320 -12dB (340)	Unspecified	<600	<310 (<650)
Luminance bandwidth	±0.5dB to 10MHz	To 7MHz	±0.5dB, 15kHz-30MHz	±0.5dB to 4MHz	To 5MHz
Chrominance bandwidth	0.6 equiband NTSC	...	-based on RGB	1.2MHz	To 0.9MHz
Aperture correction	.....	No	No	...	±4dB range
Chrominance decoder	Comb filter	Comb filter	...	Passive filter	Comb filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	...	U/V, I/Q	R-Y, B-Y
X-Y display outputs	Yes	No	No	No	No
NTSC matrix test	No	No	No	No	No
Blue gun only test	Yes	Yes	No	No	No
Underscan	Yes	Yes	...	To 10%	To 10%
Available standards	N, P-/-B/M/N, S	N, P-	HDTV only	P-, S, N-M/-N	N, P-, S
Multistandard unit	Auto selected	...	No	Auto selected	N or P-/S
Composite inputs	Yes	Yes	No	2 encoded	A, B inputs
Component inputs	RGB, YCrCb forms	RGB	RGB	Analog RGB, YUV	RGB inputs
VCR input output	No	No	No	-A version only	No
Reader Service Number	**616**	**617**	**618**	**619**	**620**

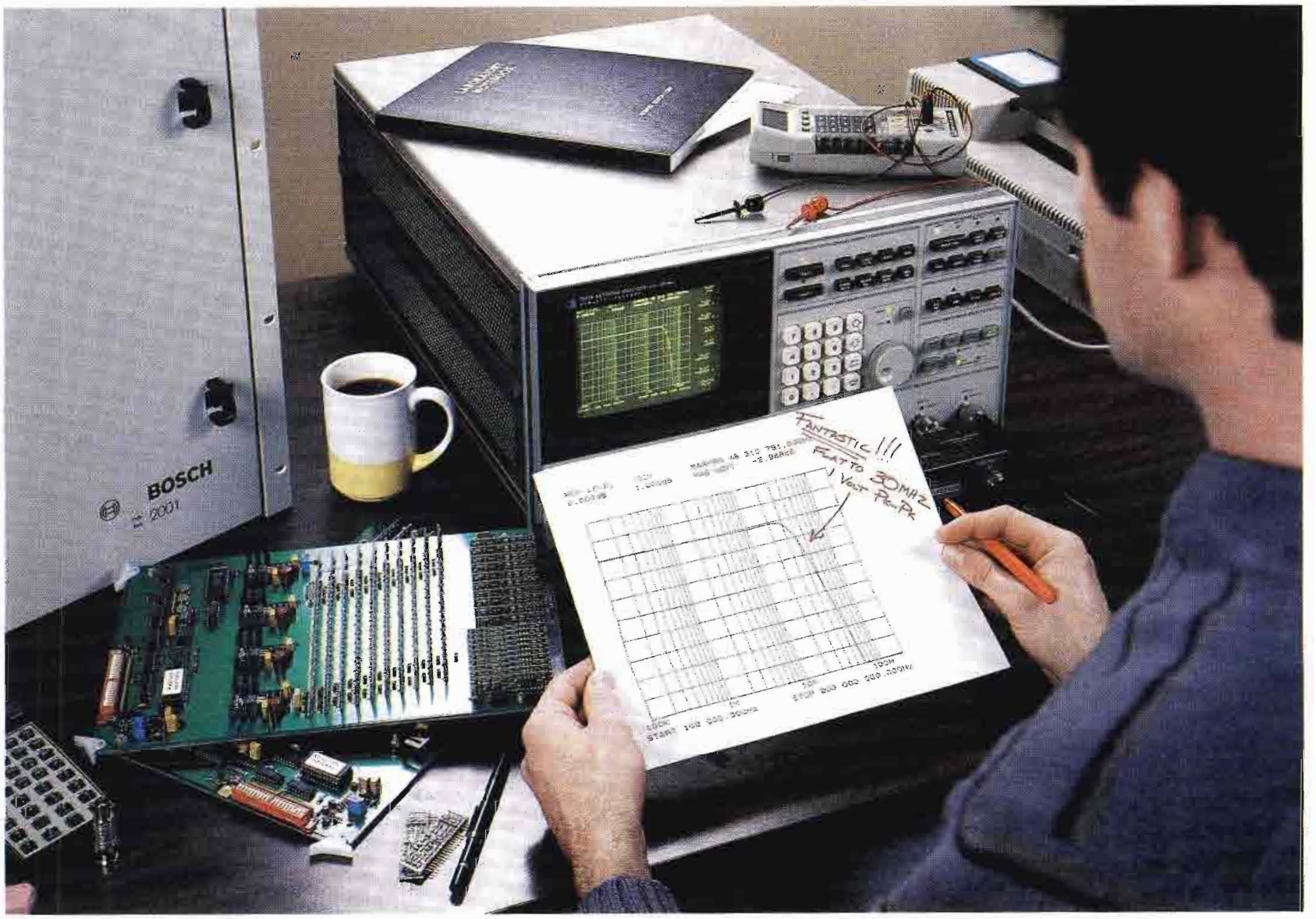
[1]Available in US through Grunder & Associates. Units provide split screen presentation of inputs 1 & 2.

Manufacturer	BTS Broadcast TV Systems	Conrac	Croma Research	Digivision	Electrohome
Model/Series	**MC37BA (51, 22)**	**6545 w/6550 Micromatch†**	**CM137 (CM142, 151)**	**BCV37 (BCV51)**	**•ECM 1900 series‡**
Application	Master control	Master control	Master control	Utility	Graphics (CGA/EGA/PGA)
CRT diagonal (Inches)	14 (20, 9)	13 (19)	14 (16, 20)	14 (20)	19
Preferred CRT type	Inline dot	PIL, dot mask	Inline, self-converged	Delta-dot	High resolution
Dot/Stripe pitch	0.31mm (0.43, 0.30)	0.31mm (0.44)	0.31mm (0.43)	0.31mm (0.43)	0.31mm
Beam feedback design	...	Yes	Yes	...	...
Resolution at center	Equiv to 5MHz	>800	...	600	1024x800 interlaced
Luminance bandwidth	±0.5dB to 6MHz	±1dB to 8MHz	±0.5dB to 5.5MHz	±3dB to 10MHz	-3dB @ 35MHz
Chrominance bandwidth	±1MHz	±1dB to 12MHz RGB	±0.3dB to 5.5MHz RGB	To 10MHz	...
Aperture correction	Adjustable	6.5dB gain 2.5MHz	Yes	Switch selected	No
Chrominance decoder	Notch & comb filter	Comb filter	Comb filter	Notch filter	None
Demodulation axes	R-Y, B-Y	...	R-Y, B-Y	R-Y, B-Y	None
X-Y display output	Yes (Yes, No)	...	Option on NTSC, PAL	...	No
NTSC matrix test	No	Yes	No	...	No
Blue gun only test	Yes	Yes	Yes	...	No
Underscan	Yes	Adjustable	Yes	Yes	No
Available standards	N, P-M/N, S	N, P-/B	N, P-B/M/N, S	N, CCIR 625/50	Analog RGB, TTL
Multistandard unit	Option	Self sensing	Auto dual, triple	No	Switched, sync sensing
Composite inputs	Yes	A, B	Yes	Yes	No
Component inputs	RGB	RGB	RGB	RGB, YCrCb	RGB, TTL
VCR input output	No	No	No	No	No
Reader Service Number	**621**	**622**	**623**	**624**	**625**

Manufacturer	Electronic Visuals		Ikegami Electronics		
Model/Series	**EV6151B‡**	**EV6251**	**TM6-1**	**TM14(TM20) [TM10]-9RH**	**TM14-10RH (TM20-10RH)**
Application	Master control	Grade 1, master	Production, industrial	Master control	Master control
CRT diagonal (Inches)	20 (51cm)	20	6	13 (19) [8.5]	13 (19)
Preferred CRT type	In-line, dot	IL gun, dot matrix	IL slot mask	IL, dot	Delta gun, dot
Dot/stripe pitch	0.4mm	0.47mm or 0.43mm	0.49mm horiz slot	0.31mm (0.43) [0.28]	0.31mm (0.43)
Beam feedback design	...	...	No	No	Yes
Resolution at center	9MHz equivalent	Equiv 8MHz	>240 lines center	700 TVL [600 TVL]	800 TVL
Luminance bandwidth	-3dB to ≥10MHz	±1dB 8MHz RGB mode	-3,+1dB to 4MHz	-3, +1dB to 8MHz	-3,+1dB, 60Hz-10MHz
Chrominance bandwidth	±1.1MHz	±1.1MHz PAL/PAL-D	-3,+1dB, 3.58±0.5MHz	±0.5dB 0.3(0.6)MHz	±0.5dB, I-0.6, Q-0.3
Aperture correction	...	...	Yes	-15,+6dB	-15,+6dB
Chrominance decoder	Notch filter	Notch filter	Notch	Comb, notch filters	Comb filter
Demodulation axes	U, V	U-V	R-Y, B-Y	I/Q [R-Y, B-Y]	I/Q
X-Y display output	...	No	No	R-Y, B-Y (No)	Yes
NTSC matrix test	No	No	No	No	Yes
Blue gun only test	No	No	Yes	Yes [No]	Yes
Underscan	No	Yes	...	90%	90%
Available standards	PAL-D std (PAL opt)	PAL, PAL-D, RGB	NTSC	NTSC, RGB	NTSC
Multistandard unit	No	No	No	No	No
Composite inputs	A, B, C PAL encoded	A, B, C	A, B	A, B, C [A, B]	Yes
Component inputs	RGB	YCbCr, RGB	No	RGB, YCbCr [RGB]	RGB, other
VCR input output	No	No	No	No	No
Reader Service Number	**626**	**627**	**628**	**629**	**630**

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(Chart/image on analyzer is actual output from the 2001 switcher.)

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Manufacturer	Ikegami Electronics		JVC Company		
Model/Series	**TM14-15RH† (TM20-)**	**TM14-16RH (TM20-)**	**TM-2048U‡ (TM-13U)✓**	**TM-9U (-22U‡✓/-63U‡✓)[1]**	**VM-R190SU (-140SU)**
Application	Master (digital control)	Utility	Utility	Utility, master	Utility
CRT diagonal (Inches)	13 (19)	13 (19)	19 (13)	9 (5)	19 (14)
Preferred CRT type	In-line, dot	IL dot	In-line	In-line slot	In-line dot
Dot/strip pitch	0.31mm (0.43)	0.41mm (0.55)	... (0.47mm)	0.47mm (...)	0.4mm (0.43)
Beam feedback design	Yes	Yes	No	No	No
Resolution at center	700 TVL	500 TVL 60ft-L (40ft-L)	<350	310	<600
Luminance bandwidth	-3,+1dB 60Hz-10MHz	-3,+1dB to 7MHz	...	To 4MHz	<8MHz
Chrominance bandwidth	≥-2dB, 1.3MHz R-Y, B-Y	-3 +1dB 3.58±0.5MHz	...	To 3.58MHz	<1.2MHz
Aperture correction	10dB	+10dB	Yes (No)	No	Yes
Chrominance decoder	Adaptive Faroudja comb	Comb, notch switchable	Comb filter	Comb filter	Comb, notch filters
Demodulation axes	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y (I/Q)	R-Y, B-Y
X-Y display output	Yes	No	No	No	No
NTSC matrix test	...	No	No	No	No
Blue gun only test	Yes	Yes	No	No	No
Underscan	Yes	90%	No	Yes (no)	Yes
Available standards	NTSC	NTSC	NTSC	NTSC	NTSC, IBM CGA/TTL
Multistandard unit	No	No	No	No	No
Composite inputs	Yes	A, B	A & B (A only)	Yes	2-inputs
Component inputs	RGB, YCrCb opt	RGB	No	No	RGB, M-II, Beta, Y/C
VCR input output	No	No	8-pin	No (Yes)	8-pin & S-VHS
Reader Service Number	**631**	**632**	**633**	**634**	**635**

[1]TM-22U/-63U are operable on 12Vdc.

Manufacturer	Lenco	Melford Electronics		Mitsubishi Electric	Panasonic Industrial
Model/Series	**ICM-219‡ (PM 519-4)**	**DU5-16C‡ (DU5-20C)**	**DU6-14C (DU-6 series)**	**AM-3501R‡✓[2]**	**BT-M1310Y (BT-D1910Y)**
Application	Utility (Master)	Master, graphics	Studio	Utility, computer	Utility
CRT diagonal(Inches)	19 (14)	16 (20)	14, 9, 20, 22 (26)	35	13, (19)
Preferred CRT type	Inline slot (dot)	IL gun, Dot matrix	IL gun, Dot matrix	Multi-step focus/stripe	Inline, dot
Dot/stripe pitch	0.68mm (0.47)	0.31mm (or 0.4-.47)	0.39mm	0.92mm	0.39mm (0.55)
Beam feedback design	No	...	Yes	...	No
Resolution at center	450 TVL (650)	100 char/inch[1]	5.5MHz (6MHz)	330 RF/400 video	550 TVL
Luminance bandwidth	To 5.5MHz (10MHz)	±0.5dB 10MHz (7MHz)	±1dB 8MHz	<3.5MHz	To 4.2MHz
Chrominance bandwidth	To 3.5MHz ±1dB	N.A.	...	...	To 1.5MHz
Aperture correction	±6dB (±3dB)	No	...	No	Yes
Chrominance decoder	...(Comb filter)	PAL available	Phase EQ notch	Comb filter	Notch, comb filters
Demodulation axes	R-Y, B-Y (I/Q)	N.A.	U/V	R-Y, B-Y	R-Y, B-Y
X-Y display output	No	No	No	No	No
NTSC matrix test	Yes	No	No	No	A/B split display
Blue gun only test	No (Yes)	No	Yes	No	Yes
Underscan	Yes	Preset size	...	No	±5%
Available standards	NTSC (& RGB)	RGB for 525/60, 625/50	PAL/CCIR 625-50	NTSC, PC multisync	NTSC
Multistandard unit	No	...	No	No	No
Composite inputs	Yes	With PAL option	A/B	3-NTSC, S-VHS	A, B
Component inputs	No (RGB)	RGB	No	RGB TTL, analog	Y/C, YCrCb opt
VCR input output	No	No	No	EIAJ-8, S-VHS	8-pin connector
Reader Service Number	**636**	**637**	**638**	**639**	**640**

[1]per 6MHz (5.5MHz) test signal.
[2]Video, computer 620x240-pixel RGB.

Manufacturer	Panasonic Industrial			Pesa Electronics	Philips T&MI
Model/Series	**BT-S1000N (BT-S series)✓[1]**	**CT-1030M‡✓ (1400M)**	**CT-1331Y‡✓[2]**	**BM-4300 series**	**PM 5625 G/L/M**
Application	Utility	Utility (& data)	S-VHS monitor	Utility, master	GP/utility
CRT diagonal (Inches)	10 (7, 13, 19)	10, 13 (14)	13, 20, 25	9, 14, 10	14
Preferred CRT type	Inline	In-line (dot)	...	PIL, stripe	In-line
Dot/stripe pitch	...	... (0.49mm)	Medium res	0.31mm & 0.43	0.65mm
Beam feedback design	No	No	No	...	No
Resolution at center	300 TVL	300, 280 (370 or 580-dot)	420, 450	<450, <600	0.65mm equivalent
Luminance bandwidth	To 4.2MHz	To 4.2MHz	To 3.9MHz	±0.5dB 50Hz-5MHz	-3dB 5MHz
Chrominance bandwidth	To 1.5MHz	To 1.2MHz	To 1.5MHz	...	To color subcarrier
Aperture correction	No	On 1301, 1400	No	No	No
Chrominance decoder	Notch, comb filter	Comb, notch	...	Comb, notch filters	Notch filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y	I/Q	R-Y, B-Y
X-Y display output	No	No	No	No	A-B Split-screen
NTSC matrix test	No	No	No	No	No
Blue gun only test	Yes	No	No	No	No
Underscan	Yes	No	...	Yes	Yes
Available standards	NTSC	NTSC, (RGB, RGB/TTL)	NTSC, S-VHS	NTSC, PAL	P, S, N
Multistandard unit	No	No	...	...	PAL/SECAM opt
Composite inputs	Line 1/VCR (Line 2)	Yes	A, B VCR	NTSC or PAL	A, B
Component inputs	No	(RGB)	Y/C from VCR	RGB,	RGB
VCR input output	Yes	8-pin	8-pin	No	No
Reader Service Number	**641**	**642**	**643**	**644**	**645**

[1]Series includes models BT-S1300N, 1900N, S700N, 701N, 702N.
[2]2010Y & 2580VY models are 20″ and 25″ diagonal CRT, respectively.

Manufacturer	Sharp Electronics		Sony Broadcast		
Model/Series	**XM-900**	**XM-1300**	**BVM8021/9021✓**	**BVM1201/1301**	**BVM1910/2010P†**
Application	Utility	Master, graphics	Utility	Master control	Master control
CRT diagonal (Inches)	9	13	8	12	19
Preferred CRT type	In-line stripe	In-line dot	Trinitron	Trinitron	Trinitron
Dot/stripe pitch	0.47mm	0.31mm	0.25mm	0.25mm	0.30mm
Beam feedback design	Yes	Yes	No	No	Yes
Resolution at center	310 TVL	600 TVL	400 TVL	600 TVL	900 TVL
Luminance bandwidth	To 5MHz	7MHz	-3dB at 4MHz	8	10

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Manufacturer	Sharp Electronics		Sony Broadcast		
Model/Series	**XM-900**	**XM-1300**	**BVM8021/9021✓**	**BVM1201/1301**	**BVM1910/2010P†**
Chrominance bandwidth	To 3.58MHz	3.58MHz	1.5	1.5	1.5
Aperture correction	...	To +8dB	0,+8dBm 4.5MHz	+8dBm at 4.5MHz	±6dB (4.5-9MHz)
Chrominance decoder	Comb filter	Comb, notch filter	Comb filter	Precision	Comb filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	...	...	R-Y, B-Y
X-Y display output	No	No	No	Yes	Yes
NTSC matrix test	No	No	No	Yes	Yes
Blue gun only test	Yes	Yes	Yes	Yes	Yes
Underscan	To 5%	To 5%	-5,10%	Yes	Yes 5%
Available standards	NTSC	NTSC	NTSC	NTSC	NTSC, PAL
Multistandard unit	No	No	No	No	Switch selected
Composite inputs	Yes	Yes	Yes	NTSC	NTSC, PAL
Component inputs	No	RGB, TTL	No	RGB, YCrCb	RGB or YCrCb
VCR input output	No	No	Yes	No	No
Reader Service Number	**646**	**647**	**648**	**649**	**650**

Manufacturer	Tektronix	Videotek		Vistek Electronics	
Model/Series	**650HR series**	**AVM-13✓ (AVM-19)**	**VM-13PRO (Studio-13)**	**GM7100 series**	**GM7200 series**
Application	Master, graphics	Utility	Studio monitor	Grade 1 - master	Grade 2 - utility
CRT diagonal (Inches)	12	13 (19)	13, 8 (13)	14, 20	6.5, 10
Preferred CRT type	Trinitron	Slot mask, in-line	Trinitron Plus	Dot mask	Dot mask
Dot/stripe pitch	0.25mm	...	0.25mm	0.39mm, 0.44mm	0.30mm, 0.28mm
Beam feedback design	No	No	No	...	...
Resolution at center	480	280/-13 (350/-19 comb)	260, 360 (380)	...	...
Luminance bandwidth	6	To 3MHz	2dB to 3.2MHz	±0.5dB 6MHz	±3dB to 8MHz
Chrominance bandwidth	1.3	To 1MHz	To 1.5MHz	...	...
Aperture correction	+10dB	±3dB	Yes	No	No
Chrominance decoder	Notch filter	Notch (or comb)	(Comb, notch)	...	Comb filter
Demodulation axes	UV or R-Y/B-Y	R-Y, B-Y	R-Y, B-Y	U-V	U-V
X-Y display output	Yes	No	No	No	No
NTSC matrix test	Yes	No	No	No	No
Blue gun only test	Yes	Yes	Yes	No	Option
Underscan	To 20%	90%	90%	Yes	Option
Available standards	N, P, S	NTSC only	NTSC	PAL, NTSC	N3.58/4.43, P, S
Multistandard unit	Switch selected	No	No	No	Option
Composite inputs	Yes	Yes	A, B, C	A, B	A, B
Component inputs	RGB	No	No	RGB	RGB
VCR input output	No	8-conductor	No	No	No
Reader Service Number	**651**	**652**	**653**	**654**	**655**

Digital Video Effects Systems

Manufacturer	Abekas Video Systems		Alta Group		Ampex AVSD
Model Series	**A52**	**A53-D**	**Centaurus**	**Pyxis[5]**	**ADO 1000/2000/3000**
No. of output channels	1 or 2	1 or 2	1	1	1, expands to 4
No. of image planes	1	1	1	1	1
System control	Dedicated, soft keys	Oedicated, soft keys	Dedicated keys	Dedicated keys	Dedicated, soft keys
Instruction memory	DataKey device	Floppy disk	ROM	....	Floppy disk
Parameter display	Control panel display	Control panel	Control panel	On control panel	Control panel, CRT
VCR connection	No	No	Yes[4]	Yes	No
TBC functions	No	No	Dual TBC, frame sync	Oual TBC, frame sync	No
Remote control port	Switcher, editor[1]	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
Image compression ratio	Variable	Variable	....	....	Infinite
Image expansion ratio	Variable	Variable	....	....	Infinite
Rotation around axes	....	X, Y, Z simultaneous	....	....	X, Y, Z simultaneous
Perspective effects	....	Cube/cyl, page turn[3]	....	....	Page turn, cylinder[6]
Image freeze	Fld/frm/storyboard[2]	Fld, frm, strobe	Fld, frm, update	Frm, fld each TBC	Fld, frm, trail, update
Picture splits	Yes	....	H, V, 4-way	Yes	....
Mirror effects	....	....	....	No	....
Push-on/push-off	Yes	Yes	Yes	No	Yes
Posterization	8 levels Y & C	8 levels, Y & C	Yes	Yes	Inf level w/false colors
Mosaic tiling	Variable	....	....	No	Infinte tile sizes
Programmable sequences	Yes	Yes	No	Yes	Yes
Reader Service Number	**758**	**759**	**760**	**761**	**762**

[1]Also 4 GPI in, 1GPI out and diagnostic test patterns.
[2]Multiple frames of 4, 9, 16 per screen.
[3]Warp option & diagnostic test patterns.
[4]Integral still-store with removable disk, S-VHS output.
[5]Includes audio control and mixing.
[6]Also rotating cube, 3D, geometrics.

Manufacturer	CEL (Grunder Associates)		Convergence	DSC/Digital Services	
Model Series	**EFX-2[1]**	**MS-101[1]**	**CDS-2000**	**Eclipse**	**Illusion**
No. of 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	....
Diff phase, gain	....	....	3°, 3%	1°, 1%	3°, 3%

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Manufacturer	CEL (Grunder Associates)		Convergence	DSC/Digital Services	
Model Series	EFX-2[1]	MS-101[1]	CDS-2000	Eclipse	Illusion
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
Image compression ratio	Continuous	1:4	....	Variable	Variable
Image expansion ratio	....	....	....	Variable	Variable
Rotation around axes	....	....	....	X, Y, Z	Z
Perspective effects	H & V	H, V	....	Page turn, cube, geo.	X, Y
Image freeze	Frm, fld, multi, strobe	Frm, fld, 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/push-off	Yes	Yes	Yes	Yes	Yes
Posterization	6 level w/false color	6 levels w/false color	No	2 level w/false color	2 levels w/false color
Mosaic tiling	H pixelization	H pixelization	No	10 steps H, V	10 levels
Programmable sequences	Yes	Yes	No	Yes	Yes
Reader Service Number	**763**	**764**	**765**	**766**	**767**

[1]Systems provide component or composite input; component output is optional.

Manufacturer	DSC/Digital Services	For-A	Fougerolle Video	GML Grove	
Model Series	SX-2000D[1]	MF-2000 Multifex (-DC)	MPV 4000 (PAL/SECAM)	X-Calibre (X-Calibre II)	Proteus
No. of output channels	Pgm, Pvw	1 (dual)	1 to 4	1, expands to 2	1
No. of image planes	Multiple	...	....	1	1
System control	Dedicated keys	Dedicated keyboard	Dedicated keyboard	Dedicated, soft keys	Dedicated keys
Instruction memory	RAM, bubble memory	Removable	Floppy disk option	ROM, floppy disk opt.	RAM
Parameter display	Control panel	LEDs, LCDs	LED on control panel	Control panel	Control settings
VCR connection	No	Async	Adaptable	w/Adv Sync out[2]	Multiple VCRs[2]
TBC functions	No	Yes	Single channel model	Dual TBC, framestore	2-channel, framestore
Remote control port	Editor, GPI	Serial control	via GPI, RS-422	GPI, RS-422	Switcher, editor, GPI
System S/N ratio	....	55dB	....	58dB	58dB
Diff phase, gain	3°, 3%	...	....	2°, 2%	2°, 2%
Sampling rate, bits	Y-13.5MHz, 8-bit	...	13.5MHz 8-bit RGB or YCrCb/Beta.	8-bit NTSC and YUV, YIQ, RGB	7.2MHz 8-bit
Image size variation	Continuous	Compress	Continuous	Continuous w/Zoom	Stepped
Image compression ratio	Variable	...	1:∞ single; 2:∞ 4-ch.	½-size & infinite	1:4, 1:2
Image expansion ratio	Variable	...	2:1 4-channel	½-size & infinite	....
Rotation around axes	Z	X, Y, Z		(Variable axis spins)	No
Perspective effects	H, V, optional	2-D only	Double pseudo-cube	Variable aspect ratio	No
Image freeze	Fld, frm, strobe	w/multifreeze	Field, frame	Fld, frm, strobe	Fld, frm, update, 2-pic
Picture splits	Yes	Yes, w/keys	H & V	Yes, quad repeats	H, V 4-quadrants
Mirror effects	H, V, diagonal	...	H & V	H, V, w/re-enter	H, V
Push-on/push-off	Yes	Yes	Trajectory paths	Yes	Yes
Posterization	2 levels w/false color	Yes	Yes	Yes, colorize	10 level w/false color
Mosaic tiling	10 levels	Yes	Yes	Yes	7 tile sizes
Programmable sequences	Yes	Multiple	Yes	Yes (w/Keyframe traj.)	Yes
Reader Service Number	**768**	**769**	**770**	**771**	**772**

[1]Includes integral 12-input video switcher with 2 M/E and 5 key amps, DSK.

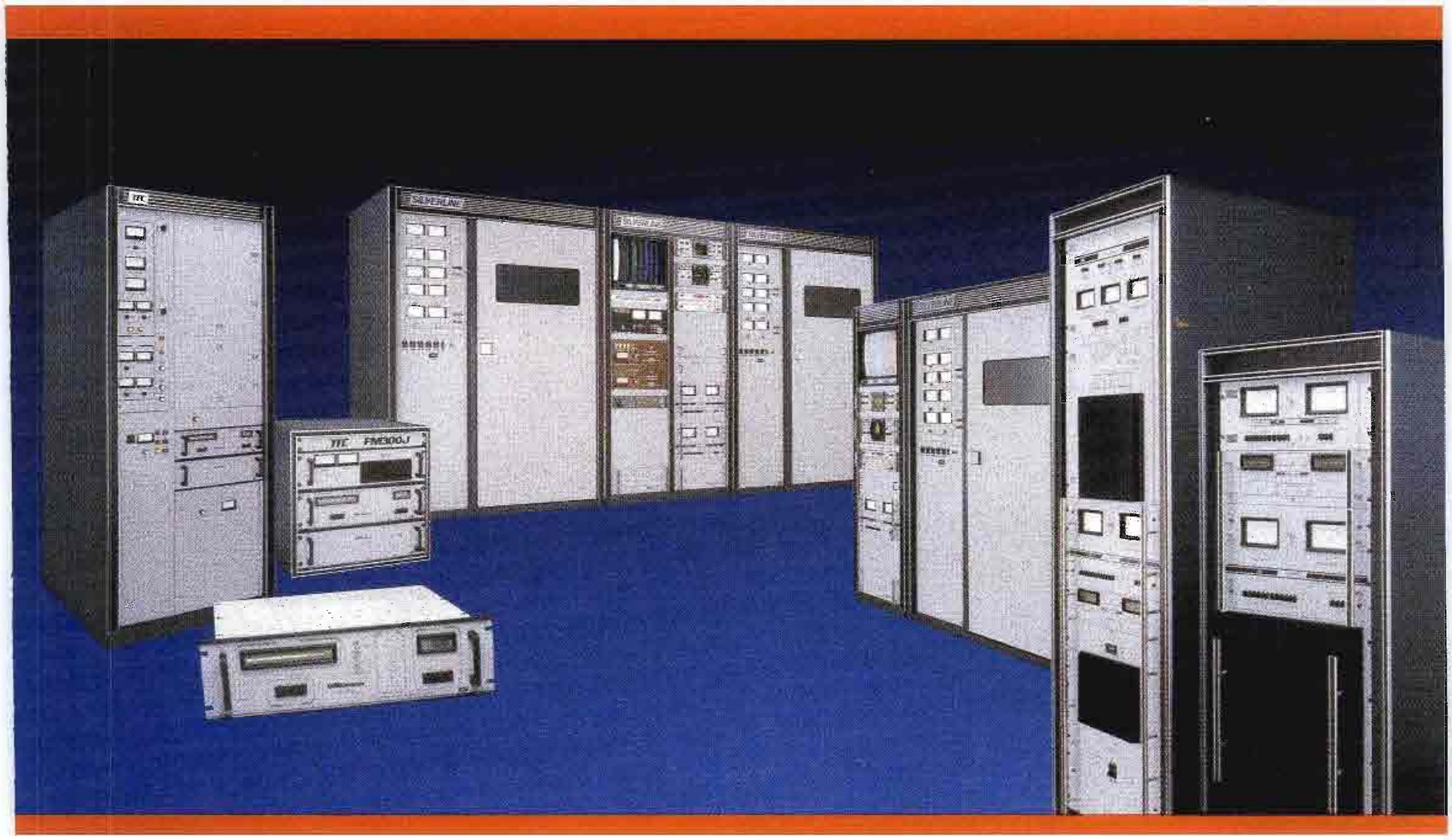
[2]Variable tracking is supported by integral TBC facilities.

Manufacturer	Grass Valley Group	Microtime		NEC America	
Model Series	Kaleidoscope DPM-1	Genesis 1 w/Act 1	RP-1[1]	DVE System 10	DVE System 100
No. of output channels	1, expands to 5	1	1, expands to 2	1	1, expands to 2
No. of image planes	2 per channel	1	1	1	1
System control	Dedicated, soft keys	Dedicated, soft keys	Dedicated, soft keys	Dedicated, soft keys	Dedicated keys
Instruction memory	Floppy disk	RAM, DataKey device	Floppy disk	Floppy disk	Floppy disk
Parameter display	On control panel	Control panel	Control panel, CRT	Control panel, CRT	Control panel
VCR connection	No	No	....	....	....
TBC functions	No	No	....	....	....
Remote control port	Switcher, editor	GPI	GPI	GPI	GPI
System S/N ratio	....	58dB	58dB	56dB	50dB
Diff phase, gain	....	2°, 2%	2°, 2%	2°, 2%	2°, 2%
Sampling rate, bits	....	8-bit	13.5MHz, 8-bit	14.2MHz, 8-bit	14.2MHz, 8-bit
Image size variation	Continuous	Continuous	Continuous	Variable	Continuous
Image compression ratio	Variable	Variable	Variable	Continuous	Variable
Image expansion ratio	Variable	....	Variable	Continuous	Variable
Rotation around axes	X, Y, Z	H, V	X; Y, Z	X, Y, Z simultaneous	No
Perspective effects	Yes	....	Page turn, cube	Page turn, cube, waves	No
Image freeze	Update/multi/trail/decay	Field, strobe	Frm, fld, strobe, trail	Frm, fld, multi, strobe	Fld, frm, update, multi
Picture splits	Yes	No	Yes	Yes	H, V
Mirror effects	Yes	Yes	Yes	Yes	Yes
Push-on/push-off	Yes	Yes	Yes	Yes	Yes
Posterization	Yes	9 level w/false color	Yes w/false colors	Variable	Variable
Mosaic tiling	Yes	Variable	Yes	Variable H, V	Variable
Programmable sequences	Yes	Yes	Yes	Yes	Yes
Reader Service Number	**773**	**774**	**775**	**776**	**777**

[1]Composite, component inputs and outputs; Signature analysis diagnostics.

Manufacturer	Pinnacle	Quantel		QuesTech	Thomson Video
Model Series	System 2010	DVM8000 Mirage	DPE5800 Encore	Charisma	TTV 5305
No. of output channels	1, expands to 2	1, expandable	1, expands to 15	Multiple	2 composite, YCrCb
No. of image planes	3	....	....	....	....
System control	Dedicated, soft keys	Dedicated, soft keys	Dedicated, soft keys	Control panel	Dedicated, soft keys
Instruction memory	Floppy disk, RAM	Floppy, hard disk, RAM	Floppy, hard disk, RAM	Floppy disk, RAM	EEROM, floppy disk
Parameter display	External CRT	External CRT	Keyboard, CRT	CRT, keyboard	Control panel
VCR connection	Yes	No	No	....	Yes
TBC functions	Yes	No	No	....	No
Remote control port	Switcher, editor	Switcher, editor	Switcher, editor	ESbus	Switcher
System S/N ratio	51dB	....	....	....	55dB
Diff phase, gain	1.5°, 2.5%	....	....	....	3°

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25000J FM Transmitter | 300J FM Transmitter | Model X FM Exciter | Silverline UHF TV Transmitter | Silverline UHF TV Transmitter | 1000W UHF TV Transmitter | 100W UHF TV Transmitter

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Manufacturer	Pinnacle	Quantel		QuesTech	Thomson Video
Model Series	System 2010	DVM8000 Mirage	DPE5800 Encore	Charisma	TTV 5305
Sampling rate, bits	13.3MHz, 8-bit	13.5MHz	13.5MHz	Per CCIR 601	13.5MHz, 8-bit
Image size variation	Continuous	Continuous	Continuous	Yes	Continuous
Image compression ratio	Infinite	Infinite	Infinite	Variable	Variable
Image expansion ratio	Infinite	Infinite	Infinite	Variable	Variable
Rotation around axes	Y, Z	X, Y, Z	X, Y, Z	X, Y, Z	X, Y, Z
Perspective effects	Page turn/3D/geo/V/cube	Page turn/3D/H-V[1]	Floating viewpoint	Yes w/Z-axis effects	Page turn, geo, 3D
Image freeze	Fld, frm, multiple	Field, frame	Field, frame, multiple	Multi, trail, sparkle	Field, frame
Picture splits	H, V, diagonal	H, V, diagonals	H, V	Yes	H, V, diagonals
Mirror effects	H, V	No	H, V	....	No
Push-on/push-off	Yes	Yes	Yes	Yes	Yes
Posterization	16 levels, false color	....	256 levels, false color	Yes	Yes
Mosaic tiling	42 to infinity	....	Yes	Yes	Yes
Programmable sequences	Yes	Yes	Yes	Yes	Yes
Reader Service Number	**778**	**779**	**780**	**781**	**782**

[1]Also geometrics, cylinder, cube.

Editing Controllers

Command entries for these audio and video editing controller systems are typically entered from a system keyboard, often with deck motion controlled from knobs; those offering other or additional forms of command/control entry (touch screen, mouse, joystick) are noted with a dagger (†). All systems provide assemble, insert and split edit modes unless noted with a double dagger(‡). Nearly all systems controlling more than one recorder and one player/source, provide edit decision list (EDL) facilities, accompanied by backup power to the EDL memory. Models not providing an A/B (sync) roll mode are noted with a check (✓). Editing accuracy is typically ±0 frames when operating in reference to SMPTE time code; referred to Ctl-Trk, accuracy may be within ±2 frames.

Manufacturer	Adams-Smith	AEG AG	Albrecht Electronik		Alpha Audio
Model Series	2600 A-V (CC✓)[1]	Mosaic-A	ESP-M series	TCS-E	The Boss 8400✓
Suggested for	On, off-line	On, Off-line	On-line	On-line, off-line	On/off-line audio
VTRs ATRs record/play	2-R, 16P (1R, 4P)	To 10 transports	1R, 4P (32[2])	4 decks (32[3])	Various
Videodisc interface	Yes	....	....	....	No
Microprocessor	Multiple 8-/16-bit	Distributed fP	Multiple 8-bit	Multiple	Multiple 8-bit
Internal storage	>1,000 (100)	....	Multiple event	Multiple event	999-event
Ext storage type	Disk (None)	....	Paper tape	Yes	Floppy disk
Edit decision list	Yes (no)	Yes	No	Yes	Yes, ADL
Edit data display	LED displays	Luminescent panel	LED displays	LED displays	CRT, printout
Printer interface	RS-232C	Yes	TTY	Yes	RS-232 Centronics
Animation mode	No	....	No	....	No
Time code reader	Yes (No)	Intelligent interfaces	Interface option	In interface	External
Time code generator	Yes (Yes)	..	In interface	....	External
Time code types	SMPTE, EBU	SMPTE longitudinal	EBU, LTC/VITC	LTC, VITC	SMPTE, EBU
Color framing use	NTSC, PAL (None)	Yes	PAL	PAL, 8-field	No color framing
Device interfaces	Switcher, title, Effects & (mixer)	Distr intelligence	Switcher, mixer, Effects	Switcher, Mixer, VTR, Telecine	to 48-track control ....
Control bus	RS-232/422, ESbus	Serial data 4-wire	Coaxial serial	Coaxial serial	RS-232/422, ESbus
Reader Service Number	**838**	**839**	**840**	**841**	**842**

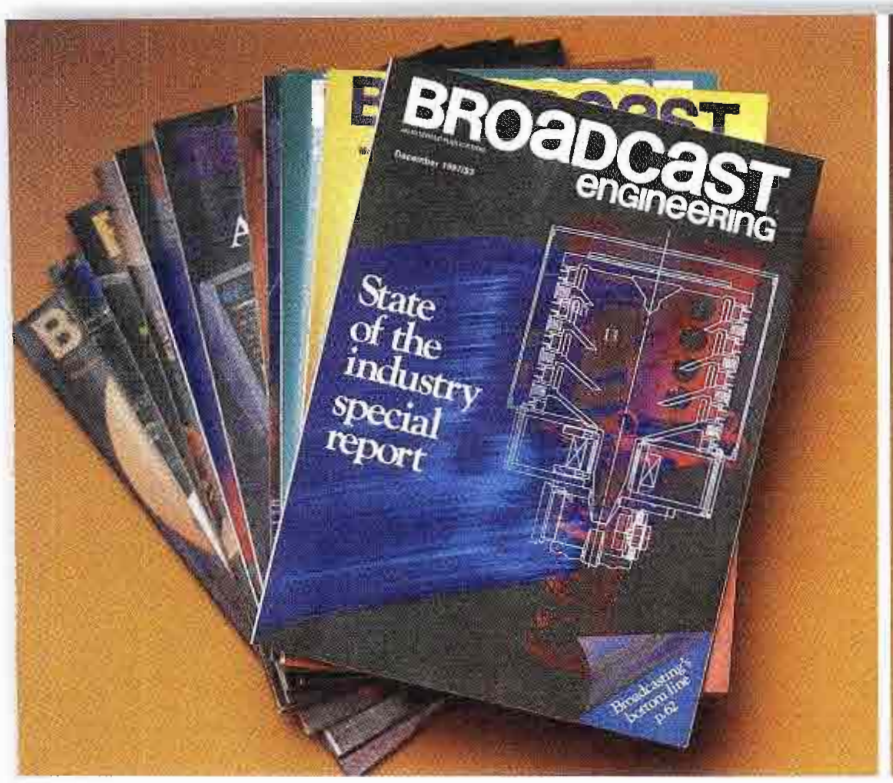
[1]A/V model for standard videotape editing; CC for use in audio-for-video applications.
[2]System allows multiple non-interacting work stations.
[3]Deck selection from a pool of 32 units for multiple, non-interacting work stations.

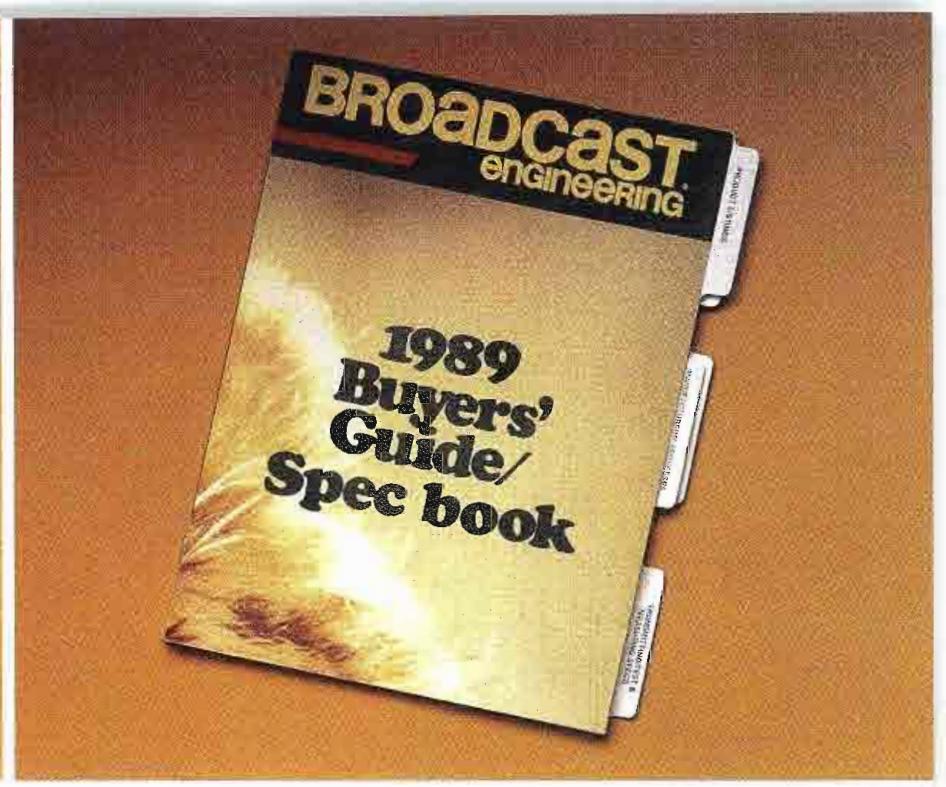
Manufacturer	Amherst Instruments	Ampex AVSD		Audio Kinetics
Model Series	ESP software†	Ace 200† (series)	ACE-25[1]†	Ace Micro†	Master Mix✓
Suggested for	On-line, off-line	On, off line	On, Off-line	On-line	Audio mixdown
VTRs ATRs record/play	1-R, 2-P	2R, 14P transports	1 R/3 P	1R, 3P transports	Multitrack ATR
Videodisc interface	....	Yes	....	Yes	No
Microprocessor	IBM PC/AT or clone	Distributed 16-bit	Distributed 16-bit	Distributed 16-bit	Centralized 8-bit
Internal storage	2 999-event lists	9,999-event, 2Mbyte RAM	1Mbyte RAM	to 9,999 events	A/B
Ext storage type	....	F.disk, paper tape	2 3.5" floppy disks	F.disk, paper tape	Disk
Edit decision list	Yes	6000-line	1000 event management	300-line	No
Edit data display	Computer CRT	CRT	CRT	CRT	LED displays
Printer interface	Yes	RS-232C	Yes	RS-232C	No
Animation mode	....	Yes	Possible	Yes	No
Time code reader	Yes	Yes	Yes	Yes	Yes
Time code generator	....	Yes	Yes	Yes	Yes
Time code types	SMPTE, EBU longit.	LTC, VITC	SMPTE, E8U, tape pos.	LTC, VITC	LTC
Color framing use	Yes	NTSC, PAL(M)	NTSC, PAL(M)	NTSC, PAL(M)	No
Device interfaces	AM2100, CTX1000 Switcher	Switcher, mixer, stills graphics, effects	2 RS-232, 1 parallel 4 GPI(1), 2 RS-422	Switcher, mixer, effects	Mixer, fader opt .
Control bus	Serial, parallel	RS-422, GPI	RS-422, GPI	RS-422, GPI	....
Reader Service Number	**843**	**844**	**845**	**846**	**847**

[1]Integral 7-source audio mixer and video switcher for composite or component signals.

Manufacturer	Audio Kinetics	BHP Inc	BTS Broadcast TV Systems†	Calaway Engineering	Cipher Digital
Model Series	ES Eclipse	TouchVision†	BBE 900†	CED, CED+ (MK III)	SOFTOUCH
Suggested for	On, off-line audio	Off-line, non-linear	On, off-line	On, off-line	Audio editing
VTRs ATRs record/play	To 16 transports	To 24 sources	1R, 3P	1R/3P, 1R/5P (1R/5P)	4 transports
Videodisc interface	....	....	No	No	....
Microprocessor	Proprietary	Multiple	Centralized 8-bit	Centralized 8(16)bit	Distributed
Internal storage	80-event, 100 loops	....	128	1,000	Multiple
Ext storage type	....	Floppy disk	None	Floppy disk	Ext memory cartridges
Edit decision list	80-event	Yes	Yes	Yes	....
Edit data display	EL panel	CRT	CRT	CRT	LED displays
Printer interface	....	....	None	RS-232	No
Animation mode	....	Possible	No	Yes	Dialog replacement
Time code reader	w/transports	Yes	Yes	In interface	Yes
Time code generator	....	....	No	In interface	Yes
Time code types	All standards	SMPTE VITC	LTC/VITC/ctl-trk/sync	LTC/VITC/Ctl-Trk/sync	LTC, VITC
Color framing use	....	NTSC	NTSC, PAL	NTSC, PAL	NTSC, EBY
Device interfaces	....	Programmable	Switcher, mixer GPI equipment	Switcher, mixer, graphic titler	5 com ports
Control bus	RS-232, RS-422	RS-422/232	RS-422, ESbus, GPI	RS-422/-232, GPI	RS-422/232
Reader Service Number	**848**	**849**	**850**	**851**	**852**

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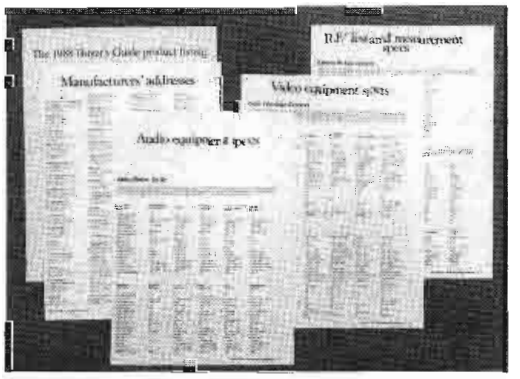
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Manufacturer	CMX Systems				
Model Series	**330XL**	**CMX-100[1]**	**3100 (3400/3600)**	**CMX-6000**	**CASS 1 (CASS 1E)**
Suggested for	On, off-line	On-line	On, off-line	Off-line	Audio for video
VTRs ATRs record/play	1R, 4P	1R, 2P	1R, 6P	....	1R, 5P
Videodisc interface	Yes	....	Yes	4 to 24 disk	....
Microprocessor	Distributed 16-bit	Distributed	Distributed 16-bit	Distributed 16-bit	PC-AT
Internal storage	500	50	700 (3,000)	Yes	Yes
Ext storage type	Floppy disk	....	Floppy disk	Floppy disk	Floppy disk
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT
Printer interface	RS-232	Yes	RS-232	RS-232	RS-232
Animation mode	Yes	....	Yes	Yes	....
Time code reader	In interface	Available	Option	Yes	Yes
Time code generator	In interface	Available	Option	....	....
Time code types	LTC, VITC, ctl-trk	LTC	LTC, VITC	LTC, VITC	LTC
Color framing use	NTSC, PAL	NTSC, PAL	NTSC, PAL	Yes	....
Device interfaces	Switcher, mixer	4 GPI, RDM VTR software	Switcher, mixer	Switcher opt, mixer VTRs	Mixer, TimeLine Lynx Adams-Smith, others
Control bus	RS-422/232, GPI	RS-422	RS-422/232, GPI	RS-422, GPI	RS-422, GPI
Reader Service Number	**853**	**854**	**855**	**856**	**857**

[1]Integral 5-in video, 6-in audio switching.

Manufacturer	Comprehensive Video	Editron		EECO/Convergence	
Model Series	**EditMaster✓‡**	**Model 500A (100)†**	**Model 520**	**Ives II (Ives II Pro)†**	**EMME†**
Suggested for	Off-line	Audio sync, sweetening	Off (& on-line)	On, off-line	On, off-line
VTRs ATRs record/play	1R, 1P	1R, 14P (1R, 4P)	2R/4P (1R/6P)	1R, 1-2P	9, any function
Videodisc interface	....	....(No)	Yes	No	No
Microprocessor	MS-DOS, 256kB	Distributed 8-bit	Distributed 8-bit	Centralized 8-bit	Distributed 16-bit
Internal storage	900-event	999 (99)	999	Single	750
Ext storage type	Floppy disk	FD/PT	8" disk-based	F.disk, p.tape, PC	F.disk, p.tape, PC
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	PC system CRT	CRT, LCD (LED)	RGB, B-W, EL screen	CRT	CRT
Printer interface	via PC	RS-232	Possible	RS-232	RS-232
Animation mode	Automation function	No	No	Yes	No
Time code reader	Yes	Yes	In interfaces	Yes	Yes
Time code generator	....	Yes	....	No	Option
Time code types	LTC, ctl trk	LTC	LTC	LTC, ctl-trk	LTC, ctl-trk
Color framing use	Yes	NTSC, PAL	NTSC, PAL	NTSC	NTSC
Device interfaces	Various	16-channel GPI	To 250 possible	....	Switcher
Control bus	RS-232 data	RS-422, ESbus,	RS-422, ESbus,	RS-422/232, GPI	RS-422/232, GPI
Reader Service Number	**858**	**859**	**860**	**861**	**862**

Manufacturer	EECO/Convergence			Generic Designs	Grass Valley Group
Model Series	**ECS-195 (ECS-195+)†**	**ECS-900+ (Super 90)†**	**ECS-204x (205)†**	**DeskTop**	**IPS-100 (-100B[1])†**
Suggested for	On, off-line	On, off-line	On, off-line	On, off-line	On/off-line
VTRs ATRs record/play	1R, 2P	1R, 5P (1R, 1P)	1R, 3P (1R, 7P)	Multiple	4, assignable
Videodisc interface	No	No	No	....	No
Microprocessor	Centralized 8-bit	Centralized 8-bit	Centralized 8-bit	PC MS-DOS system	Centralized 16-bit
Internal storage	50 (500)	1,000 (1-event)	1,000	....	1,000
Ext storage type	F.disk, p.tape, PC	F.disk, p.tape, PC	F.disk, p.tape, PC	Per PC system	Floppy disk
Edit decision list	Yes	Yes	Yes	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT
Printer interface	RS-232	RS-232	RS-232	Centronics parallel	RS-232
Animation mode	Yes	Yes	Yes	....	Yes
Time code reader	Yes	Yes	Yes	Yes	In interface
Time code generator	Option	Yes (Option)	No	....	In interface
Time code types	LTC, ctl-trk	LTC, ctl-trk	LTC, ctl-trk	SMPTE	LTC, VITC
Color framing use	Yes	Yes (No)	NTSC	NTSC	NTSC, PAL
Device interfaces	Switcher, mixer	Switcher, mixer (....)	Switcher, GPI, mixer	Parallel switcher	CV-100, AMX-170, GPI Dubner titler
Control bus	RS-422, GPI	RS-422, GPI	RS-422/232, GPI	RS-422	RS-422
Reader Service Number	**863**	**864**	**865**	**866**	**867**

[1]The -100B model does not contain video switcher and audio mixer.

Manufacturer	Grass Valley Group		JVC Company	JVC/Paltex	Lyon Lamb
Model Series	**Model VPE-151†**	**Model VPE-141†**	**RM-G850U (86U/810U/410U)**	**Abner**	**VAS-IV controller✓**
Suggested for	On, off-line	On, off-line	On, off-line	On, off-line	On-line, off-line
VTRs ATRs record/play	22 ports total	7 + 2 aux source	1R, 1P, 2P opt (1)	1 record, 2 play	1R, 1P
Videodisc interface	Option	Option	No	No	Possible
Microprocessor	DEC LSI 11/73 CPU	LSI-11/73 CPU	Centralized 8-bit	Centralized 8-bit	Proprietary
Internal storage	9,999 event, 4MByte	9,999 events/500kByte	Single event	20 event	Frame, scene numbers
Ext storage type	3.5/8" floppy, H.disk	3.5", 8" floppy option	No	F-disk, P-tape	....
Edit decision list	BINS multi-EDL	Yes	No	Yes	....
Edit data display	CRT, color, mono	CRT color or mono	LED display	CRT	LEDs, super on CRT
Printer interface	RS-232	RS-232	No	RS-232C	....
Animation mode	Yes, film modes	Yes	No	Yes	Yes
Time code reader	Yes	Yes	No	Yes	w/VTR
Time code generator	No	No	No	....	....
Time code types	LTC, VITC, mixed	LTC, VITC, mixed	Control track	SMPTE, EBU, ctl-trk	LTC, VIFC
Color framing use	NTSC, PAL	NTSC, PAL	525/60, 625/50	NTSC, PAL	NTSC, PAL
Device interfaces	Switcher, effects, Stills, title, mixer	Video/audio switchers, GPI, titlers	None	Switcher, mixer, still graphics, effects	Various, RS-232
Control bus	RS-422/232, GPI	RS-422/232, GPI	No bus	....	RS-422
Reader Service Number	**868**	**869**	**870**	**871**	**872**

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Manufacturer	Lyon Lamb	Montage Group	Paltex		
Model Series	VAS-Delta†	Picture Processor II	ES/D (ES/P)	Elite	Esprit Plus
Suggested for	On or off line	On or off line	On, off-line	Off-line, non-linear	On & off-line
VTRs ATRs record/play	1R, 1P	To 17 SuperBeta VCRs	Any 6 of 12, assignable	Any 3 of 6, assignable	Any 8 of 16, assignable
Videodisc interface	Possible	Future option	Yes	Yes	Yes
Microprocessor	Proprietary	MC68000	Multiple 16-bit	Distributed 16-bit	Multiple 16-bit
Internal storage	....	3MByte RAM	500 (998) event	250 event	700 event
Ext storage type	....	H.disk, F.disk	F-disk/P-tape (H-disk)	F-disk, P-tape	F-disk, P-tape, H-disk
Edit decision list	Scene file memory	Yes	Yes	Yes	Yes
Edit data display	LEDs	CRT	CRT	CRT	CRT
Printer interface	....	Option	RS-232C	RS-232C	RS-232C
Animation mode	w/BVH2500 and others	....	Yes	Yes	Yes
Time code reader	w/VTR	In VCR interfaces	Yes	Yes	Yes
Time code generator	....	....	....	....	....
Time code types	LTC, VIFC	LTC	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU
Color framing use	NTSC, PAL	NTSC	NTSC, PAL	NTSC, PAL	NTSC, PAL
Device interfaces	VTRs, graphic systems, RS-232	A/V switching matrix and effects integral	Switcher, effects Mixer	Switcher, mixer, effects	Switcher, effects Mixer
Control bus	RS-422	....	RS-232/422 parallel	RS-232, 422, parallel	RS-232/422, parallel
Reader Service Number	**873**	**874**	**875**	**876**	**877**

Manufacturer	Paltex	Panasonic Broadcast	Sony Broadcast		Spectra Image
Model Series	Elan	AU-A65	BVE-600[1]	BVE-9000	Spectra system
Suggested for	On, off-line	On, off-line	On-line	On, off-line	On, off-line
VTRs ATRs record/play	Any 4 of 12, assignable	1-R, 3-P	1R 2P	8R, 6P	5 VTRs†
Videodisc interface	Yes	....	....	No	2-head disks
Microprocessor	Distributed 16-bit	Yes	MC 68000	Centralized 16-bit	Centralized 16-bit
Internal storage	326	250-event	1 event	512, expand to 999	1,000
Ext storage type	F-disk, P-tape	Floppy disk	None	Floppy disk	Floppy disk
Edit decision list	Yes	Yes	N.A.	Yes	Yes
Edit data display	CRT	LEDs and CRT	LEDs or opt(1)	CRT	CRT
Printer interface	RS-232C	36-pin	RS-232C	RS-232	RS-232
Animation mode	Yes	Possible	....	No	Yes
Time code reader	Yes	....	LTC	Yes	No
Time code generator	....	....	LTC	No	Option
Time code types	SMPTE, EBU	LTC, VITC, Ctl-Trk	LTC, Ctl-trk	LTC/VITC/ctl-trk/sync	LTC, VITC
Color framing use	NTSC, PAL	4-field NTSC	Yes	NTSC, PAL	NTSC, PAL
Device interfaces	Switcher, mixer Effects	GPI 15-pin, RS-422	to MXP-29 audio mixer BKE-661/621 opt(1)	Switcher, GPI mixer	Switcher, mixer, self-contains
Control bus	RS-232/422 parallel	RS-232C port	RS-422 (VTR), 2 GPI	RS-422	RS-422
Reader Service Number	**878**	**879**	**880**	**881**	**882**

[1]BKE option is component or composite video switcher with effects; edit accuracy is ±1 frame in Ctl-Trk mode, machine dependent; capabilities include control of machines with variable tracking (DT).

Manufacturer	United Media		Videomedia		
Model Series	Commander series[1]	Multi-Tasking[2]	Eagle series I/II/III	Magnum system	Mickey 1 (Mickey 2)†
Suggested for	On, off-line	On, off-line	Any	Any	Any
VTRs ATRs record/play	2 to 8-machine	2 to 9	6 transports total	5 source, 1 record	1 R, 2P assignable
Videodisc interface	Yes	Yes	....	....	....
Microprocessor	Distributed 16-bit	Distributed 16-bit	Z80A distributed	Z80As distributed	Z80A distributed
Internal storage	500 event	500 event	250 event	250 event	50 event
Ext storage type	F-disk, P-tape	F-disk, P-tape	Floppy disk	Floppy disk	....
Edit decision list	Yes	Yes	Management on II/III	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT
Printer interface	RS-232	RS-232	RS-232 serial	RS-232C/serial	Yes
Animation mode	Yes	Yes	Yes	Possible	....
Time code reader	Yes	Yes	In interfacing	In interfacing	In interfacing
Time code generator	Yes	Yes	....	In interfacing	In interfacing
Time code types	SMPTE, EBU, ctl-trk	SMPTE, EBU, ctl-trk	SMPTE, EBU, ctl-trk	SMPTE, EBU, ctl-trk	SMPTE, EBU, ctl-trk
Color framing use	NTSC, PAL	NTSC, PAL	Yes	Yes	Yes
Device interfaces	Switcher, mixer, title Effects, still, graphics	Switcher, mixer, title Effects, still, graphics	Switcher	Switcher, transports printer	Video/audio fader
Control bus	RS-232/422, UMI-bus	RS-232/422, UMI-bus	Serial, parallel	RS-232C, ser/parallel	RS-232C/ser, V-LAN
Reader Service Number	**883**	**884**	**885**	**886**	**887**

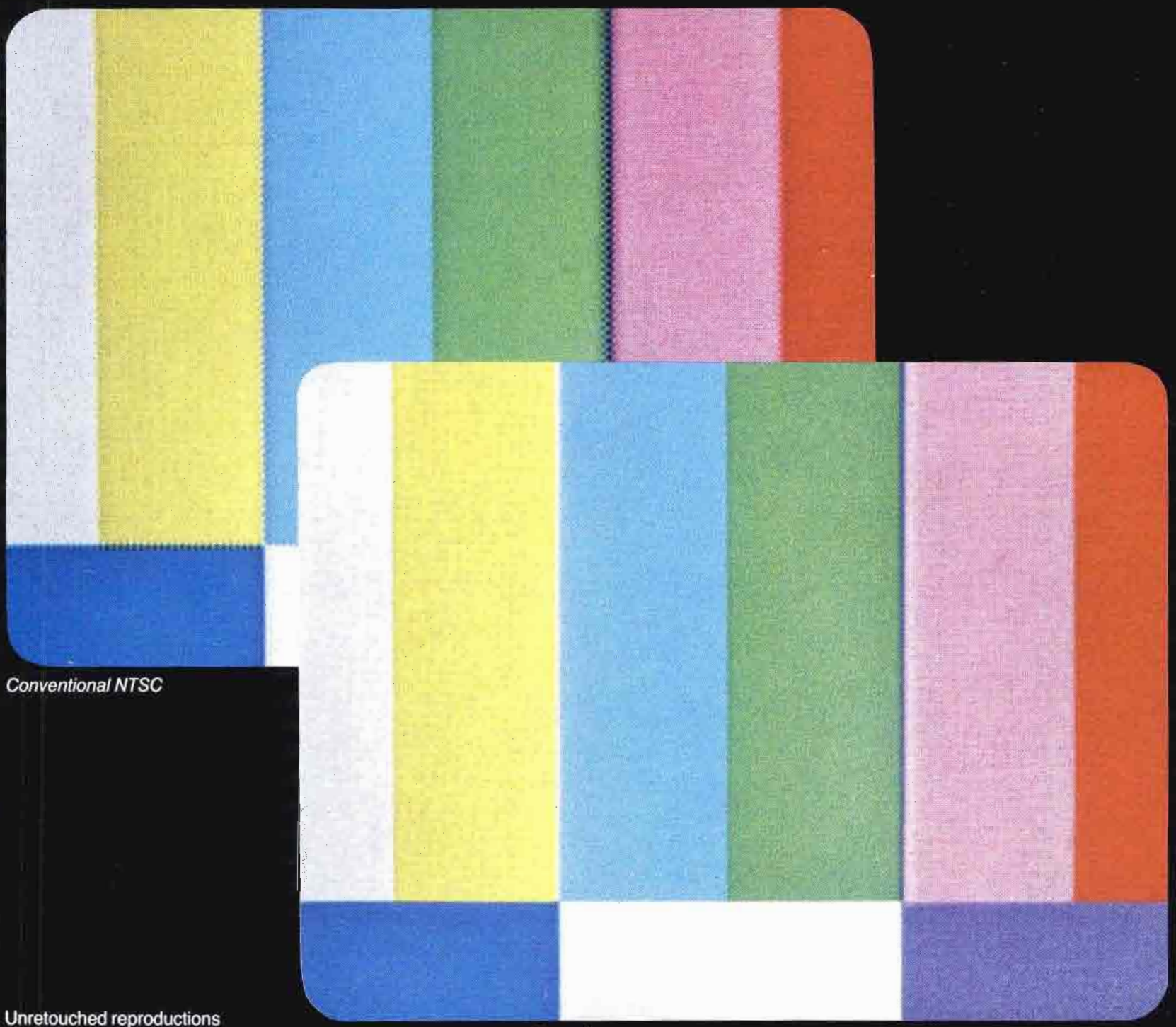
[1]COMM-ETTE A/B roll, Mini-COMM 2-6 roll, Commander II, 2-8 roll.
[2]MT30 AB roll; MT60 2-6 roll; MT90 2-9 roll.

Graphic Production Titlers

Electronic character generator systems for generation and placement of captions, titles and other textual material over various types of background video. Under Type Styles, some system capabilities are coded as A - serif face, B - sans serif face, C - italic, D - script.

Manufacturer	Abekas Video Systems	Ampex	Aston Electronics		BTS Broadcast TV Systems
Model/Series	A72	ALEX	Caption	Aston 4	Viditext II[1]
Subtitles	Yes	option	Any screen area	Any part of screen	Screen 3rds
Tabs	Yes	Yes	Yes	Yes	Yes
Underlining	Yes	Yes	Yes	Yes	Yes
Italicize function	Yes	Yes	4° to 30°	Yes	No
Page format	....	Free-form	Free-form	56 char/14 line	64 char/31 line
Resolution	....	4.6ns effective	<10ns	10ns	48ns
Anti-aliasing	256-level	256 levels	Software	Hardware, software	Hardware, software

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Manufacturer	Abekas Video Systems	Ampex	Aston Electronics		BTS Broadcast TV Systems
Model/Series	A72	ALEX	Caption	Aston 4	Viditext II[1]
On-line type faces	15 master faces	Multiple	Multiple	8	8
Type styles	Instant resizing	1500 face library	Instant resizing	A/B/V/D	A/B/C/D
Non-Arabic faces	....	Yes	Yes	Yes	Yes
Type face storage	Disk	RAM, disk	Disk	Disk	Disk, RAM
Face-font compose	Yes	w/true perspective	Option	Logo compose opt	option
Display flash	Yes	Yes	Yes	Yes	Char/word/line/page
Edging effects	Yes	Full edging control	Full edging control	Full edging control	Full edge control
Auto centering	Yes	....	Yes	Yes	Assignable center
Roll/crawl control	Yes	w/full animation	VECTOR effects	8 speeds	Variable
Keyer/colorizer	Yes	Yes & components	External keyer	External keyer	Integral
Color pallette	16.7 million	16.7 million	16.7 million	4,096	4,096
Colors per screen	16.7 million	16.7 million	16.7 million	40/screen	64/screen
Internal memory	....	....	....	2 pages	300 pages
Memory architecture	4:4:4:4 component	32-bit	24-bit	24-bit	16-bit/bit-slice
Integral still store	3.5″ floppy	optical, H.disk	No	No	Graphic Store opt
Off-line storage	100MByte Winchester	optical, H.disk	Disk	Floppy/Winchester	Floppy/Winchester
Access time page	....	....	<1s	<1s	<0.9s
Effective planes	Multiple channel	Multiple	4 plane	3	32 planes
Remote control	RS-232/-422	RS-232/422, Ethernet.	RS-232/-422	RS-232/422	RS-232/422
Image sources	RGB, CCIR 601	Any video	Camera, LogoMaster draw	....	RGB, composite
Multi-user system	Possible	1 or 2-channel	....	2-station	2 keyboard on-line
Automation interface	RS-232/-422/GPI	GPI	RS-232/422	Various	No
Reader Service Number	**330**	**331**	**332**	**333**	**334**

[1]System provides 2D animation standard, 3D optional; sports and election packages available.

Manufacturer	Chyron				Comprehensive Video
Model/Series	RGU-2	VP-2 Plus (VP-1)	Scribe series[1]	Chyron IV series[2]	PC-2
Subtitles	Any screen area	Any screen area	Any screen area	Any screen area	Possible
Tabs	256 position	10 positions	256 positions	256 positions	Yes
Underlining	Yes	Yes	Yes	Yes	....
Italicize function	....	9° increments	Yes	Yes	Yes
Page format	62 char/20 line	....	Free-form (63cx24r)	62 char/24 line	10-62 char x 13 lines
Resolution	27ns	35ns	(0.84ns HD)	27ns	1000x512-pixel 40ns
Anti-aliasing	Yes..	Yes	Hardware (16-lvl HD)	Yes	Yes
On-line type faces	4 load positions	6 (36 opt)	8 w/auto size, kerning	12 font positions	30
Type styles	Various proportional	A/B/C/D	1500 in library	Proportional, kerning	30 in library
Non-Arabic faces	International faces	International opt	International sets	....	....
Type face storage	Disk, RAM	ROM	Disk, 512k, 2MB opt	Disk, 45 font	....
Face-font compose	Option	No	00Option	Option, paint opt	Possible
Display flash	Yes, also effects	Yes	Yes & 3D modeling	Yes, also effects	Yes
Edging effects	Surround/shadow	Full edge control	to 29 multiple borders	Full edge control	Various controls
Auto centering	Horizontal	Yes	Yes	Horizontal	Yes
Roll/crawl control	Variable	Variable	Variable	Variable	Yes
Keyer/colorizer	Integral	Integral	Integral	Integral	Integral
Color pallette	64	512	16.7 million	512	64
Colors per screen	8/screen	16/screen	256 (32 Jr)	185/screen	64
Internal memory	2 page	1 page/4000 lines	2 pages	2 page	H.Disk
Memory architecture	16-bit	8-bit	32-bit	16-bit	16-bit, XT/AT
Integral still store	No	No	No	Vididisc	Winchester
Off-line storage	Floppy	Floppy	Floppy/Winchester	Floppy/Winchester	F.Disk
Access time page	1s page/frame	....	0.5s	1s	....
Effective planes	2	Infinite	2	3	1
Remote control	RS-232	RS-232	RS-232/422	RS-232	....
Image sources	Camera	None	Camera	Camera, tablet/Wx	Composite video
Multi-user system	2 stations	Yes	2 stations	3 stations	No
Automation interface	No	No	No	Weather service opt	....
Reader Service Number	**335**	**336**	**337**	**338**	**339**

[1]Scribe series includes Scribe Jr., Super Scribe and High Definition Scribe.
[2]Chyron IV series includes 4200 w/Motion II and 4100EXB.

Manufacturer	Dubner Computer Systems			For-A Corporation	
Model/Series	Texta	CBG-2	20-K	VTW-220 (VT-210H[1])	VTW-400 (VTW-240)
Subtitles	Yes	Yes	Yes	....	Possible
Tabs	Yes	Yes	Yes	Yes	Yes
Underlining	Yes	Yes	Yes	Yes	Yes
Italicize function	....	....	....	No	4 slants
Page format	100 char/30 lines	100 char/16 lines	100 char/16 line	32 char/8 line	32 char/8 line
Resolution	37ns	525x1024 pixel	37ns/485x1384-pixel	16x20 pixel	24x24 pixels
Anti-aliasing	Hardware, software	Hardware/software	Software	....	... (Yes)
On-line type faces	255	255	8	1, 4 sizes	2, 4 sizes (4 fonts)
Type styles	A/B/C/D	A/B/C/D	A/B/C/D	1 (Arabic opt -A)	1
Non-Arabic faces	....	....	Yes	Option	Option
Type face storage	Disk	Disk	Disk	NV ROM	NV ROM (Floppy disk)
Face-font compose	Yes	No	Yes	No	No
Display flash	By character	By character	By character	Character	Character
Edging effects	Full edging control	Full edging control	Full edging control	Yes (drop shadow)	Yes (Drop shadow)
Auto centering	Yes	Yes	Yes	Yes	Page, H, V
Roll/crawl control	9 speeds	Variable speeds	9 speeds	9 speed (4-speed)	4, w/transitions
Keyer/colorizer	Integral	Integral	Integral	Integral	Integral
Color pallette	....	4,096	16.7 million	512	64 (512)
Colors per screen	....	128	256	14	64 (14/3-zone bkgnd)
Internal memory	....	2 pages	1,000 pages	32 pages (4 page)	8 pgs/600 opt
Memory architecture	....	Encoded frame buffer	8-bit frame buffer	8-bit	8-bit
Integral still store	Yes	Yes	No	No	No
Off-line storage	Floppy/Winchester	Floppy/Winchester	Winchester disk	32K RAM card	Floppy disk[2]
Access time page	<0.5s/page	0.25s/page	0.25s/page	0.5s	0.5s
Effective planes	....	3	1	1	1
Remote control	RS-232/422/IEEE	RS-232/422/IEEE	RS-232/422	RS-232	RS-232
Image sources	Bit-pad/camera/Wx	Bitpad/camera/Wx	Weather	Background video	....

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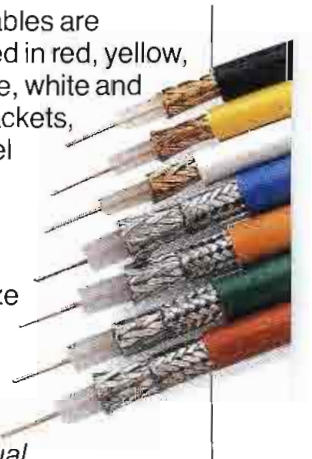
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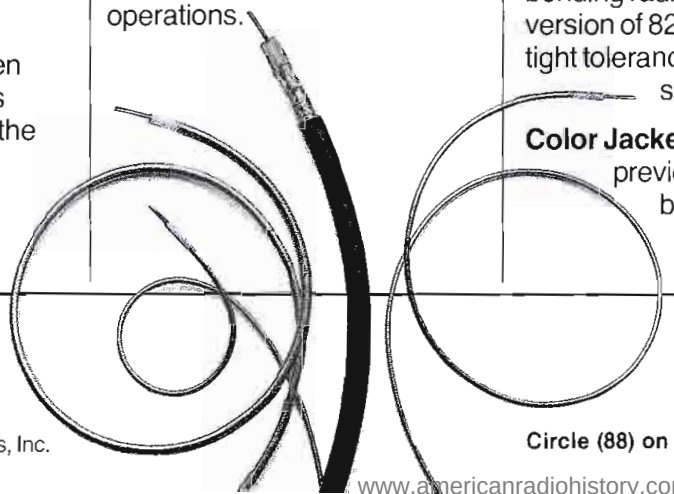
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Circle (88) on Reply Card

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Manufacturer		Dubner Computer Systems		For-A Corporation	
Model/Series	**Texta**	**CBG-2**	**20-K**	**VTW-220 (VT-210H[1])**	**VTW-400 (VTW-240)**
Multi-user system	....	2 stations	....	No	No
Automation interface	Yes	Yes	Yes	No	No
Reader Service Number	**888**	**889**	**890**	**891**	**892**

[1]30MHz bandwidth, RGB; word corrector function.
[2]3.5″ floppy disk stores 1600 pages.

Manufacturer	.ICM Video	Knox Video		Laird Telemedia	
Model/Series	**CG-7000P**	**K40 Microfont (K20)**	**K-200 Chromafont II**	**1500[2] (1450)**	**CG-7000ES (-Y/C[3])**
Subtitles	Any line	Possible	Possible	Lower thirds (....)	Yes
Tabs	....	....	Yes	16 position	Yes
Underlining	....	Yes	Yes	Yes	....
Italicize function	....	Yes (No)	Yes	14 slants	7 slants
Page format	38 char/16 line	....	32C/17L, 32TVL font	80char/27 rows	60c/24l 12TVL
Resolution	48x64 dot character	....	....	35ns	35ns
Anti-aliasing	Hardware	....	None	Yes	....
On-line type faces	8	20/32-line (1 size)	8, 2 sizes	16 (6) resident	4 (6)resident
Type styles	A/B/D	Helvetica[1]	A/B/C	70 font library	....
Non-Arabic faces	....	No	No	1 international set	No
Type face storage	ROM	ROM 256 char (128)	ROM	Disk	Disk
Face-font compose	Yes	No	No	Yes (Paint/graphic opt)	Yes (No)
Display flash	Character	Yes	Character, page	Yes	Yes
Edging effects	Surround edge	No	3V, 16H styles	Full edging control	Drop, surround
Auto centering	....	....	....	Horizontal	By page
Roll/crawl control	Variable	Yes	10 speeds	Yes	Variable
Keyer/colorizer	Integral	Integral	Integral	External units	Intergral facilities
Color pallette	Unlimited	32 (8)	512	65,536	....
Colors per screen	....	32 (8)	8 palettes of 64	946 (...)	....
Internal memory	80 pages	16 page exp to 64	64 pages	100 lines (pages)	80 pg, 12,160 char
Memory architecture	8-bit	8-bit	8-bit	8-bit	8-bit
Integral still store	No	No	No	No	No
Off-line storage	....	Computer interface	No	3.5″ F.disk	Floppy disk
Access time page	2s/page	....	....	0.5s	0.5s
Effective planes	1	1	Background, title	1	1
Remote control	....	....	....	RS-422	....
Image sources	....	NTSC, PAL, PAL-M	NTSC, PAL, PAL-M	None	None
Multi-user system	No	No	No	....	4 kboard (...)
Automation interface	No	No	No	....	....
Reader Service Number	**893**	**894**	**895**	**896**	**897**

[1]K40 contains foreign language set; K20 includes Eurobold uppercase only.
[2]Model 1500 PRoM includes 6 type styles with no floppy disk drives in system.
[3]CG-7000-Y/C unit provides component video output signals.

Manufacturer		3M Company	PESA	Quanta	
Model/Series	**D-6000 Panther**	**D-3600 (D-2200)**	**CG-4722**	**QCG-38**	**Orion**
Subtitles	Yes	Yes (Possible)	Yes	Yes	w/lower thirds
Tabs	Yes	Yes	Yes	Yes	Yes
Underlining	Yes	Yes	Yes	Yes	Yes
Italicize function	Yes	Yes	Yes	Yes	Yes
Page format	768x483 pixels	32 char/10 lines	32 char/16 rows	40 char/13 lines	Per characters
Resolution	35ns	35ns (70ns)	35ns	18ns	5ns effective, 74ns
Anti-aliasing	....	....	....	....	16-levels
On-line type faces	Unlimited (15 std)	5, 16 sizes, reverse	8	8, 8 sizes	5 faces/8 sizes
Type styles	A/B/C/D	A/B/C/D	A/C/D	A/B/C	32 fonts resident
Non-Arabic faces	....	....	....	....	Various international
Type face storage	ROM, Disk	ROM & (disk)	Disk	ROM	32-font typical
Face-font compose	Yes	No	Yes	No	....
Display flash	Yes	Yes	Yes	Yes	Yes
Edging effects	Yes	Yes	Yes	Yes	Various
Auto centering	Yes	Yes	Yes	Yes	Yes
Roll/crawl control	Variable speeds	Multiple speeds	8 speeds	10 speeds	w/reveals, wipes
Keyer/colorizer	Integral	Integral	Integral	Integral	Linear DSK, encoder
Color pallette	128 char/1024 bknd	4,096 (512)	112	512	16.7 million
Colors per screen	16 char/256 bknd	16 char/16 bknd (8/8)	....	13 ch/13 bknd/8 edge	8 per character
Internal memory	1 page	1 page	15 pages	20 pages	2.5MByte
Memory architecture	8-bit	8-bit	8-bit	8-bit	68000μP, 16-bit
Integral still store	No	No	No	No	F.disk, H.disk opt
Off-line storage	100 pages/disk	1,000 pages/disk	128 pages/disk	Disk	H.disk option
Access time page	1/30s	1/30s	<1s	0.5s	....
Effective planes	Background, title	Background, title	1	Background, title	2
Remote control	RS-232	RS-232	RS-232	RS-232	RS-232/422
Image sources	Digitizer, tablet	Background video	Camera	Input video	option
Multi-user system	Multiple keyboards	No	....	No	....
Automation interface	....	Closure switch	Yes	No	
Reader Service Number	**898**	**899**	**900**	**901**	**902**

Manufacturer		Quanta		Quantel	Ryley Communications
Model/Series	**Delta 1**	**Microgen Plus**	**QCG-500**	**Cypher, Cypher Sports**	**CapGen Series 2**
Subtitles	Yes	Yes	Yes	Possible	....
Tabs	Yes	Yes	Yes	.....	Yes
Underlining	Yes	....	Yes	....	Yes
Italicize function	Yes	....	Yes	....	Yes
Page format	Free-form	32 char/row	64 char/24 lines	....	32 char/12 lines
Resolution	74ns, 4.6ns apparent	50 ns	29ns	....	11.1ns

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Manufacturer	Quanta		Quantel	Ryley Communications
Model/Series	Delta 1	Microgen Plus	QCG-500	Cypher, Cypher Sports	CapGen Series 2
Anti-aliasing	256-level software	Yes	....	Hardware, software	Hardware
On-line type faces	Multiple	4	2, 52 sizes	Numerous	2, 4 sizes
Type styles	User alterable	....	A/B/C/D	90 available	A/B/C
Non-Arabic faces	w/international set	No	....	Yes	....
Type face storage	....	....	ROM, disk	Disk	Disk
Face-font compose	Option	No	Yes	Yes	No
Display flash	Yes	Yes	Yes	[Numerous effects	By word
Edging effects	Yes	Yes	Yes	[manipulations on	Yes
Auto centering	Yes	Yes	Yes	[generated titles	Yes
Roll/crawl control	Yes	Yes	10 speeds	Variable	9 speeds
Keyer/colorizer	w/CCIR-601 opt	Integral	Integral	Within system	Integral
Color pallette	16.7 million	256	16.7 million	16.7 million	64
Colors per screen	16.7 million	....	16 ch/16 bknd/16 edge	16.7 million	64
Internal memory	4MByte, 256kbyte	600 rows	400/disk	....	400 pages
Memory architecture	32-bit 68020/68881	....	8-bit	16-bit	8-bit
Integral still store	F.Disk, H.Disk	RAM	No	Limited	No
Off-line storage	H.Disk opt	....	Disk	Floppy/Winchester	Floppy disk
Access time page	....	....	0.5s	<1s	<1s
Effective planes	Digital compositing	....	Background, title	Multiple	1
Remote control	....	RS-232	RS-232	RS-422	....
Image sources	Any video	....	Camera, tablet	CCIR 601 eqpt	....
Multi-user system	....	....	No	....	4 keyboards
Automation interface	....	....	Various	Yes	Scorepad option
Reader Service Number	**903**	**904**	**905**	**906**	**907**

Electronic Graphic Art Systems

These video graphic generator systems include full color memory except those marked with a check (✓), which are color mapped. A color palette of 16.7 million colors is available, unless otherwise indicated; if less than a full palette is available per screen, that number is given in footnotes. A pressure-sensative stylus and tablet serves as the artist-system interface. A dagger (†) marks models where a mouse or joystick interface is provided. A font-compose feature is standard unless noted with a double dagger (‡). Software anti-aliasing is typical on all systems; those including hardware anti-aliasing are noted with a bullet (•). All systems provide some integral image storage and offer multiple on-line type faces, air brush, and user-definable brush shapes. Abbreviations used include: FD (Floppy Disk), HD (Hard, Winchester Disk), ST (Streaming Tape), R.pack (Removable Hard Disk), F.buffer (Frame Buffer); Pers (perspective), Ref (reflection), Rot (rotation), Geo (geometric shapes), Brdr (border), Mag (magnify), Pstr (posterization), Stncl (stencil).

Manufacturer	Alias Research	Ampex AVSD	Aurora Systems	Aurora Systems (Harris)	AVS (AF Assoc.)
Model Series	Alias/1	AVA-3	System/225 (250)	System/220	Art Master[1]
Base computer	68020/Sun Iris	68000	80286 (80386)	IBM PC/AT	80286, 68020, 68881
Internal memory	8MB RAM/16MB virtual	....	12-plane frame buffer	512kB	10MByte RAM +
Memory architecture	32-bit	24-bit, 8-bit key	32-bit RBGA	32-bit	32-bit, 24-bit RGB
Off-line storage	FD, HD, ST	Tape cartridge	FD/HD/ST	F/HD, ST	FD, removable 20MB
Image resolution	1024x768 pixels	716-pixel/line	512x486/13.5MHz	512x486 pixel	720Hx675V pixel
Image sources	NTSC, tablet Eikonix hi-res camera	Any video source,	RGB, modem, tablet Ethernet	RGB, tablet, modem	Any including U-matic, VHS, RGB, YUV
Output drivers	NTSC, Betacam, DigVid Film recorder	Digital I/O option	RGB F.buffers, NTSC Film recorder	RGB F.buffer, modem Film recorders	PAL, RGB, CCIR-601 YUV, Key-matte
Encoder/Decoder/Sync-gen	Int/not req/int	Int/Int/Int	Ext/ext/ext	Ext/ext/ext/	PAL, options
VTR controller	Lyon-Lamp VAS-5	Internal	Internal	Internal	Yes
Image manipulations	Standard	Perspective/distort/flip Comp/exp/rot	Skew/perspective/stretch Rot/reflect/move/cpy/scale	Perspective/stretch/copy Rot/reflect/move/scale	Yes
Artist's tools	All standard Opt 3D modeling	Geom/grid/zooms Cut-paste	Geom/curvetrace/writon Fill/brdr/magnify	Geo/curve trace/write on Fill/brdr/magnify	Brushs, cut/paste matte, screen print
Texture mapping	Animated/bump/natural	....	....	....	Yes
Shading	Lambert, Phong, Blinn	....	Reflectance	Reflectance	Tint, merge
Animation features	Ojbs, light, camera	Objs/lights/camera	Options	Color cycle/reveal/motion	Yes
3D render features	Wireframe prvw/PIXAR	Wireframe prevw/fulclr	Options	Wireframe prvw/3D model	Yes
CRTs used for	Canvas	Canvas	Canvas, system	Menu, canvas, system	Menus on art screen
Multiple user	....	....	....	....	No
Remote/Data input by	IGES/RS-232/Ethernet	RS-232/422	RS-232, Ethernet, WX	RS-232, Ethernet, WX	....
Reader Service Number	**1059**	**1060**	**1061**	**1062**	**1063**

[1]Of a 16.7 million color palette, 400,000 may be used in one screen.

Manufacturer	Barco Ind/Wavefront	BTS Broadcast TV Systems		CGL/Computer Graphic Lab	
Model Series	Producer†	Vidifont Graphics[1]	•FGS-4500[2]	Images II+	Instamation[3]‡✓
Base computer	68020/S.G. Iris	Opt to Viditext II	68000 series μP	DEC 11/73	PC/AT or equiv
Internal memory	8MB RAM, 16MB virtual	70/260MB, 2000 pic ext	....	....	Host memory 4MB
Memory architecture	32-bit	16-bit	16-bit	24-bit	24-bit
Off-line storage	F/HD, ST	40/140MB HD	R.pack/FD/ST	FD/HD pack	FD disk
Image resolution	1024x768 pixel	....	4kx4k internal	....	506x486 pixel
Image sources	NTSC/RGB, tablet	NTSC/RGB, library	RGB, tablet, library	RGB, tablet, camera	RGB, tablet, camera
Output drivers	RGB F.buffer Film recorder	RGB/NTSC F.buffer	RGB F.buffer, Scitex Film recorder, DigVid	F.buffer, film printer Film recorder	F.buffer
Encoder/Decoder/Sync-gen	Ext/ext/ext	Int/Int/ext	Ext/ext/ext	Ext/ext/ext	Ext/Int-ext/Ext
VTR controller	LyonLamb VAS/miniVAS	....	Ext, BTS	Internal	Internal
Image manipulations	All standard types	Standard types, stencils Crop, geom/mosaic/montage	All standard types	Std 2D manipulations Perspective/transforms	Scale/rotate/mirror Copy/move
Artist's tools	TIPS, Media Logic, NPS paint	All standard types	Geom/retouch	Geom/grids/std tools/ mosaic/posterization	Color correction, crop Enhance
Texture mapping	Yes	....	Texture/bump	....	No
Shading	Gouraud, Phong	....	Gouraud, Phong, others	....	No
Animation features	Dynamic Imaging module	Color cycle, 2D	Objs/lights/camera	2D motion, color cycle	50 ind 2D objects
3D render features	Model software module	No	Wireframepv/fullclr rndr	....	None
CRTs used for	RGB/NTSC, Text	Canvas, edit	Canvas, status	Menu, canvas	Menu, canvas
Multiple user	Yes	Yes	....	Yes	No
Remote/Data input by	Modem, RS-232, Ethernet	RS-232/422	Ethernet	Ethernet	Ethernet from Images II+
Reader Service Number	**1064**	**1066**	**1065**	**1068**	**1067**

[1]Of a 16.7 million color palette, more than 2,000 can be used on one screen.
[2]PIXELERATOR rending engine option greatly improves 3D rendering speed.
[3]All of a palette of 32,780 colors may be used simultaneously on one screen.

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Manufacturer	Chyron	ColorGraphics Systems	Cubicomp	Cubicomp (Vertigo)	Digital Arts
Model Series	Chameleon[1]✓	3D ArtStar (4:2:2)	PictureMaker Ver 3.0	V-2000 Ver 8.0	DGS 2.0 package†
Base computer	....	68020	IBM PC/AT	68020/68881	PC-AT, DSI-780/4
Internal memory	....	4MB video, CPU	....	4MB RAM	4M RAM
Memory architecture	16-bit	32-bit & 8-bit	16-bit	32-bit	32-bit, TARGA, VISTA
Off-line storage	Yes	HD, FD, ST	FD/40-140MB HD	HD, ST	FD
Image resolution	62 char/ 20 line	768x483-pixe	....	720x486 pixel	....
Image sources	Video	Tablet, Library Camera, Wx data	RGB, tablet, library	RGB, tablet	RGB/composite video Tablet, ASCII files
Output drivers	Video printer	Encoder	RGB F.buffer	Frame buffer, DigVid Film recorder	RGB F.buffer Film recorder
Encoder/Decoder/Sync-gen	Internal encoder	Integral	Ext/ext/ext	Ext/ext/ext	Ext/ext/ext
VTR controller	....	Yes	Diaquest	Internal	Lyon-Lamb MiniVAS
Image manipulations	Zoom, pan, scroll Rotate, flip, other	Cut-paste, wash Overlay, pix repeat	All std/stencil/crop geom/mosaic	All standard types	Perspective/translation Effects module opt
Artist's tools	2-D paint software	3D Plus paint software GEOS images	All standard types	All standard types	Digital matte Transparency 256-lvl
Texture mapping	....	....	Yes	Texture/bump	Texture/reflct/bump/shdw
Shading	....	....	Gouraud, Phong	Gouraud, Phong, others	Gouraud, Phong, flat
Animation features	No	3D Plus software	Objs, lights, camera	Objs. lights, camera	DGS Animate module
3D render features	No	Yes	Wireframe prvw	Wireframe prvw/PIXAR	2D/3D Build modules
CRTs used for	Canvas	Canvas-menu	Canvas, system	Canvas	Menu, RGB
Multiple user	No	Yes	Yes	....	No
Remote/Data input by	....	RS-232/422	RS-232/422	RS-232, modem	....
Reader Service Number	**1069**	**1070**	**1071**	**1072**	**1073**

[1]Of a palette of 4,096, 256 colors can be used simultaneously on one screen.
[2]Optional Pixar rendering engine.

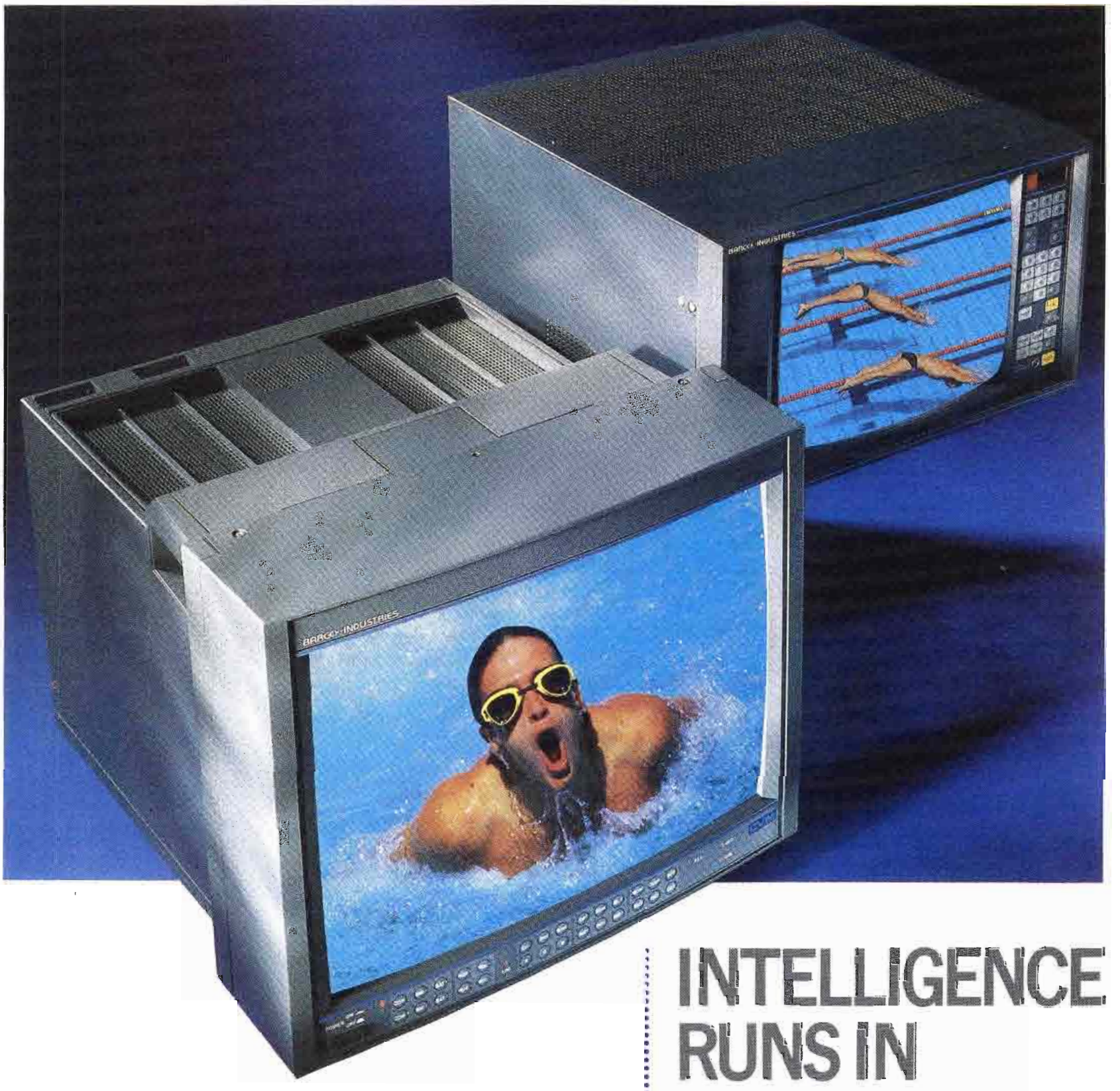
Manufacturer	Dubner Computer	Getris Images	3M Company	Magni Systems	Microtime
Model Series	DPS-1‡	Atalis	Specter systems	Series 4000[1]†	ImagePlus†
Base computer	68000 series	AT & proprietary	68020, PC-AT	PC-XT/AT, Amiga 2000	PC-AT (80386 opt)
Internal memory	2-image	....	to 16MByte, 1MByte	640kByte, 512kByte	2 images
Memory architecture	8-bit	24-bit	32-bit, TARGA	16-bit	16-bit
Off-line storage	Yes	....	HO, FO	....	FD disk
Image resolution	768x525-pixel	765x576-pixel	1024x768 pixel	768x480 (IBM) NTSC	8kx8k pixel
Image sources	Camera, video Tablet	Any video source	RGB/NTSC, tablet Component scan-in	VCR, video	RGB source, tablet
Output drivers	Encoder	Composite & DVTR	Video F.buffer Film recorder	NTSC .	RGB Fbuffer, film recorder, Bernoulli
Encoder/Oecoder/Sync-gen	....	....	Int/int/int	Ext/ext/ext	Ext./ext/ext
VTR controller	....	Yes	Lyon Lamb MiniVAS	....	Internal
Image manipulations	Standard effects	Real time effects	Standard, flips, digvid Multi-freeze	Per software package	Perspective
Artist's tools	Standard tools	Geometrics, others	Grid, all std tools TIPS paint software	Per software package	Cut-paste, move Transparency
Texture mapping	....	Yes	....	....	Texture, reflectance
Shading	....	Yes	Ray-tracing	Per software package	Gouraud, Phong, metallic
3D render features	....	Yes	...(Yes)	Per software package	Obj, light, 3D metal
CRTs used for	Canvas	....	Menu-canvas	Menu, NTSC	Menu, RGB
Multiple user	No	....	....	No	Yes
Remote/Data input by	RS-232	....	RS-232, Ethernet LAN	....	Moden, LAN, renderer
Reader Service Number	**1074**	**1075**	**1076**	**1077**	**1078**

[1]Two color palettes are involved; of 16.7 million, 256 colors can be used per screen; of a secondary set of 4,096, 16 can be used per screen.

Manufacturer	Pinnacle Systems		Quanta		Quantel
Model Series	Model 2020/2030	Model 3000E	Quantapaint-32	ARTISTA	•Paintbox, Graphic
Base computer	Proprietary	Proprietary	TI 34010 series w/math	68020/68881	68000 μP
Internal memory	....	....	8MByte	4MByte RAM	....
Memory architecture	32-bit	32-bit	32-bit	32-bit	16-bit
Off-line storage	FreezFile option	3000E-20 option	FD disk	FD, HD, ST	....
Image resolution	4.2MHz NTSC equiv.	768x484-pixel	756x486 pixel	756x486 pixel	....
Image sources	RGB/NTSC source, Tablet Component video scan-in	RGB/NTSC source, tablet Component video opt	RGB/NTSC, CCIR-601 4:2:2 Tablet, other	Any video	RGB source, Tablet Library
Output drivers	Frame buffer for video	Frame buffer for video	RGB f.buffer, encoder Network	RGB frame buffer Encoder	RGB Fbuffer Film recorder
Encoder/Decoder/Sync-gen	Int/int/int	Int/int/int	Int/int/int	Int/int/int	Ext/ext/ext
VTR controller	Yes	w/serial protocol	RS-422	RS-232/422	....
Image manipulations	Standard, flips, digvid Multifreeze, PRIZM	3000E-10 option PRIZM option	Mosaic, duplicate, move Posterize, emboss	2D, 3D effects	All standard types
Artist's tools	Geom, grids, std tools mosaics, posterization	Geom, grids, std tools, Mosaics, posterization	Geom/paint, mix, fixative magnify, graph	All standard tools Business graphics opt	All standard types
Texture mapping	Yes	Yes	....	Yes	....
Shading	....	Gouraud, Phong, flat	Phong, gamma correction	Phong, Gouraud, flat	....
Animation features	With upgrade 2040	3000E-40 option	TOPAS-32 processor	2D, 3D software	w/Harry system
3D render features	With upgrade 2033	Yes	TOPAS-32 processor	Yes	....
CRTs used for	Menu, canvas	Menu-canvas	System, canvas	Menu, canvas	Canvas
Multiple user	.	....	Yes	....	Yes
Remote/Data input by	.	....	RS-232/422	RS-232/422	RS-232
Reader Service Number	**1079**	**1080**	**1081**	**1082**	**1083**

Manufacturer	Rank Cintel	Shima Seiki	Symbolics Graphics	Transformations
Model Series	Art-File	SDS series systems[1]	Symbolics	EFX†
Base computer	Proprietary	Proprietary	Proprietary/LISP-AI	MicroVAX
Internal memory	200 images	....	Virtual memory	5MB RAM, 4GB virtual
Memory architecture	24-bit	32-bit	32-bit	32-bit

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(1) Price at time of publication.

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Manufacturer	Rank Cintel	Shima Seiki	Symbolics Graphics	Transformations
Model Series	Art-File	SDS series systems[1]	Symbolics	EFX†
Off-line storage	Tape cartridge	HD, Optical disk	Tape cartridge	HD, tape cartridge
Image resolution	720x484 CCIR	512x512 screen	to 1280x1024	....
Image sources	RGB, Tablet, Library	Video, digitizers	RGB source, tablet	Any RGB, tablet
Output drivers	RGB Frame buffer	Video printer	F buffer, film recorder	RGB frame buffer
Encoder/Decoder/Sync-gen	Ext/ext/ext	Yes	Ext/ext/ext	ext/ext/ext
VTR controller	....	....	Internal	Lyon-Lamb VAS
Image manipulations	Reflect/copy/move/paste Expand, reduce	X/Y/Z effects opt	All std, user defined	Perspective
Artist's tools	Geom/color mix/mirror rotate/defocus/fill/stenc	Full paint software	Geom/3D geom/std tools	Transparency, script projections
Texture mapping	....	Yes	Textures, bump refl.trans	Texture/bump/reflect/shdw
Shading	....	Color ramps	Gouraud, Phong	Gouraud, Phong, flat
Animation features	....	Option	Objs, lights, camera	Obj. lights, camera
3D render features	....	Ray tracing	Wire, solid prvw colorrender	Real-time, wire, full color
CRTs used for	Canvas	Menu, canvas	Menu-canvas, RGB	Menu, RGB
Multiple user	5 work stations	....	Yes	....
Remote/Data input by	RS-422	....	Yes	....
Reader Service Number	**1084**	**1085**	**1086**	**1087**

[1]Of a palette of 16.7 million, all colors are available per screen under most conditions; in some modes; 256 individual colors are available per screen.

Video Processing Systems

These systems include analog component translator systems, standards conversion units and signal correction products. In Standards Conversion, abbreviations N - NTSC, P - PAL, S - SECAM are used. YCrCb denotes equiband color difference components.

Manufacturer	Accom	A.C.E./Midwest Communications		AVS (AF Associates)	
Model Series	DIE 125	ACC 200 translator	600, 660 series	ADAC	AVS-6500
Enhancement	H & V 10dB adj balance	(732 - RGB-Betacam/MII)	No	H aperture, detail	H aperture
Noise reduction	to 15dB, 1dB steps	(733 - Betacam/MII-RGB)	No	9dB Y, 12dB C	6dB Y, 9dB C
Color correction	(w/Motion detection	No	RGB gain/ped/gamma	RGB gains, pedestals	Chroma retiming
Contrast correction	No	No	Manual control	Manual adjustment	Manual control
Sync regeneration	...	No	No	Yes, DOC output	TBC, freeze modes
Standards conversion	No	Intercomponent format	No	NTSC, PAL/M/N, SECAM	NTSC, PAL (SECAM opt)
Dubbing application	Yes	Yes	Yes	Yes [4:2:2 sampling	Yes
Production application	Yes	Yes	Yes	Yes [at 13.5MHz and	.....
On-air application	...	No	Yes	Yes [8-bit, 4-field	Yes
Format conversions	Yes	RGB-component analog	RGB-YCrCb	Encoded, CCIR601, YCrCb	Composite, RGB
Video response	13.5MHz Y/6.75MHz C	±0.1dB, to 5.5MHz	±0.1dB to 5.5MHz	-3dB to 5.5MHz	-3dB to 3.5MHz
S/N ratio	(Group Delay is:	>46dB unwtd	65dB	±55dB	....
Envelop delay	(3nsec Y to 5.75MHz	....	±10ns	±5ns chr, <1% K-factor	....
Diff phase, gain	(6nsec C to 3MHz	timing δ <5ns	0.5°, 0.5%	1.5/1.5	....
Video level adjust	....	None	±30 IRE	0.5V-2V	-300, +100 IRE
Chroma level adjust	....	None	-90, +30 IRE	+3dB	....
Pedestal level adjust	....	None	±30 IRE	±60mV	±8.5 IRE
Chroma phase adjust	....	None	±40°	±180°	±180°
Subcarrier phase range	....	None	±40°	360°	±180°
Sync level adjust	4.5μsec H positioning	None	Not ops control	Fixed	....
RGB gain/pedestal adjust	....	None	Both gain & pedestal	Yes	None
Programmable system	....	None	600/660TC, 600J timecode	Yes	No
Component formats	CCIR-601, RGB, YPrPb	None	660/660TC	RGB, YUV, YIQ, S-MAC	RGB
Remote control type	RS-232, RS-422	None	RS-232/422[1]	RS-232, other	Manual only
Reader Service Number	**975**	**976**	**977**	**978**	**979**

[1]Data from RAM can be downloaded for storage in PC with setting recall from menu prompts.

Manufacturer	BTS Broadcast TV Systems	CEL/Grunder	Electrocraft Consultants	Faroudja Laboratories	
Model Series	XCC 6016 corrector	P156-2	CPS-84 (PAL)	Flesh tone corrector	VHP detail processor
Enhancement	....	Digital sampling	H crispening	No	Small detail, H & V
Noise reduction	....	Motion interpolation	6dB chroma	No	Effective
Color correction	RGB, YUV, decoder adapter	TBC/freeze functions	RGB gain, lift, gamma	Flesh tone only	No
Contrast correction	Gamma control	With setup	Yes	No	Effective
Sync regeneration	Yes	Yes	Yes	....	No
Standards conversion	W/decoders, encoders	P/S to N, N to P	Intercomponent	No	No
Dubbing application	Yes	Yes	Yes	Yes	Yes
Production application	Yes	Yes	Yes	Yes	Yes
On-air application	Yes	Possible	Yes	Yes	Yes
Format conversions	Yes	No	Y/C to YUV, RGB, PAL	....	No
Video response	±0.5dB to 5MHz Y	-3dB 2.5MHz NTSC/3.5 PAL	To 3.5MHz luma	±0.5dB to 4.2MHz	±1dB to 4.2MHz
S/N ratio	>70dB Y	53dB	....	>65dB	60dB
Envelop delay	....	....	480ns adjustable	....	<20ns
Diff phase, gain	....	....	....	1.5°, 1.5%	2.5°, 2.5%
Video level adjust	±40% white	±50%	±6dB	±3dB	(Boosts detail by
Chroma level adjust	....	±50%	±6dB	±3dB	(200% under 10 IRE
Pedestal level adjust	±30% black	±150mV	150mV range	No	(100% to 20 IRE
Chroma phase adjust	....	....	None	±30°	(5% at 100 IRE
Subcarrier phase range	....	360°	None	....	....
Sync level adjust	With output encoders	No	0-180°	....	....
RGB gain/pedestal adjust	Yes	No	To 200mV p-p gamma	Color balance	No
Programmable system	Yes	No	No	No	No
Component formats	RGB, YUV	No	Yes	R-Y, B-Y processing	No
Remote control type	Proprietary	No	None	No	n.a.
Reader Service Number	**980**	**981**	**982**	**983**	**984**

Manufacturer	Faroudja Laboratories	For-A Corporation		Fortel	Laird Telemedia
Model Series	CTC-N transcoder	CCS-4300/4350 (-4400)	CT-600 transcoder	Interpreter	VC-2000 video corrector
Enhancement	No	No	No	....	Yes
Noise reduction	No	No	No	....	Yes 6dB improvement

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Manufacturer	Faroudja Laboratories	For-A Corporation		Fortel	Laird Telemedia
Model Series	**CTC-N transcoder**	**CCS-4300/4350 (-4400)**	**CT-600 transcoder**	**Interpreter**	**VC-2000 video corrector**
Color correction	Color balance	RGB gain, setup, gamma	No	....	Yes
Contrast correction	From setup/gain	Yes	No	....	Yes
Sync regeneration	Yes	Yes	No	....	Yes
Standards conversion	No	No	Format	....	No
Dubbing application	Yes	Yes	Yes	Yes	From ½-¾" tape
Production application	Yes	Yes	Yes	Yes	Yes
On-air application	....	Yes	No	Yes	....
Format conversions	YCrCb, RGB, bidir.	4400 YCrCb to encoded	RGB, YPrPb, YC358, YC688	RGB/YCrCb/Y688/Y629(1)	No
Video response	±0.3dB to 8MHz	±0.1dB 4.2 (±0.5 to 8MHz)	-1dB to 5MHz	to 5.5MHz	±3dB 5MHz
S/N ratio	60dB	60dB random, 50dB hum	....	60dB	60dB
Envelop delay	<5ns relative	YC delay 40ns/K(2T) 0.5	1% H/V Tilt	2° chroma linearity	....
Diff phase, gain	....	<0.5/<0.5	1°, 1%	2° 2%	±1.5°, 1.5%
Video level adjust	±2dB	±3dB (±3dB YCrCb)	No	....	0 IRE-3x input
Chroma level adjust	±5 IRE balance	±3dB (±3dB CrCb)	No	[Y/3.58 with	½ to 1½x input
Pedestal level adjust	±15 IRE	±20IRE (±10% Y)	No	[output only	-15, +20IRE ref 7.5IRE
Chroma phase adjust	No	±15°	No	[for NTSC.	....
Subcarrier phase range	±2μs genlock	±1° on 4350	No	....	±65°
Sync level adjust	±10 IRE	Fixed	No	....	....
RGB gain/pedestal adjust	Pedestal black bal	±30dB (±30%G, ±15%Ped)	No	....	No
Programmable system	No	No	No	No	No
Component formats	Yes	4400 only	All forms	All component formats	No, includes audio
Remote control type	....	Proprietary	None	....	No
Reader Service Number	**985**	**986**	**987**	**988**	**989**

Manufacturer	Leitch Video	Lenco		Magni Systems	Merlin Snell & Wilcox
Model Series	**VPA-330N (VPA-331N)**	**PCD-473**	**PRC-465 (PRC-365)**	**125AD/125DA**	**ME 8700 Triple**
Enhancement	No	No	In white clip areas	(Operation in 8-bit	Yes
Noise reduction	No	Inherent in comb filter	No	(& 10-bit modes with	Temporal recursive
Color correction	Chroma AGC	Hue, gain	Gain, phase	(13.5MHz sampling	....
Contrast correction	Luminance AGC	....	With setup	Setup adj, removal	Inherent
Sync regeneration	RS-170A phasing	No	Yes	....	TBC, Synchro features
Standards conversion	No	Component only	No	No	NTSC, PAL, SECAM
Dubbing application	Yes	Yes	Yes	Yes	Yes (Motion adaption)
Production application	Yes	Yes	Yes	Yes	Yes (4-/8-field)
On-air application	Yes	No	Yes	No	Yes (±15ns stability)
Format conversions	Yes	Encoded to RGB/YCrCb/YIQ	No	Digital 4:2:2/CAV	Composite, Y-C
Video response	±0.1dB 5MHz luma	±0.5dB 30H-5MHz Y	±1dB to 15MHz	±0.2 5MHz Y-channel(1)	±1dB to 3.3MHz
S/N ratio	>60dB	>55dB non-coherent	>50dB below 1Vp-p	>60dB to 5MHz	>56dB CCIR wtd
Envelop delay	....	....	<10ns	....	-100, +500ns adj
Diff phase, gain	<0.2°, <0.5%	....	<0.5°, <0.5%	1% K factor 2T pulse	....
Video level adjust	±2.5dB	±6dB	-40dB, +6dB	±3dB on input	±6dB continuous
Chroma level adjust	±2.5dB	+6dB saturation	-30dB, +6dB	....	Yes
Pedestal level adjust	±10 IRE	....	±20 IRE	7.5 IRE or 0 IRE	Yes [Single direction
Chroma phase adjust	±20°	±22°	....	[Chroma response:	[conversion only
Subcarrier phase range	360°	....	±20°	[-90.2dB to 2.75MHz	[between any 2
Sync level adjust	±10 IRE	....	20-80IRE	[in R-Y/B-Y	[standards.
RGB gain/pedestal adjust	No	No	No	[signal channels	....
Programmable system	No	No	No	....	No (Freeze, fades
Component formats	No	Component outputs	No	SMPTE, BETA, M-II, RGB	M-II, S-VHS, ED-Beta
Remote control type	Conductor/function	No	No	Yes	None
Reader Service Number	**990**	**991**	**992**	**993**	**994**

Manufacturer	Merlin Snell & Wilcox			Oki Electric	Quantel
Model Series	**DIP 9800/ME-888B**	**DIP 9700A/ME-808**	**ME 8500 Unidirectional**	**LT1210 (LT1250)**	**Satin, Satin 601**
Enhancement	H/V aperture	H/V detail correction	Yes	Yes	Yes
Noise reduction	Temporal recursive	to 9dB Y, to 12dB C	Luma, chroma	No	Yes
Color correction	Color balance	Color balance	....	Level, hue	....
Contrast correction	Inherent, Y-C delay	Yes	Inherent	Setup level	....
Sync regeneration	Inherent	Yes (4-field upgrade	TBC, Synchro features	Yes	TBC functions
Standards conversion	All, automatic select	All available	NTSC, PAL, SECAM	Yes[1]	NTSC, PAL, SECAM
Dubbing application	Yes (4-field with	Yes	Yes (Motion adaption)	Yes	Yes
Production application	Yes (motion	Yes	Yes	....	Yes
On-air application	Yes (interpolation.	Yes	Yes	....	Yes
Format conversions	Composite, RGB, YCrCb	YUV out for SECAM	Composite, Y-C	No	RGB to composite
Video response	±0.5dB 3.3MHz NTSC	±0.5dB 3.3MHz, NTSC	±1dB to 3.3MHz	....	>4.2MHz NTSC
S/N ratio	52dB wtd flatfield	52dB CCIR wtd	>56dB CCIR wtd	....	....
Envelop delay	-100, +600ns horiz	-100, +600ns adjustment	(4-field NTSC	Adjustable	....
Diff phase, gain	....	....	(8-field PAL	....	....
Video level adjust	±6dB continuous	1V+±6dB adjustment	±6dB continuous	Yes	....
Chroma level adjust	Yes	Yes	....	Yes	....
Pedestal level adjust	±150mV continuous	±150mV adjustment	...[Single direction	Yes	....
Chroma phase adjust	NTSC only	NTSC only	...[conversion only	Yes	....
Subcarrier phase range	Yes	....	...[between any 2	Yes	....
Sync level adjust	Fixed	....	...[standards.	>±3dB	....
RGB gain/pedestal adjust	Color balance	Color balance	....	....	No
Programmable system	No	....	No	....	Yes
Component formats	RGB, YUV outputs	YUV out for SECAM	M-II, S-VHS, ED-Beta	No	CCIR 601 compatible
Remote control type	Duplicates ctl panel	Duplicates ctl panel	None	....	RS-422
Reader Service Number	**995**	**996**	**997**	**998**	**999**

[1]NTSC-3.58, PAL, SECAM, NTSC-4.43 input only, PAL-M option.

Manufacturer	Shintron	Sony Broadcast	Utah Scientific/ADC	Video International	
Model Series	**MC-1 intermatrix**	**BVX-30 system**	**da Vinci**	**DTC 4500[1]**	**DTC 3602 (DTC 3502[2])**
Enhancement	No	H-V detail	....	Continuous adj	Continuously adj
Noise reduction	No	15dB luma	Grain reduction	7-stage, Y & UV	3-stage
Color correction	(MC-1CC ±6dB/channel)	RGB gain, lift, gamma	16-vector system	Full control, 4-field	Full control
Contrast correction	(MC-1WC white clipper)	No	Yes	Setup adj	Setup level adj

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Manufacturer	Shintron	Sony Broadcast	Utah Scientific/ADC	Video International	
Model Series	**MC-1 Intermatrix**	**BVX-30 system**	**da Vinci**	**DTC 4500[1]**	**DTC 3602 (DTC 3502[2])**
Sync regeneration	Sync replacement	Yes	Replaces sync	TBC/synchronizer	TBC/synchronizer
Standards conversion	Intercomponent	No	NTSC, PAL	PAL/N/M-NTSC/4-SECAM,	PAL/N/M-NTSC/4-SECAM,
Dubbing application	Yes	Yes	Yes	spec to Y/C U-matic	U-matic Y/C
Production application	Yes	Yes	Yes	Motional interpolation	w/digital effects
On-air application	....	Yes	Possible	w/freeze frame	w/freeze frame
Format conversions	RGB-YIQ-YCrCb-M-Beta	No	Any component accepted	YCrCb, RGB, composite	YCrCb, RGB, composite
Video response	±0.5dB to 10MHz	±0.5dB, to 5MHz	±0.3dB to 8MHz	>5.5MHz (13.5MHz 8-bit)	>5.5MHz (13.5MHz 8-bit)
S/N ratio	....	>51dB	55dB, 10kHz-5.5MHz	54dB Peak sig/RMS noise	54dB Peak/RMS noise
Envelop delay	....	<1%	<1%	2% K-factor	2% K-factor
Diff phase, gain	....	2°, 3%	1°/1%	2°/2%	2°/2%
Video level adjust	None	±3dB	±100%	Yes	Yes
Chroma level adjust	None	±3dB	-90, +100%	Yes	Yes
Pedestal level adjust	None	±20 IRE	-40, +100 IRE	Yes	Yes
Chroma phase adjust	None	90°	±60°	Yes	Yes
Subcarrier phase range	None	360°	....	Yes	Yes
Sync level adjust	None	....	Standard fixed	Yes	Yes
RGB gain/pedestal adjust	None	±30% gain, ±15% setup	Yes, also gamma	Yes	Yes
Programmable system	None	Yes	1000 color events	....	Digital effects
Component formats	Yes	....	All component formats	RGB, YUV	RGB, YUV
Remote control type	None	BVR-10, BVR-30	RS-232/422, GPI	D25 connector	D25 connector
Reader Service Number	**1000**	**1001**	**1002**	**1003**	**1004**

[1]4-field, EBU-3246, parallel inputs & outputs.
[2]PAL-M, PAL-N optional.

Video Master Control & Production Switchers

These switching systems serve for video source selection in the production studio and for audio/video selection in the on-air control room. All production systems typically provide an integral Video Black source, switcher effects position/modulation control and re-entry facilities. Master control types may not include those items. Quad-split features often involve optional units and are not listed here.

Manufacturer	A.C.E. (Midwest Communications)		Ampex AVSD		
Model Series	**T24-2 (T24-PO)**	**Model T8**	**AVC-33S (AVC series)**	**AVC Vista[1] (Vista 18)**	**AVC Century 330**
Control application	Production (master ctl)	Production	Video production	Video Production	Video production
# of inputs	23V (& 23A)	8 video	32V, 16A opt	10 (18)	32 video
Integral matte source	Yes	Yes	Yes	5 matte generators	1 per keyer, key fills
Key sources	4 external	8 int, 2 ext	32 int, 6 ext opt	Any int, mult. ext/masks	Any int, 30 ext
Chroma keyers	Enc/RGB (option)	Encoded, RGB opt	10 enc, 6 RGB opt	RGB/enc SPECTRAKEY	RGB/enc SPECTRAKEY
Downstream keyer	4 source opt (std)	2 sources opt	All sources	W/Unikey linear key	Linear/chroma/luma/ext
Switching buses	10, 4 aux (2, 2 aux)	3 primary, 1 aux	8, 16 aux opt	4 aux, 2 with reentry	Multiple
Mix Effects amps	3 (1)	1, multilayer	3	Dual multilevel keyers	3 w/3-level keyer
Pattern generator	100 (9) patterns	80 patterns	164 patterns	32 inc/pixel dissolve	Yes
Wipe effects	Rotary & (soft-edge)	Rotary, soft-edge	Rotary, soft, user pgmd	Rotary, hard, soft	164 hard, soft



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	Transmitter output power	Frequency range	Typical Sync efficiency
WIDEBAND SERIES			
K3773BCD	60-70 kW	470-860 MHz	44% to 48%
K3673BCD	55-60 kW	470-860 MHz	44% to 48%
K3573BCD	40-55 kW	470-860 MHz	43% to 46%
K3672BCD	55-60 kW	470-810 MHz	44% to 48%
K3572BCD	40-55 kW	470-810 MHz	43% to 46%
K3271BCD	15-30 kW	470-860 MHz	42% to 47%
K3270BCD	5-15 kW	470-860 MHz	42% to 47%
STANDARD SERIES			
Low Band			
K3276HBCD	40-55 kW	470-596 MHz	38% to 43%
K3382BCD	40-55 kW	470-590 MHz	38% to 42%
K3217HBCD	30-45 kW	470-590 MHz	40% to 42%
K3230BCD	10-30 kW	470-596 MHz	40% to 42%
K376L	10-30 kW	470-610 MHz	34% to 40%
K370/W series	5-10 kW	470-606 MHz	29% to 35%
Mid Band			
K3277HBCD	40-55 kW	590-710 MHz	38% to 43%
K3383BCD	40-55 kW	590-702 MHz	38% to 42%
K3218HBCD	30-45 kW	590-702 MHz	40% to 42%
K3231BCD	10-30 kW	590-704 MHz	40% to 42%
K377L	10-30 kW	590-720 MHz	38% to 45%
K371/W series	5-10 kW	606-742 MHz	32% to 35%
High Band			
K3278HBCD	40-55 kW	702-860 MHz	38% to 43%
K3384BCD	40-55 kW	702-860 MHz	38% to 42%
K3219HBCD	30-45 kW	702-860 MHz	40% to 42%
K372/W series	5-10 kW	740-860 MHz	32% to 35%

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Manufacturer	A.C.E. (Midwest Communications)		Ampex AVSD		
Model Series	**T24-2 (T24-PO)**	**Model T8**	**AVC-33S (AVC series)**	**AVC Vista[1] (Vista 18)**	**AVC Century 330**
Spotlight effects	Integral (No)	Integral	Integral	Yes	Yes
Border effects	Integral	Integral	Integral	Hard, soft, halo	Hard, soft, combined
Shadow effects	Integral	Option	Options	Yes	Yes
Automation interface	Editor/memory/SMPTE bus	Serial, relay	SMPTE serial opt	RS-232/422, GPI ports	SuperStar Memory
Programmable functions	X-fade, fade-black	X-fade, fade-black	x-fade, fade-black	24 setups	48 switcher setups
Memory backup battery	Yes	Yes	Yes	Yes	Multiple batteries
Diagnostic software	Yes	Yes	Yes	Yes	Yes
Digital effects port	Yes (No)	No	Yes	ADO options	For ADO system
Path length or deviation	1.2μs	2μs	1.5° accuracy	1.5° accuracy	1.5° accuracy
Crosstalk at subcarrier	56dB	58dB	60dB	≤-55dB	<-55dB
Audio preview, follow	No (Yes)	Option	Option	AVC audio system opt	With option
Audio metering	No (Yes)	Option	Option		With option
Audio level control	No (Yes)	No	.....	No	With option
Audio mixer interface	No (Yes)	Yes	Yes	....	Yes
Edit control interface	Yes (No)	Yes	.....	....	Yes
Reader Service Number	**1088**	**1089**	**1090**	**1091**	**1092**

[1]An electroluminescent panel on the Vista systems provides status display; extended memory options are available.

Manufacturer	Beaveronics		BTS Broadcast Television Systems		CAL/Cox Associates
Model Series	**Model 712**	**Model BI-154 (-156)**	**MCS-2000**	**R102ME (RME series)**	**Title Assembler**
Control application	Video production	Video production	Master control	Production	Graphics production
# of inputs	12 video	15 video	250V, 250A	16 or 24	10 RGB or YUV w/key
Integral matte source	Yes	Yes	Yes	Yes	No
Key sources	3 int, 1 ext	r int, 2 ext	Int, ext	Various provisions	1 each input
Chroma keyers	RGB integral	RGB, encoded options	No	RGB std, encoded opt	Yes
Downstream keyer	4-source opt	(4-source, BI-156)	250 sources	Yes	No
Switching buses	4	4 (6, 2 aux opt)	150, 150 aux	10 prime	A and B
Mix Effects amps	1 eff-key, 1 mix	1-2 (2-3)	No	2	3 (mix, self-key,
Pattern generator	10 patterns	32 patterns	120 paterns	60 patterns	No(separate-key.
Wipe effects	Soft-edge	Soft-edge	User programmable	Rotary, soft-edge	Limited H/V key occlude
Spotlight effects	Integral	Integral	No	Yes	No
Border effects	Integral	Integral	No	Yes	No
Shadow effects	Options	Option	Integral	.....	No
Automation interface	No	No	RS-232, 422	Option	No
Programmable functions	.....	No	X-fade, fade-black	Option	No
Memory backup battery	No	No	Yes	Yes	No
Diagnostic software	No	No	Yes	Yes	No
Digital effects port	No	No	No	Yes	No
Path length or deviation	140ns	220μs (350μs)	100°	.....	...
Crosstalk at subcarrier	53dB	53dB	60dB	.....	For 525-/625-line
Audio preview, follow	No	No	Yes	No	No
Audio metering	No	No	Yes	No	No
Audio level control	No	No	Yes	No	No
Audio mixer interface	No	No	No	No	No
Edit control interface	No	No	.....	RS-422 port	No
Reader Service Number	**1093**	**1094**	**1095**	**1096**	**1097**

Manufacturer	Crosspoint Latch				Echolab
Model Series	**6112(AK) (6124A)**	**6150BK**	**6129AHK (6139)**	**8200/8200C[2]**	**DV-5 w/AFS**
Control application	Production	Master control	Production	Production	Production
# of inputs	8 (12)	16V, 16A	8 (8, 16, 24)	5	10V
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	Multiple int, 2 ext	4 ext	Int, 2 ext per M/E	Int, Ext, multilevel	3 + RGB ext & int.
Chroma keyers	Options	No	RGB std, 2nd opt (dual)	Yes	Encoded or RGB opt
Downstream keyer	Yes	No	Dual, 4-input	Yes	2 sources
Switching buses	4 primary	2	3 primary (6 primary)	2	4 prime, 3 aux
Mix Effects amps	Independent dual	1	2 (3)	Multilevel w/digital	1+
Pattern generator	12 per ME	Patterns optional	32 patterns (12 or 32/ME)	12-pattern	>40 patterns
Wipe effects	Soft-edge	No	Soft-edge	Inc push, pulls	Soft, rotary options
Spotlight effects	6112 [6124A]	No	Integral	...(posterize/mosaic	Integral
Border effects	Yes	Optional	Integral	Yes	Integral, soft edge
Shadow effects	.....	No	Integral	Yes	Optional
Automation interface	RS-232/422	Serial	Serial, parallel[1]	w/7285 option	RS-422
Programmable functions	Yes (AK μP controlled)	Fade-black, X fade	Auto-trans/sequences	0.5-5s transitions	x-fade, fade-black
Memory backup battery	Yes	No	No (Yes)	...	Yes
Diagnostic software	Yes	No	No (Yes)	...	Yes
Digital effects port	.....[6124A]	No	No	No	RS-422
Path length or deviation	±1.5° differential	.....	±1° differential	...	±1°
Crosstalk at subcarrier	50dB 3.58/4.43MHz	50dB	50dB (55dB 4.43MHz)	...	52dB
Audio preview, follow	No	Yes	Yes (No)	No	w/AFS Audio Follow opt
Audio metering	No	Yes	No	No	LED ladder
Audio level control	No	Yes	No	Int. 2-input mixer	Yes
Audio mixer interface	No	Yes	No	Through 7282, 7285	From DV-5
Edit control interface	6403 editor module	.....	Yes (6403 interface)	7282, 7285	RS-232, -422
Reader Service Number	**1098**	**1099**	**1100**	**1101**	**1102**

[1]Automation functions determined by model 7203 or 7239 Auto-Drive controls.
[2]Switcher system includes dual TBCs for VCR operation; 8200C system is prepared for S-VHS VCRs.

Manufacturer	Echolab	Electrocraft	For-A Corporation		Grass Valley Group
Model Series	**SE-3 (SE-6)**	**VM-8548**	**CVM-500, -600, -1000**	**PVM-500 (PVM-600)**	**DPP-1 Kadenza[1]**
Control application	Production	Production	Component production	Production (& editing)	Production
# of inputs	10V	8	6, 12, 16/24 RGB, YCrCb	6 (12)	32 maximum[1]
Integral matte source	Yes	Yes	Yes	Yes	Multiple sources
Key sources	2 int, 3(5) ext	Various int, 1 ext	2, 2, 5 external	Any int, 2 ext (2)	Multiple
Chroma keyers	Encoded, RGB opt	RGB	Opt, opt, yes	CCK-500 EXKEY opt	Option
Downstream keyer	2 sources	Yes	Yes	Integral	....
Switching buses	3 (5)	4 primary	4, 4, 6	4 primary (key select)	One image layer/bus
Mix Effects amps	2+	Yes	1, 1, 2/3	1	Yes w/Kaleidoscope
Pattern generator	40 patterns	23 programmable	22, 24, 24	22 (24) patterns	Yes

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Manufacturer	Echolab	Electrocraft	For-A Corporation		Grass Valley Group
Model Series	**SE-3 (SE-6)**	**VM-8548**	**CVM-500, -600, -1000**	**PVM-500 (PVM-600)**	**DPP-1 Kadenza[1]**
Wipe effects	Soft, programmed	Soft-edge	Yes	Yes (hard/soft edge)	Soft/hard edge
Spotlight effects	Integral	No	No	No	w/defocus option
Border effects	Integral	Yes	Yes	No (Hard/soft/modulated)	BORDERLINE generator
Shadow effects	Optional	.....	...	No (...)	Possible w/masks
Automation interface	No (RS-422)	Yes	Serial option	FMX-500 (GPI, -422)	Editor interface
Programmable functions	Yes (...)	Yes	Transitions	Transitions	Yes
Memory backup battery	Optional (Yes)	Yes	...	No	F.Disk storage
Diagnostic software	Yes	No	...	No	....
Digital effects port	Optional	No	FXM-500 option	FMX-500 EXTROL opt	For Kaleidoscope
Path length or deviation	12μs	.....	...	...	....
Crosstalk at subcarrier	52dB	.....	...	(<-54dB 4.43MHz)	N.A.
Audio mixer interface	Yes	No	No	No	
Edit control interface	.....	No	Yes	Yes	
Reader Service Number	**1103**	**1104**	**1105**	**1106**	**1107**

[1]Number of inputs is dependent upon the configuration desired and on the Video Source Selectors necessary to interface NTSC, PAL composite video, RGB, YUV, YCrCb and CCIR-601/656. The primary function of this system is image compositing, which removes the standard program and preview bus structure. Each bus is a layer of the final image. Although not a typical production switcher, the DPP-1 does provide many switching functions, along with multiple layer facilities and other digital processing.

Manufacturer	Grass Valley Group				
Model Series	**Master 21**	**Model 100 (100CV)**	**Model 1680 (series)**	**Model 200-2 (200-1)**	**1600-4S**
Control application	Master control	Video production	Video production	Video production	Master control
# of inputs	16 w/stereo audio	8 video (8 component)	10-24V, audio opt	20 primary	To 24V, 24A +6A stereo
Integral matte source	Yes (routing switcher	Yes (RGB, YCrCb, YIQ	Yes	Yes (6 matte sources)	Yes
Key sources	4-input	8 int, 2 ext, 1 DSK	10-24 int, 10-22 ext	Int, ext Key and fill	Int, ext
Chroma keyers	...	RGB option	Encoded, RGB opt	Multi-format component	.....
Downstream keyer	Option w/effects	8 sources	4-source standard	Full feature	.....
Switching buses	Pgm, Pst	3	4-8, 1 aux on -16F	12 (Pgm/Pst F-F mix)	2 prime
Mix Effects amps	Key, mattes	1	1 to 3	2 (7 w/mask generator)	Key/matte only
Pattern generator	...	10 patterns	54 patterns	32 + programmable	.....
Wipe effects	...	Soft-edged	Soft-edge, rotary	Soft-edge, rotary	.....
Spotlight effects	...	Integral	Integral	Yes (background wash)	No
Border effects	Yes	Optional	Option	Yes	Analog, digital opt
Shadow effects	Yes	Option	Option	Yes	No
Automation interface	M200 series	Serial opt	Serial std	For E-MEM	For M-200 series
Programmable functions	4 auto transitions	Auto transitions	Via E-MEM	Auto (fade to black)	Yes
Memory backup battery	...	Yes	Yes	Yes	.....
Diagnostic software	...	Yes	Via E-MEM	Yes	.....
Digital effects port	No	For Key-MEM	Yes, w/E-Disk storage	For Kaleidoscope DPM-1	No
Path length or deviation	< ±1.5° deviation	206ns	<1.5° deviation	<1.5° deviation	<1° deviation
Crosstalk at subcarrier	<-56dB 5MHz	<-54dB	<-54dB	<-54dB	<-60dB V, <-80dB A
Audio preview, follow	Yes	.....	(Series includes:	...	Yes
Audio metering	3 sets L/R LED ladder	.....	(-10V, -10X, -16F	...	L, R, SAP
Audio level control	Yes	.....	(-16K, -24F, -24K.	...	Yes
Audio mixer interface	...	For AMX-100 mixer	.....	...	Integral
Edit control interface	RS-232/-422 serial	RS-232/422, GPI	Serial	Serial, GPI	No
Reader Service Number	**1108**	**1109**	**1110**	**1111**	**1112**

Manufacturer	Grass Valley Group	Ikegami Electronics	Image Video	Intergroup Video Systems	JVC Company
Model Series	**Model 300 (series)**	**DSS-5108C 4:2:2 digital**	**8010 (8020)**	**Series 9600**	**KM-2000U (1200U)**
Control application	Video production	Component, production	Master control	Production	Production
# of inputs	24 video	8 RGB, Y/R-Y/B-Y, YIQ	10 A&V (20 A&V) + 5 A	16, 24	8 (5)
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	26 int, 6-32 ext	3 Super, 1 key	5 inputs	12 input	1 int, 1 ext
Chroma keyers	Encoded or RGB opt	Option	....	RGB w/ shadow	RGB
Downstream keyer	26 sources std	Standard	(5 inputs)	Yes	1 source
Switching buses	12	A, B, Key	2 (5) primary	8 primary, 2 aux	2, 1 aux (2 primary)
Mix Effects amps	3	1	Key only	1 or 2	2
Pattern generator	44 patterns	More than 64 patterns	....	42 patterns w/modifiers	13 (6) patterns
Wipe effects	Rot, soft, programmed	Yes	No	Rotation, soft	Soft-edge -2000U
Spotlight effects	Integral	.....	No	w/dual source	No
Border effects	Integral	Yes	....	Yes	No
Shadow effects	Integral	.....	....	Yes	No
Automation interface	.....	Editor control opt	(20-event store)	RS-232/422	No
Programmable functions	Yes	Cut, fade, wipe	No (w/rate adj)	REFEX memory	Fade-black 2000U
Memory backup battery	Yes	Yes	....	Yes	No
Diagnostic software	Yes	.....	....	Yes	No
Digital effects port	Yes	No	No	.....	No
Path length or deviation	0.7μs	.....	....	.....	.....
Crosstalk at subcarrier	-54dB	.....	-56dB	.....	50dB
Audio preview, follow	.....	No	Yes	Option	.....
Audio metering	.....	No	Single (dual)	No	No
Audio level control	.....	No	Yes	Option	No
Audio mixer interface	.....	No	No	Option	No
Edit control interface	.....	Option	No	RS-232/422	No
Reader Service Number	**1113**	**1114**	**1115**	**1116**	**1117**

Manufacturer	Kaltronics	3M Company	Numark Electronics	Omicron Video	Polar Video Ltd
Model Series	**CMS-12**	**Model 324**	**VAM-2000**	**Model 507 series**	**PVM-1 portable**
Control application	Master control	Master control	Production	Master control	Video production
# of inputs	12, expand to 20	32 V A	3V + 4 stereo audio	10/15/30/NTSC or PAL	4 video
Integral matte source	No	2 integral matte systems	Integral	Options	Yes
Key sources	N/A	....	None	Yes	Int, ext
Chroma keyers	No	....	No	....	Pos/Neg luminance only
Downstream keyer	No	Yes	No	Yes	No
Switching buses	Prgm, prvw	3	2	Pgm/Prset	3
Mix Effects amps	0	None	1	1	2
Pattern generator	No	....	No	None	Yes 22 standard wipes

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Manufacturer	Kaitronics	3M Company	Numark Electronics	Omicron Video	Polar Video Ltd
Model Series	**CMS-12**	**Model 324**	**VAM-2000**	**Model 507 series**	**PVM-1 portable**
Wipe effects	No	....	H, V, Corners	No	Also nonstandard wipes
Spotlight effects	No	....	No	No	No
Border effects	No	Edging Generator	(integral effects:	No	No
Shadow effects	No	....	(video beat freeze	Integral	No
Quad split feature	No	....	(freeze frame	No	No
Automation interface	RS-232C	Option	None	Ser./par. options	PAF-1 opt
Programmable functions	Possible	99 preset events	Manual only	Fade/black/non-sync	X-fade, fade-black
Memory backup battery	N/A	....	....	No	No
Diagnostic software	N/A	....	None	No	No
Digital effects port	No	....	No	No	No
Crosstalk at subcarrier	55dB	....	....	<-56dB at Fsc	50dB 4.5MHz
Audio preview, follow	Possible	Yes	Separate switching	Yes w/split	No
Audio metering	Yes	Yes	None	Illuminated VU	[Nominal weight 5.5 lb
Audio level control	Right, left	Yes, stereo	3-stereo + aux	Manual, stereo opt	[ac or dc powered
Audio mixer interface	Yes	....	None	No	No
Edit control interface	RS-232C	....	None	....	No
Reader Service Number	**1118**	**1119**	**1120**	**1121**	**1122**

Manufacturer	Ross Video				Shintron
Model Series	**RVS 416**	**RVS-508 (514) [517]¹**	**RVS 210A (RVS 216A)**	**RVS-524**	**Empress 2000 (EC2000)**
Control application	Production	Production	Production	Production	Production (component)
# of inputs	16V	16,20,24 ([12,20])	10 (16) NTSC, PAL	12 or 20 NTSC, PAL/-M	10 + key + spare
Integral matte source	6 generators	Yes	Yes	Yes	Yes
Key sources	Int, ext	Int, ext	Int, ext	Any int, ext, titler	Int, ext
Chroma keyers	RGB & encoded opts	RGB, encoded available	RGB (& encoded)	Opt encoded, RGB	RGB
Downstream keyer	3 sources	Yes ([...])]	3-source	Yes	Option
Switching buses	6 primary	8(4)[7] prime, to 10 aux	3 primary	4 primary	4 primary
Mix Effects amps	2 4-bus multilevel	Single ([dual])	1 multilevel	1 MLE	1
Pattern generator	2 w/rotary, matrix, spin	62 per ME	12 patterns	27 patterns	16 pattern
Wipe effects	Hard, soft-edge	Rotary, soft-wipe	Hard, soft	9 rotary, hard, soft edge	Soft-edge
Spotlight effects	w/Linear key	Yes	No	....	No
Border effects	Opt/analog key border	Yes	Opt, analog key border	Yes	Yes
Shadow effects	Yes	Yes	No	Yes	No
Automation interface	RS-422 optional	Encore memory system	RS-422 option	Scene store memory	RS-422 & Empress
Programmable functions	X-fade, fade-black	Auto transitions	x-fade, fade-black	Yes	Yes
Memory backup battery	Yes	Yes	Yes	In scene store memory	No
Diagnostic software	....	....	Yes	....	No
Digital effects port	....	Option	Yes	Yes	No
Path length or deviation	1.5μs differential	±1/5° ∂ NTSC, PAL/-M	≤1.5° ∂, NTSC, PAL	±1.5° differential	50ns
Crosstalk at subcarrier	<-53dB NTSC, PAL	>53dB 3.58/4.43MHz	≤-53dB to 4.43MHz	53dB 3.58/4.43MHz	<-50dB
Audio preview, follow	....	....	Opt mixer	....	A270 AFV switcher
Audio level control	....	....	No	....	via RS-422
Audio mixer interface	....	....	For 12-input mixer	....	A270 AFV switcher
Edit control interface	Expanded GPI	RS-422	Yes	Option	RS-422, SMPTE
Reader Service Number	**1123**	**1124**	**1125**	**1126**	**1127**

¹Series also includes models 504 and 505.

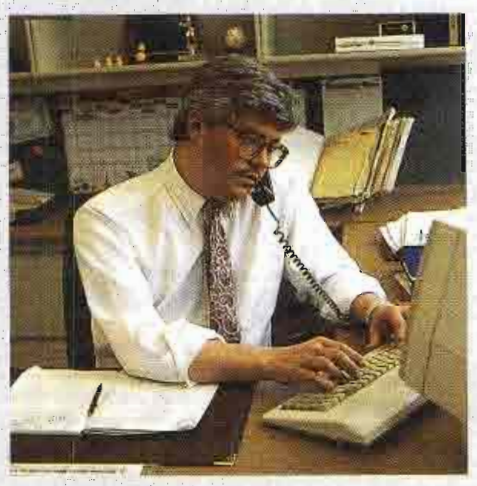
Manufacturer	Thomson Video Equipement		Toshiba	Utah Scientific	Videotek
Model Series	**TTV 5650 Digital**	**TTV 5630S (SECAM)**	**DSW-4220**	**MC-501B (MC-502)B**	**Prodigy**
Control application	Production/CCIR 601	Production	Production	Master control	Production
# of inputs	16	16 (24, 32 options)	10 component (A & D)	30-150 V/A+8A stereo	10
Integral matte source	Yes	Yes	2-color	Yes	Yes
Key sources	Yes	Int, 4 ext	Ext, int, DPE, luminance	3 ext + preview bus	Int, 3 ext, var gain
Chroma keyers	3 inputs	2-6 RGB possible	Option digital 4:2:2	No	....
Downstream keyer	....	Yes	Yes	....	Yes
Switching buses	7 primary	7 primary	5	3-bus (2-bus)	Video, audio
Mix Effects amps	1 w/4 effects buses	1 w/4 effects buses	2	Option	Multilevel effects
Pattern generator	4 generators	4 to 5	53	Option	24-wipe
Wipe effects	Various types	Soft edges	Rotary, spin, ring	Option	Hard, soft edge
Spotlight effects	Yes	....	Includes half halos	No	No
Border effects	Yes	Yes	With edging/color	Edges for key	Hard, soft edge
Shadow effects	Yes	....	Yes	Yes for key	....
Automation interface	w/editing controller	From edit controller	....	SAS-2, PC controller	100 events effects,
Programmable functions	Uses MemBox storage unit	w/MemBox event storage	Yes	Yes	replays, sequences
Memory backup battery	Yes	Yes	Yes	Yes	Yes
Diagnostic software	Yes	....	....	....	....
Digital effects port	Yes	....	3-D effects integral	....	Bench, rack
Path length or deviation	....	1.5μs	....	differential ≤ ±1.0°	≤1.5° deviation
Crosstalk at subcarrier	....	<-50dB at 4.43MHz	....	≤-60dB	<-54dB to 4.43MHz
Audio preview, follow	No	No	None	Yes	Integral, stereo
Audio metering	No	No	(Y, R-Y, B-Y, RGB	L/R Pgm/Mon LED VU	No
Audio level control	No	No	(4:2:2 digital &	L/R Pgm, Over/under ratio	....
Audio mixer interface	No	No	(analog composite.	(SAP available)	Integral system
Edit control interface	Yes	Yes	RS-422	Dynabus machine ctl	RS-422 serial
Reader Service Number	**1128**	**1129**	**1130**	**1131**	**1132**

Routing/Distribution Switchers

Large format, matrix-type switching systems for signal source-to-destination reconfiguration. These systems may operate stand-alone or in conjunction with master control and other routing systems to increase the flexibility of the audio/video facility. This listing includes systems designed for component video use, but does not include "single-bus" utility/monitor-selection systems.

Manufacturer	BSM	BTS Broadcast Television Systems		CEL/Grunder	Datatek
Model/Series	**Modula/Mini Modula**	**TVS/TAS-2000**	**BSX-350**	**P169V/P169A**	**D-2000 AV**
Crosspoint matrix	8x8 (8x8)	10x10	10x10	8x4	25x1/50x1
Typical system size	256x256 (24x32)	450x150	....	8x4x3	256x256 8-level

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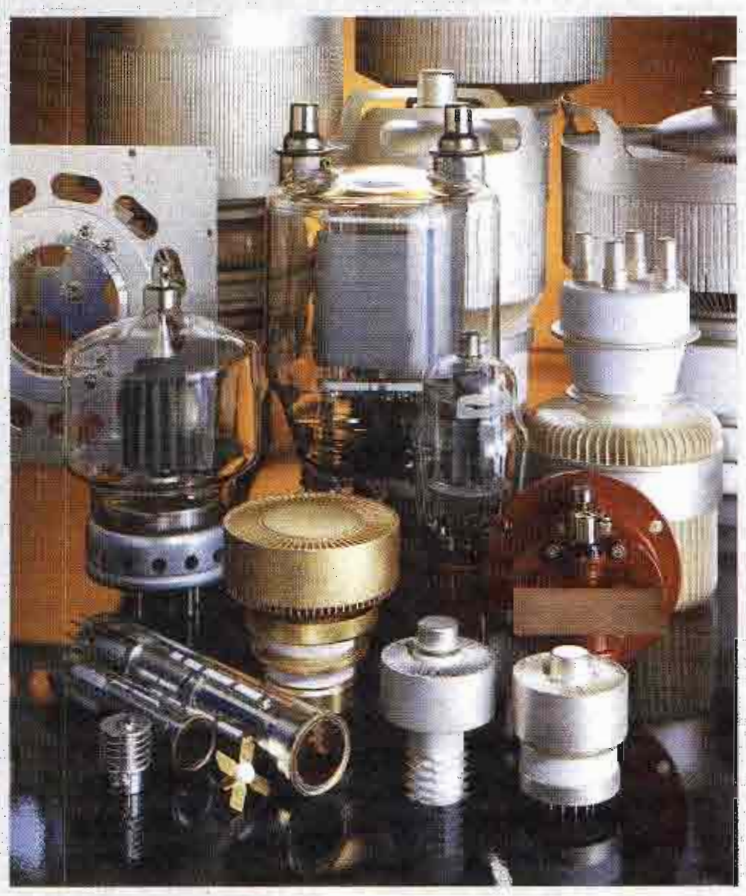


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Manufacturer	BSM	BTS Broadcast Television Systems		CEL/Grunder	Datatek
Model/Series	**Modula/Mini Modula**	**TVS/TAS-2000**	**BSX-350**	**P169V/P169A**	**D-2000 AV**
Audio response	±0.1dB 10-50k	±0.1dB 20-20k	....	-3dB 10-100k	-0.1dB 20-20k
Harmonic distortion	<0.1%	<0.005% 20-20k 10dBv	....	....	0.05% 30dBm
S/N ratio	-80dBm noise floor	85dB hum & noise	....	<-90dBm	<-105dB below max out
Audio crosstalk worst	-90dB max	<-90dB worst	....	-70dB	<-85dB to 20kHz
Video response	±01d8 15MHz	±1.5dB to 15MHz	±1.5dB to 15MHz	0.1dB 6MHz	±0.25dB to 10MHz
Differential phase/gain	<0.1°, <0.1%	<±1°, <0.1%	0.1°, <0.1%	±0.2°, ±0.2%	0.15°, 0.15%
Video S/N ratio	>65dB noise floor	>75dB	>75dB hum & noise	>80dB	60dB to 6MHz BW
Video crosstalk worst	-65dB max	>60dB worst	>60dB worst	<-55dB to 4.43MHz	<-60dB to 4.43MHz
Control format	RS-232 & others	SMPTE-422 bus	SMPTE-422 bus	RS-423/422	RS-232C
Applicable to CAV	Possible	Yes	Yes	Yes	Yes
Reader Service Number	**1148**	**1149**	**1150**	**1151**	**1152**

Manufacturer	Datatek	Di-Tech		Dynair Electronics	
Model/Series	**D-2400**	**5800 (5850) series**	**5861-V/5862-A**	**Dynasty series[1]**	**Dynasty 100**
Crosspoint matrix	20x10 (4-8 level)	20x1 (40x1)	32x2	10x10	10x10
Typical system size	40/60/80/160x20	100x15 AFV (>200x200)	64x32 A/V 10-level	100x100 A&V	50x80 A&V
Audio response	±0.5dB 20-20k	±0.25dB 20-20k	±0.1dB 20-20k	±0.2dB 30Hz-20kHz	±0.2dB 30Hz-20kHz
Harmonic distortion	<0.005% 16dBu 600Ω	<0.5% >18dBm	<0.1% 24dBu	0.25% +24dBm	0.1%-15kHz 8dBm(.25 +24)
S/N ratio	-116dB 20kHz ba	<-70dBm (<-80dBm)	>104dB below 24dBu	75dB	75dB max
Audio crosstalk worst	-82dB 20kHz 30dBu	<-70dB to 20kHz	<-70dB to 20k	<-80dB to 15kHz	<-80dB to 15kHz
Video response	±o.5,-3dB to 60MHz	±0.25dB to 10MHz	±0.5dB 12MHz	±0.15dB to 5MHz	±0.1dB 80MHz/100MHz BW
Differential phase/gain	0.05°, 0.05%	<0.25°, 0.25%	<0.25°, <0.25%	<0.5°, 0.5%	0.2°, 0.2%
Video S/N ratio	75dB hum/noise 5MHz	<-65dBV	>70dB	80dB rms, 10MHz BW	65dB rms 10MHz bw
Video crosstalk worst	<-63dB to 5MHz	<-60dB 4.5MHz	<-60dB 4.5MHz	<-60dB 5MHz	<-50dB 5MHz/-25dB 100MHz
Control format	RS-232/-422	Serial, parallel	Serial coax/tw pair	RS-422/-423	RS-422/-423
Applicable to CAV	Yes	[multilevel audio	Possible	Yes	Yes
Reader Service Number	**1153**	**1154**	**1155**	**1156**	**1157**

[1]The Dynasty series provides systems of several bandwidths, including 30MHz, 40MHz and 60MHz.

Manufacturer	Dynamic Technology/DTL		For-A	Grass Valley Group	
Model/Series	**Routemaster**	**3900 series**	**VRS-2000/ARS-2000**	**Horizon HX-series[4]**	**Horizon systems**
Crosspoint matrix	16x1	16x8 A & V	8x8	16x16 to 64x64	16x16
Typical system size	16x4, 16x8, 32x4	16-256x8-256V[2]	32x32[3]	128x128	128x128
Audio response	±0.25dB 20H-20kHz	±0.25dB 20Hz-20kHzt	<±0.2dB 50Hz-15kHz	24dBu, 12.28V	±0.1dB 20-20k
Harmonic distortion	0.1%, 40Hz-20kHz	0.1%, 40Hz-20kHz	<0.1%	<0.5%, 20Hz-20kHz	<0.5% 24dBu
S/N ratio	-80dBm hum+noise	-80dBm hum+noise	>70dB	>100dB ref +24dBu	>100dB 24dBu
Audio crosstalk worst	-70dB, 10kHz, 600Ω	-70dB, 10kHz, 600Ω	<-70dB at 8kHz	<-80dB 20Hz-20kHz	<-90dB overall
Video response	±0.1dB 5.5MHz[1]	±0.1dB 5.5MHz[1]	±0.1dB to 6MHz	±0.15dB, 5MHz	-0.5,+0.1dB 8MHz
Differential phase/gain	0.1°, 0.1%	0.1°, 0.1%	1°, 1%	<0.1°, <0.1%	<0.1°, <0.1%
C/L delay	....	....	....	....	<10ns
Video S/N ratio	80dB rms wtd	80dB rms	60dB	>75dB	>75dB
Video crosstalk worst	-60dB at 4.43MHz	-60dB at 4.43MHz	56dB 4.43MHz	-60dB, 5MHz	-60dB 5MHz worst
Control format	4-bit BCD codes	RS-422	RS-232C	RS-232/422	RS-422/232C
Applicable to CAV	Possible	Possible	Possible	Possible	Yes
Reader Service Number	**1158**	**1159**	**1160**	**1161**	**1162**

[1]Response is -0.5dB at a 10MHz video bandwidth.
[2]May also be configured at 16-to-128 video x 8-to-128 audio.
[3]Systems can be configured in various ways to audio-follow-video with breakaway.
[4]Horizon systems can be configured for multiple level control.

Manufacturer	Grass Valley Group	Image Video			
Model/Series	**Ten-20, 20-Ten**	**Model 9520/9521**	**Model 9600**	**6200**	**Model 9400 RGB(Y)**
Crosspoint matrix	10x20, 20x10	20x10/20x10	40x40 + 2 audio	10x1	20x20 Video only
Typical system size	10x40, 20x20	20x10 w/dual audio	40x40-320x320/multilevel	Unlimited	2-20x40, 20x80 typical
Audio response	±0.1dB 20-20k	-0.25,0dB 20Hz-20kHz	-1,0dB 20Hz-100kHz	-3,0dB 20Hz-20kHz	[Parallel, serial
Harmonic distortion	0.05% +24dBu	<0.02% +18dBm	<0.02% +18dB	<0.02% +18dBm out	[or multiplex
S/N ratio	110dB 20Hz-80kHz	>96dB	105dB typical	>80dB below +8dBm	[component encoded
Audio crosstalk worst	80dB 20Hz-20kHz	<75dB 20kHz	>75dB 20kHz	>73dB 15kHz	[video systems.
Video response	±0.5dB to 10MHz	-2.5,0.05dB to 30MHz	-1,0dB to 20MHz	-0.5,0dB to 10MHz	-0.1,0dB dc-10MHz
Differential phase/gain	0.1°, 0.1%	<0.15°, <0.15%	<0.1°, <0.1%	<0.25°, <0.25%	<0.25°, <0.25%
C/L delay	0.25% 2T Pulse/Bar	....	....	....	....
Video S/N ratio	75dB to 5MHz	>70dB	75dB typical	>70dB below 1Vp-p	>75dB rms
Video crosstalk worst	-50dB 10MHz	....	-70dB typical, 5MHz	<-60dB to 4.2MHz	<-65dB to 5MHz
Control format	RS232/422, 9-pin D	RS-232/422, BCD	Various methods	8-bit serial control	Various
Applicable to CAV	Possible	Not suggested	Also MAC, HDTV	No	Yes
Reader Service Number	**1163**	**1164**	**1165**	**1166**	**1167**

Manufacturer	Intergroup Video	ITC/3M	Kaltronics		Key Video
Model/Series	**Series 1100**	**Audio Switcher**	**RS-10 series[1]**	**RGB-component series**	**AVS-series[3]**
Crosspoint matrix	10x10 AFV, 20x10 A/V	32x32	10x1	10x1	10x1
Typical system size	80x80	32x64, 64x32, 256x256	10x5, 10x10[1]	10x5, 10x10[2]	Various, multilevel
Audio response	±0.1dB 30-15k	±0.1dB 20-20k 0dBm	±0.3dB 20Hz-20kHz	±0.3dB to 20kHz	±0.2dB 20Hz-20kHz
Harmonic distortion	<0.025%	<0.01% 0dBm	0.1% +4dBm wtd	0.1% +4dBm	<0.05% +18dBm
S/N ratio	>78dB	>90dB 0dBm	>60dB	>60dB	>90dB below +18dBm
Audio crosstalk worst	≤-70dB	<-90dB 1kHz 20dBm	70dB isolation to 20kHz	>70dB isolation	>80dB below +18dBm
Video response	±0.25dB to 8MHz	[Includes memory	±0.1dB to 6MHz	30dB bandwidth	±0.1dB to 5MHz
Differential phase/gain	<0.25°, <0.25%	[backup, system	<0.25°, <0.25%	<0.25°, <0.25%	<0.1°, 0.1%, 4.43MHz(2)
C/L delay	....	[status monitors;	....	....	<10ns, <0.1dB
Video S/N ratio	≥65dB	[alerts operator	>70dB	>70dB	>70dB unwtd
Video crosstalk worst	≤62dB	[of failures.	<-60dB	<-60dB	>60dB at 4.43MHz
Control format	Various types	To 31 remote controls	RS-232C/-422	RS-232C/-422	RS-422, RS-232
Applicable to CAV	Yes	....	Yes	Yes	Possible
Reader Service Number	**1168**	**1169**	**1170**	**1171**	**1172**

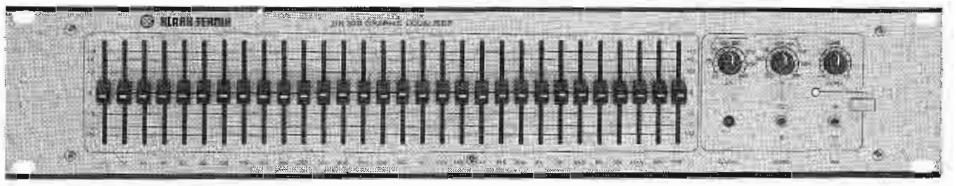
[1]The system allows up to 3 levels of audio-follow control.
[2]Levels include 1-audio, 3-video.
[3]Various configurations of audio, video and A/V multilevel control available; values given based on 0dB system gain.

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30 band ⅓ octave graphic equaliser – Frequency response ±0.5dB (20Hz – 20kHz), Distortion (+4dBm)<0.01% at 1kHz, Equivalent input noise <−90dBm, Auto-bypass failsafe, Low and High pass variable filters, Balanced XLR input and output.

Also available for stereo applications DN360 Dual Channel 30 band ⅓ octave graphic equaliser.

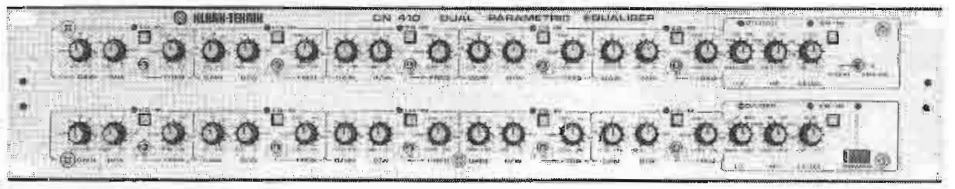
DN300
GRAPHIC EQUALISER



Dual channel 5 band parametric equaliser – Frequency response ±0.5dB (20Hz – 20kHz), Distortion (+4dBm)<0.01% at 1kHz, Equivalent input noise <−90dBm, 100% Frequency overlap for each filter + variable bandwidth, Bypass, XLR inputs and outputs.

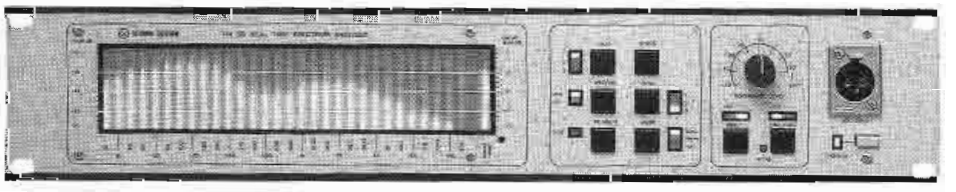
Also available DN405 Single Channel 5 band parametric equaliser.

DN410
PARAMETRIC EQUALISER



Real time audio spectrum analyser – 30 band ⅓ octave + overall level, LED display, Pink noise source, Mic/line XLR input, AT1 measuring microphone, X-Y plotter output, Add-on reverberation analyser available.

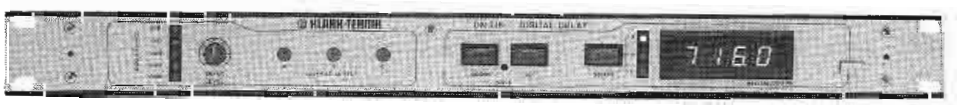
DN60
SPECTRUM ANALYSER



One input-three outputs digital delay line – Frequency response ±1dB (20Hz-20kHz), Distortion<0.01% at 1kHz, Dynamic range>90dB, Minimum increment 20 micro sec, Delay range 0-1.311 sec, Digital conversion 16 Bit Linear, XLR terminated input and outputs.

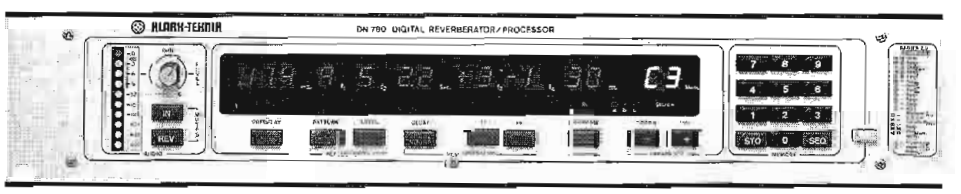
Also available DN773 Stereo 10 sec. digital delay line.

DN716
DIGITAL DELAY LINE



Digital reverberation system – Bandwidth (reverb mode) 20Hz-12kHz, Distortion <0.03% at 1kHz, Dynamic range 85dB, Digital conversion 16 Bit Linear, Arithmetic processor 32 Bit, Stereo processing, Balanced XLR input and outputs, 7 parameter control, 28 programme library, 50 user memories, Midi interface, Updatable programming, Remote control.

DN780
DIGITAL REVERB



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Manufacturer	Key Video	3M Company		
Model/Series	SRS-1000	AX series	Series H	Model 40X
Crosspoint matrix	10x1	20x10	16x2 V/A	10x1 (40x1)
Typical system size	80x512	40x10 m/20x10 s	64x64 V w/3A[1]	40x20 Vw/2A
Audio response	±0.2dB 20Hz-20kHz	±0.25dB 20-20k	±0.15dB to 20kHz	±0.25dB 20-20k
Harmonic distortion	<0.05% +18dBm	<0.15%	0.15%, 0.1% IMD	<0.3%
S/N ratio	>90dB below +18dBm	65dB hum+noise	76dB 300kHz bw	>85dB to 15kHz
Audio crosstalk worst	>80dB below +18dBm	>65dB 20-20k	79dB	>70dB 20kHz 21dBm
Video response	±0.1dB to 5MHz	....	-1.8,+.5dB to 20MHz	±0.5dB to 12MHz
Differential phase/gain	<0.3°, 0.3%, 4.43MHz	....	0.1%, 0.1° 3.58MHz	0.4%, 0.4°
C/L delay	<10ns, <0.1dB	....	±10ns max	....
Video S/N ratio	>70dB unwtd	....	>73dB	>60dB hum+noise
Video crosstalk worst	>60dB at 4.43MHz	....	-60dB 4.43MHz	60dB at 3.58MHz
Control format	RS-422, RS-232	RS-232	RS-422	RS-232
Applicable to CAV	Possible	No	....	No
Reader Service Number	**1173**	**1174**	**1176**	**1177**

[1]Systems of 32x32 and 128x32 configuration also available.

Manufacturer	McCurdy Radio	NEC America	Omicron Video	PESA	pro-bel
Model/Series	ACP-1 (ACP-24)	TKA-500B/AKA-500B	553-20/10-4V/A	SIM-4032	ADAM mixed A/D
Crosspoint matrix	200x2 (24x2)	8x16	10x1	16x2	4-in, 4-out buffers
Typical system size	200x>200 (24x24)	512x512 A/V 6-level	20x10 4V/1A	32x32	128x128, 256x256
Audio response	±0.2dB 20-20k	±0.2dB 20-20k	±0.5dB 30-20k	0.5dB 100-10k	±0.25dB 20-20k
Harmonic distortion	<0.1% -10,+24dBu	<0.01% 8dBu	<0.1% 18dBm	≤0.1%	<0.1% 30-20k 8dBu
S/N ratio	>95dB wideband	-85dBu	>105dB +25dBv output	≥65dB	>80dB wtd
Audio crosstalk worst	<-80dB worst case	-85dB 20-20k worst	<-80dB 15kHz	<-75dB	<-96dB 20kHz
Video response	[Unit for audio	-0.5,+0.2dB 10MHz	±0.2dB 300k=5MHz	[Design intent is	[Mixed analog &
Differential phase/gain	[only, input and	±0.2°, ±0.2%	<0.25°, <0.25%	[for intercom use.	[digital in/out,
C/L delay	[output modules	±5ns	....	[Possible program	[48kHz sampling
Video S/N ratio	[required.	64dB unwtd 10MHz	>65dB	[audio use.	[per CCIR, AES, EBU
Video crosstalk worst	....	<-50dB 10MHz worst	<-60dB at Fsc	....	....
Control format	X-Y, DTMF, other	BSNET lan, RS-422	RS-232/-422	RS-232C	RS-422/485/232
Applicable to CAV	....	Yes	Possible	....	....
Reader Service Number	**1178**	**1179**	**1180**	**1181**	**1182**

Manufacturer	pro-bel	ROH/Anchor Audio	Shintron	Siemens AG	Sierra Video Systems
Model/Series	Analog systems	ARMS-7000	12X-Q4 (12xC4-12xV4)	Crossmatic D Audio	Series 8/16
Crosspoint matrix	8x1/8x8	16x16	4-RGB/pulsex4	32x32	8x8, 16x4
Typical system size	256x64/144x256	48x48, mono, stereo	12x4	32x96, 96x96	16x24 V/SA/TC
Audio response	<±0.2dB 15-20k	±0.2dB 20Hz-20kHz	....	±0.4dB 40Hz-15kHz	±0.1dB 20-20k
Harmonic distortion	<0.05% 8dBu	0.01% Max THD/IMD	[For analog video	≤0.5% +22dBu 40Hz	0.1% 24dBm
S/N ratio	>90dBu true RMS DIN	>85dB, 20kHz bw	[component use only	<-92dBq	100dB 24dBm
Audio crosstalk worst	<-90dB worst	<-85dB, 1kHz	....	>100dB	-80dB
Video response	-0.5,+0.25dB 8MHz	....	-3dB to 30MHz	....	-0.5,+0.1dB 8MHz
Differential phase/gain	-L0.2°, <0.2% 4.43MHz	[Audio signal	<0.25°, <0.25%	[System for	≤0.25°, 0.25%
C/L delay	<0.5%	[routing only.	10ns	[audio applications	....
Video S/N ratio	>73dB wtd luminance	....	63dB typical	[only.	....
Video crosstalk worst	<-60dB adjacent	....	<-60dB, 5MHz	....	≥50dB 3.58MHz
Control format	RS-232C/422/485	IBM PC/AT	RS-422 bus	RS-232C, RS-422	RS-232
Applicable to CAV	Possible	....	Yes	Not applicable	Yes
Reader Service Number	**1183**	**1184**	**1185**	**1186**	**1187**

Manufacturer	Sigma Electronics	Telemet	Utah Scientific		Vortex Communications
Model/Series	SVC212/SVC213	Series 7900	AVS-1B	CAA/CAV-20/10	GC series
Crosspoint matrix	10x1 component	30x4, 12x8, 6x12	10x10	10x10	....
Typical system size	10x2, 10x3	300x300	320xcox8-level	10x10, 20x10, 4-level	64x64, 4-level[1]
Audio response	....	±0.5dB 30Hz-15kHz	±0.5dB 30-20k	±0.05dB 30Hz-20kHz	±3dB 10Hz-200kHz
Harmonic distortion	....	0.5% +18dBm	0.05% 24dBm	0.05% 24dBm	<0.1% wtd 4-Hz-30kHz
S/N ratio	....	-65dBm	-85dBm 15kHz bw	70dBm 15kHz bw	-95dBu true rms
Audio crosstalk worst	....	-65dB 15kHz	-90dB 30dBm	-75dB 30dBm dc-20kHz	90dB at 15kHz
Video response	1dB to 20MHz	±0.2dB to 8MHz	±0.5dB to 20MHz	±0.1dB to 10MHz	±3dB to 25MHz
Differential phase/gain	<0.5%, 0.2°	<0.5°, 0.5%	0.05°, 0.05%	±0.5°, 0.05%	<0.4°, <0.4%
Video S/N ratio	>70dB hum+noise	70dB	80dB hum & noise, wtd	75dB w/5MHz BW	>70dB
Video crosstalk worst	>60dB worst	-60dB to 3.58MHz	-60dB at 4.43MHz	-58dB 1Hz-3.58MHz	-92dB 3.58/4.43MHz[2]
Control format	Serial, parallel	RS-232, other	RS-422/-232/Dynabus	RS-232/422	RS-422
Applicable to CAV	Yes	Possible	Yes	Yes	MAC, RGB, Packet, HDTV
Reader Service Number	**1188**		**1189**	**1190**	**1191**	**1192**

[1]Allows master switching with any number of slave units.
[2]Video crosstalk rated -70dB for a 40MHz bandwidth.

Still Stores/Video Disk Recorders

Electronic video image archiving equipment based on magnetic or optical disk mass storage technologies. These systems include store/retrieve as well as signal/image manipulation functions.

Manufacturer	Abekas Video Systems		Ampex AVSD		ASACA/ShibaSoku
Model Series	A42 video slide proj	A62 (A64, A60)[1]	ESS-3	ESS-5 & ESS-5G	ADS-6000 HDTV
Storage medium	Winchester disk	Winchester disk	Winchester, floppy	Removable disk, tape	Magneto-optical
# of work stations	1	1	To 10	2 (compose, access)	1
Output channels	2-pgm, 1-prvw	1-pgm, 1-prvw	10-pgm, 15-prvw	Pgm/Prvw or dual	1-prg, 1 prvw
Color standards	NTSC	NTSC/RGB (CCIR 601/PAL)	NTSC, PAL	NTSC, PAL	CCIR 601, NTSC

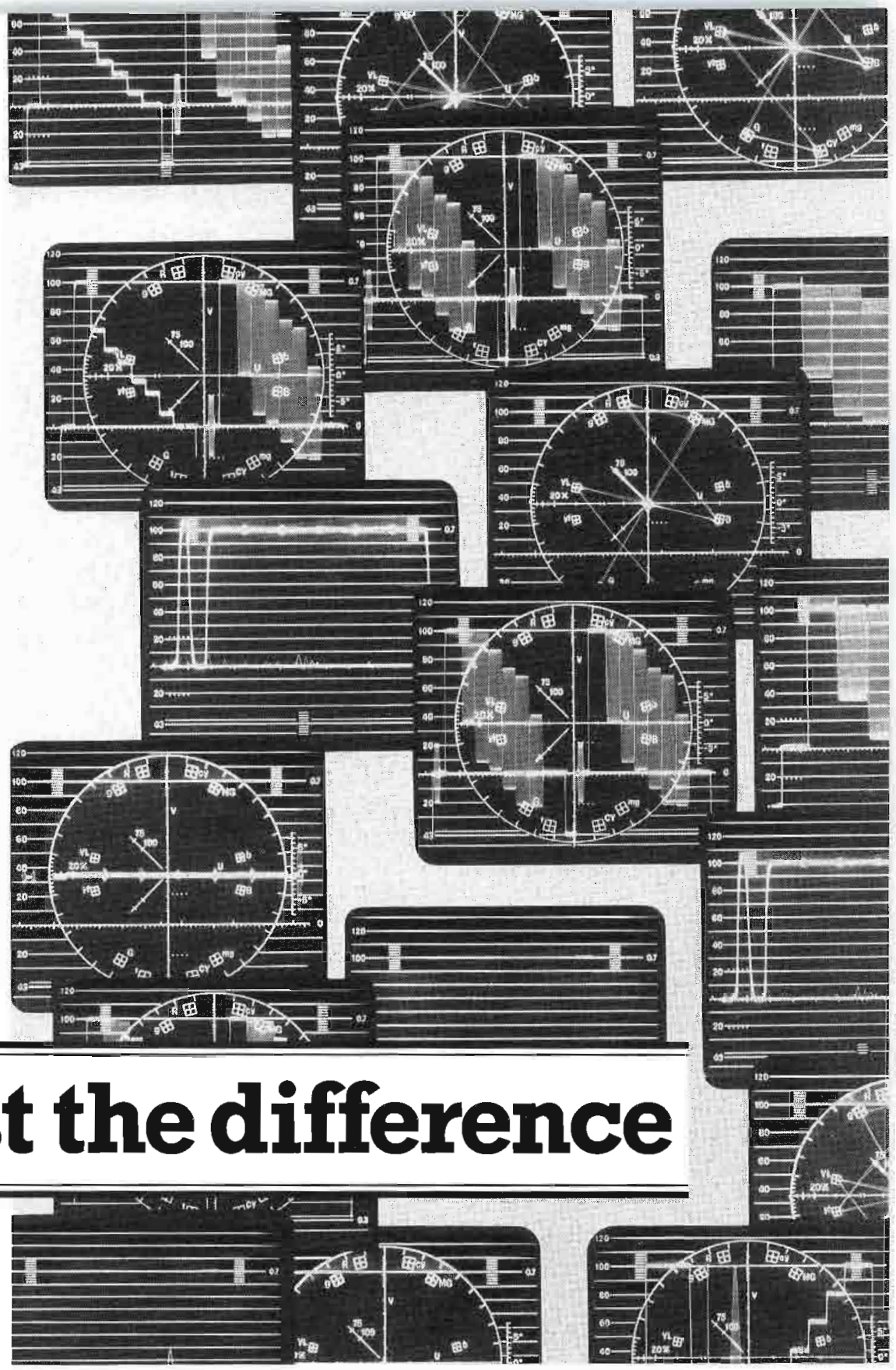
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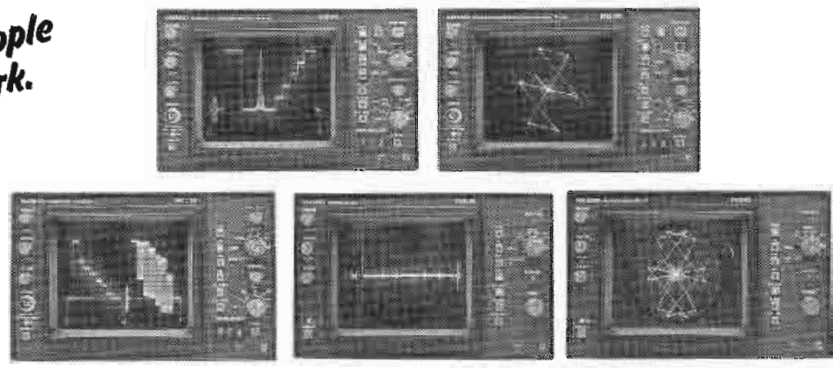
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Manufacturer	Abekas Video Systems		Ampex AVSD		ASACA/ShibaSoku
Model Series	**A42 video slide proj**	**A62 (A64, A60)[1]**	**ESS-3**	**ESS-5 & ESS-5G**	**ADS-6000 HDTV**
Directory.catalog	Data list, proof sheet	Parameter display	List, proof sheet	w/browse 12/screen	Data list
Integral effects	Yes	Key, matte (& layering)	Yes	Yes	....
Editing control port	GPIB	RS-232/422/GPIB/SMPTE	GPI	....	RS-422, VME bus
Portable system	Yes	No	No	No	No
Video response	±0.25dB to 4.2MHz	±0.25dB 4.2MHz (5.5)	±0.5dB to 5MHz	±5dB to 5.9MHz	-3dB 60Hz-29MHz
S N ratio	52dB	52dB (56dB)	....	....	....
Diff. phase, gain	2=0, 2%	2=0, 2%	1=0, 1%	≤2°, ≤2%	(1125 line/60 field
K factor	1%	1%	....	≤1% 2T	(with 2:1 interlace.
Chroma luma delay	5ns	[Real time play	....	≤10ns	Overshoot <2% sin²
Time base stability	....	[and simultaneous	....	(4:2:2 13.5MHz proc)	[System uses 64.8MHz
TBC requirement	....	[record functions	External required	No	[8-bit sampling of
Composite digital	Yes	....	Yes	Composite analog I/O	[RGB signals.
Component digital	No	RGB, YCrCb (YUV)	4:2:2 encoded	RGB outputs	RGB digital recording
# of drives max	3	1 (2)	25 possible	1 + 4 outboard	8 disk drive units
Streaming tape	Yes	No	No	Yes	....
Frames per disk	350	....(30s/disk)	100 on 80MByte drive	200 NTSC/160 PAL std	1,200 per disk unit
Frames per systems	1050 (2100 fields)	3000, 100s time (60s)	25,000	....	9,600 frames
Worst case access	0.8s	Instantaneous	3s	≤0.8s	30-500ms, jump dep
Programmed sequences	Yes	Loops, sequence editor	Yes	Yes	Yes
Reader Service Number	**955**	**956**	**957**	**958**	**959**

Manufacturer	ASACA/ShibaSoku		Aston Electronics	BTS Broadcast TV Systems
Model Series	**ADS-200**	**ADR-5000 (-5500)[1]**	**ADS-5000[2]**	**Wallet**	**Vidifont GraphicStore**
Storage medium	Floppy disk	Rewritable MO disk	Magneto-optical	Winchester cartridge	Winchester, floppy
# of work stations	1	1	1	1	1
Output channels	Pgm, prvw	1-prg, 1 prvw	Dual pgm, prvw	Pgm, Prv, Key	1 pgm, 1 prvw
Color standards	NTSC	Composite Dig (4:2:2)	NTSC	NTSC/PAL from RGB	NTSC, PAL
Directory.catalog	....	Data list	16-pix proof sheet	Disk directory	Data list, proof sheet
Integral effects	Limited effects	No	No	....	w/Vidifex 3-D
Editing control port	RS-422	RS-422	RS-422 LAN	No	RS-232/422
Portable system	Limited	No	No	No	No
Video response	±0.5dB to 5.5MHz	±0.5dB to 6MHz (5.5MHz)	±0.5dB to 6MHz	[System based on	1088x483 pixel
S N ratio	>50dB	>52dB (>56dB)	>52dB	[CCIR 601 13.5MHz	....
Diff. phase, gain	<2°, <2%	<2°, <2=5 (n.a.)	<2°, <2%	[luma, 6.75MHz	....
K factor	....	<1 for 2T pulse	....	[chroma sampling.	....
Chroma luma delay	....	....	....	[Output processors	....
Time base stability	....	....	....	[for NTSC/PAL	....
TBC requirement	Integral processing	No	Integral processing	....	Integral unit
Composite digital	....	4xFsc	1, 2, 4-field modes in	....	....
Component digital	4xFsc/8-bit recording	RGB or Y/R-Y/B-Y	4xFsc/8-bit recording	RGB, YUV	RGB analog
# of drives max	2, hard drive option	10 disk packs	4	2	8
Streaming tape	No	....	Option	No	No
Frames per disk	25 frames/floppy	18,000 or 10 min video	2,250 2-field w/audio	39 40MByte/42 44MByte	70-250, 40-140MByte

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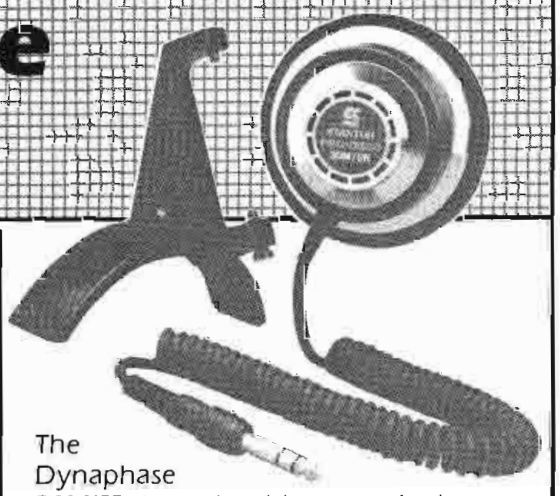
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Manufacturer	ASACA/ShibaSoku		Aston Electronics	BTS Broadcast TV Systems
Model Series	**ADS-200**	**ADR-5000 (-5500)[1]**	**ADS-5000[2]**	**Wallet**	**Vidifont GraphicStore**
Frames per systems	100 frames w/hard drive	180,000 (72,000)	18,000	78, 84	2,000 max
Worst case access	3.7s FD, 1.2s HD	30-500ms, jump dep	500ms	2s or less	5s
Programmed sequences	Yes	Yes	Yes	Yes	Yes
Reader Service Number	**960**	**961**	**962**	**963**	**964**

[1]Includes 2-channel 16-bit digital audio capability.
[2]Disk stores 115s of 16-bit digital audio per 2-field image.

Manufacturer	DSC/Digital Services	Harris Video		Leitch Video	Logica
Model Series	**DiSC**	**Vws 1000 (5000)**	**Iris C (Iris-II)**	**DSF-3100N Still File**	**Gallery 2000 library**
Storage medium	Winchester	Winchester, optical	Winchester	5¼" Winchester	Optical/disk
# of work stations	1	Multiple	2 (6)	2 independent	Multiple
Output channels	1	2	4-pgm, 4 prvw (12, 12)	Single, dual	Multiple
Color standards	NTSC	NTSC, CCIR-601	NTSC, PAL, SECAM	NTSC 4-field	CCIR 601/525-60/625-50
Directory.catalog	Full screen disk status	MultiViews 12-image	Data list	Still review mode	Proofsheet
Integral effects	Priority key, DSK	Option	Yes	3100FX options	w/Art File graphics
Editing control port	RS-232, IEEE-488	Yes	RS-232	PC SCSI interface	Yes
Portable system	No	No	Yes (No)	....	No
Video response	....	[Equipment can be	±0.2dB to 4.2MHz	±0.15dB to 4.5MHz	±0.5dB 5.5MHz
S N ratio	[Real time play and	[configure to multi	57dB (56dB)	>70dB	[per CCIR 601
Diff. phase, gain	[simultaneous record	[function work	1°, 1%	<1°, <2%	[recommendation
K factor	[during multilayer	[station.	1%	....	[for digital
Chroma luma delay	[image construction.	....	17ns	±10ns	[TV use.
Time base stability	[Macro program store	....	....	....	....
TBC requirement	[on 3.5" floppy.	Integral frame buffer	Integral	2-3110FB frame buffers	No
Composite digital	SMPTE/CCIR 601X	Option	....	Yes	A/D conversion
Component digital	No	Option	4:1:1 sampling	....	YUV 4:2:2 encoded
# of drives max	2 std/4 opt	Various configurations	2 (8)	Multiple	Multiple
Streaming tape	....	....	No	750-field option	No
Frames per disk	212s/2-disk	400/300MByte disk	1,066	750 frames	2,800 525-line
Frames per systems	424s optional	>450,000	2,132 (8,528)	Expand to 10,000	56,000
Worst case access	"Instantaneous"	....	600ms	<0.6s	1s
Programmed sequences	Loops, random access	Yes	Yes	10 seq of 99	Yes
Reader Service Number	**965**	**966**	**967**	**968**	**969**

Manufacturer	Optical Disc Corporation		Quantel	Rank Cintel	TEAC
Model Series	**RLV Mark II**	**#610A**	**Library Systems**	**Slide File**	**LV200, 200A (250)**
Storage medium	Optical disc	Optical DRAW system	Winchester	Winchester	Optical disk WORM
# of work stations	1	1	2 (1)	5	1
Output channels	1	1	2-pgm, 1-prvw, (1 pgm)	3-pgm, 3-prvw	One

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Circle (96) on Reply Card

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Manufacturer	Optical Disc Corporation		Quantel	Rank Cintel	TEAC
Model Series	**RLV Mark II**	**#610A**	**Library Systems**	**Slide File**	**LV200, 200A (250)**
Color standards	NTSC	NTSC, PAL	NTSC, PAL, SECAM	NTSC, RGB, PAL, SECAM	NTSC (monochrome)
Directory.catalog	No	....	Data list, proof sheet	Proof sheet	None
Integral effects	No	No	Yes (No)	Yes	No
Editing control port	....	No	RS-422	RS-232/422/QIC02	RS-232C
Portable system	No	No	If desired	Yes	Yes
Video response	4.5MHz bandwidth	[For preparation of	[CLL6000 access to	±0.5dB to 5.5MHz	Equiv 330TVL (550TVL)
S N ratio	>45dB unwtd	[recordable Laser	[40 drives to total of	[Per CCIR 601	45dB
Diff. phase, gain	....	[Videodiscs only,	[100,000 frame stored	[recommendation	....
K factor	[Includes program	[not for on-air	[with 25-workstation	[for digital	....
Chroma luma delay	[audio capability	[broadcast use.	[network.	×elevision use.	....
TBC requirement	....	....	....	Integral	Preferred
Composite digital	Analog	Yes	Yes	Yes	RS-170A analog
Component digital	....	No	YCrCb	YUV 4-2-2 encoding	No
# of drives max	1	1	8 (2)	2	1
Streaming tape	No	No	No	Yes	None
Frames per disk	60 minutes CLV	n.a.	800	390	54,000 per side
Frames per systems	30 minutes CAV	n.a.	6,400 (1,600)	500,000	108,000 per disk
Worst case access	....	n.a.	0.5s	1s	1s across disk
Programmed sequences	No	No	Yes	Yes	Programmed RAM pack
Reader Service Number	**970**	**971**	**972**	**973**	**974**

Video TBCs, Frame Synchronizers

Equipment for stabilizing reproduced images from VTRs, VCRs or in synchronizing imported video signals from satellite, ENG microwave or other out-of-house sources. Models marked with a check (–) do not include a coherent 3.58MHz output. A single dagger (†) indicates color correction capabilities. Some dropout compensation is available in all TBCs, while all synchronizers include hot-switching capabilities.

Manufacturer	ALTA Group	Ampex AVSD		Broadcast System Design	Digital Processing Systems (Midwest)
Model	**Cygnus[1]†✓**	**TBC-6**	**Zeus[2] (TBC-7)†**	**501 TBC[4]†**	**DPS-165/165A†✓**
Function	TBC, synchronizer	TBC only	TBC, framestore (TBC)	TBC	Synchronizer
Sample freq/bits	....	14.3MHz/8-bit	4xFsc/9-bit (8-bit)	16.11MHz/8-bit	4xFsc/8-bit
Correction window	1 field	28 TVL	60 TVL, 1-frame (28 line)	±8 lines	>525 TVL
Video bandwidth	290 TVL	±0.2dB to 4.2MHz	±0.2dB to 5MHz (4.2MHz)	±0.5dB 10Hz-6.4MHz	±0.25dB, 0-4.2MHz
S/N ratio	>55dB	56dB	>58dB (>56dB)	58dB p-p to RMS	>58dB luma wtd
Differential phase/gain	<3°/<3	2°/2	≤2°/≤2%	1.5°/1.5%	<2°/<2
Residual error	....	±2.5ns chr	<2.5ns Chr/<10ns mono	±10ns Y, ±2ns C	....
Advanced sync out	....	Yes	Yes	Yes	No
Component in	No	Composite	Composite	Y/C, Y/688, Y/629, NTSC	Mono or direct color
Component out	No	Composite	Composite	Y/C, Y/688, Y/629, NTSC	Composite only
Velocity compensation	....	Yes	Frame averaging (Yes)	....	....
Heterodyne processing	Yes	Yes	Yes	Yes	No
Non-servo capstan	Yes	No	Yes	Yes	Yes
Dynamic tracking	Yes	Yes	-1, +3x play, full color	No	....
Noise reduction	Yes	No	Adaptive comb filter	No	No
Image enhancement	H, V	No	Effective[3](No)	H detail	Proc starts line 11
Production effects	Mosaic, poster, freeze	No	Time compress/expand	No	Field/frame freeze
Reader Service Number	**783**	**784**	**785**	**786**	**787**

[1]System includes a 4-input audio/video switcher.
[2]Zeus available in NTSC, PAL, PAL-M, SECAM; TBC-7 available in NTSC, PAL.
[3]Effective enhancement results from Multi-Gen setup with Zeus.
[4]Available in NTSC, PAL.

Manufacturer	Digital Processing Systems (Midwest Communications)			For-A Corporation	
Model Series	**DPS-170†**	**DPS-270†**	**DPS-175A†**	**FA-800 Autocor**	**FA-400✓ (TBC-420)**
Function	TBC	TBC	TBC, synchronizer	TBC, synchronizer	TBC, frame store
Sample freq/bits	4xFsc/8-bit	4xFsc, 8-bit	4xFsc/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	16 TVL	16 lines	>525 TVL	2-field memory	1-frame
Video bandwidth	±0.25dB, 0-4.2MHz	±0.25dB 4.2MHz/±.5 5.5MHz	±0.25dB, 0-4.2MHz	±0.3dB to 5MHz	±0.5dB to 4.2MHz
S/N ratio	>58dB	>58dB	>58dB luma wtd	58dB	58dB
Differential phase/gain	<2°/<2	<2°/<2%	<2°/<2	2°/2	2°/2
Residual error	....	....	....	±25ns	±2° (±10ns)
Advanced sync out	8-line advance	Yes	8-line advance	Yes	Yes
Component in	Composite only	Composite & Y/C(S-VHS)	Composite only	Composite	Composite
Component out	Composite only	Composite & Y/C(S-VHS)	Composite only	Composite	Composite
Velocity compensation	....	....	....	Yes	No
Heterodyne processing	Yes	....	Yes	Yes	Yes
Non-servo capstan	....	....	Yes	Yes	Yes
Dynamic tracking	-1, +3x	....	-1, +3x	Yes	No
Noise reduction	No	No	No	No	No
Image enhancement	No	No	Proc starts line 15	No	No
Production effects	No	No	Field/frame freeze	No	No
Reader Service Number	**788**	**789**	**790**	**791**	**792**

Manufacturer	For-A Corporation				Fortel
Model Series	**FA-410 (FA-430†)**	**FA-740[1]**	**TA-450N, TA-450P**	**FA-300†✓ S-VHS/YC358**	**SP-100/SuperPro**
Function	TBC	Dual TBC w/effects	TBC, framestore	TBC	TBC
Sample freq/bits	14.3MHz/8-bit	8.95-Y/2.2-C/8-bit	13.5-Y/6.75-C/8-bit	13.5MHz, 8-bit/4:1:1	4xFsc 8-bit
Correction window	16 TVL	1-frame	2-field	Frame memory	16 lines
Video bandwidth	-0.5dB to 4.2MHz	8.93MHz Y/2.2MHz C	3.5-N, 4.43-P, 5.5-Y	-3dB Y to 5MHz	4.2MHz, 5.5MHz dub
S/N ratio	58dB color, 56dB VTR-358	55dB	58dB	56dBp-p rms	58dB
Differential phase/gain	2°/2	2°/2%	2°/2	2°, 2%	2°, 2%
Residual error	2° color, 15ns VTR-358	±15ns Y, ±2° C	±2° chr, ±15ns Y	±15ns Y, ±2° C	±15ns
Advanced sync out	Yes	Yes, with Key out	Yes	Yes	Yes
Component in	Composite (Y-688)	Yes	Composite/RGB/YC/YCrCb	Composite/Betacam/M-II	Y/C S-VHS U-matic
Component out	Composite (Y-688)	Yes	Composite/RGB/YC/YCrCb	Composite/Betacam/M-II	Y/C S-VHS
Velocity compensation	No	....	Yes	....	....

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Manufacturer	For-A Corporation				Fortel
Model Series	**FA-410 (FA-430†)**	**FA-740[1]**	**TA-450N, TA-450P**	**FA-300†✓ S-VHS/YC358**	**SP-100/SuperPro**
Heterodyne processing	Yes	¾", ½"	Yes	¾", ½"	Yes
Non-servo capstan	Yes	Yes	Yes	Yes	Yes
Dynamic tracking	No	....	Yes	No	No
Noise reduction	No (6dB)	Comb filtering	No	CCD comb filter	No
Image enhancement	No (Yes)	Yes, programmable	No	....	No
Production effects	No	Yes, RS-422, GPI	No	Freeze, strobe	No
Reader Service Number	**793**	**794**	**795**	**796**	**797**

[1]AS-740 audio switcher and EC-740 edit control for A/B roll editing.

Manufacturer	Fortel			Fougerolle SA	
Model Series	**SuperPro-200†✓**	**Turbo 2✓ (NSC, PAL)**	**DHP525S (625)**	**MPV 1100 series[2]✓**	**MPV 1000[3]†✓**
Function	TBC/framestore	TBC	TBC NTSC (PAL)	Synchronizer	Dual TBC synchronizer
Sample freq/bits	13.5MHz 8-bit	13.5MHz 4:1:1	13.5MHz 8-bit	27MHz/8-bit 4:2:2	13.5MHz/8-bit
Correction window	Infinite window	Infinite window	Infinite window	2-frames	2-fields/channel
Video bandwidth	2.2MHz NTSC, 5.5MHz dub	4.3MHz NTSC dub mode	2.2MHz (3.25MHz)	5MHz RGB or YCrCb	5MHz RGB or YCrCb
S/N ratio	58dB	57dB	57dB	S/N out = S/N in	55dB.
Differential phase/gain	1°, 1%	1°/1%	1°/1%	....	<2°, <2%
Residual error	±15ns	±15ns L, ±2° C	±15ns L, 2° C	None	15ns
Advanced sync out	Yes	Yes	Yes	No	No
Component in	Y/C, Y629, Y/688	Y/688, Y/629, S-VHS	Y/C S-VHS (No)	Parallel 4:2:2	RGB, YCrCb
Component out	Y/C, Y629, Y/688, YCrCb	YCrCb, Y/688	Y/C S-VHS (No)	Parallel 4:2:2	RGB, YCrCb
Velocity compensation	....	....	....	....	Yes
Heterodyne processing	Yes	No	....	....	Yes
Non-servo capstan	Yes	No	Yes	....	....
Dynamic tracking	Yes	Yes	....	No	No
Noise reduction	No	Luminance	Luminance	No	No
Image enhancement	Yes	Horizontal	Horizontal	No	No
Production effects	Freeze frame[1]	Frame, field freeze	Field/frame freeze	Freeze on loss of ref.	Freeze on loss of ref.
Reader Service Number	**798**	**799**	**800**	**801**	**802**

[1]Or interpreted fields.
[2]For use in parallel configured 4:2:2 systems.
[3]Appropriate for in PAL, SECAM applications.

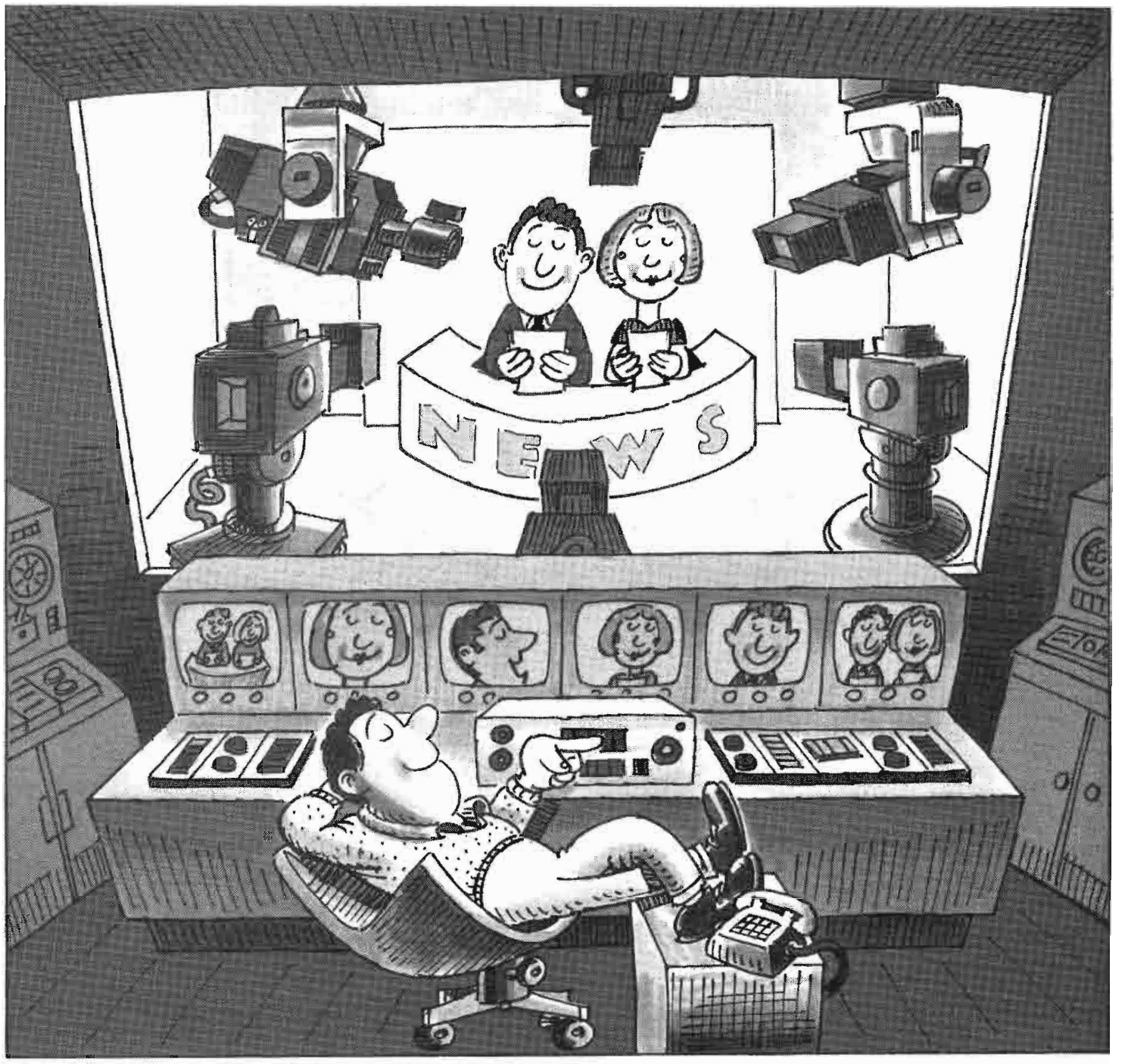
Manufacturer	GML Grove	GML/Gunnerfield Mktg	Harris Video		
Model Series	**SYSTEM DVP†**	**GML4004S PAL/SECAM†**	**632 NTSC (631 PAL)✓**	**Model 642**	**VW-3**
Function	TBC, synchronizer[1]	Dual TBC w/effects	Synchronizer	TBC, synchronizer	TBC, synchronizer
Sample freq/bits	8-bit Y/U/V	13.5MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	....	16 TVL	2-field	2 field	1 frame
Video bandwidth	260 TVL	To 3MHz w/color under	±0.5dB 5MHz(±0.5dB 4.2L)	±0.5dB to 4.2MHz	±0.5dB to 5MHz
S/N ratio	58dB	55dB	57dB (56dB)	58dB unwtd	56dB
Differential phase/gain	2°/2%	4°/4%	2°/2% (1°/1%)	<2°/2%	<2°/2%
Residual error	....	±25ns	±10nsL/±2°C (±20nsL)	±2ns sync, ±20ns TBC	±20ns
Advanced sync out	2 outputs	Yes	Sync out	16 line advance	Yes
Component in	Composite only	No	RGB	No	No
Component out	Composite only	RGB	RGB	No	No
Velocity compensation	....	No	Yes	No	Direct, hetero mode
Heterodyne processing	Yes	Yes	Yes	No	Yes
Non-servo capstan	....	Yes	Yes	No	....
Dynamic tracking	No	Channel A only	No	-1, +3x play	No
Noise reduction	No	Noise coring	12dB range L, C	12dB frame recursive	No
Image enhancement	10 event memory	....	No	No	No
Production effects	Solar, poster, mosaic[2]	Yes	630 compress/position	No	Field, frame freeze
Reader Service Number	**803**	**804**	**805**	**806**	**807**

[1]Single & dual channel configurations possible.
3W[2]Conceals, reveals, wipes also available.

Manufacturer	Harris Video		Hotronic		
Model Series	**550VT (540/560)**	**634 Component RGB✓**	**AE61 (AE61B✓)**	**AF71**	**AG81**
Function	TBC	Synchronizer	TBC	TBC, synchronizer	TBC/stills/slow motion
Sample freq/bits	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	
Correction window	16 TVL	1-frame	16 TVL	4-field	32-128 frame
Video bandwidth	±0.5dB 4.2MHz #540	0.2dB 4.2MHz Luma	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz
S/N ratio	>59dB (56dB)	57dB	58dB	58dB	58dB
Differential phase/gain	2°/2% (3°/3%)	1°/1%, 17ns C/L delay	<2°/<2	<1.5°/<1.5	<1.5°, <1.5%
Residual error	±20ns L, ±2ns C (<±15ns)	±10ns L/±2° C (50dB S/N)	±20ns monochr	±20ns	±20ns
Advanced sync out	Yes	Sync, blanking	Yes	Yes	Yes
Component in	No	RGB, NTSC composite	No	Composite	Composite only
Component out	No	RGB, NTSC composite	No	Composite	Composite only
Velocity compensation	Not 560	....	No	No	Yes
Heterodyne processing	550, 560	Yes and direct	Yes	Yes	Yes
Non-servo capstan	No	Yes	....	No	Non-segmented
Dynamic tracking	540, 550 option	....	No	No	Yes
Noise reduction	No	10dB range L, C	Option	3dB chroma	No
Image enhancement	No	No	No	No	No
Production effects	No	Field, frame freeze	No	No	Field, frame freezes
Reader Service Number	**808**	**809**	**810**	**811**	**812**

Manufacturer	JVC Company		Leitch Video	Lenco
Model Series	**SA-T3000U (SA-T400U)**	**SA-T300U, -350U**	**KM-F250U Multiformat**	**DFS-3000N[3]†✓**	**Starflex 4500 Ministore✓**
Function	TBC	TBC	Synchronizer	Synchronizer 2/4-field	TBC/synchronizer
Sample freq/bits	858H, 8-bit	13.5MHz 8-bit	13.5MHz/8-bit/CCIR 601	14.3MHz/8-bit (9-bit)	14.3MHz/8-bit
Correction window	±16 lines	32 lines	525 lines	Infinite	525-line
Video bandwidth	-3dB 4.5MHz Y, 1.5MHz C	-3dB to 4.2MHz luma	-3,+0.5MHz[1]	±0.15dB to 4.5MHz	-3dB at 3MHz
S/N ratio	>56dB	>56dB	>58dB	>70dB	>55dB

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Manufacturer	JVC Company			Leitch Video	Lenco
Model Series	**SA-T3000U (SA-T400U)**	**SA-T300U, -350U**	**KM-F250U Multiformat**	**DFS-3000N[3]†✓**	**Starflex 4500 Ministore✓**
Differential phase/gain	<2°/<2%	<2°/<2%	<±2° error Y/C separte	<1°/<2%	<2° /<2%
Residual error	....	<20ns	±15ns luminance	<±0.1dB gain, <±10ns	....
Advanced sync out	....	....	Yes	H&V adjustable	No
Component in	Y/R-Y/B-Y (Y-C3.58)	Y/R-Y/B-Y	YCrCb, Y-C[2], NTSC	Composite only	No
Component out	Y/R-Y/B-Y, composite	Y/R-Y/B-Y, NTSC	YCrCb, Y-C[2], NTSC	Composite only	No
Velocity compensation	....	....	....	....	....
Heterodyne processing	....	No	Yes	No	Composite signal
Non-servo capstan	....	....	Yes	No	....
Dynamic tracking	No	No	No	No	....
Noise reduction	No	No	No	Digital, adaptive	No
Image enhancement	No	No	No	No	No
Production effects	....	Field, frame freeze	Field, frame freeze	Field, frame freeze	Freeze
Reader Service Number	**813**	**814**	**815**	**816**	**817**

[1]Values given for composite configuration; 5.5MHz bandwidth for Y component.
[2]Applicable to both U-Matic and S-VHS VCRs.
[3]DFS-3000N-9 uses 9-bit sampling; both 8- and 9-bit units include an RS-232 port coupling to an audio delay synchronizer.

Manufacturer	Lenco	Marconi Communications		Microtime	
Model Series	**TBC-450**	**B2022 PAL[1]✓**	**S-130 (S-230)**	**Tx2[3]†**	**Tx4[4]†**
Function	TBC	Synchronizer	Synchronizer (& TBC)	Single, dual TBC	TBC
Sample freq/bits	14.3MHz/8-bit	3xFsc, 9-bit	4xFsc/8-bit (3x PAL-B)	13.5MHz	14.3MHz/8-bit
Correction window	16-line	2-fields	4-field	1-frame, infinite	1-field
Video bandwidth	±0.5dB to 4.2MHz	±0.25dB to 5MHz	±0.3dB, 5MHz[2]	2.6MHz NTSC, 5MHz Y/C	Flat to 5.2MHz
S/N ratio	58dB 100IRE flat field	....	>58dB NTSC >53dB PAL-B	58dB	58dB
Differential phase/gain	<2° /<2%	<2°, <3%	2°/2	2°/2	2°/2
Residual error	±20ns	±2°	<±30ns C/L delay	....	<15ns luminance
Coherent 3.58 out	Yes	No	S-234 only	Color field ID pulse	Key signal
Advanced sync out	Yes	No	S-234 only	Yes	Yes
Component in	No	Composite only	Composite	Composite/YC/YCrCb/S-VHS	S-VHS, U-Matic, composite
Component out	No	Composite only	Composite	Composite/YC/YCrCb/S-VHS	S-VHS, composite, Y/CrCb
Velocity compensation	....	No	....	....	....
Heterodyne processing	Yes or 3.58 feedback	No	Yes	Yes	Yes
Non-servo capstan	....	No	Yes	....	....
Dynamic tracking	....	No	No	VariTrak	Yes
Noise reduction	No	No	No	To 5dB	.....
Image enhancement	No	No	Scramble option	No	No
Production effects	No	Black on input failure	Auto mode sensing	Frame freeze	Production effects
Reader Service Number	**818**	**819**	**820**	**821**	**822**

[1]VITS, Teletext pass facility is an optional available through software change.
[2]Video response -3dB to 2.6MHz in TBC mode of S-234; includes 3.58MHz output.
[3]Available for NTSC, PAL-B, PAL-M; offers PAL high-/low-band dubbing.
[4]Offers low-, high-band PAL, NTSC use.



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Manufacturer	Microtime	NEC America	Nova Systems		
Model Series	**T-300 (T-320) [T-320D]**	**FS-18[1]✓ (FS-19)**	**Model 700✓ (700S)**	**Nova Sync✓**	**Model 511**
Function	TBC	Synchronizer, TBC opt	TBC	Synchronizer	TBC
Sample freq/bits	14.3MHz/8-bit	14.3MHz/8-bit (10-bit)	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	35 TVL [Field]	Infinite	32-line	1-frame	32 TVL
Video bandwidth	±0.5dB to 4.2MHz	Y 5MHz (2.4MHz hetero)	2.5MHz-Y, 1.1MHz-C	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz
S/N ratio	58dB	53dB (60dB)	58dB	>58dB pp video/rms noise	58dB
Differential phase/gain	2°/2	<2°/<2 (<1°/<1%)	<2°/<2%	2°/2%	2°/2
Residual error	±10ns	....	±10ns	±10ns Y, 2° C	2° C, ±10ns Y
Coherent 3.58 out	Yes	No (Yes)	No	No...	Yes
Advanced sync out	Yes	Yes	Yes	Looped genlock ref.	Yes
Component in	Composite	No	Composite (Y/C-3.58)	Composite	Composite
Component out	Composite	No	Composite RS-170A	Composite	Composite
Velocity compensation	Averaging ([Yes])	Yes	No	Yes	Yes
Heterodyne processing	Yes	Opt for U, Beta, M, C	Yes	Direct	Yes
Non-servo capstan	Yes	Yes	No	Yes	No
Dynamic tracking	[VariTrak T-320D]	No	No	Yes	Yes
Noise reduction	No	No	No	No	No
Image enhancement	No	No	No	No	No
Production effects	No	Opt Freeze	No	No	No
Reader Service Number	**823**	**824**	**825**	**826**	**827**

[1]AS-18 audio synchronizer interface; 4-field option; integral diagnostics features.

Manufacturer	Nova Systems	Panasonic AV	Panasonic Broadcast	Polar Video	Prime Image
Model Series	**Model 620 (620S)**	**TBC-100 (TBC-200)✓**	**AU-TB50✓**	**Roger - Dual Channel**	**S TBC+ (S TBC-SYNC+)✓**
Function	TBC, framestore	S-VHS TBC	TBC	TBC/synchronizer/store	TBC (synchronizer)
Sample freq/bits	14.3MHz/8-bit	14.3(13.5)MHz 8-bit	13.5MHz/8-bit	17.72MHz, 8-bit	8-bit luma, chroma
Correction window	2-field, 525-line	16-line window	32-line	1 field, each channel	16 line (1-frame)
Video bandwidth	±0.5dB to 4.2MHz	5.5MHz-Y/C 2.2MHz-Enc	Y 4.5MHz, C 1.5MHz	Chroma -3dB at 3.58MHz	4.2MHz
S/N ratio	58dB	58dB	>54dB component	....	58dB
Differential phase/gain	<2°/<2	2°, 2%	1°/1%	2°, 1%	1.5°/1.5%
Residual error	±2°, ±10ns	....	....	±25ns rel. to sync in	±15ns
Advanced sync out	Yes	Yes	10H-21H	No	Yes
Component in	Composite (Y/C-3.58)	Y/3.58, Y/629	CTCM Y-C (YPrPb)	PAL, VHS, U-matic	Y/C S-VHS
Component out	Composite RS-170A	Y/3.58, Y/629	YPrPb	Composite PAL	Y/C S-VHS
Velocity compensation	No	....	....	....	....
Heterodyne processing	Also direct	....	....	Yes	Yes
Non-servo capstan	Also servo	....	....	Yes	No
Dynamic tracking	Yes	No	-1x, +2x	....	Yes
Noise reduction	3dB chroma noise	For chroma	No	By Y/U/V processing	No
Image enhancement	No	In chroma	No	Detail, each channel	No
Production effects	Freeze, var rate strobe	No	No	Field freeze/channel	Yes
Reader Service Number	**828**	**829**	**830**	**831**	**832**

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Circle (100) on Reply Card

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Manufacturer	Sony Broadcast	Tektronix	Video International		Videotek
Model Series	BKH-3010 (BKH-3050)	110-S✓	TBC 3000 NTSC/PAL-M	DTC 2602 (DTC 2502[1])†	VDP-8000†[2]✓
Function	TBC (for BVH-3000/3100)	TBC, synchronizer	TBC, synchronizer	TBC, synchronizer	Synchronizer
Sample freq/bits	14.3MHz/9-bit	14.3MHz/10-bit	13.5MHz-Y/6.75MHz-C 8-bit	13.5, 6.75MHz/8-bit	4xFsc, 8-bit
Correction window	15 TVL	Infinite window	1 frame	Full frame	>525 lines
Video bandwidth	±0.5dB to 4.2MHz	To 4.2MHz	>5.5MHz	>5.5MHz	+0.5, -3dB 4.2MHz
S/N ratio	>49dB	60dB unwtd	54dB	54dB	>54dB
Differential phase/gain	<4°/<4	1°, 1%	2°/2	2°/2	≤2°, ≤2%
Residual error	±2.5ns C, ±15ns mono	....	....	....	....
Advanced sync out	....	No	Yes	25H advance	No
Component in	Signal system dependent	No	Encoded/RGB/YC/YCrCb	Encoded/RGB/YUV/U-matic	Composite only
Component out	Signal system dependent	No	Encoded/RGB/YC/YCrCb	Encoded/RGB/YUV/U-matic	Composite only
Velocity compensation	Yes	No	....	Yes	....
Heterodyne processing	Option	Yes	....	Yes	....
Non-servo capstan	No	Yes	....	Yes	....
Dynamic tracking	With 3050, -1, +3x play	No	Yes	Yes	....
Noise reduction	Inherent reduction	No	4-level to 15dB	3-stage selectable	Inherent 3-line comb
Image enhancement	No	No	H-detail	Detail	Independent field freeze
Production effects	No	No	No	Freeze frame only	Audio sync. output
Reader Service Number	**833**	**834**	**835**	**836**	**837**

[1]DTC 2602 for NTSC/4, PAL, SECAM; PAL-M/N opt; DTC 2502 for NTSC/4 & PAL; PAL-M/N, SECAM opt; both do standards conversion.
[2]Audio synchronizer output available.

Time Code Generators, Readers

These systems are based on SMPTE (and EBU) timing code specifications for use in editing facilities. A check(✓)designates portable systems; all others are rack-mount or desk-top units.

Manufacturer	Adams-Smith	Albrecht Elektronik			Amtel Systems
Model Series	System 2600†	TCU-1	TCU-M3†	TCD	800✓
Operating modes	DF/NDF/CF/JS	NDF/CF	NDF/CF/JS	NDF/CF	Not 24fps
Standards supported	SMPTE, EBU	EBU	EBU PAL 8-field	EBU PAL 8-field	SMPTE
Time reference	Video, 60Hz, xtal	Video	Video	Video	Video sync
Data entry for	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	0 min, 100x max	0.3 to 30x play	0.30 to 30x play	0.30 to 30x play	Play only for jam
Editor interface	Yes	....	Yes	....	....

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Circle (102) on Reply Card

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Manufacturer	Adams-Smith	Albrecht Elektronik		Amtel Systems
Model Series	System 2600†	TCU-1	TCU-M3†	TCD	800✓
VITC code output	SMPTE, EBU	VITC reader	EBU standard	No	No
LTC output signal	0dBm, 1Vp-p 600Ω	LTC reader	0-4V	No	Yes
Synchronizer function	Yes	No	Yes	No	No
Power requirement	110/220Vac	220Vac	220Vac	220Vac	Battery
User bit recognition	Yes	....	Yes	No	No
Time code comparator	Yes	....	Yes	No	No
Video display keyer	16-char/10-100TVL	Yes	Yes	Yes	No
Display window	2-line	....	2-line	No	No
Reader Service Number	1005	1006	1007	1008	1009

Manufacturer	Amtel Systems	Audio Kinetics		Cipher Digital
Model Series	Model 6000	Striper w/Quickstripe	VTL translator‡	GEARBOX TC converter†	CDI-735CD/V/L
Operating modes	All modes	All modes	Translator/editor	DF/NDF	DF/NDF/CF
Standards supported	SMPTE	SMPTE/EBU	PAL, NTSC	SMPTE, EBU	SMPTE, EBU
Time reference	Video/sync	Video, xtal	Video, sync	Input code	Video
Data entry for	Time, User bits	Time presetable	None	No	Time -735CD
Data display of	Time, User bits	Time, user bits	Time, user bits	None	Time, user bit -CD/L
Reading speed range	±5x play	....	0-20x	Play speed	1/30x-80x
Editor interface	....	....	....	....	RS-422/232
VITC code output	No	No	No	No	No
LTC output signal	Yes	0-17V p-p	750Ω bal	Std levels	Restored +4dBm
Synchronizer function	No	No	No	No	-CD/8 control channels
Power requirement	110Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac
User bit recognition	....	[System allows pre-	....	[Reshapes TC signal	-CD
Time code comparator	....	[striping of tape	....	[and converts from	-CD
Video display keyer	Yes	[with time code at	No	[one time reference	-V
Display window	Variable position	[2x/4x playspeed.	No	[to another.	Variable
Reader Service Number	1010	1011	1012	1013	1014

Manufacturer	Cipher Digital			Datum	
Model Series	CDI-750 master	CDI-700A, -710A readers	CDI-716A generator	5360 reader (5370 VCG)	5350TC generator
Operating modes	DF/NDF/CF/JS	DF/NDF/CF	DF/NDF/CF/JS+offset	DF/NDF/CF	DF/NDF/CF
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU
Time reference	Video, tach, xtal	Video	Video, 60Hz, xtal	Video	Video, 60Hz
Data entry for	Time, user bits	....	Time, user bits	None	Time
Data display of	Time, user bits	Time, user bits	Time, user bits	Time, user bits	Time, user bits
Reading speed range	1/30x-80x	1/30x-80x	1x-256x tack frame rate	1/30x-90x	....
Editor interface	RS-232/422	Data output options	RS-232/422	Yes	Yes



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Circle (103) on Reply Card

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Manufacturer	Cipher Digital			Datum	
Model Series	**CDI-750 master**	**CDI-700A, -710A readers**	**CDI-716A generator**	**5360 reader (5370 VCG)**	**5350TC generator**
VITC code output	No	No	No	No	No
LTC output signal	+4dBm (0.5-2Vp-p)	Restored +4dBm 600Ω	+4dBm (0.5-1Vp-p)	2Vp-p, 600Ω	2Vp-p, 600Ω
Synchronizer function	Event controller	No	No	No	No
Power requirement	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac
User bit recognition	Yes	No	No	No	No
Time code comparator	Yes	No	No	No	No
Video display keyer	Variable format	Variable format	No	(8-char/variable)	No
Display window	Variable	Variable	No	(1-line)	No
Reader Service Number	**1015**	**1016**	**1017**	**1018**	**1019**

Manufacturer	Datum	Denecke	ECCO/Convergence		
Model Series	**5303 time processor†**	**Dcode TC-1 reader✓**	**TCR-65/-66✓/-67**	**VCG series✓**	**VIG-850 master†**
Operating modes	DF/NDF/CF/JS	DF/NDF/CF	DF/NDF	DF/NDF	DF/NDF/CF/JS
Standards supported	SMPTE, CBU	SMPTE, EBU	SMPTE	SMPTE	SMPTE, EBU
Time reference	Video	Video	Video	Video	Video, slave to TC
Data entry for	Time, user bits	No	None	No	Time, user bits
Data display of	Time, user bits	Time or user bits	Time, user bits	Time, user bits VCG-77	Time, user bits
Reading speed range	1/30x-80x	±1/50x-50x	1/20x-20x -65, 1/16x-30x	1/20x-20x -77, 1/16x-30x	±45x play
Editor interface	Yes	parallel port opt	....	....	RS-422
VITC code output	Yes	No	No	No	Yes
LTC output signal	2Vp-p, 600Ω	1V 2kΩ reshaped	....	....	1Vp-p, 30Ω source
Synchronizer function	No	No	No	No	No
Power requirement	110/220Vac	7024Vac/dc, 110Vac	7-16Vdc -66, 110Vac	10-18Vdc -76, 110Vac	110/220Vac
User bit recognition	Yes	No	Yes	....	Yes
Time code comparator	No	No	No	No	No
Video display keyer	8-char/variable	No	No	Yes	8-char
Display window	1-line	No	No	Variable	....
Reader Service Number	**1020**	**1021**	**1022**	**1023**	**1024**

Manufacturer	ECCO/Convergence	ESE		Evertz Microsystems
Model Series	**PTG-56✓ (MTG-55/-57)**	**727 (257/258) readers**	**ES 461 generator**	**453 (456) readers**	**ECM 4010 master†**
Operating modes	DF/NDF/CF(55/57 JS)	DF/NDF	DF/NDF/JS	DF/NDF	DN/NDF/CF/JS
Standards supported	SMPTE	SMPTE	SMPTE	SMPTE & EBU	SMPTE, EBU
Time reference	Video	Video	Video w/color frame	Video w/color frame	Video, xtal
Data entry for	Time	Time	Time/User bits	Time/User bits	Time, user bits
Data display of	Time -56/-57	Time (Not 258)	Time	0.56" Time/UB	Time, user bits
Reading speed range	1/30x-30x -56/-57	....	....	Std (1/30, 20x)	1/30-70x, 0-40x
Editor interface	....	Contact closures	....	....	RS-232/422
VITC code output	No	n.a.	No	No	Yes
LTC output signal	0dBm Ω	....	0dB 600Ω	No	-20,+12dBm
Synchronizer function	No	No	No	No	....
Power requirement	9V -56, 110Vac -55/-57	110Vac	110Vac	110Vac	115/230Vac
User bit recognition	No	No	No	No	Yes
Time code comparator	....	Yes	Yes	No	....
Video display keyer	No	No	No	ES-455, 452 readers	Yes
Display window	No	No	No	455, 452 adjustable	Variable
Reader Service Number	**1025**	**1026**	**1027**	**1028**	**1029**

Manufacturer	Evertz Microsystems			For-A Corporation	
Model Series	**4900 reader†**	**3700D LTC master[1]**	**EV-Bloc 610[2]†**	**TGR-2000 Gen/Reader**	**TGR-3300 (TCR-3300)†**
Operating modes	DF/NDF/CF/JS	DF/NDF/CF/JS	DF/NDF/CF/JS	DF/NDF/CF/JS	DF/NDF/CF/JS
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE, EBU, NTSC/PAL	EBU, SMPTE	SMPTE, EBU (PAL or NTSC)
Time reference	Video, xtal	Video, xtal	Video, other	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 vits	Time, user bits	Time, user bits	Time, ub, reel #s	Time, user bits
Reading speed range	1/30-70x	±1/30x,70x L, 0-20x V	±1/30x-70x	....	1/32-110x L, 0-10x V
Editor interface	Yes	RS-232C, 1200 baud	Via RS-232C/422	RS-232C/422, parallel	No
VITC code output	49V option	No	Yes	No	Yes
LTC output signal	+12dBm	±6dBm	+12dBm ¼" phone jack	2.2Vp-p 600Ω	0dB, 600Ω
Synchronizer function	No	....	w/machine controller	No	No
Power requirement	110/220Vac	110/220Vac	115/230Vac	110Vac	110 or 220Vac
User bit recognition	Yes	Yes	Yes	Yes	Yes
Time code comparator	No	....	Yes	Yes	Yes
Video display keyer	24-char/8-16TVL	24-char/16-32TVL	Yes	Integral	8-char, 18-36TVL
Display window	1-line	1, 2-line	2-sizes, positioning	....	Position control
Reader Service Number	**1030**	**1031**	**1032**	**1033**	**1034**

[1]Companion unit 3600D is a reader with timecode character generator.
[2]Series includes 611/622 reader modules, 612/621 generator modules and 613 TC character generator with keyer.

Manufacturer	Fostex	Gray Engineering Labs			JVC Company
Model Series	**4010 (4011†)**	**VID225† (VIE224)**	**DT113/104F/213**	**DR115/107B/109B reader**	**TG-P49U✓**
Operating modes	DF/NDF/CF/24-25FPS	DF/NDF	DF/NDF/CF	DF/NDF/CF	DF/NDP/CF
Standards supported	SMPTE/EBU	SMPTE	SMPTE/EBU	EBU, SMPTE	SMPTE
Time reference	External pulse	Video	Video, 60Hz, BCD in	Video	Video, crystal
Data entry for	Time, UB	(Incoming LTC only)	Time, user bits external	None	Time/user bits
Data display of	Time, UB	Time, user bits	Time, user bits	(-109B time, user bits)	Time/user bits
Reading speed range	0.1-100x	1/100-100x L, ≤4x V	Real time	1/100x-100x	....
Editor interface	Yes	Yes	Yes	Yes	No
VITC code output	4011	Yes	FCM-227 opt for VITC	No	No
LTC output signal	w/level control	Yes (No)	+8dBm 600Ω	Reshaped	....
Synchronizer function	4030	No	No	No	No
Power requirement	110Vac	110/220Vac	110/220Vac	110/220Vac	12Vdc

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Manufacturer	Fostex	Gray Engineering Labs			JVC Company
Model Series	**4010 (4011†)**	**VID225† (VIE224)**	**DT113/104F/213**	**DR115/107B/109B reader**	**TG-P49U✓**
User bit recognition	Yes	Yes	Yes	Yes	No
Time code comparator	Yes	No	No	(-115 4-channel)	No
Video display keyer	4011	No	DT-213 only, variable	Variable format	No
Display window	....	No	DT-213 variable	Variable	No
Reader Service Number	**1035**	**1036**	**1037**	**1038**	**1039**

Manufacturer	Shintron			Skotel	
Model Series	**#690 ET master†**	**#647 gen (646 reader)**	**#640 (641✓) readers**	**TCG-80N (TCG-80N-FT)**	**AV TC-20✓ (TC-20 VI)**
Operating modes	DF/NDF/CF/JS	DF/NDF	DF/NDF/CF (NDF/CF)	All modes[1]	All modes
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE/EBU (EBU only)	SMPTE	SMPTE, EBU
Time reference	Video, xtal	Video	Video	Composite video	Video
Data entry for	Time, user bits	Time, user bits (None)	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	±1/60-80x	(1/16x-40x)	n.a.	±10% play	(Pause to 150x)
Editor interface	RS-422 interface	No	No	....	None
VITC code output	Yes	No	No	Option 008, 006	(Read only)
LTC output signal	0dBm, <10Ω source	0dB @ 30Ω	No	0.5-5Vp-p <100Ω	0.1-2V
Synchronizer function	Yes	No	0dB ± 2dB 2kΩ	No	No
Power requirement	110/220Vac	110/220Vac	3 AA cells, 4.5Vdc	110Vac	12-14Vdc
User bit recognition	Yes	No	No	....	No
Time code comparator	Yes	No	No	....	No
Video display keyer	Yes	(646 only variable)	No	Yes	(Yes 3-char size)
Display window	15-char/5-line	(Variable)	No	Variable	(Variable position)
Reader Service Number	**1040**	**1041**	**1042**	**1043**	**1044**

[1]80N-FT model includes 3/2 film pull-down recognition.

Manufacturer	Skotel			Sony Broadcast	
Model Series	**TCR-111 (111C)**	**TCR-80, TCR-80V†**	**TCR-112 (132†)**	**BVG-100 gen/reader✓**	**BVG-1600 G(1500 R†)**
Operating modes	DF/NDF/CF	All modes	DF/NDF/CF	DF/NDF/CF/JS	DF/NDF/CF/JS
Standards supported	EBU/SMPTE	SMPTE	EBU/SMPTE	SMPTE/EBU	SMPTE/EBU
Time reference	Video	....	Video	Video	Video
Data entry for	Time, user bits	No	Time, user bits	Time/user bits	Time/user bits
Data display of	LEDs, time, user bits	Time, User bits	Time, user bits	8-digit time/user	8-digit time/user
Reading speed range	1/40x-40x play	1/20-40x, ±45X play	1/40x-40x play	Normal play	1/32x-110x
Editor interface	RS-232/422 on 111C	....	....	No	BVG-1500 only
VITC code output	No	Looped only, TCR-80V	TCR-132 only	SMPTE/EBU	SMPTE/EBU
LTC output signal	Reshaped	Bridged	Reshaped	2.5Vp-p 10kΩ	0-8dBm
Synchronizer function	No	No	No	No	No
Power requirement	110Vac	110Vac	110Vac	9-18Vdc	110-220Vac
User bit recognition	Yes	....	Yes	No	BVG-1500
Time code comparator	No	....	Yes	No	BVG-1500
Video display keyer	No	Yes	Yes	No	8 (9) 1-line
Display window	No	Variable	Var size/position	No	**1049**
Reader Service Number	**1045**	**1046**	**1047**	**1048**	

Manufacturer	Telcom Research				
Model Series	**TCG-550/TCR-660✓**	**T5010 R/G[1]**	**T-7000A R/G✓**	**T800/T900 translators†**	**TCR680✓ (T6020[2])**
Operating modes	All mode	All modes	All modes	24/25/30fr, DF mode	All modes
Standards supported	SMPTE, EBU	SMPTE, EBU	EBU, SMPTE	Auto NTSC, PAL select	SMPTE/EBU
Time reference	Video or sync	Video, sync	Video, sync	....	....
Data entry for	Time	Time, User bits	Time, User bits	None	No
Data display of	Time, User bits	Time, User bits	Time, User bits	Status only	None
Reading speed range	0.1-10x TCR660	....	0.1-5x	....	0.1-8x
Editor interface	No	No	....	No	....
VITC code output	No	No	No	T800	No
LTC output signal	11dB 600Ω TCG550	Dual 11dBm 600Ω	11dBm 600Ω bal	11dBm 600Ω bal	Bridged input only
Synchronizer function	No	No	No	No	No
Power requirement	ac or dc	110Vac	5 AA cells	110Vac	ac, dc
User bit recognition	No	....	No	No	No
Time code comparator	No	....	No	No	No
Video display keyer	No	Yes	No	No	Yes
Display window	No	Variable attributes	No	No	Variable positioning
Reader Service Number	**1050**	**1051**	**1052**	**1053**	**1054**

[1]Companion unit T6010 includes reader, timecode character inserter.
[2]Provides facilities for 4 video signals.

Manufacturer	TimeLine	United Media		
Model Series	**Lynx/VSI module**	**305 (310) reader**	**205 (210) Generator**	**Model 500 sequencer**
Operating modes	DR/NDF/CF/JS	DF/NDF/CF	DF/NDF/CF	DF/NDF, 24/25F, RT
Standards supported	SMPTE, EBU	SMPTE/EBU	SMPTE/EBU	....
Time reference	Video, 60Hz, xtal	Video	Video	Off-tape TC
Data entry for	Time, user bits	Timer, user bits	Timer, user bits	TC, UB
Data display of	Time, user bits	Dual 8-digit	Dual 8-digit	TC, UB, channel
Reading speed range	±1/20x-60x	1/30-120x	....	....
Editor interface	RS-422/232C	....	Yes	RS-232
VITC code output	No	No	No	No
LTC output signal	-10, +8dBm	....	+8dBm	No
Synchronizer function	Yes	No	No	16-channel
Power requirement	110/220Vac	100-240Vac	100-240Vac	110-220Vac
User bit recognition	Yes	....	....	Yes
Time code comparator	No	....	....	Yes
Video display keyer	No	305 (opt 310)	205 (opt 210)	No
Display window	No	Variable format	Variable format	No
Reader Service Number	**1055**	**1056**	**1057**	**1058**

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Video Recorders, Types B & C

Reel-to-reel video recorders using 1″ media operating in a composite analog video format. A capstan/pinchroller system pulls tape through the transport, except on those models marked with a dagger (†) which are air/vacuum assisted. The transport and electronics control involve one or more μP. Most provide individual meters for each audio channel; video metering includes tracking. Luminance bandwidth is ±0.5dB to 4.2MHz; except PAL/SECAM models which extend response to >5MHz. In color standards, N - NTSC, P - PAL, S - SECAM. Moire rating with 75% color bars is typical -40dB for NTSC Type C units and -37dB for PAL/SECAM and/or type B equipment. Models marked with a bullet (•) provide a tape parameter memory.

Manufacturer	Ampex AVSD			Ampex AVSD/Nagra	BTS Broadcast TV Systems
Model Series	**•VPR-3†**	**•VPR-6**	**VPR-80**	**VPR-5 portable**	**BCN-21 portable B**
S/N ratio L/C	47dB w/Zeus processor	46dB L, 46dB C	46dB L, 46dB C	46dB L	>47dB NTSC, >43dB PAL
Diff phase/gain	4°/4% max	4°/4%	4°/4%	4°/4%	<4°/<4%
K factor 2T	1% max	1%	1%	1%	<1.5%
Video confidence	Yes	Yes	No	Yes	.....
No. audio channels	3 NTSC (4 for PAL)	3 NTSC, 4 PAL	3	3	3 AF or 2 AF/1 TC
AF response	±2dB, 50Hz-18kHz	±2dB, 50Hz-18kHz	±2dB, 50Hz-15kHz	±2dB, 50Hz-15kHz	-3, +2dB, 40Hz-14kHz
AF S/N ratio	56dB (+16dBm out Ch 1/2)	56dB unwtd +16dBm out	56dB, +16dBm output	56dB, +8dBm out	>57dB NTSC, >54dB PAL
AF distortion	1%, 8dBm out, 1kHz	1%, 8dBm out, 1kHz	1%, +1dBm out, 1kHz	1%, +8dBm	<3%, 1kHz, 254nWb/m
LTC reader/generator	Integral equipment	Integral equipment	Integral option	Yes	μP controlled generator
VITC reader/generator	Integral equipment	Integral equipment	External option	Integral equipment	.....
TC displays	Yes	2 8-digit LED	1 8-digit LED	External unit	W/user bits
Integral editor	Full feature	Full feature	Full feature	Partial feature	Assemble, inserts
Diagnostic software	Yes, with panel & CRT dis	Yes	Yes	Yes	No
Remote control type	RS-422	RS-422	RS-422	Simple remote	Standard functions
System TBC preference	External Zeus	Zeus 1 or TBC-6	External TBC-6, TBC-40	External required	No
Nonstandard tracking	-1, +3x play	-1, +3x	-1, +3x	No	No
Slow motion mode	With Zeus	No	Yes	No	No
Single frame mode	Yes	No	No	No	No
Reel diameter max.	14″, 190 min	11.75″, 124 min	11.75″, 124 min	9″, 60 min	To 9″ for 60 min
Weight	270 lb (rack-mount)	150 lb (table top config)	145 lb (table top config)	15 lb	20 obs
Portable, rack mount	19″	19″	19″	With adapter kit	.....
Color standards	N, P/-M, S	N, P/-M, S	N, P/-M, S	N, P/-M, S	N, P/-M, S
Reader Service Number	**1345**	**1346**	**1347**	**1348**	**1349**

Manufacturer	BTS Broadcast Television Systems		Hitachi Denshi	Sony Broadcast	
Model Series	**BCN-51 Type B**	**BCN52/53 Type B (PAL)**	**•HR-230**	**BVH-2000 (2180)**	**BVH-2500 Delta-Time**
S/N ratio L/C	47dB	>44dB	>48dB	48dB unwtd	48dB unwtd
Diff phase/gain	<4°/<4%	<4°/<4%	3°/3%	<±4°, <4%	<4°, <4%
K factor 2T	<1.5%	<20ns	<1%	<1%	<1%
Video confidence	Yes	Yes	Yes	Yes	Yes
No. audio channels	3	3 or 2 audio, 1 TC	3	3 analog	3 analog
AF response	-3, +2dB, 40Hz-14kHz	-3, +2dB 40Hz-18kHz	-3, +1.5dB, 50Hz-15kHz	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k
AF S/N ratio	57dB ref 254nWb/m	>7dB w/o Dolby or Telcom	56dB unwtd, +8dBm out	56dB	56dB ch 1/2
AF distortion	<3%, 254nWb/m out	<3% 1kHz 284nWb/m	<1%, 1kHz	1% 1kHz 0dBm	1% 1kHz
LTC reader/generator	Integral equipment	Integral	Integral option	Integral opt	Integral
VITC reader/generator	External available	.....	Integral option	Integral opt	Integral
TC displays	Yes	Yes	Yes	Yes	Yes
Integral editor	Full feature	Full feature	Full feature	Full feature	Full feature
Diagnostic software	No	Yes	Yes	Yes	Yes
Remote control type	RS-423 & simple remote	RS423, EBU/SMPTE, BTS	RS-422, RP-113	RS-422	RS-422
System TBC preference	Integral equipment	W/4-field framestore	Integral or ext opt	Integral	External required
Nonstandard tracking	-¼x, +½x	.....	-1x, +3x	Yes	Still, step, slow
Slow motion mode	No	-¼, +1x play	No	-1x, +3x	-1x, +3x
Single frame mode	Yes	No	No	No	Yes
Reel diameter max.	12″, 196 min.	12.5″ 2½ hr	14″, 180 min	11.75(14″)/126(188)min	11.75″/126 min
Weight	.....	484 lbs	198 lbs/661 lbs console	.....	.....
Portable, rack mount	Includes rack	52 console, 53 rack	Yes	14″ (24″) rack	19″
Color standards	N, P/-M, S	PAL	NTSC	NTSC	NTSC
Reader Service Number	**1350**	**1351**	**1352**	**1353**	**1354**

Manufacturer	Sony Broadcast			Thomson Video
Model Series	**BVH-2700 (Super Motion¹)**	**BVH-3000/-3010†**	**BVH-500A**	**TTV 3705 P/S**
S/N ratio L/C	47(47)dB	>49dB unwtd V1-K tape	47dB p-pV/RMS noise	>44dB unwtd
Diff phase/gain	4°, 4% (6°, 6%)	<4°/<4%	<4°, <4%	<4°, <4%
K factor 2T	1% (2%)	<1% TBC output	<1%	<1%K
Video confidence	Yes	Video and audio	Yes	.....
No. audio channels	3	4 (LTC on 3, sync on 4)	3	3 AF, 1 TC/AF
AF response	-3, +1.5dB 70-15k	-3, +1.5dB, 50Hz-15kHz	-3, +1.5dB 50-15k	-3, +1.5dB 50-15k
AF S/N ratio	>56dB	>56dB 3% THD, Ch 1/2	56dB 3% distortion	>56dB
AF distortion	1% 1kHz 0dBm	<0.1%	1% 1kHz 0dBm	<1%
LTC reader/generator	Generator	LTC & cue Audio Ch 3	Integral	Integral
VITC reader/generator	Generator	Available	Integral	Integral
TC displays	Yes	Display panel or video	Yes	Yes
Integral editor	Backspace edits	Full feature	Assemble only	Full feature
Diagnostic software	Yes	Yes	None	Yes
Remote control type	RS-422	RS422, 232 opt, parallel	Simple rmt ctl	RS-422
System TBC preference	BVT-2700	BKH-3010, BKH-3050	External required	BKH-2300 int
Nonstandard tracking	In Type C mode	With BKH-3050	No	Yes
Slow motion mode	-1x, +3x	-1, +3x play; time mod.	.....	-1x, +3x
Single frame mode	Dual mode VTR	No	No	No
Reel diameter max.	11.75″/126 (42)	11.75″ (126 min)	9″ 62 min	14″
Weight	.....	148 lbs	35 lbs	.....

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Manufacturer	Sony Broadcast		Thomson Video
Model Series	**BVH-2700 (Super Motion[1])**	**BVH-3000/-3010†**	**BVH-500A**	**TTV 3705 P/S**
Portable, rack mount	19"	Or self-contained	No	19"
Color standards	NTSC	NTSC	NTSC	PAL, SECAM
Reader Service Number	**1355**	**1356**	**1357**	**1358**

[1]The Super Motion model records at 3x standard play speed; playback at standard speed creates slow motion.

Automated Cassette Playback Systems

Video playback automation systems, based on 1", 19mm (¾") and ½" cassette media. They are integrated deck and control computer systems, not controllers that may be interfaced to available playback transports. Manual override is available at all times; an as-run log is generated along with event verification. Cassettes are automatically cued.

Manufacturer	Ampex AVSD	ASACA/ShibaSoku	BTS	LaKart	Odetics
Model/series	**ACR225**	**ACL-6000C (ACL-5100)**	**BCN-100**	**ALS Library**	**TCS-2000 (TCA-3000)[1]**
Recording format	Composite digital/D-2	Betacam/SP or M-II	1" B	Any ½", ¾"	Betacam/SP or M-II
No. play decks	3-4	2-5	2-3	4	4-6
Specific play decks	Ampex	Per format	BTS	Per format	Per format
Output channels	2 simultaneous	5 simultaneous	Single channel	Options	1, Opt of 6
No. record decks	3-4	1-4	1-3	To 4	2
Edit features	....	Per VCR deck	Full feature	Per VCR deck	....
Control computer	Ampex proprietary	Universal 6853	Integral, proprietary	68000 32-bit	IBMPC/AT
RS-control interface	232/422/ESbus	232/422	423	....	422
Master automation port	Yes	Yes	Yes	Yes	Yes
Record/delayed play	....	Yes	Yes	5 min to ∞	Yes
Cassette ID type	Barcode, TC user bits	Barcode	LTC data	Barcode, TC user bits	Barcode TC
TC reader/generator	LTC	....	LTC	LTC std, VITC opt	LTC
Storage magazine	256 D-2 cassettes	600 cassettes (48)	32 1" cassettes	500, 1000, 1500	Per system
Shortest segment	1s	....	2-frame +22s	10s w/4-decks	1 frame
System TBC	Integral	Integral per deck	Integral	Per deck requirement	TBC per deck
Reader Service Number	**1333**	**1334**	**1335**	**1336**	**1337**

[1]TCP1000 play only system excludes record hardward, software; TCA3000 on-air automation system, plays, records events under control of real-time, interactive station automation controller.

Manufacturer	Panasonic Broadcast	Sony Broadcast
Model/series	**MARC II**	**BVC-1000 Betacart**
Recording format	M-II	Betacam/Betacam SP
No. play decks	5 maximum	4 maximum
Specific play deck	Standard M-II deck	....
Output channels	2 + monitor	3 simultaneous
No. record decks	1-2	....
Edit features	Full feature	....
Control computer	IBM PC/AT	Integral controller
RS- control interface	422	422
Master automation port	Option	Yes
Record/delayed play	Yes	....
Cassette ID type	Barcode, TC user bits	Barcode
TC reader/generator	Reader	LTC reader
Storage magazine	107+[1]	....
Shortest segment	10-15s	1s in 4-event seq.
System TBC	AU-TB50	Per deck
Reader Service Number	**1338**	**1339**

[1]Option 352-cassette rotary-bin expansion units for 472, 824, 1176-cassette library;
Type III VTR expansion module provides 5 additional VCR decks.

Videocassette Systems, ¾" U-matic

Record and/or play equiment using ¾" or 19mm cassette tape media. Reference inputs of sync, subcarrier may be used. Models listed are for NTSC; a bullet (•) indicates models are available in PAL; a dagger (†) indicates SECAM availability. All systems provide AGC on video recording function; on audio, AGC is switchable. An external TBC is necessary to integrate these units into on-air or production operations. All systems include an RF Y-C dub facility.

Manufacturer	JVC Company	Sony Broadcast		Thomson Video Equipement	
Format version	**Standard**	**Standard**	**SP**	**Standard**	**SP**
Models					
Portable	**CR-4900U**	**•BVU-50/110†**	**•BVU-150**	**•V3905S/P† •TTV3902P •TTV3901**	
Player	**CP-5200U/5550U**				
Recorder	**CR-600U/6650U**				
Editor	**CR-850U/8250U**	**•BVU-800/820†**	**BVU-850**	**•TTV3915/3916†**	**•TTV3935/3936†**
Video parameters					
Response Luma/Chroma	340TVL/260TVL	340TVL/260TVL	340TVL	260TVL C	370TVL/260TVL
S/N ratio	49dB L/47dB C	49dB L/47dB C	>50dB L/>47dB C	>46dB	>46dB
Audio parameters					
Input connection	Bal 600/10kΩ	Xfmr bal, 3k/10kΩ	Bal 3k/10kΩ	Bal 3k/10kΩ	Bal 3k/10kΩ
Output connection	Bal, low Z	600Ω on -110	Bal low Z	Bal low Z	Bal low Z
Output level	0dBs	+4dBm on -110	+4dBm	+4dBm	+4dBm
S/N ratio	>48dB	48dB 3% THD	>52dB 3% THD	>48dB	>52dB
Distortion	<3%	<2.5%	<2%	<3%	<3%
LTC modules	External units	Integral on -800, -820	Integral	Options	Options
VITC modules	....	External units	External units	....	....
Remote control format	RS-422/45-pin	RS-422	RS-422	RS-422	RS-422
Reference input	Sync, subcarrier	Sync, subcarrier	Sync, subcarrier	Sync, subcarrier	Sync, video
Variable tracking feature	No	On -820	No	On TTV3916	On TTV3936
Reader Service Number	**1340**	**1341**	**1342**	**1343**	**1344**

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Small Format VCRs

These video recorders use ½'' cassette media with Betacam, Betacam SP, M-II and S-VHS recording formats. Typically, studio units include full metering with a single meter switched for video input, tracking and time code monitoring. RS-422 remote control and full feature editing are available on studio systems. Backspace editing is typical on portable units. Betacam SP and M-II models offer two channels of AFM audio recorded with video and two channels of standard audio as longitudinal tracks. For audio frequencies, Hz are understood. Dolby C noise reduction is standard. Variable speed tracking (VT) refers to reproduction of stable video signals at nonstandard playback speeds. Reader service numbers in this section provide information on all products of the format from that manufacturer.

Betacam & Betacam SP Formats

Betacam SP

Video parameters:	
Luma response	-6,+0.5dB 4.1MHz
Chroma response	-3,+0.5dB 1.5MHz
Video S/N ratio	>51dB N/50dB P
Composite	NTSC, PAL, SECAM
Component	YCrCb, Y-C
Audio parameters:	
Audio response	-3,+1.5dB 50-15k
Audio S/N ratio	>53dB w/o NRS
THD distortion	<1% 1kHz
No. of Tracks	2 analog, 2 AFM

Betacam

When different from Betacam SP:	
Video S/N ratio	48dB N, 46dB P/S
Composite	NTSC, PAL, SECAM
Audio response	±3dB 50-15k
Audio S/N ratio	>50dB w/o NRS
THD distortion	<2%
No. of tracks	2 analog

Manufacturer	Ampex	BTS	Sony	Thomson
1-piece camcorder	CVR-200	...	BVW-200	...
Docking recorder	CVR-5	BCB-5	BVV-5	TTV-3505
Playback adapter	CVA-500	...	VA-500	...
Field R/P unit	CVR-35	BCB-35	BVW-25,-21	TTV-3535
Office player	CVR-22	BCB-22	BVW-22	TTV-3522
Studio player[1]	CVR-60	BCB-60	BVW-60	TTV-3560
Studio player/VT[1]	CVR-65	BCB-65	BVW-65	TTV-3565
Studio editor[1]	CVR-70	BCB-70	BVW-70	TTV-3570
Studio editor/VT[1]	CVR-75	BCB-75	BVW-75	TTV-3575
Reader Service No	**1133**	**1134**	**1135**	**1136**
Docking Recorder	CVR-1A	BCB-5	BVW-1A	TTV-MA1611A
Portable player	CVR-21	BCB-21	BVW-21	...
Portable recorder	CVR-25	BCB-25	BVW-25	3625/26[2]
Studio player	CVR-10	BCB-10	BVW-10	...
Studio player/VT[1]	CVR-15	BCB-15	BVW-15	TTV-3615/16[2]
Studio editor[1]	CVR-40	BCB-40	BVW-40	TTV3635
Reader Service No	**1137**	**1138**	**1139**	**1140**

[1]Integral TBC circuitry.
[2]For PAL and SECAM use only.

M-II and S-VHS Formats

M-II

Video parameters:	
Luma Response	-3,0.5dB 4.5MHz
Color response	-3,0.5dB 1.5MHz
S/N ratio	>50dB Y, >50dB C
Composite	NTSC
Component	YPbPr, Y/C-3.58[3]
Audio parameters[4]:	
Response	-2,1dB 20-20k
S/N ratio	>80dB
THD distortion	<0.6%
No. of tracks	2 linear, 2 AFM

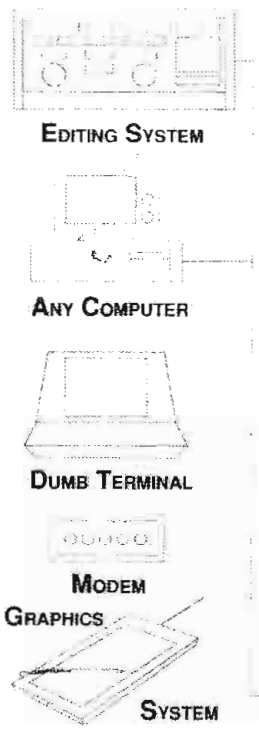
S-VHS

Video parameters:	
Resolution	>400TVL
S/N ratio	>45dB
Audio parameters:	
Response	20-20k
S/N ratio	>44dB
Dynamic range	>90dB
Wow/flutter	<0.005%
No of tracks	2 linear, 2 HD

Manufacturer	JVC	Panasonic
Docking recorder	KR-M260U	AU-400
Portable recorder	KR-M460U	AU-500
Portable player	...	AU-505
Studio player	...	AU-620[4]
Studio player/VT	...	AU-630[4]
Studio recorder	...	AU-640[4]
Studio recorder/VT	KR-860U	AU-650[4]
	...	AU-660[4]
Studio editor	KR-880U	AU-X80[4]
Reader Service No	**1141**	**1142**

Manufacturer	JVC	Panasonic	Hitachi	Sharp
1-piece camcorder	BR-S200U	...	VL-S100	XA-2500S
Portable recorder	BR-S410U	AG-7400		
Player	...	AG7100A	**1145**	**1147**
Recorder/player	BR-S610U	AG-7300		
Editor	BR-S810U	AG-7500(A)	**Mitsubishi**	
Duplicator	BR-8711U			
			BV100R	
Reader Service No	**1143**	**1144**	**1146**	

[3]S-VHS specification provide.
[4]Values based on AFM audio channels.

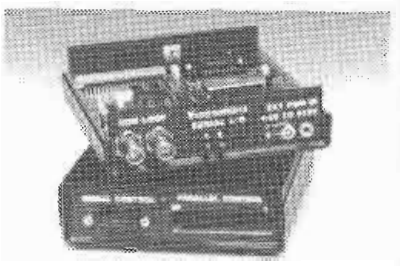


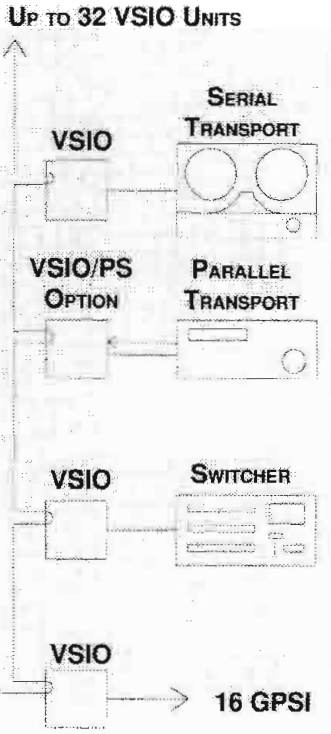
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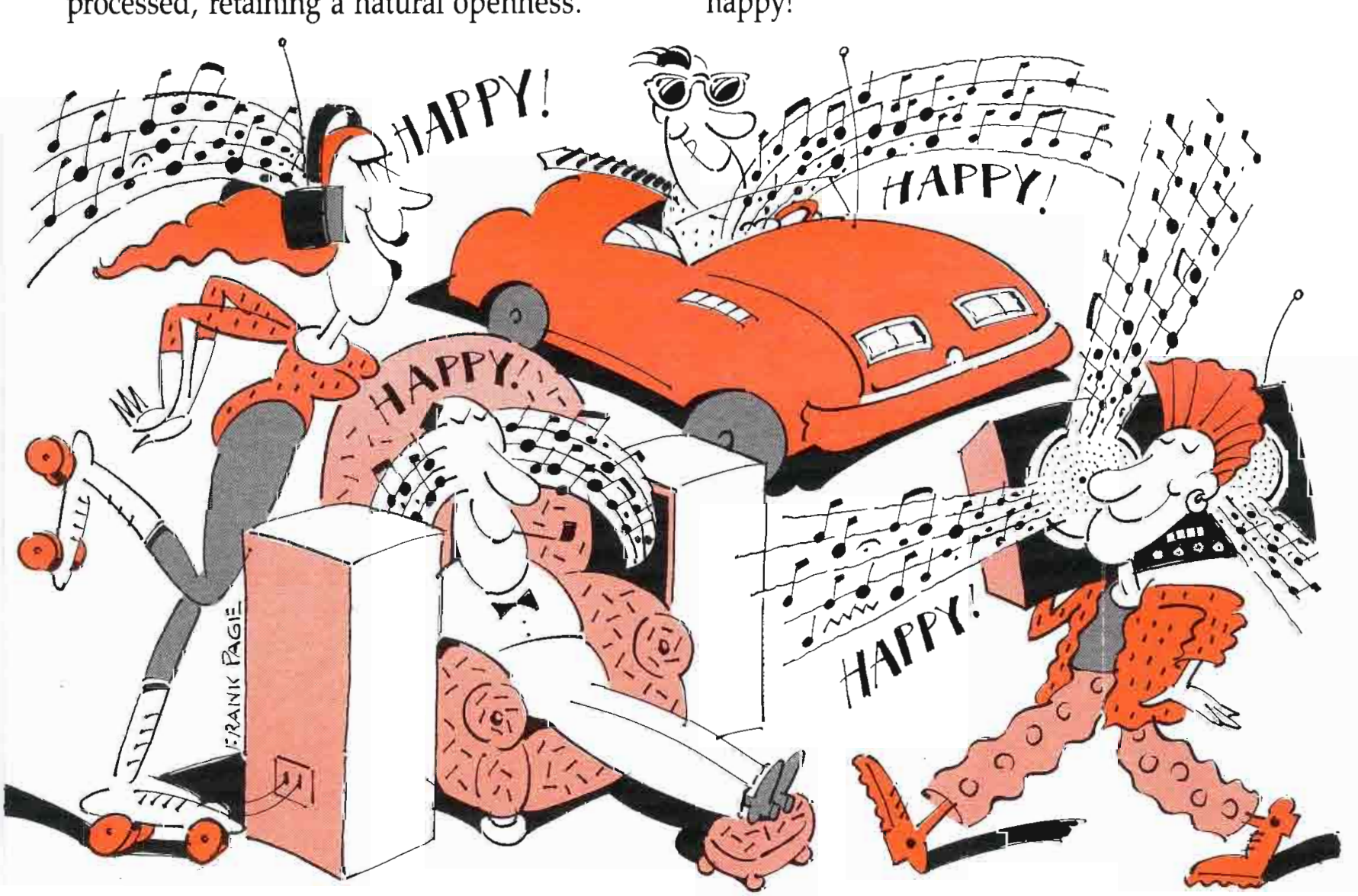
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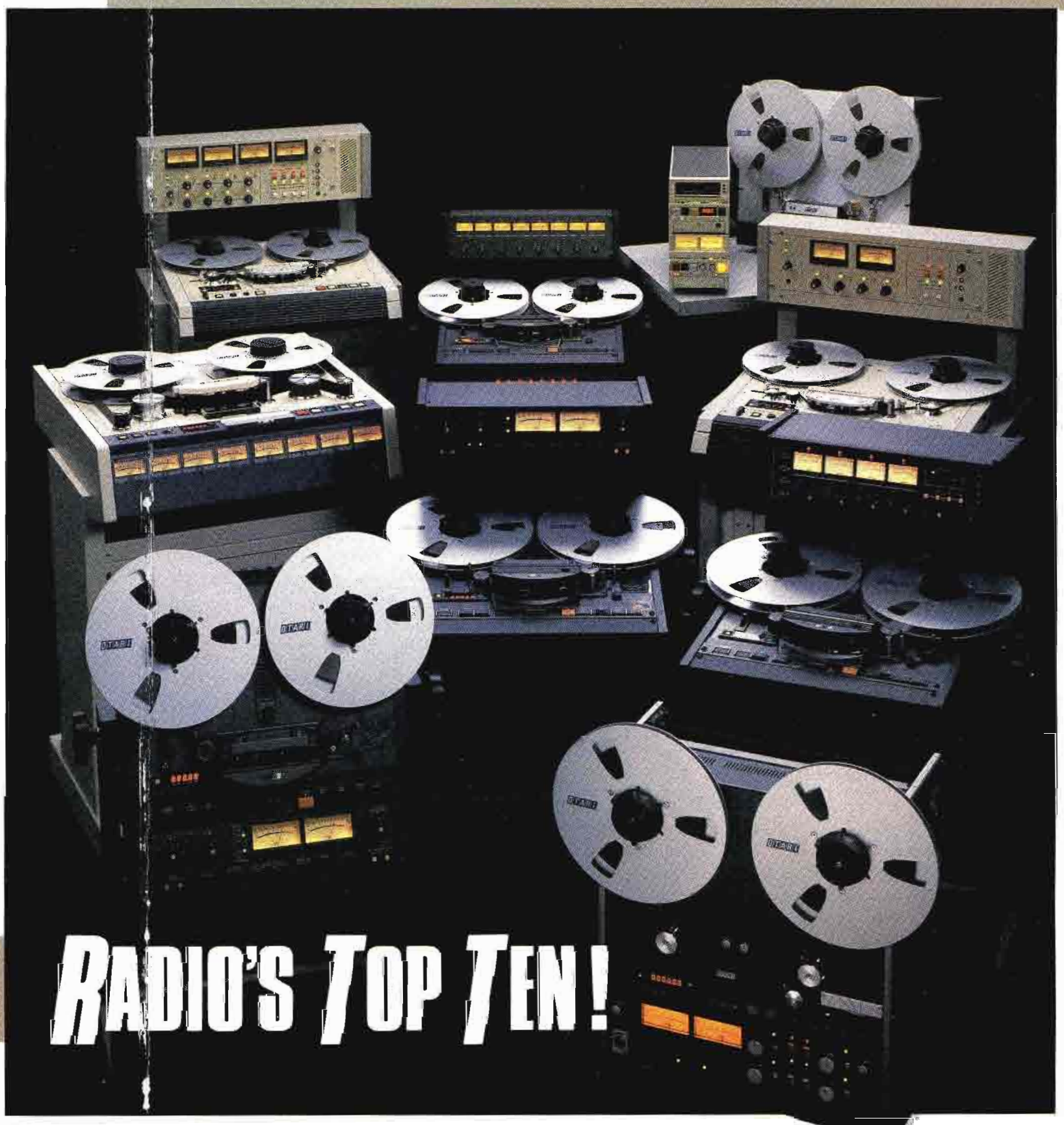
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Audio equipment specs

Audio Mixers, On-Air

Audio mixing systems designed for the on-air control room of radio and TV facilities, although they may also serve some production applications. Nearly all provide for switch-selection of nominal mic or line level inputs. Speaker muting circuits are typical. Those marked with a dagger (†) are prepared for installation with automation. Systems not providing talkback circuits are noted with a double dagger (‡). In Audio Response, Hz is understood. AB refers to Actively Balanced, while TB is Transformer Balanced.

Manufacturer	ADM Technology	Arrakis Systems		ATI/Audio Technologies	Auditronics
Model Series	ST-240 series II	250SC‡	Model 5000	Vanguard series‡	200 series
Modular construction	Yes	No	Yes	Yes	Yes
# of mixing positions	24	6-ch rack-mount	16 (32 input)	8	24
Output channels	Pgm/aud/aux/cue/mono	Pgm/aux/mono	Pgm/aud/mono/mix	Pgm/aud/cue/mono	Pgm/aud/mono/cue
Fader types	Slider, VCA	Rotary/VCA	P&G slider/VCA	Slider, rotary	Slider, VCA
Bus switching by	Push button	Push button	Push button	Membrane	Push button
Input patch points	Yes	No	Prefader	No	Yes
Internal switching by	Electronic	Solid-state	Solid-state	Solid-state	Mechanical, VCA
Machine starts stops	Relay	Relay	Yes	Yes	Yes
Cue circuits	On fader, bus switch	On fader	On fader	On fader	On fader
Metering types	VU, PPM	VU meters	VU meters	VU, VFD opt	VU
Int cue amp speaker	Yes	Amp only	2W/channel	Yes	Yes
Int headphone amp	No	...	...	Yes	Yes
Input connections	TB 600Ω	AB 1k/100kΩ	Bal 1k/100kΩ	AB 20kΩ	AB 150/10kΩ
Output connections	TB 600Ω	Bal 600Ω	Bal 600Ω	AB 600Ω	TB/AB 50Ω
Output level	8dBm	27dBm max	27dBm	4dBm, 26dBm max	4dBm, 30dBm max
AF response	±1dB	±0.5dB 20-20k	±0.5dB 20-20k	±0.25dB	0,-1dB 8dBm
Distortion	0.07% 1kHz 24dBm	0.02% 8dBm	0.02% 8dBm	0.15% 18dBm	<0.01% 1kHz 24dBm
S/N ratio, mic/line	-125dBm EIN/72dB	72dB mic/82dB line	62dB mic/82dB line	-124dBm EIN/92dB	-128.5dBm EIN/>82dB
Crosstalk (worst)	-72dB 8dBm 100-10k	-90dB 2kHz	Below noise	-74dB 10kHz	<-83dB 20kHz
Reader Service Number	1418	1419	1420	1421	1422

Manufacturer	Autogram			B.F.E.	Broadcast Audio
Model Series	AC-8 (AC-6)‡	IC-10 (LC-10)‡	R/TV-20†‡ (F/TV-12)	BC-20	System 16 series[1]‡
Modular construction	No	No Mono-stereo models	Yes	Yes	Yes
# of mixing positions	8 (6) 26 (23) inputs	10	20 (12)	14	16, 6-module ext
Output channels	Pgm/aud/cue/monitor	Pgm, aud, cue, mono	Pgm/aud/cue/mono	Pgm/aux/cue	Pgm/aud/aux/cue/mono
Fader types	Rotary	Rotary (slider)	Slider	Slider	Slider
Bus switching by	Keyswitch	Key switch	Push button	Push button	Push button
Input patch points	No	No	Yes	Yes	Yes
Internal switching by	Mechanical	Mechanical	Solid-state	Mechanical	Solid-state
Machine starts stops	Relay	Push button	Solid-state, relay	10 contacts	Solid-state, relay
Cue circuits	On fader	Fader detent	On fader	Push button PFL	On fader, keyswitch
Metering types	VU	VU	VU	LED, PPM	VU, LED peak
Int cue amp speaker	Amp only	Amp only	Amp only	Yes	Amp only
Int headphone amp	Yes	Yes	Yes	Yes	Yes
Input connections	Bal/unbal 200/10kΩ	Xfmr bal	AB 600/20kΩ	TB/AB 1k/5.7kΩ	TB/AB 1.5kΩ
Output connections	Bal/unbal 600Ω	Xfmr bal	AB 600Ω	TB/AB 600Ω	Xfmr 150Ω
Output level	8dBu	+8dBm	8dBm	6dBm	8dBm, 28dBm max
AF response	±1dB 30-15k	±1dB +18dBm	±0.1dB 20-20k	±0.5dB	-0.5dB 8dBm
Distortion	0.5% 15kHz	0.5%, 15kHz, +18dBm	0.05% 15kHz 18dBm	0.2% 1kHz 22dBm	<0.02% 1kHz 28dBm
S/N ratio, mic/line	-120dBm EIN/82dB	-120dBm EIN, 82dB	-124dBm EIN/92dB	-126dBm EIN	-125dBm EIN/90dB
Crosstalk (worst)	....	-68dB, 15kHz +18dBm	-68dB 15kHz 18dBm	-77dB 15kHz 6dBm	<-80dB 15kHz
Reader Service Number	1423	1424	1425	459	460

1Also in this series, System 8 - 8-channel, System 12 - 12-channel.

Manufacturer	Broadcast Audio	Broadcast Electronics			Dorrough Electronics
Model Series	System 6‡	10S250A (8S250A‡)	10S350A‡	MixTrak 90	700 Dual Mono‡
Modular construction	Yes	No	No	Yes	No
# of mixing positions	6	10 (8)	10	18 or 12	7
Output channels	Pgm/aud/util/mono/cue	Pgm/aud/cue/mono	Pgm/aud/cue/mono	Pgm, aud, 3 mix-minus	Pgm/aud/cue/mon
Fader types	Slider	Rotary	Slider	P&G slider w/VCAs	Rotary Shallco
Bus switching by	Push button	Keyswitch	Push button	Pushbutton	Keyswitch
Input patch points	Yes	No	No	Yes	No
Internal switching by	Mech, electronic	Solid-state	Solid-state	Hall effect devices	Mechanical
Machine starts stops	Push buttons	No	No	Yes	No
Cue circuits	On fader	On fader	On fader, keyswitch	Monitor dim feature	On fader
Metering types	VU, peak LED	VU	VU	VU, PPM opt	VU, LED opt
Int cue amp speaker	Amp only	Yes	Yes	Yes	Yes
Int headphone amp	Yes	Yes	Yes	Yes	No
Input connections	TB/AB 1.5kΩ/20kΩ	AB 54kΩ	AB 54kΩ	Balanced	AB 150Ω/10kΩ
Output connections	TB 150Ω	TB 600Ω	TB 600Ω	Balanced	AB 600Ω
Output level	28dBm max	8dBm	8dBm	0,+8dBu, adj	+26dBm max
AF response	±0.5dBm	-0.5dB 8dBm	-0.5dB 8dBm	-0.5,0dB 20-20k	n.a.
Distortion	<0.02% 28dBm 1kHz	0.075% 1kHz 18dBm	0.05% 1kHz 18dBm	<0.05% 20-20k	n.a.
S/N ratio, mic/line	-125dBm EIN/90dB	70dB 18dBm	70dB	-128dBu/>80dB	n.a.
Crosstalk (worst)	-80dB 15kHz	n.a.	n.a.	<-80dB bus/<-75dB R/L	n.a.
Reader Service Number	461	462	463	464	465

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Manufacturer	EELA Audio	Hallikainen & Friends	Harris Broadcast		Harrison Systems
Model Series	SBM series	TVA142/TVA132‡	Medalist series‡	Medalist-AU‡	AIR-790
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	16	36 max	8, 10, 12	12 max	20, 28, 36
Output channels	Pgm/aud/cue/mono	Pgm/aud/cue	Pgm/aud/mono opt	Pgm/aud/mono	Pgm/aud/aux/cue
Fader types	Slider, VCA	Rotary	Slider or rotary	Slider, VCA	P&G slider w/pan
Bus switching by	Push button	Keyswitch	Push button	Push button	Push button
Input patch points	No	No	No	No	No
Internal switching by	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Machine starts stops	Yes	No	Yes	Yes	2 circuits
Cue circuits	PFL bus switch	On fader	On-fader, push button	On-fader, push button	On-fader
Metering types	LED, other	VU w/peak LED	VU	VU	VU mechanical
Int cue amp speaker	Yes	No	Yes	Yes	Speaker
Int headphone amp	Yes	No	Yes	Yes	.....
Input connections	AB/TB 5k/40kΩ	TB 150/15kΩ	AB 150/600Ω	AB 5k/8kΩ	AB 1.2k/10kΩ
Output connections	TB/unbal 600Ω	Bal 600Ω	AB 20Ω	AB 200Ω	AB 600Ω
Output level	6dBm nom	8dBm, 22dBm max	24dBm max	24dBm max	24dBm max
AF response	-1dB 6dBm	±dB 8dBu	-0.5dB 8dBm	±0.5dB	±0.2dB
Distortion	0.05%	0.25% 1kHz 22dBm	0.05% 8dBm	0.05% 8dBm	0.1% 7kHz 18dBm
S/N ratio, mic/line	<-126dBm EIN	-115dBm EIN/74dB	-127dBm EIN/>95dB	-127dBv EIN	-128dBm EIN
Crosstalk (worst)	<-66dB 16kHz 6dBm	-82dB 1kHz 8dBm	-85dB 15kHz 18dBm	-85dB 15kHz 18dBm	-65dB 15kHz 4dBm
Reader Service Number	**466**	**467**	**468**	**469**	**470**

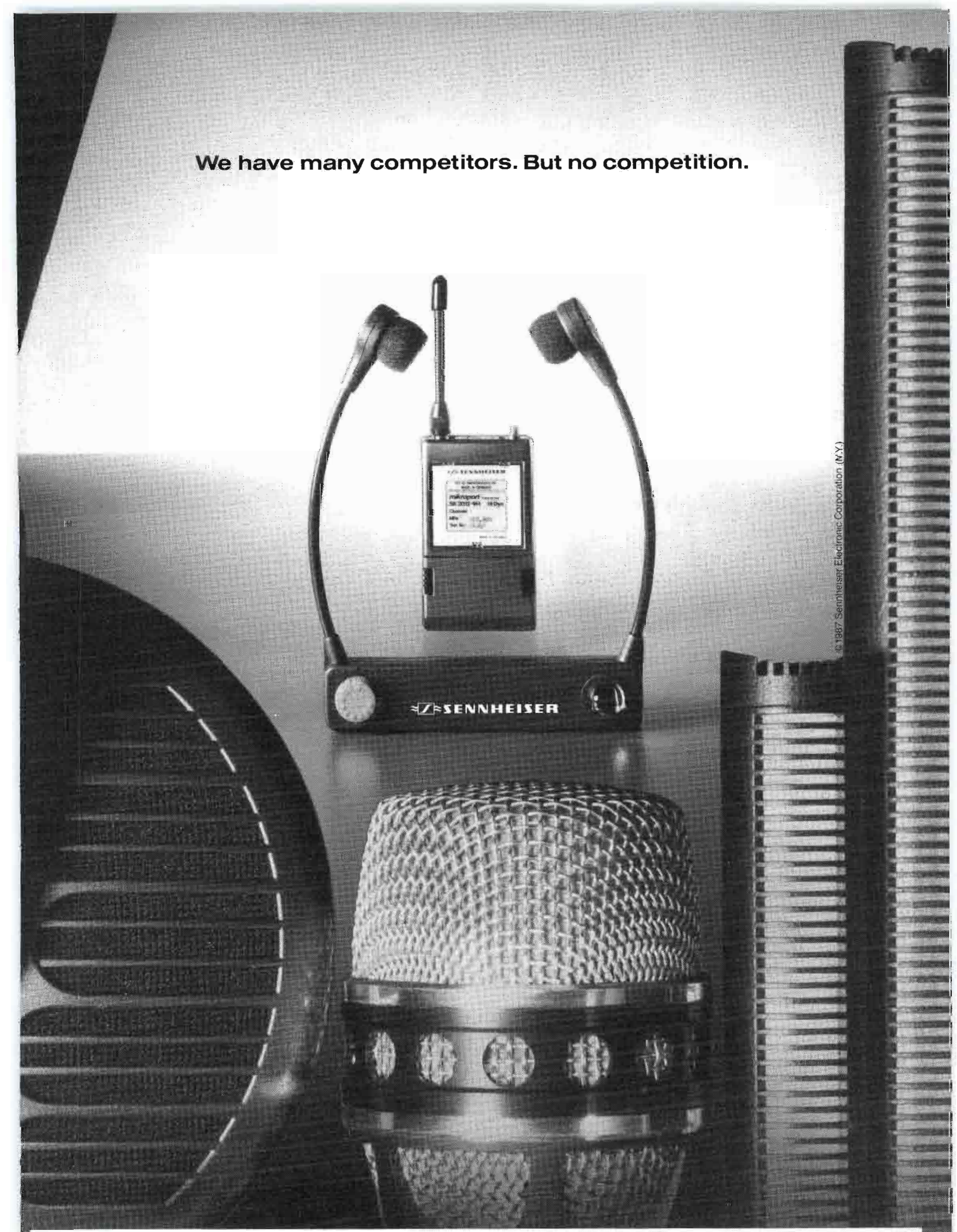
Manufacturer	HoweTech		Logitek	LPB Inc
Model Series	8000 (9000)‡	Series 10000	Series 7500	Perfectionest-8 (12)‡	Citation‡
Modular construction	Yes	Yes	No	No	No
# of mixing positions	10 (12)	30, 22, 14	12 or 22	8 (12)	8, 10 (24, 30 inputs)
Output channels	Pgm/aud/cue/mono	Pgm1/Pgm2/L+R utility	Pgm/aud/cue/mono	4-pgm/aud/mono/cue	Pgm/mono
Fader types	Rotary (slider)	Slider, VCA	Slider	Slider, rotary opt	Rotary or slider
Bus switching by	Pushbutton	Pushbutton	Push button	Push button	Push button
Input patch points	Yes	Yes	No	Yes	No
Internal switching by	Solid-state, EQ opt	Solid-state	Solid-state	Solid-state	Solid-state
Machine starts stops	Yes	Optical isolators	Yes	Yes	10 circuits
Cue circuits	On-fader, bus switch	Yes	Push button	On-fader	Bus switch
Metering types	VU, PPM, LED	VU	VU, PPM	VU, peak flasher	LED
Int cue amp speaker	Yes	10W to 8Ω output	Yes	Yes	Amp, speaker
Int headphone amp	Yes	L&R/5W to 8Ω	Yes	Yes	.....
Input connections	AB 600Ω/10kΩ	AB 10kΩ	AB 600Ω/10kΩ	AB 1kΩ/600Ω	AB 150/600Ω
Output connections	AB 150Ω	AB 150Ω	AB 150Ω	AB 600Ω	TB/AB 600Ω
Output level	4dBm nom	4dBm	4dBm	+4dBm	24dBm max
AF response	±0.1dB 4dBm ref	±0.1dB 4dBm	±0.1dB 4dBm	±0.25dB, 4dBm	±0.3dB 8dBm
Distortion	0.03% 1kHz 4dBm	0.025% THD, 0.04% IMD	0.03% 1kHz 4dBm	0.008% 1kHz 4dBm	05% 20-20k 8dBm



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Circle (107) on Reply Card

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Manufacturer	HoweTech		Logitek	LPB Inc
Model Series	8000 (9000)‡	Series 10000	Series 7500	Perfectionest-8 (12)‡	Citation‡
S/N ratio, mic/line	-124dBm EIN	-124dBm EIN	-124dBm EIN	-125dBm EIN/88dB	76dB mic/80dB line
Crosstalk (worst)	-70dB 10kHz 4dBm	-70dB 10kHz 4dBm	-70dB 10kHz 4dBm	-80dB	-65dB 1kHz 8dBm
Reader Service Number	471	472	473	474	475

Manufacturer	LPB Inc	McCurdy Radio		McMartin Industries	Neve Electronics/Siemens
Model Series	Signature III‡	Series "S"	SS8800E	B-500 series	5104/5114† (5106/5116)
Modular construction	No	Yes	Yes 2/4-track possible	No	Yes
# of mixing positions	6, 8, 10 mono, stereo	26	24 max (10, 16, 20)	5	36 (48)
Output channels	Pgm/aud/cue/mono	Pgm/aud/mono/cue/telco	Pgm/aux/cue/mono	Pgm, Aud	Pgm/aux/aud/solo
Fader types	Rotary	P&G slider, VCA	Slider	Rotary	P&G slider
Bus switching by	Key switch	Push button	Push button	Key switch	Push button
Input patch points	No	Yes	Yes	No	Yes
Internal switching by	Mechanical	Electronic	Solid-state	Mechanical	Solid-state. mech
Machine starts stops	9 circuits	Yes	Yes	On switch, fader	Relay contact/36
Cue circuits	On-fader	Cue assign buttons	On-fader	Yes	On-fader, bus switch
Metering types	VU	VU, PPM	VU, PPM, peak LED	VU	VU or PPM
Int cue amp speaker	Amp, speaker	Amp	Yes	Yes	Amp, speaker
Int headphone amp	.....	Yes	Yes	...	.....
Input connections	TB 150/600Ω	AB 10k/20kΩ	AB 10kΩ/20kΩ	Bal 50-600Ω	TB/AB 1.2kΩ/10kΩ
Output connections	TB 600Ω	AB 60Ω	AB 60Ω	Bal 600Ω	TB/unbal 10Ω
Output level	24dBm max	+28dBu max	+8dBm	+8dBm, +18dBm max	4/8dBm 26dBm max
AF response	±0.5dB 8dBm	±0.5dB 20-20k	±1dB 20-20k	±0.5dB 30-15k	±0.5dB
Distortion	0.06% 18dBm	0.1% mic/0.01% line	S/N ratio, mic/line	75dB mic/78dB line	<-125dBv EIN/>90dB
<-125dBv EIN/90dB>72dB line-125dBm EIN/80dB					
Crosstalk (worst)	-61dB 1kHz 8dBm	-80dB adj bus or module,	65dB mod/bus, 60dB L-R	Below noise	-60dB 15kHz 20dBm
Reader Service Number	476	477	478	479	480

Manufacturer	Pacific Recorders & Eng.		Quantum Audio Labs	Radio Systems	
Model Series	BMX Series II	AMX	Series QS 22	ESA-10‡	RS-18 (RS-series)
Modular construction	Yes	Yes	Yes	No	No
# of mixing positions	10-26 configurations	10-34 configurations	28 max	10	18, 12, 6
Output channels	Pgm/aud/cue/mono	Pgm/aud/util/mon/cue	Pgm/aud/mono/fb/aux/cue	Pgm/aud/cue/mono	Pgm, aud, mono, cue
Fader types	Slider	Slider	Slider	Slider	P&G slider w/VCAs
Bus switching by	Push button	Push button	Pushbutton	Push button	Push button
Input patch points	Yes	Yes	Yes	Yes	Yes
Internal switching by	Mechanical	Relay, electronic	Solid-state	Solid-state	Solid-state
Machine starts stops	Yes	Yes	Solid-state	Yes	Yes
Cue circuits	Push button	Push button	Keyswitch	On-fader, push button	On-fader
Metering types	VU, PPM	VU, PPM	VU	LED	VU, LED peak
Int cue amp speaker	Yes	Stereo line out	No	Yes	Yes
Int headphone amp	No	No	....	No	Yes
Input connections	TB/AB 1.5k/10kΩ	TB/AB 1k/40kΩ	AB 1.2kΩ/≥15kΩ	AB 10kΩ	Active balanced
Output connections	TB/AB 95Ω	AB/TB 30Ω source	TB 600Ω	AB 200Ω	Active balanced
Output level	28dBm max	+8dBm, 28dBm max	8dBm, 24dBm max	25dBm	4dBm, 22dBm max
AF response	-0.9,0dB 20-20k	-0.9,0dB 20-20k	20-20k	<±1dB	±0.25dB, 20-20k
Distortion	<0.03% +28dBm	<0.008% 8dBm	≤0.1%	0.02% 1kHz 22dBm	0.02% 1kHz +4dBm
S/N ratio, mic/line	-127dBu EIN/-88dBu	-127dBu EIN/-88dBu	≤-127dBm EIN/≥80dB	80dB mic/90dB line	-124dBV EIN/88dB
Crosstalk (worst)	<-85dB 1kHz	<-85dB 1kHz	<-80dB 1kHz 8dBm	-90dB 1kHz	<-75dB 20k, <-85dB 1k
Reader Service Number	481	482	483	484	485

Manufacturer	SATT Communications	Schafer World Communications		Solid State Logic	Sonosax
Model Series	SAM-83	8000 series	2000 family	SL 5000 M†	SX series†
Modular construction	No	Yes	No	Yes	Yes
# of mixing positions	8	8, expand to 16	5 (8)	64	32
Output channels	Pgm/aux/cue/mono	3 stereo, 1 mono	Pgm, Audition M/S	Pgm/aud/aux/mono/cue	Pgm/aud/aux
Fader types	Slider	P&G slider	Rotary	Slider	Slider
Bus switching by	Key switch	Pushbutton	Keyswitch	Centrally assigned	Push button
Input patch points	No	No	No	Yes	Yes
Internal switching by	Mechanical	Solid-state	Mechanical	Solid-state	Solid-state
Machine starts stops	2 relay contacts	Yes	...	Relay contacts	Solid-state, relay
Cue circuits	On-fader	Yes	Yes	On-fader	On-fader
Metering types	PPM, VU opt	5 VU mvmnt	Dual VU movement	VU, PPM, LCD	LED
Int cue amp speaker	None	4W amp	Yes	Amp only	Amp only
Int headphone amp	...	Yes	Yes	Yes	...
Input connections	TB 600/1kΩ	Xfmr bal	TB 150Ω, 10kΩ	AB/TB 600Ω	AB/TB 600Ω
Output connections	TB 600Ω	Balanced	Xfmr bal	TB/AB 35Ω	TB/AB 25Ω
Output level	6dBm at 0VU	28dBm max	8dBm, 20dBm max	28dBm max	26dBm max
AF response	-1,0.5dB 6dBm	-1dB, 20-20k	±1dB, 30-20k	±0.5dB 8dBm	±0.1dB 6dBm
Distortion	0.015% 1kHz 6dBm	<0.001% 1,Hz	<0.2% 50-20k +8dBm	0.05% 1kHz 20dBm	0.02% 1kHz 6dBm
S/N ratio, mic/line	-128dBm EIN/85dB	-125dBv, 73dB	-125dBv, 72dB	-127.5dBm EIN	-128dBm/-115dBm
Crosstalk (worst)	-95dB 15kHz 6dBm	...	<-65dB 1kHz	-80dB 20kHz 8dBm	-80dB 1kHz 6dBm
Reader Service Number	486	487	488	489	490

Manufacturer	Soundcraft	Soundtracs	Southern Broadcasting	Studer	Tore Seem Audio A/S
Model Series	SAC-2000	FM Broadcast	Alldesign console†	970	SEECON
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	24 max	.....	16	18, expands by 9s	16-40
Output channels	Pgm/aud/aux/mono/cue	Pgm/aud/aux/cue/mono	Pgm/aud	Pgm/aud	Pgm/aux/sub/mono
Fader types	Slider	Slider	Slider, VCA control	Slider	Slider
Bus switching by	Push button	Push button	Push button	Push button	Push button
Input patch points	Yes	No	...	Yes	Yes
Internal switching by	Solid-state	Mechanical	CMOS devices	n.a.	n.a.
Machine starts stops	Yes	8 circuits	With sequencing	Yes	Fader switches
Cue circuits	Push button	Bus switching	Hall effect switching	PFL, push button	PFL
Metering types	VU	LED	VU, LED	PPM, VU	PPM, bar graph, LED

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Manufacturer	Soundcraft	Soundtracs	Southern Broadcasting	Studer	Tore Seem Audio A/S
Model Series	SAC-2000	FM Broadcast	Alldesign console†	970	SEECON
Int cue amp speaker	Speaker	Amp only	Yes	Yes	Yes
Int headphone amp	Yes	...	Yes	Yes	n.a.
Input connections	Active bal	Xfmr	AB 40kΩ	1.6k/10kΩ	AB >1k/10kΩ
Output connections	AB 600Ω	Xfmr	AB 600Ω	Bal <200Ω	AB 20Ω
Output level	26dBm max	4dBm/-10dBv	8dBu, 16dBu max	6,15dBu	6dBu, 20dBu max
AF response	-1dB 8dBm	...	-0.3dB 16-16k	-1, +0.5dB	<0.5dB
Distortion	0.01% 20-20k 8dBm	0.015% 1kHz	0.007% 1kHz 8dBu	<0.03% 6dBm	<0.1% 20dBu
S/N ratio, mic/line	80dB	...	-92dBu ref 8dBu	<-125dBu EIN/93dB	-124dBu EIN/80dBu
Crosstalk (worst)	-65dB 1kHz 8dBm	...	-83dB 1kHz	<-80dB	n.a.
Reader Service Number	491	492	493	494	495

Manufacturer	UREI	Ward-Beck Systems		Wheatstone	
Model Series	1690 (1650, 1580)‡	R2200	Series ST - M500	A-20	A-500a
Modular construction	No	Yes	Yes	Yes	Yes
# of mixing positions	12 (5, 8)	22	24(12m-12st)/36(12-24)	10	22
Output channels	Pgm/aud/mono opt	Pgm/aux/cue/mono	Pgm/aud/aux/cue/mono	Pgm/aud/mix-minus/mono	Pgm/aud/aux/mono opt
Fader types	Slider, rotary opt	Slider	Slider	Slider	Slider
Bus switching by	Push button	Push button	Push button	Push button	Push button
Input patch points	No	No	Yes	Yes	Yes
Internal switching by	Solid-state	Mechanical	Solid-state, mech	Solid-state, relay	Solid-state, relay
Machine starts stops	Switch contacts	22 relay contacts	6 circuits	Yes	Yes
Cue circuits	On-fader	On-fader	On-fader, bus switch	On-fader, push button	On-fader, push button
Metering types	VU	VU, PPM opt	VU, PPM opt	VU	VU, Yes
Int cue amp speaker	Yes	Amp, speaker	Amp, speaker	Speaker opt	Speaker opt
Int headphone amp	Yes	...	...	Yes	Yes
Input connections	AB/TB opt 1.5k/10kΩ	TB 750/24kΩ	TB 1.5k/20kΩ	AB 150/20kΩ	AB/TB opt 150/20kΩ
Output connections	TB 600Ω	Bal 600Ω	Bal <100Ω	AB 600Ω	AB 600Ω
Output level	4dBm, 24dBm max	8dBm for 0VU	8dBm nom	+30dBu max	30dBm max
AF response	±1dB 8dBm	±1dB 8dBm	±0.5dB 8dBm	<±0.5dB 20-20k	<±0.5dB 20-20k mic
Distortion	0.02% 4dBm	0.25% 15kHz 18dBm	0.2% 20kHz 24dBm	<0.005% 1kHz 20dBm	<0.005% 1kHz 18dBm
S/N ratio, mic/line	-124dBm EIN	-125dBm EIN/78dB	-125dBm EIN/80dB	-128dBm EIN/<-88dBm	-128dBm EIN/90dB
Crosstalk (worst)	n.a.	-75dB 15kHz 8dBm	-75dB 15kHz 8dBm	<-55dB L-R separation	-90dB 1kHz Pgm-Aud-Aux
Reader Service Number	496	497	498	499	500

Audio Mixers, Portable

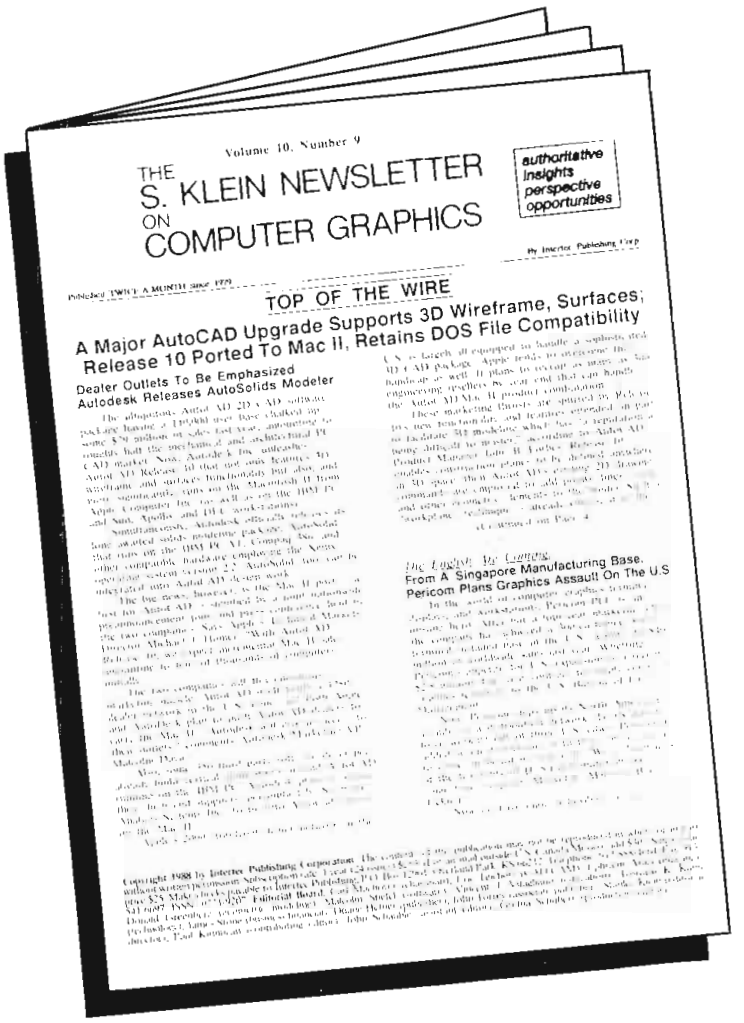
This equipment includes ENG mic mixers to smaller format production consoles, many easily carried by one person. Models with an integral TELCO interface are marked with a dagger (†), while those with compression & limiting are marked with a double dagger (‡). In Audio Response, Hz is understood.

Manufacturer	a&a Systemes de Communications		ADM Technology	Allen/Heath	AMEK Consoles
Model Series	CORA series†‡	Report'2 (Report'4)†‡	RM 1083	SR series	BC-II series†
Modular system	Yes	No	Yes	No	3-chassis sizes
# of mixing positions	4	3 (4)	8	8, 16, 24 models	32 max
# of inputs	17	2 M/1 L (4 M/L)	16	13, 22, 30	28
# of mixing buses	2	1 (2)	3	2 or 6	6 to 4 subs to 2 out
Stereo output	No	No	Yes	3 pairs	Yes
Output provisions	Line, telco,	Pgm, Telco, phone	Line, aux, phones	Line, monitor, aux	Line, aux, phones
Channel fader type	Rotary, sliders	Rotary	Rotary	TBM slider	Slider
EQ, filtering	Yes	Yes	Prefader	4-band, shelving, peak	Pre & post
Test oscillator	Yes	Yes	None	No	Variable
Metering types	VU meters	LED VU ladder (VU)	VU	LED displays	VU, PPM, LED
Power requirements	220Vac	2 9Vdc or external dc	110Vac	110Vac	120Vac
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	600Ω, 200Ω, 10kΩ	500Ω, 10kΩ	600Ω	.....	150Ω
Input levels	-40, +40dB	-65dB, +12dB	+8dBm	.....	Mic/line switched
Output connections	Active bal	Balanced	Xfmr bal	Unbalanced	Active bal
Output impedance	600Ω, 1kΩ	600Ω	600Ω	.....	150Ω
Output level	+12dB max	+12dBm	+8dBm	.....	+22dBm or 25dBv 6kΩ
AF response	±3dB	40-15k	±1dB at +24dB ref	±1dB, 20Hz-20kHz	±0.5dB at +20dBm ref
Distortion	.....	.....	0.07%, 1kHz, +24dBm	<0.05%, +4dBm out	0.02%, 1kHz 0dBm
S/N ratio	.....	.....	-125.5dBm EIN	-125dBv EIN	-128dBm EIN
Crosstalk	....	....	-72dB 8dBm = 0.1-10k	<-60dB 4dBm	-88dB 1kHz 20dBm
Reader Service Number	395	396	397	398	399

Manufacturer	Audio Developments (Gotham Audio)			Audio-Technica	Audix
Model Series	AD062 (AD062-M)‡	AD160 (AD260) ENG‡	AD145 (AD145-E)	AT4462 Modu-Comm‡	MXT500
Modular system	Yes	No	Yes	No	Yes
# of mixing positions	12, 4-16 opts	4	4/6/8 mic/line	.....	7
# of inputs	4-16	3-m/1-l (4-m/l)	4/6/8, phantom power	6	14
# of mixing buses	A/B/C/Mon L-R/phones	1 mono (1 stereo)	2	L/R	2 main, 2 aux
Stereo output	Yes	No (Yes)	1 pair	Yes	Yes
Output provisions	Line, mic, phones	Line/mic, phones	Line, phones, mon	Line, Modu-Comm phones	Line, aux, phone, mono
Channel fader type	P&G slider (VCA opt)	Rotary	Slider (VCA option)	Rotary	Slider, rotary
EQ, filtering	3-band EQ, HPF	Prefader HPF	Prefader, HPF	No	Yes
Test oscillator	Fixed 1kHz	Fixed 1kHz	Yes	1kHz, 400Hz, 4.5kHz	1kHz fixed
Metering types	VU, PPM (on bridge)	VU, PPM	VU/PPM/LED	Dual VU	Dual VU or PPM
Power requirements	10-24Vdc, 10C cells	10-24Vdc, 9AA (12AA)	10-24Vdc, 10C cells	12-18Vdc, 2 9V cells	110-220Vac/24Vdc
Operating weight	24 lbs 8-in (35 10-in)	3.3 (5.5) lbs	12-16 lbs	4.7 lbs	35 lbs
AF input connections	Xfmr mic, AB line	Xfmr & AB (xfmr bal)	Xfmr bal	Xfmr bal	Xfmr bal
Input impedance load	1kΩ (m), 100kΩ (l)	1kΩ (3kΩ)	1kΩ mic, 10kΩ line	1.5kΩ(m), 47kΩ(l)	1.2kΩ(m), 10kΩ (l)
Input levels	Switched mic/line	Mic/line (switched)	-35, +20dBm, switched	Switched mic/line	Switchable, mic/line
Output connections	Xfmr bal	AB (xfmr bal)	Xfmr bal	Xfmr bal	Xfmr bal, floating
Output impedance	75Ω	20Ω (75Ω)	75Ω	1Ω source	75Ω nominal

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Manufacturer	Audio Developments (Gotham Audio)			Audio-Technica	Audix
Model Series	AD062 (AD062-M)‡	AD160 (AD260) ENG‡	AD145 (AD145-E)	AT4462 Modu-Comm‡	MXT500
Output level	+24dBm maximum	+24dBm	+24dBm into 600Ω	+22dBm maximum	+24dBu max into 600Ω
AF response	±1dB 20-20k	-3,+1dB 10-30k	-3,+1dB 10-30k	-1,+1dB 40-20k	±0.5dB, +24dBm
Distortion	<0.05%, 0dBm	0.05%, 1kHz, 0dBm	≤0.05%, 1kHz +0dBm	<0.1% +4dBm	<0.1%, 40-20k, +18dBm
S/N ratio	-126dBm EIN	-125dBm EIN	-126dB EIN	-127 dBV EIN 150Ω	-125dBm EIN
Crosstalk	<-70dB 40-15k	-60dB 40-15k	<-70dB 40-15k	65dB R-L	<-70dB 18dBm 30-15k
Reader Service Number	400	401	402	403	404

Manufacturer	Bandive/Connectronics		Broadcast Audio	Broadcast Electronics	Calrec
Model Series	SECK 1882 (1282)	SECK62 (SECK112)	System 6RM RackMount	4S50AP (4M50AP/4R50A)	Mini Mixer‡
Modular system	No	No	Yes	No	Yes
# of mixing positions	18 (12)	6 (12)	6	4 max	16 channels max
# of inputs	72 mic/line/tape/ins	6M/6L, 4 aux, (12M/12L)	2/mixer	12 (8/10)	To 18
# of mixing buses	L/R+8 subgroup	L/R, solo	Rotary	1 stereo (1 mono)	2 + aux
Stereo output	Yes	Yes	No	Yes (no)	Yes
Output provisions	Line, mon, group, solo	Line, phones, 4 aux	Pgm, Aud, Cue	Line, aux, phones	Line, aux, link, mono
Channel fader type	Slider, rotary pan	Slider	Rotary	Rotary	Slider
EQ, filtering	Shelving, peak-dip	HF, LF, mid-sweep	None	None	3-band, HF, LF
Test oscillator	30Hz slate tone	.....	No	None (none/fixed tone)	Yes
Metering types	LED bar graph, peak	LED bar graph	VU	VU	Dual VU
Power requirements	120/240Vac	220-240Vac(50Hz)	110Vac, 220Vac opt	110Vac	120/240Vac or ±12Vdc
Operating weight	38 lbs (33 lbs)	11(17.6) lbs ps 2.2 lb	30 lbs	20 (20/10) lbs w/o bat	26 lbs
AF input connections	Active bal	Balanced	TB/AB	Act bal (act/xfmr)	Xfmr bal
Input impedance load	>1kΩ, 50kΩ, 20kΩ, 10kΩ	1kΩ(m), 50kΩ(l)	1.5kΩ/20kΩ	20kΩ	1.2kΩ, 10kΩ
Input levels	-55,+10dBm, +20dB	-60,-30,-15dBu	Mic, line	Switchable mic/line	+8dBu(m), +28dBu(l) max
Output connections	Active bal	Balanced	Xfmr bal	Xfmr bal	Xfmr bal
Output impedance	<50Ω	600Ω, 1kΩ aux	150Ω	600Ω	600Ω, 10kΩ
Output level	+21dBu 20-20k	+21dBm max	28dBm max	+8dBm	+24dBm to 600Ω max
AF response	-1dB, 20-20k	-2dB, 20-20k	±0.5dB 20Hz-20kHz	-1(-2)dB +8dBm	±0.5dB, 30Hz-15
Distortion	<0.0056%, 1kHz	0.03% 1kHz, 0.04% 10kHz	<0.2% 28dBm 1kHz	0.1(0.5/0.3)% 1kHz	<0.05% 40-16k 12dBu
S/N ratio	-124dBu EIN, 80dB	-127.5dBm EIN, 74dB	<-127dBm EIN/90dB	65(60/70)dB	-127dBu EIN, >80dB
Crosstalk	-95dB 1k/-83dB 10k	....	<-80dB 15kHz	....	....
Reader Service Number	405	406	407	408	409

Manufacturer	Comrex Corporation	D&R Electronica		DDA/Klark-Teknik	Digitec
Model Series	STLX (SLX) Sports†‡	300 Mark II	700 Mark 3	Series S PA	UPS 6166 (6000 series)
Modular system	No	No	Yes	Yes	Yes
# of mixing positions	2 mic, 2/line	8	12 and 24	16, 24, 32	16
# of inputs	7 max	20	2/channel + aux	16, 24, 32	8
# of mixing buses	1	L/R, 2 aux send	L/R line, 3 aux	8	6
Stereo output	No	Yes	Yes	Yes	Yes
Output provisions	Line, aux, phone	Line, mono, aux	Line, phones	L/R, mono, mon, phone	4 pgm, 2 aux
Channel fader type	P&G slider (P&G option)	ALPS or plastic slider	ALPS, P&G sliders	Slider	Slider
EQ, filtering	Yes	3-band	4-band	4-band	3-band peak, high-pass
Test oscillator	Fixed	1kHz	.....	Yes	60Hz, 1kHz, 12kHz
Metering types	VU	Bargraph	LED bargraph	VU	VU, PPM
Power requirements	110Vac or battery pack	50/60Hz ac	ac	110 or 220 Vac	120/240Vac, int/ext 12Vdc
Operating weight	18 lbs (15 lbs)	.....	.....	.....	55 lbs
AF input connections	Active bal & aux unbal	Balanced	Bal, unbal	Bal, unbal	Xfmr bal
Input impedance load	150Ω	2kΩ, 10kΩ	2kΩ, 10kΩ	>2k/10kΩ	>1kΩ, >5kΩ
Input levels	Switchable mic/line	Mic, line switched	Mic, line switched	Mic, line switched	-70,+20dBu
Output connections	Xfmr bal, aux unbal	Balanced	Balanced	Active bal	Balanced
Output impedance	600Ω	100Ω	100Ω	<75Ω	<50Ω for 600Ω load
Output level	-9,+6dBm	0dBu	+4dBu	+26dBv max	+21dB max
AF response	±0.5dB 50-15k	±0.025dB, 20-20k	0.025dB, 20-20k	<0.75dB, 20-20k	-1,+0.5dB
Distortion	<0.5%, 50-15k	0.039%	<0.01% any level	<0.05%	<0.2%, +12dBu
S/N ratio	-127dB EIN	-126.5dBu EIN >80dB	-126.5dB EIN, 83dB	-127dBv, 84dB	-125dBu EIN
Crosstalk	<-60dB 1kHz	.....	.....	<-80dB 1kHz	<-70dB overall
Reader Service Number	410	411	412	413	414

Manufacturer	EELA/ESL	Electro-Voice	EMT-Franz	Fostex	Gentner Electronics
Model Series	S20(S22) Reportophone†‡	ELX-1†‡	EMT 10.00.2‡	Multitracker series[1]‡	CRM Combo Remote‡
Modular system	No	No	Yes	No	Yes
# of mixing positions	2	4	10 expandable	4 to 8	4
# of inputs	2	5	...	6	4 mic or line
# of mixing buses	1	1	2	4-8 track to recorder	1
Stereo output	No	No	Yes	Yes	No
Output provisions	Telco line	Line, mic, phones	Line, aux, phones	Line, tape, phones	Pgm
Channel fader type	Rotary	Rotary	Slider	Sliders	Rotary
EQ, filtering	No	Yes	3-band, low cut	Shelving & parametric	Lo-cut, boost, flat
Test oscillator	No	Lo-freq 100Hz	63, 1kHz, 10kHz	Option	1kHz
Metering types	LED	LED VU, PPM display	Analog, LED	LED ladder	VU movement
Power requirements	9Vdc	120Vac, 24-45Vdc	120-240Vac	120Vac, some 12Vdc	110/220Vac, battery
Operating weight	2.5 (3) lbs	5.5 lbs w/batteries	61.7 lbs	5 lbs to 24 lbs	10 lbd
AF input connections	Xfmr bal	Active bal	Xfmr bal	Unbal	XLR Xfmr bal
Input impedance load	1.2kΩ, 40kΩ	6kΩ for low Z mics	2kΩ, 10kΩ, 5kΩ	20kΩ	1kΩ/>50kΩ
Input levels	Mic, line	Switched mic/line	Switched mic/line	3mV-3V	-55dBm (m)/-10dBm (l)
Output connections	Hybrid bal	Xfmr bal	Xfmr bal	Unbal	Xfmr & Act bal
Output impedance	600Ω	10Ω, 60Ω	<35Ω source	to >10kΩ load	600 Ω
Output level	-3dB 600Ω	.....	+20dB max	0.3V	+4dBm, +24dBm clip
AF response	-3dB	-125dB, +4dBm	-1,0.5dB, +6dBm	±3dB 40Hz-12.5kHz(1)	±0.5dB 10Hz-20kHz
Distortion	<0.1%, 200-7k	<0.15% 50-20k +18dBu	0.1%, 1kHz, 6dBm	<0.05% 1kHz	<0.05%
S/N ratio	-122dBm EIN	-128dBu EIN, 150Ω in	>74dB	≥70dB wtd	>70dB
Crosstalk	.....	.....	<-70dB 1kHz 60dBm	≥50dB separation	.....
Reader Service Number	415	416	417	418	419

[1]Values based on system integral with 4-track cassette recorder.

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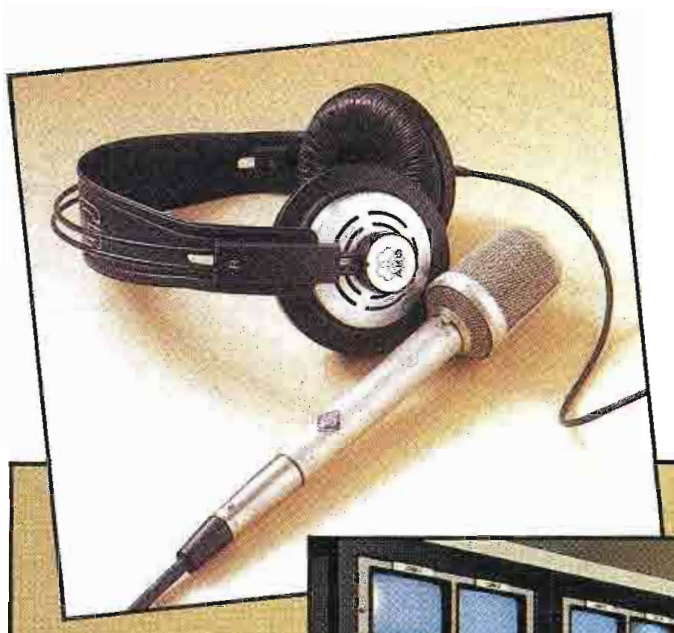
Manufacturer	Harrison Systems	Ikegami Electronics	JVC Company	Kaitronics	Logitek
Model Series	MX-8 (Pro-7)	ABX-160A	MI-2000U	AM-8000 (VAS-ST)	Stereorack (Audiorack)
Modular system	Yes	Yes	No	No	No
# of mixing positions	10 (36)	16	8	8 (8A+8B)	6
# of inputs	8 (24)	16	16	8 (16) mic or line	11 (6)
# of mixing buses	2-st/2-mono (4-group)	6, 4 groups, mono	4	1 (L & R on A & B)	Pgm/Prvw
Stereo output	Yes	Yes	Yes	No (Yes or no)	Yes (no)
Output provisions	Line, phones, (aux)	Line, aux, mon	Pgm, aux, mon, send	Line (L/R line, mon)	Line, aux, mic, phones
Channel fader type	Slider	Slider	Slider, rotary pan	Rotary	Rotary
EQ, filtering	No (prefader)	Yes	3-band	None	No
Test oscillator	Fixed (variable)	Variable	1kHz	No	Fixed
Metering types	VU (PPM, LED)	VU, 3 pair L&R	12-LED bar graphs	VU (dual VU)	VU
Power requirements	±15Vdc	110-220Vac	110Vac or 12Vdc	117Vac	120Vac (also 12Vdc)
Operating weight	25 (125) lbs	.....	18 lbs	....	22 lbs (20 lbs)
AF input connections	Active bal	Balanced	Bal, XLR, unbal RCA	Bal, unbal	Active bal
Input impedance load	150Ω	600Ω	10kΩ line	Hi-z mic, 600Ω line	150Ω, 600Ω
Input levels	Mic (& line)	Mic, line switchable	-70,-10dB	-70, +15dBm	Switchable mic/line
Output connections	Active al	Balanced	Bal XLR, unbal RCA	1 bal or 2 unbal	Xfmr bal
Output impedance	600Ω	For 600Ω load	600Ω load, l0kΩ recorder	600Ω or 300Ω	600Ω
Output level	-24dBm max	+4dBm	0dB	+4dBm	0dBm
AF response	±0.2dB, +4dBm=0VU	±0.3dB, 30Hz-20kHz	-2,0dB, 20Hz-20kHz	-0.25,0dB 20Hz-20kHz	±0.3dB, 0dBm
Distortion	.....	0.1%	<0.1% +20dB output	0.05% +4dBm 20-20k	0.04%, 0dBm (0.07% +4dBm)
S/N ratio	-129dBm EIN	>56dB mic, >75dB line	-128dB EIN IHF-Awtd 150Ω	128dBm EIN	-122dBm EIN (-114dBm)
Crosstalk	-65dB 4dBm 15kHz	<-50dB	<-70dB 1kHz Pgm-Aux	....	-80dB 4dBm 1kHz
Reader Service Number	420	421	422	423	424

Manufacturer	Micro-Trak	Neve/Siemens	Pacific Recorders & Eng.	Precision Design	Ramko Research
Model Series	Sport mixers†	5422 (542 series)	NewsMixer (StereoMixer)†‡	ROAM-8‡	P-4MS (P-5MX)
Modular system	No	Yes	Yes	No	No
# of mixing positions	4 max	8 max (12-16)	8 possible	8	4 (5)
# of inputs	5 max	10	2 per channel	8elco (mic or line)	4 (5)
# of mixing buses	1	2 + 2 aux	Mix 1, 2	To telco	2 (1)
Stereo output	No	Yes	No (Yes)	Monaural	Yes (mono)
Output provisions	Line, phones	Line, 2-aux, phones	Mix1/2, Aux (Pgm/Mon)	Line, telco, send bus	Phones & (line)
Channel fader type	Rotary	P&G slider	Rotary	Sliders	Rotary
EQ, filtering	No	3-band, high-pass	3-band EQ/filter opt	3-band	Yes (no)
Test oscillator	None	Variable	Yes	Pink-noise	No
Metering types	VU	VU, PPM	Dual ANSI VU	LCD bargraph	LED ladder (no)
Power requirements	110/220Vac, dc	120Vac or int Vdc	117Vac	ac or D cells	120-240Vac
Operating weight	8 lbs	42 lbs w/batteries	.....	13.75 lbs in case	.....
AF input connections	Xfmr bal	Xfmr bal	Balanced	Electronic bal	Active bal
Input impedance load	600Ω, 150Ω	1.2kΩ(m), 10kΩ(l)	30kΩ (m), 40kΩ (l)	600Ω	.....
Input levels	Switchable mic/line	Switchable mic/line	-70,-35dBu(m),+9dBu (l)	Mic, line	Switchable, mic/line
Output connections	Xfmr bal/telco	Xfmr bal	Balanced	Balanced	Actie bal
Output impedance	600Ω	50Ω	30Ω to drive 600Ω load	600Ω	600Ω
Output level	+8dBm	+4, +8, +20dBu, 600Ω	+4-8dBm=0VU, +24 max	+4dB	+26dBm max
AF response	Per telco regulation	±0.5dB, +4/+8dBm=0VU	-0.7,0dB, 20Hz-20kHz	±0.2dB, 20Hz-20kHz	-1.5,0dB
Distortion	0.5% 1kHz +8dBm	<0.05% 30-15k +20dBm	<0.01% +24dBm out	≤0.01% THD+N/0.016% IMD	0.008% 1kHz +8dBm
S/N ratio	-120dBm EIN	-125dBm EIN	-126dBu EIN 150Ω source	-109dB EIN	70dB(m), 90dB(l)
Crosstalk	....	<-60dB 20dBm 15kHz	<-80dB 1kHz (-70dB)	.....	<-65dB 1kHz
Reader Service Number	425	426	427	428	429

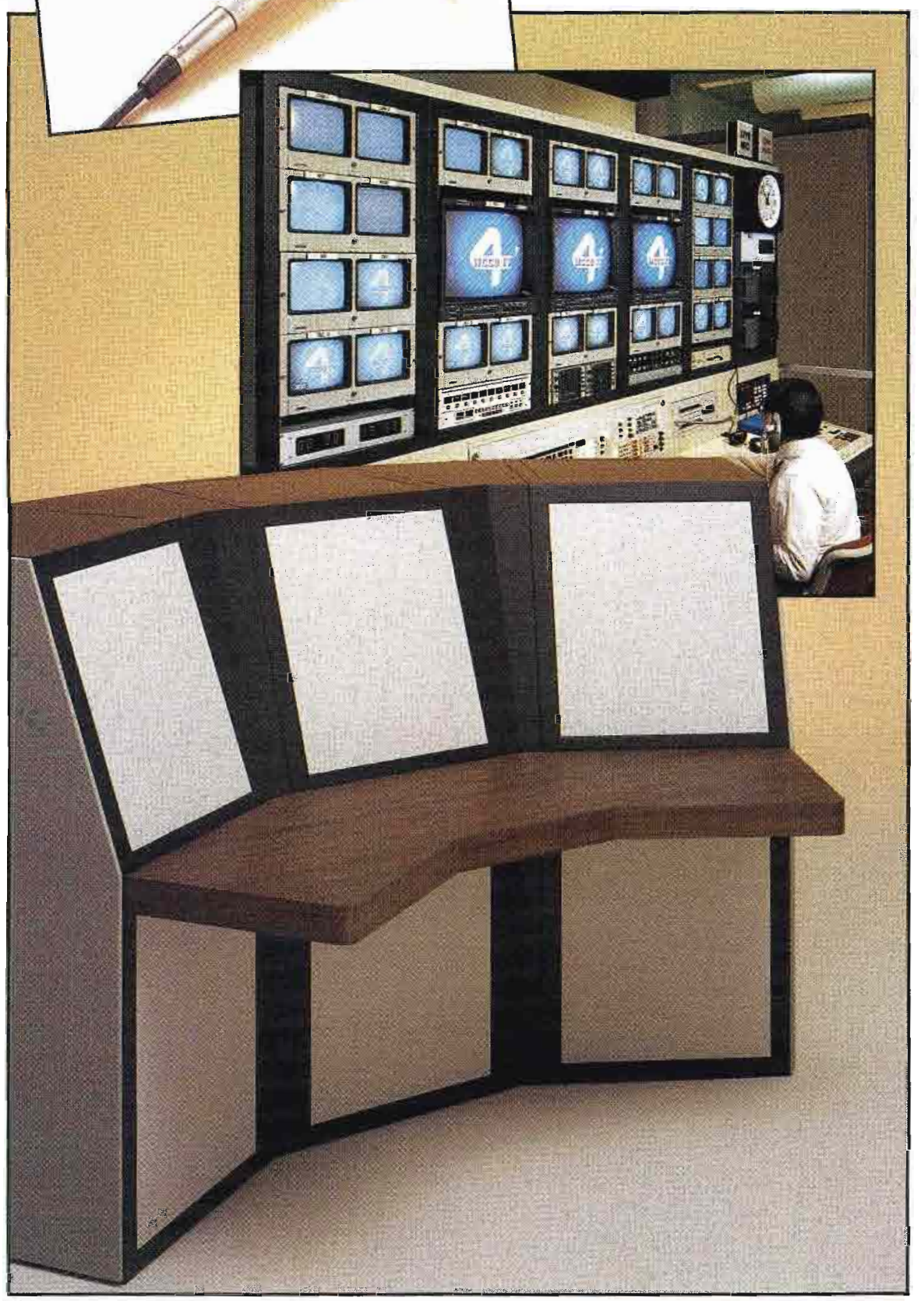
Manufacturer	Ramko Research	Ramsa/Panasonic Pro A/V		ReVox	SATT Communications
Model Series	Primus Sidekick‡	WR-133 (WR-500)	WR-M10‡	C279‡ (expander opt)	SAM-42‡
Modular system	No	No	No	No	No
# of mixing positions	4 max	8	6	6	4
# of inputs	2-line, 2-mic/line	18 (8/12)	4 mono, 6 stereo	6 mic/line/stereo(phono)	6
# of mixing buses	1	3	2	Pgm, aux	2
Stereo output	No	Yes (3)	Yes	Yes	Yes
Output provisions	Line, phones	Mono/main/rec (1 pr)	Main, record, monitor	Pgm, aux send, channel	Line, phones
Channel fader type	Rotary	Proprietary slider	Rotary, slider	Slider/VCA, rotary pan	Slider
EQ, filtering	No	2-band peaking	2-band peaking EQ	LF, HF shelving	No
Test oscillator	Yes	No	No	In expander	Fixed tone
Metering types	Vu	Dual VU movement	Signal, Peak, Clip LEDs	LED ladder PPM	PPM, VU opt
Power requirements	9Vdc	120Vac (or 12Vdc)	120Vac, 10W	110-240Vac	110-220Vac, ±15Vdc
Operating weight	2.5 lbs	22 lbs	13.2 lbs	24.2 lbs	8.5 lbs
AF input connections	Balanced	Bal/unbal XLR/RCA	Active bal, unbal	Bal mono, unbal stereo	Xfmr bal
Input impedance load	.....	10k/20kΩ (600/10kΩ)	>5kΩ, >20kΩ, >50kΩ	>1.2kΩ (m); 4.7kΩ (l)	1kΩ (m), 600Ω(l)
Input levels	Switchable mic/line	-80,+20dB (-70,+4)	-60,-6dBu; line, phono	-66,-6dBv; -26,+10dBv	Switched mic/line
Output connections	Balanced	Bal/unbal, XLR/RCA	Xfmr floating, isolated	Bal, unbal	Xfmr bal
Output impedance	Low Z source	600Ω, 10kΩ	600Ω actual Z, 10kΩ	1kΩ unbal, 50Ω bal	600Ω
Output level	+16dBm, 0dBm=0VU	+4dBm, -10dB record	+4dBu, -10dBu recorder	+6,+10,+14dBu bal	+20dBm, +21dB 5kΩ
AF response	<+1.5dB, 20-20k	-2,+0.5dB, 20-20k	-1,+0.5dB, 20-20k	±1dB, 20-20k	-1, 0.5dB, +6dBm
Distortion	0.08%, +8dBm	<0.1% (<0.3%) 18dBm	0.1% THD/0.1% IMD	<0.03%	0.01% 1kHz +6dBm
S/N ratio	72dB(m)/90dB(l)	-129dBm EIN (-128)	-125dBm EIN IHF A-wtd	-125dBv EIN, 86dB line	-128dBm EIN
Crosstalk	.....	<-65dB 1kHz	-65dB max 1kHz	.....	-90dB 15kHz 6dBm
Reader Service Number	430	431	432	433	434

Manufacturer	Tore Seem Audio A/S		Shure Brothers		
Model Series	SEESAM 2††‡	Pluto 3/1 mini‡	FP42 (FP51)‡	M268 mix mixer	M267‡
Modular system	Yes, multiunit possible	No	No	No	No
# of mixing positions	8 expandable to 24	3	4 max	4	4 max
# of inputs	8 (to 24)	1 mic/line, 2 mic	4 mic-line, mix-bus	4 mic, aux, mix-bus	4 mic-line/mix-bus
# of mixing buses	10	1	2 (1)	mix-bus	1
Stereo output	Yes	No	Yes (Mono only)	No	No
Output provisions	line, aux, subgroups	Line, phones	Line, phones, mic	Hi/Lo-z mic, aux, mix	Line, mic, phones
Channel fader type	P&G sliders	Rotary	Rotary w/pan (Rotary)	Rotary	Rotary
EQ, filtering	Yes	Low-cut	Low cut	No	Low-cut filter

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Manufacturer	Tore Seem Audio A/S		Shure Brothers		
Model Series	SEESAM 2†‡	Pluto 3/1 mini‡	FP42 (FP51)‡	M268 mix mixer	M267‡
Test oscillator	.....	1kHz tone	Yes	No	1kHz
Metering types	Dual LED PPMs	VU	Dual VU (single VU)	No	VU, LED
Power requirements	115-220Vac, +12,24Vdc	6 1.5V cells, ext 9Vdc	120-240Vac, 27Vdc	120/240Vac	120/240Vac, 27Vdc
Operating weight	.....	6 lbs	6.5 lbs (6.1 lbs)	4 lbs	5 lbs
AF input connections	Active, xfmr bal	Balanced	Xfmr bal	Xfmr bal	Xfmr bal
Input impedance load	>1kΩ, 600Ω, >10kΩ	1kΩ(m), 10kΩ(l)	1kΩ, 66kΩ, 3.5kΩ	1kΩ,140kΩ, 43kΩ, 3.3kΩ	150Ω, >10kΩ, 3.5kΩ
Input levels	+6dBm	Switched mic/mic/line	Mic, line, mix-bus	Mic, line	Switchable mic/line
Output connections	Xfmr bal	Balanced	Xfmr bal & unbal	Xfmr bal & unbal	Xfmr bal
Output impedance	<40Ω	<40Ω	≤1Ω, 185Ω, 3.5kΩ	50Ω, 5kΩ, 2.5kΩ, 3.3kΩ	0.5Ω, 150Ω, 3.5kΩ
Output level	+20dBu into 600Ω	+9dB limiting level	-33dBV to +18dBm	-20dBm, +18dBv	+18dBm, -34dBv mic
AF response	±0.5dB	±0.5dB, 40-15k	± 0.2dB 30-20k	±3dB 40-20k	±2dB 30-20k
Distortion	<0.1% 20-20k 20dBu	0.15% 40-15k +9dB	0.4% +15dBm/0.5% IMD	≤±0.2%	≤0.35% 15dBm/0.5% IMD
S/N ratio	-125dBu EIN, >80dBu	5dB, CCIR 468	-129dBm EIN	-128dBm EIN	-128.5dBm EIN
Crosstalk	.....	.....	<-40dB 15dBm 10kHz	.....	.....
Reader Service Number	435	436	437	438	439

Manufacturer	Shure Brothers	Sonosax		Sony/Pro Audio	
Model Series	FP32 (FP31) ENG‡	SX-S series (SX-V)‡	SX-PR6 (-PR2/-PR4)‡	MX-P61‡	MX-P42‡ (-P21)
Modular system	No	Yes	Yes	Yes	No
# of mixing positions	3 max	6, 8, 10 (10)	6 (2, 4)	12	4 (8)
# of inputs	3 mic-line, mon (slate)	6, 8, 10 (10)	6 (2, 4)	17	6 (22)
# of mixing buses	2 (1)	5	3	7	2 (4)
Stereo output	Yes (2 mono)	Yes	Yes	Yes	Yes
Output provisions	Mic, line, tape, phones	Line, aux, phones	R/L line, phone	Line, aux, phones	Line/mic/phones
Channel fader type	Rotary	Slider	Rotary	Slider	Rotary (slider)
EQ, filtering	Low-cut prefader	Yes	Low cut	Prefader	Prefader
Test oscillator	1kHz	Fixed	1kHz	1kHz fixed	None (fixed)
Metering types	Dual VU, LED (VU, LED)	PPM, LED	LED VU ladder	VU, PPM, LED	VU (& LED)
Power requirements	11-18Vdc [phantom 48V]	9-18Vdc (D cells)	3 C cells, ext 6-12Vdc	12Vdc, 110-220Vac	9Vdc (12Vdc/120Vac)
Operating weight	2.5 lbs (2.2 lbs)	15 lbs	5 (3, 4) lbs	40.3 lbs	8.6 lbs (28 lbs)
AF input connections	Xfmr bal	Xfmr & (active bal)	Active bal	Active bal	Xfmr (active bal)
Input impedance load	1kΩ, 66kΩ, 24KΩ	600Ω (5kΩ/10kΩ)	10kΩ	10kΩ	600Ω
Input levels	Switchable, mic/line	Switchable mic/line	Mic, line switched	Mic, line	Mic, line
Output connections	Xfmr bal	Xfmr, active bal	Floating bal	Active bal	Xfmr (active bal)
Output impedance	1Ω, 330Ω, 7.5kΩ	50Ω	2kΩ, 10kΩ	150Ω	For 600Ω load
Output level	-34dBV, +16dBm (+18dBm)	+18dBm	+18dBu, +21dBu max	+24dBm	+4dBm
AF response	±2dB 50-15k (30-20k)	±0.5dB, +6dBm	±0.5dB, 30-20k	±0.5dB, 30-20k	±1(0.5)dB, +4dBm
Distortion	<0.25% 4dBm	0.01% 1kHz 6dBm	0.03%	<0.1% 1kHz 4dBm	0.1% (0.03%) 4dBm
S/N ratio	-128dBV EIN (-129dBV)	-129dBm EIN	-129dBm EIN 150Ω source	-125dBm DIN	-125dBm EIN
Crosstalk	-30dB 10kHz	-80dB 8dBm 1kHz	.....	-70dB 4dBm 15kHz	<-70dB (-60dB)
Reader Service Number	440	441	442	443	444

Manufacturer	Soundtracs/ Stellavox		Studer	TASCAM	
Model Series	PC MIDI series‡	AMI-48‡	Model 961/962‡	M-208 (M-216) [M224]	M-06 (M-106)
Modular system	Yes	.....	Yes	No	No (Yes)
# of mixing positions	16 or 24 channel	5 max	17 max	8 (16) [24]	6
# of inputs	32 or 48	10 max	.....	Mic/line/tape per channel	6 mic/6 line/6 insert
# of mixing buses	25	1	6	4 + 2	L+R (and 4-line)
Stereo output	Yes	Yes	Yes	Yes	Yes
Output provisions	Line, aux, mon	Line, aux, phone	Line, aux, phones	Line, aux, phones	Pgm, aux, effects
Channel fader type	Slider w/MIDI ctl	Slider	Slider	Slider	Slider, rotary pan
EQ, filtering	4-band param/shelving	Yes	Yes	Prefader, 3-band	±15dB, 100Hz, 10kHz
Test oscillator	4-tone	Fixed	Variable	None	None
Metering types	Bargraph	PPM	VU or PPM	VU w/peak LED	VU + peak LEDs
Power requirements	Ext ac	18Vdc	110Vac or dc	ac	110-220Vac
Operating weight	90 or 121	9 lbs	35 lbs with batteries	18.75 (26.5) [32] lbs	5.73 lbs (15.4 lbs)
AF input connections	Active bal, unbal	Bal	Balanced	Active bal, unbal	Unbal
Input impedance load	2k/10kΩ mic/line	600Ω	.....	2.8kΩ, 22kΩ	45kΩ, 10kΩ
Input levels	Mic, line switched	Switched mic/line	-70,-10dBu; -10,+20dBu	-70dBV, +24dBV range	-70,+4dBV nom.
Output connections	Unbalanced	Balanced	Balanced	Unbalanced	Unbal
Output impedance	50Ω source	200Ω, 600Ω	<50Ω source	<100Ω source	100Ω
Output level	+22dBm max	+6 or +15dBm	24dBm, 2.4dBu 300Ω	+20dBu max	0dBu nominal
AF response	-2dB, 25-20k	-1dB @ 6dBm	-1,+0.5dB 4dBm	-2,+1dB, 20-25k	-2,+1dB, 20-20k
Distortion	<0.015% THD/IMD	0.03% 1kHz 6dBm	0.03% 30-15k	<0.03% -10dBV input	<0.03%
S/N ratio	-127dBm EIN, 80dB	-125dBm EIN	-125dBm EIN	-130dB IHF A-wtd	-109dB IHF A-wtd
Crosstalk	-80dB 1kHz	-80dB 6dBm 1kHz	<-80dB 4dBm 15kHz	<-60dB 1kHz	<-60dB 1kHz
Reader Service Number	445	446	447	448	449

Manufacturer	TASCAM			Telfax Communications	UREI Electronics
Model Series	MiniStudio series[1]	246 Portastudio	338 Studio 8	Ten 32 (Ten 44[2])†‡	1620 music mixer
Modular system	Integral 4-track ACR	Integral 4-track ACR	Integral ,'' ATR	No	No
# of mixing positions	4 and 6	6	8	4	6
# of inputs	4 or 6 mic/line	6 mic/line + buses	8 mic/line + buses	4-mic or 2-mic/2-line	11
# of mixing buses	4	4	8	1	1
Stereo output	L+R & 4-channel	L+R & 4-channel	L+R & 8-channel	No	Yes
Output provisions	Line, direct to tape	Line, direct to tape	Line, direct to tape	Telco line, phones	Tape, PA, phones
Channel fader type	Slider, rotary pan	Slider, rotary pan	Slider, rotary pan	Rotary	Rotary
EQ, filtering	2-band, 2-channel	2-band sweep, peak/dip	3-band sweep peak/dip	No	R/L tone controls
Test oscillator	None	None	None	Ten 44 only, 1kHz	No
Metering types	VU, peak LED or Ladders	VU, peak LED	VU, peak LED	VU	None
Power requirements	11-15Vdc 400mA/battery	110Vac	110Vac	20Vac, 24Vdc (1)	110, 220Vac
Operating weight	7.7 lbs max	22.7 lbs	83.6 lbs	5 lbs	13 lbs, rack-mount
AF input connections	Unbal	Unbal	Bal, unbal	Balanced, isolated	Bal, unbal
Input impedance load	5kΩ and 50kΩ	10kΩ	2.4kΩ, 50kΩ	150Ω(m), 600Ω(l)	150/10k/47kΩ
Input levels	Mic, line	Switchable mic/line	-70dBV, -10dBV nom.	Mic or line	Mic, line, phono
Output connections	Unbal	Unbal	XLR & RCA jack	Balanced	Bal, unbal
Output impedance	100Ω source	100Ω	100Ω source, 10kΩ load	600Ω, 10kΩ, 150Ω	<50Ω
Output level	-10dBV	10dBV	+4dBm nom.	+4dBm = 0VU	+20dB max in 200Ω

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Manufacturer	TASCAM			Telfax Communications	UREI Electronics
Model Series	**MiniStudio series[1]**	**246 Portastudio**	**338 Studio 8**	**Ten 32 (Ten 44[2])†‡**	**1620 music mixer**
AF response	±3dB 40-12.5k (ACR)	±1dB	±3dB 30-16k (ACR)	±3dB 90-15k	±1dB 20-20k
Distortion	1% 1kHz	0.05% 1kHz	0.5% 0VU w/dbx	<1% 14dBm clipping	<0.1% +4dB
S/N ratio	>85dB IHF A-wtd	>65dB THF a-wtd	>5dB IHF A-wtd w/dbx	...	<-126dB EIN
Crosstalk	55dB separation	-65dB 1kHz	-75dB 0VU w/dbx	.....	.....
Reader Service Number	**450**	**451**	**452**	**453**	**454**

[1]Series includes Porta One, Porta Two and 05.
[2]Ten-44 includes a NiCad battery charger.

Manufacturer	Ward-Beck Systems	Yamaha International		
Model Series	**T-1202A†**	**EMX200/EMX300**	**MC1204/-1604/-2404**	**M508/M512**
Modular system	Yes	Yes	Yes	Yes
# of mixing positions	12	8/12	12/16/24 + 6	8/12
# of inputs	24	8/12	12/16/24 + sub inputs	8/12
# of mixing buses	3	L-R, FB, echo	4 + 2 + 2 + cue	L-R, FB, echo
Stereo output	No	Yes	Yes	Yes
Output provisions	Line, phones	Line, EO, phone, FB	Line/phone/grp/FB/echo	Line/FB/phones/echo
Channel fader type	Slider	Slider	Slider	Slider
EQ, filtering	Yes	3-band EO	3-band	3-band EQ
Test oscillator	1kHz fixed	.....	.....	No
Metering types	VU or PPM opt	VU, peak LED	VU, peak LED	VU
Power requirements	115-230Vac	110Vac	120Vac	110Vac
Operating weight	120 lbs	68/77 lbs	48/57/74 lbs	34/44 lbs
AF input connections	Xfmr	Bal, unbal	Bal & unbal	Bal & unbal
Input impedance load	1.5k/30kΩ	1k/10kΩ	4k/10kΩ	800/1k/2k/4k/10kΩ
Input levels	Mic, line	Mic, line	Mic, line	Mic, line
Output connections	Balanced	Unbal	Bal & unbal	Balanced
Output impedance	.....	370Ω	150Ω	150Ω source
Output level	+8dBm=0VU	+20dB (7.75V)	+20dB max	+24dB max
AF response	±1dB ref +8dBm	-3,+3dB 20Hz-20kHz	-3,+1dB 20Hz-20kHz	-3,+1dB 20Hz-20kHz
Distortion	0.25% 20kHz +18dBm	<0.2%	<0.1%	<0.5% 20Hz-20kHz
S/N ratio	-125dBm EIN, 75dB	-126dB EIN (66dB)	-128dB EIN	-127dB EIN
Crosstalk	-70dB 15kHz 8dBm	-60dB	-60dB 1kHz	-60dB
Reader Service Number	**455**	**456**	**457**	**458**

Audio Mixers, Studio Production

These stereo production mixers include direct out, multitrack recording outputs unless marked with a bullet (•). AB and TB under Input, Output Connections refers to Actively and Transformer Balanced, respectively. A dagger (†) indicates no remote machine start/stop switching. Systems not specifically stating automation preparation are marked with a double dagger (‡).

Manufacturer	ADM Technology		AMEK Systems & Controls	
Model/Series	**Post-Pro 12†**	**VP series†**	**Classic**	**APC-1000**	**G2520†**
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	12	16 max	To 64	150	4B (64)
# of mixing buses	2	3	8+2+1 typical	64	24 (24)?ux
Patch points	No	No	Yes	Routing keyboard	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	Slider	Slider	P&G slider	P&G moving fader/VCA	P&G slider w/VCAs
Equalizer	3-band	4-band	4-band, sweep	4-band	4-band
Filtering	High, low-pass	.....	High, low-pass	High, low, pass	High, low-pass
Panpots	No	Yes	Yes	Yes	Yes
Groups subgroups	2 groups	3 groups	8 stereo subs	10 subs	Multiple
Sends returns	None	1-pre, 1-post	8 each pre/post	8 send pre/post	Multiple
Solo bus	None	PFL	In-place/PFL	AFL/PFL/in-place	AFL/in-place
Compression limiting	No	Yes	CC316 module	Compress, expand	Option
Talkback circuits	Yes	Yes	Yes	With routing	W/routing
Speaker muting	Yes	No	Yes	Yes	3 monitor sets
Lineup oscillator	Fixed frequency	Variable	3-range variable	Yes	Variable
Metering types	VU	VU/PPM	VU/LED	Plasma	200-seg plasma
Input connections	Bal 600Ω	TB 600Ω	AB >1kΩ/10kΩ	AB 150Ω	AB 1k(m)/10k(l)Ω
Output connection	Bal 600Ω	Xfmr 600Ω	Unbal 150Ω	Bal 150Ω	Unbal 150Ω
Output levels	8dBm	8dBm = 0VU	26dBm max	22dBv	22dBm
AF response	±0.4dB	±1dB 24dBm	±0.5dB	±1dB 4dBm	±1dB 4dBm ref
Distortion	0.05% 1kHz 24dBm	0.07% 1kHz 24dBm	0.03% +20dBv	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	-85dB 1kHz 8dBm	-72dB 100-10k 8dBm	-80dB 1kHz	-80dB 1kHz	-78dB 1kHz
Reader Service Number	**340**	**341**	**342**	**343**	**344**

Manufacturer	Arrakis Systems	Auditronics		Audix Ltd	
Model/Series	**Model 10000‡**	**400 series**	**Series 310**	**AAT3000 assignable**	**MXT 1200 series‡**
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	18, 24, 30	24	32	24-100	48
# of mixing buses	Pgm/aud/util/mono	8 or 16	4-8+2+1	24+8+2	8
Patch points	Yes	Yes	Yes	Computer control	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	P&G slider	Slider P&G VCA	Slider	Slider (VCA opt)	Slider
Equalizer	3-band	Optional EQ	Peak/shelf/swept	4-band	4-band
Filtering	High, low-pass	High, low-pass	High, low-pass	.....	High-pass
Panpots	Yes	VU, LED opt	Yes	Yes	Yes
Groups subgroups	4 or 8	Yes	4 or 8	24, 8 aux	8 each
Sends returns	2 aux send	Yes	2-4 pre & post	Various	4 pre, post
Solo bus	Yes	Yes	In-place	In-place	AFL/PRL
Compression limiting	No	AB bridging	Accessory	.....	Yes
Talkback circuits	Yes	Yes	Acessory	Yes	Yes
Speaker muting	Yes	Yes	No	Yes	Yes
Lineup oscillator	Multi-tone	Optional	11-frequency	Yes	Variable

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Manufacturer	Arrakis Systems	Auditronics		Audix Ltd	
Model/Series	Model 10000‡	400 series	Series 310	AAT3000 assignable	MXT 1200 series‡
Metering types	VU	VU (bargraph opt)	VU (PPM opt)	VU, bargraph	VU, LED PPM
Input connections	AB low/high-Z	AB <1.5kΩ/50kΩ	AB <1.5kΩ/50kΩ	Bal/unbal 1.2k/10kΩ	TB 1.2k/10kΩ
Output connection	AB 600Ω	AB 60Ω	AB 60Ω	Bal/unbal 150Ω	TB 150Ω
Output levels	27dB	4dBv ref 0.775Vrms	4dBv ref 0.775Vrms	24dBm max	24dBm max
AF response	±1dB 20-20k	≤0,-0.5dB 20-20k	0,-0.5dB 20-20k	±0.5dB 24dBm	±0.5dB 24dBm
Distortion	0.1%	≤0.05% THD 20-20k	<0.05% THD 20-20k	0.05% 18dBm	0.1% 18dBm
S/N ratio	-100dB line	≤-129dB EIN, >84dB	<-129dB EIN,>G84dB	<-125dBm EIN	-125dBm EIN/80dB
Crosstalk	-80dB 20kHz	≤-65dB 20-20k	<-65dB 20-20k	<-70dB 18dBm	-70dB 18dBm
Reader Service Number	345	346	347	348	349

Manufacturer	Calrec by AMS			D&R Electronica b.v.
Model/Series	UA8000	Logic 1	Assignable console	M studio (M OB)	8000 series III
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	64 max	8 + 2	48, 72 (128 max)	To 64	24 + 8
# of mixing buses	32	32	8 grp+8 aux+4 main	24grp/8sub/4main/aux	8 groups
Patch points	Yes	Yes	Computer control	Yes	96 points
Stereo output	Yes	Yes	4 pair	Yes	Possible
Fader types	Slider	Motorized slider	Slider	Slider	ALPS slider (P&G opt)
Equalizer	4-band	4-band	4-band	3/4-band	4-band
Filtering	High, low-pass	High, low-pass	.....	High, low-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Groups subgroups	32 S/9 R	32 S/9 R	8 stereo/8 aux	32 total	8 groups
Sends returns	Pre & post	Pre & post	Multiple, pre/post	Pre & post	8 aux send, pre/post
Solo bus	AFL/PFL/in-place	AFL/PFL/in-place	Yes	PFL/AFL/in-place	PFL/in-place
Compression limiting	Yes	Yes	Yes	Option	Accessory
Talkback circuits	Yes	Yes	Yes	Available	Yes
Speaker muting	Yes	Yes	.....	Yes	Yes
Lineup oscillator	Variable	Variable	Yes	6-tone/slate/pink	9-tone, slate
Metering types	Bargraph	LEDs in Knob	LED bargraph, VU	Bargraph	LED bargraph
Input connections	TB/AB 20kΩ	TB/AB 20kΩ	TB/AB >1.2k/10kΩ	TB/AB 1.2k/10k/20kΩ	AB >4kΩ
Output connection	AB <22Ω	AB <22Ω	AB <75Ω	TB 600Ω	100Ω
Output levels	26dBm max	26dBm max	24dBu max	22dBu max	22dB, 1kΩ
AF response	±0.25dB 4dBm	±0.25dB 4dBm	-0.25,0dB 20-20k	±0.5dB 30-15k	-0.5dB 20-20k
Distortion	0.007% 1kHz 20dBm	0.007% 1kHz 20dBm	<0.005% 20dBm	<0.01% 40-16k	0.009% 1kHz
S/N ratio	80dB	80dB	<-128.5dBu/-90dBu	<-127dBm/-80dBu	-128dB EIN/-96.5dB
Crosstalk	-80dB 100-10k 4dBm	-80dB 100-10k 4dBm	<-90dB 100-10k	.....	<-79dB 100-10k
Reader Service Number	350	351	352	353	354

Manufacturer	DDA/Klark-Teknik		Digitec
Model/Series	DCM 232	AMR-24	D-series‡	UPS6500
Modular construction	Yes	Yes	Yes	µP control
# of mixing positions	32	24	30/38/42 positions	24-48
# of mixing buses	32	24	8+2	8-16
Patch points	Yes	Yes	Yes	µP controlled
Stereo output	Yes	Yes	Yes	Yes
Fader types	Slider	Slider	Slider	Slider/VCA control
Equalizer	4-band	4-band	4-band & 2-band	3-band
Filtering	High-pass	High-pass	High-pass	High, low-pass
Panpots	Yes	Yes	Yes	Yes
Groups subgroups	24 groups	24 groups	8 groups	8-16 groups
Sends returns	4 mono, 2 st, 1 st	2 st, 4m pre/post	8 stereo	6/in monitor system
Solo bus	AFL/PFL/in-place	AFL/PFL/in-place	AFL/PFL	Yes
Compression limiting	No	No	No	.....
Talkback circuits	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes
Lineup oscillator	5 tones	Variable	4 frequencies	6-frequency
Metering types	VU movements	VU	VU & 5-seg LED	VU(PPM/bar graph)
Input connections	AB >2k/10kΩ	AB >2k/10kΩ	AB >2kΩ/>10kΩ	TB >1k/5kΩ
Output connection	AB <75Ω	AB <75Ω	AB <75Ω	TB <20Ω
Output levels	26dBv	26dBv	26dBv	12dB nom, 22dB max
AF response	-0.25dB 20-20k	-0.25dB 20-20k	-0.25dB 20-20k	-1,+0.5dB 30-20k
Distortion	<0.05%	<0.05%	<0.05%	<0.2% typical
S/N ratio	-127dBv/-80dBv	-127dBv/-82dBv	-127dBv/-82dBv	<-125dBm EIN
Crosstalk	<-80dBv 1kHz	<-82dBv 1kHz	<-80dBv 1kHz	<-80dB 20kHz
Reader Service Number	355	356	357	358

Manufacturer	EELA Audio	EMT-Franz	Fostex	Graham-Patten Systems	Grass Valley Group
Model/Series	S-3000 II/VCA (S-300‡)†	EMT 30.16.2‡	450 (450-16)†‡	ESAM 608, 612, 616†	AMX-170S w/E-MEM†
Modular construction	Yes	Yes	No	No	No
# of mixing positions	.....	30	8 (16)	8, 12, 16 channel	10
# of mixing buses	30 (13)	2	7	Stereo pgm, pvw	4+2+1
Patch points	Yes	Yes	.....	No	...
Stereo output	Yes	Yes	Yes	Yes	Yes (PGM A, B)
Fader types	Slider	Slider	Slider	Slider w/VCA	Slider w/VCA
Equalizer	Shelving, swept	3-band parametric	3-band	Sidechain	4-band EQ per input
Filtering	High, low-pass	Hi-pass	No	.....	Hi-/lo-cut
Panpots	Yes	Yes	Yes	No	...
Groups subgroups	9 grps (variable)	None	4x2	No	Effectively 4
Sends returns	4 each	Echos pre/post	2 pre/3 post	No	...
Solo bus	AFL (PFL)	Yes	AFL	No	No
Compression limiting	No (Yes)	Yes	No	700 ser sidechain	No
Talkback circuits	Yes	A 113 module	None	No	No
Speaker muting	No (Yes)	Yes	No	No	...
Lineup oscillator	Yes	63Hz, 1kHz, 10kHz	No	No	400Hz, 1kHz
Metering types	VU, PPM	Analog, LED	VU/PPM/LED	4 VU, PPM	LED ladder
Input connections	AB (& TB) 1.2k/10kΩ	Xfmr bal	AB/unbal 1.2k/10kΩ	AB >20kΩ	RB >20kΩ
Input levels IGNORE	Mic, line switchable	Mic, line switched	Switchable mic, line	+30dBu max	-10, +8dBu

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- Complete Communication System with advanced capabilities
- Point-to-Point communications
- Dynamic Party Lines or conference (PL)
- Interrupted Foldbacks (IFB) or Program Interrupt
- Interface to two-wire beltpacks
- Interface to dedicated and dial-up telco circuits
- Two-way radio interface
- New larger system size up to 640×640 matrix (optionally expandable)
- Innovative building block concept and fully modular design allows complete field expansion or reconfiguration easily at minimal cost
- No restrictions on the input and output ports configuration
- New dedicated high speed distributed microprocessors for instantaneous crosspoint access
- Full redundancy in master and group controllers
- Single logic controller per channel for the ultimate in reliability
- Completely redundant modular switch-mode power supply
- Simple telephone-type three pair wiring between panels and matrix
- Fully balanced audio switching and distribution paths with superb broadcast specifications
- Low rack space requirement
- RS-232 ports for system printer, external terminals and diagnostic modem
- RS-422 ports for matrix networking, relay matrices and program assignment panels
- Direct analog crosspoint control and status

SOFTWARE FEATURES

- Advanced software and intercom operating system allows for a truly flexible and dynamically programmable system
- Instantaneous crosspoint access
- Dynamic on- or off-line programming utilizing system controller, VT100 terminal or compatible PC
- Reprogramming can be instantaneous or edited for later "batch change"
- Exclusive dynamic status of all matrix functions (no read or file transfer required)
- 80 Interrupted Foldback (IFB) groups with 4 assignments per group
- Programmable 3 level priority for IFB interrupt
- Exclusive In-Use, Busy and Override tally system for IFB
- 80 dynamic Party Lines with innovative software based two-wire (conference) type operation and assignment
- 48 user programmable Special Lists for All Call or Group functions
- 48 user programmable relays for output oriented, specific or coordinate assignments
- Full keypanel talk and listen and function assignments
- Copy function and edit/programming tools for rapid assignments
- Full crosspoint on/off control and status
- Call Waiting (CW) and Caller Tally identification system
- Comprehensive user programmable, key-by-key and function restrictions
- Unparalleled user defined alpha-numeric labelling capabilities for stations, IFB, Party Lines and relays
- Highly sophisticated on-line diagnostic features
- On-line task-related Help key
- Screen and menu driven print function
- Complete disk back-up and automatic refresh
- Dynamic tie-trunk capability for networking several CS9400+ matrices
- User friendly function key driven keyboard
- Modem option for remote off-site diagnostics and support



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System Components

FR9422 BUS CONTROLLER FRAME

This 3 R.U. (5.25 inches) frame consists of up to 25 BC9453 Bus Controller cards and two GC9453 Group Controller cards. All port identification is part of the frame and slot address resulting in generic interchangeable cards with standard EPROMS. All connections to the frame are via gold plated connectors for data and redundant power. The frame is also removable from a rack for maintenance and service purposes.

FR9421 CROSSPOINT FRAME

This 4 R.U. (7 inches) ultra-compact (1,000 crosspoints) frame consists of up to twenty-five XP9401 Crosspoint cards and four SA9402A (Voltage) or SA9402B (Current) Summing Amplifier cards. All cards are generic and completely interchangeable resulting in reduced maintenance inventory. All connections to the frame are via gold plated connectors for audio, data and redundant power. The frame is also removable from a rack for maintenance and service purposes.

FR9423 DISTRIBUTION AMPLIFIER FRAME

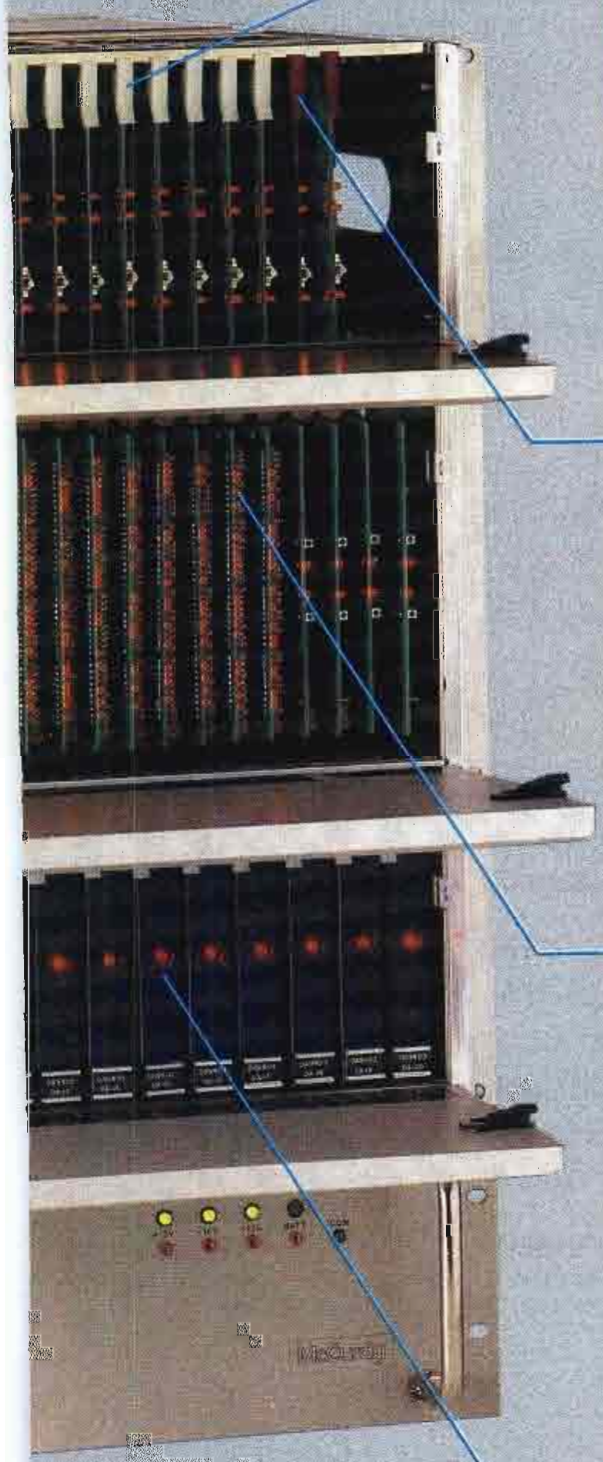
This 3 R.U. (5.25 inches) frame consists of up to 20 DA9403 (fixed active outputs) or DA9404 (Adjustable transformer output) Distribution Amplifier cards. All connections to the frame are via gold plated connectors for audio and redundant power. This frame is used when many crosspoint frames using voltage summing amplifiers are to be combined for the stations. The frame is also removable from a rack for maintenance and service purposes.

PS9428 POWER SUPPLY SYSTEM

This 3 R.U. (5.25 inches) unit consists of three industry standard high frequency switch mode power supplies. These extremely cool running supplies provide bi-polar 15 volts DC for the analog elements and +12 volts DC for the digital elements. Distribution to the various frames is via gold plated power connectors. Status LED's, convenient front panel test points and external voltage monitoring connectors are also provided. The frame is removable from a rack for maintenance and service purposes. In addition a 12 volt external redundant back-up power connector is provided eliminating the need for re-initializing the disk based back-up.



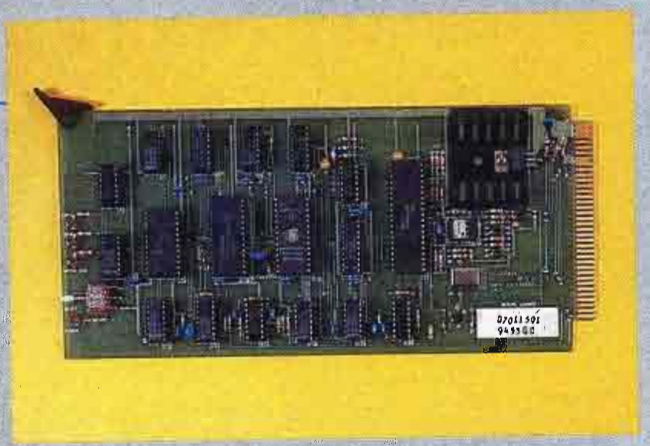
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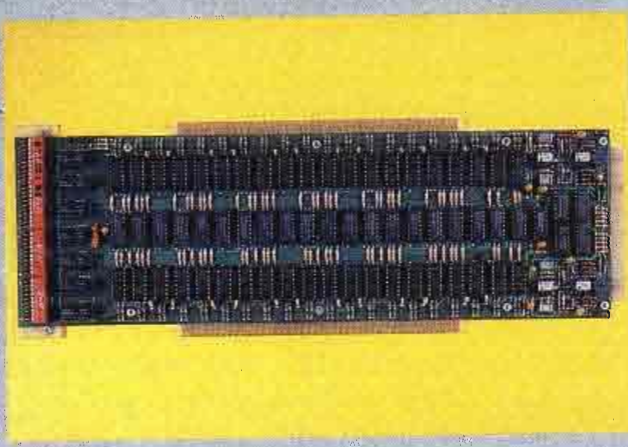
BC9453 BUS CONTROLLER CARD

This high performance 8-bit microprocessor based logic and interface card is used to communicate via bi-directional RS-422 serial data lines to the stations and to the frame mounted group controller card. In addition, this dedicated single station card also controls the respective crosspoint cards (up to 16 cards for 640 outputs). Front panel LED's provide for power, watchdog, panel and group communications status. Extensive use of CMOS devices results in an ultra-low power dissipation card.



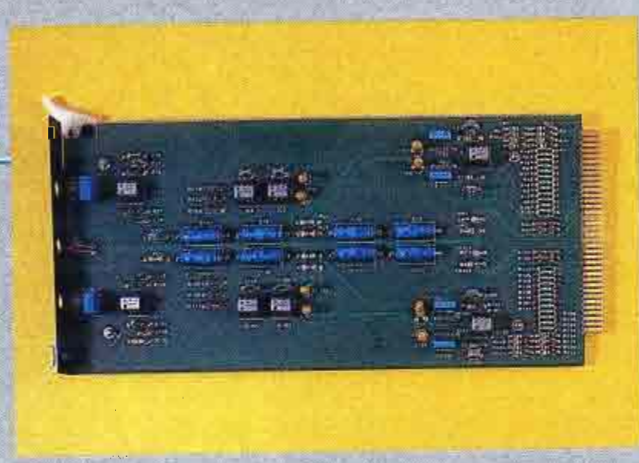
GC9453 GROUP CONTROLLER CARD

Identical to the BC9453 Bus Controller with the exception of different EPROM software and jumper settings, this card is used to communicate between the Bus Controllers and to send information to the Master Controller.



XP9401 CROSSPOINT CARD

This solid state balanced audio switching crosspoint card is configured as a 1 input by 40 output device. Dual audio input buffer circuits and solid state transient-free balanced crosspoints provide for the ultimate in performance and reliability. Front panel accessible switches and LED's allow for manual switching of the crosspoints with status. This and all other modules are fabricated using the highest quality glass epoxy printed circuit boards and components.



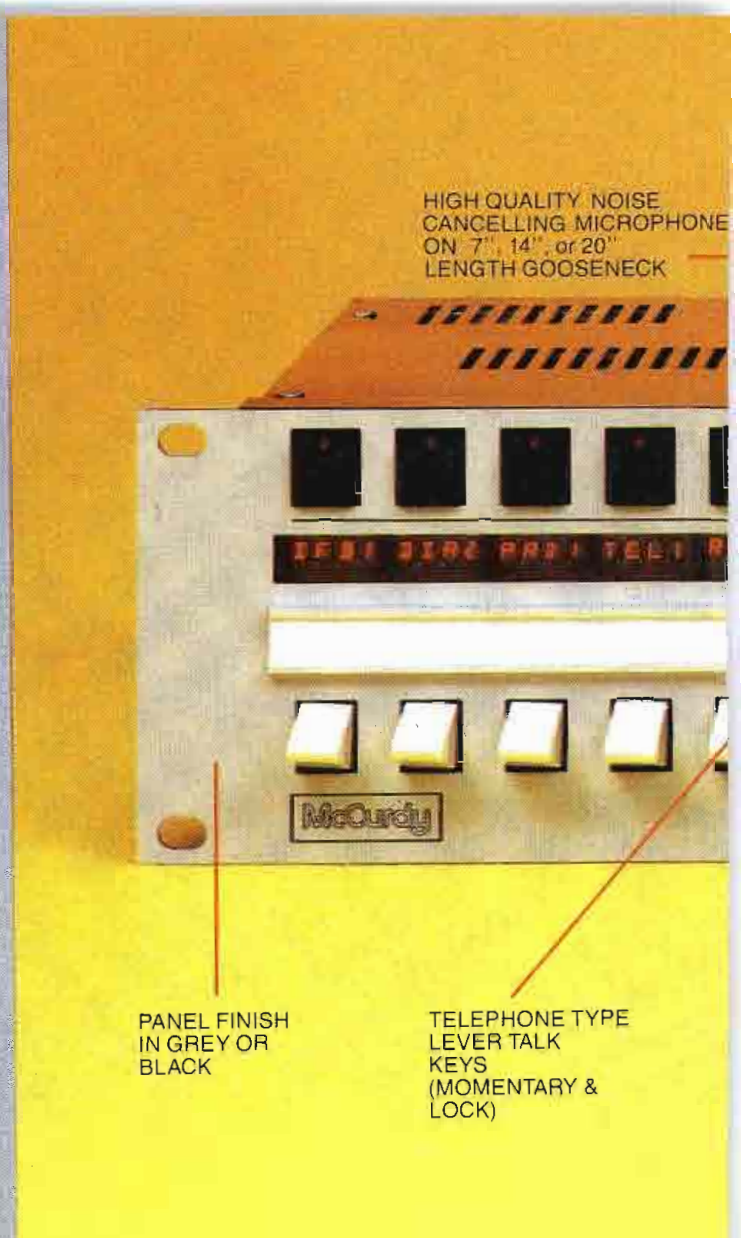
DA9403/9404 DISTRIBUTION AMPLIFIER CARDS

This card is used to combine audio signals from the different crosspoint frames for transmission to the appropriate station. The DA9403 provides a single low impedance active output with front panel level adjustment. The DA9404 provides a fixed and front panel adjustable transformer isolated output.

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KEYPANEL FEATURES

- User-defined 4-character high speed memory mapped alpha-numeric display labels per destination
- Unique caller identification and reply system
- 16 talk and 16 listen keys per compact panel
- Field installable expansion panel for an additional 16 talk and 16 listen keys and full alpha-numeric readout or 48 talk and listen keys with LED's
- Readouts with solid, slow and fast flash for In-Use, Override and tally applications
- All talk keys programmable for point-to-point, Special Lists, Party Line, IFB, relay and comprehensive All Call functions
- All listen keys programmable for point-to-point, auto-follow, auto reciprocal, relay, Party Line and exclusive IFB output monitoring
- More than 50 different types of keypanels to suit all applications
- Keypanel assignments programmable locally or at central station
- Software controlled headset transfer function
- Supports wide range of industry standard dynamic and carbon headsets with local adjustable sidetone
- External input for auxiliary program monitoring
- Selectable channel on control for privacy
- Line level pre- or post- channel on output for auxiliary equipment
- External footswitch and mute controls
- Modular keypanel construction for ease of maintenance
- Comprehensive adjustments (key controls accessible from top) for level, AGC and mute levels
- Total panel depth is less than 8 inches for installation in production consoles without requirement for remote electronics
- Slave panels can be connected using three pair cable
- Microprocessor based architecture with all user-oriented data stored in the matrix negating the need for customized EPROMS
- All data communications to keypanels via single pair balanced high speed RS-422 line
- Inexpensive three pair telephone wire on DB25 or RJ-type modular telephone connectors
- Industry accepted rugged telephone type lever keys



ACCESSORIES

TIF-940

The TIF-940 telephone-to-intercom interface is a 2 R.U. (3.5 inches) high rack mountable unit that allows a telephone caller using a touch tone (DTMF) telephone to have access to the CS9400+ switching matrix. A four digit password is required before the caller is connected to the intercom switching circuitry. By depressing the appropriate keys on the telephone pad the caller can reach any of the intercom stations in the network.

When the receiving station's call-answer key is depressed, normal two-way conversations can proceed. Key components of the interface are a programmable microprocessor card, an auto-answer hybrid and power supply.

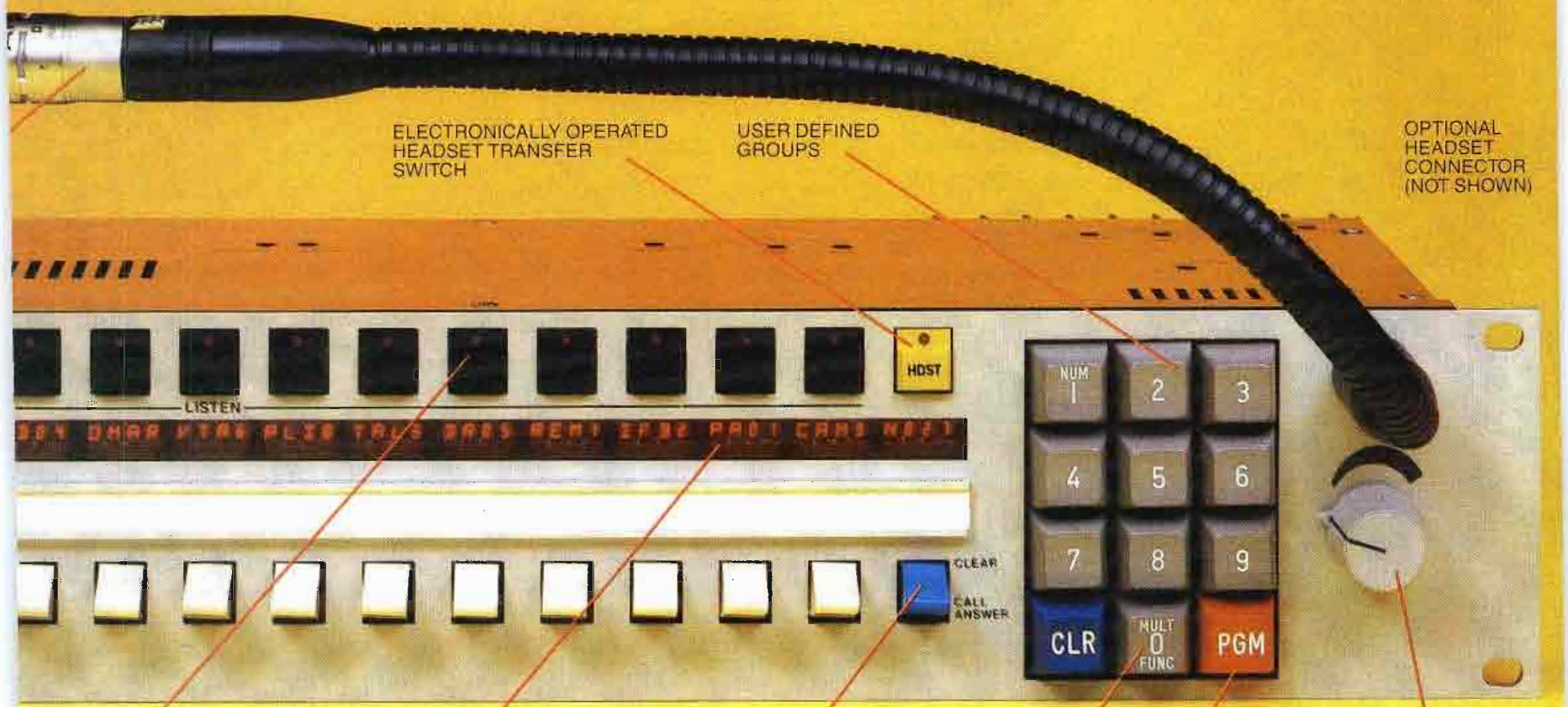
COB-100

This remote producer or director communications unit allows for field, news or sports operations to be interfaced to the CS9400+ system. The connection link between the COB-100 and the CS9400+ can be via a four-wire dedicated telco circuit or a conventional dial-up circuit.

This compact 2 R.U. (3.5 inches) frame incorporates a built-in microphone, speaker, headset, telephone hybrid and two/four-wire interface. Two talk and listen keys are provided for communication to the CS9400+ and/or local two- or four-wire systems. A front panel mounted touch tone (DTMF) key pad and line seize/drop controls are also provided eliminating the need for a telephone instrument. The detachable front panel can be installed remotely from the main chassis when space is limited.



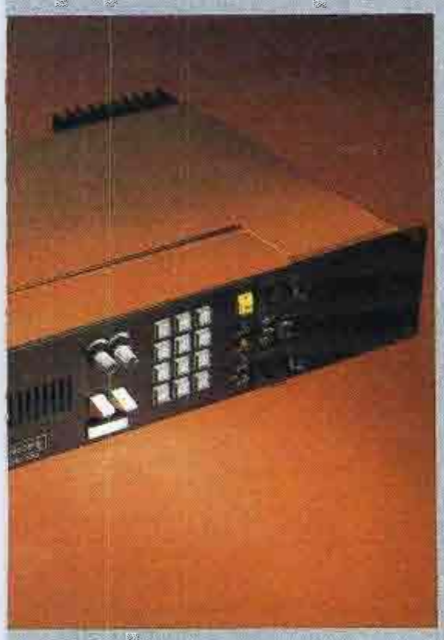
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CPL-3

This compact Monitoring Panel is a 2 R.U. (3.5 inches), self-contained mixing system allowing the user to monitor eleven different inputs simultaneously. Eight inputs are individually selectable to two separate output buses, A or B. Each input has a front panel level control and audio presence indicator. Bi-colour LED's indicate the current bus assignment. A four input-to-single output mixer for one of the inputs is also provided. Its corresponding level control is located on the front panel. Two 3 Watt amplifier/speaker assemblies, each allowing two inputs, provide audio monitoring to the user.





PAP-940

This Program Assignment Panel for the IFB's allows for off-terminal assignments of audio sources or mix-minuses for the outbound IFB lines. Up to four of these panels can be connected on a single RS-422 serial data line for use in areas such as Audio, Maintenance, Master Control etc. The panel allows for assignment and status enquiry of 24 program sources and 40 IFB lines.

FR9424 RELAY CHASSIS

This single R.U. (1.75 inches) chassis provides dry relay contacts to interface external control equipment such as two way radios, paging and telco controls. 24 relays are provided per frame with fourteen 2 'C' type contacts and ten 'A' type contacts. Communication to the Master Controller is via an RS-422 serial data line.

TWO/FOUR-WIRE TELCO INTERFACE

A comprehensive range of two- and four-wire control interfaces are available for interfacing the intercom to external dedicated and/or dial-up telephone circuits. In addition, various control and delegation systems are also available. Please contact McCurdy Radio for further information.

ICP-XXX CUSTOMER CONNECT INTERFACES

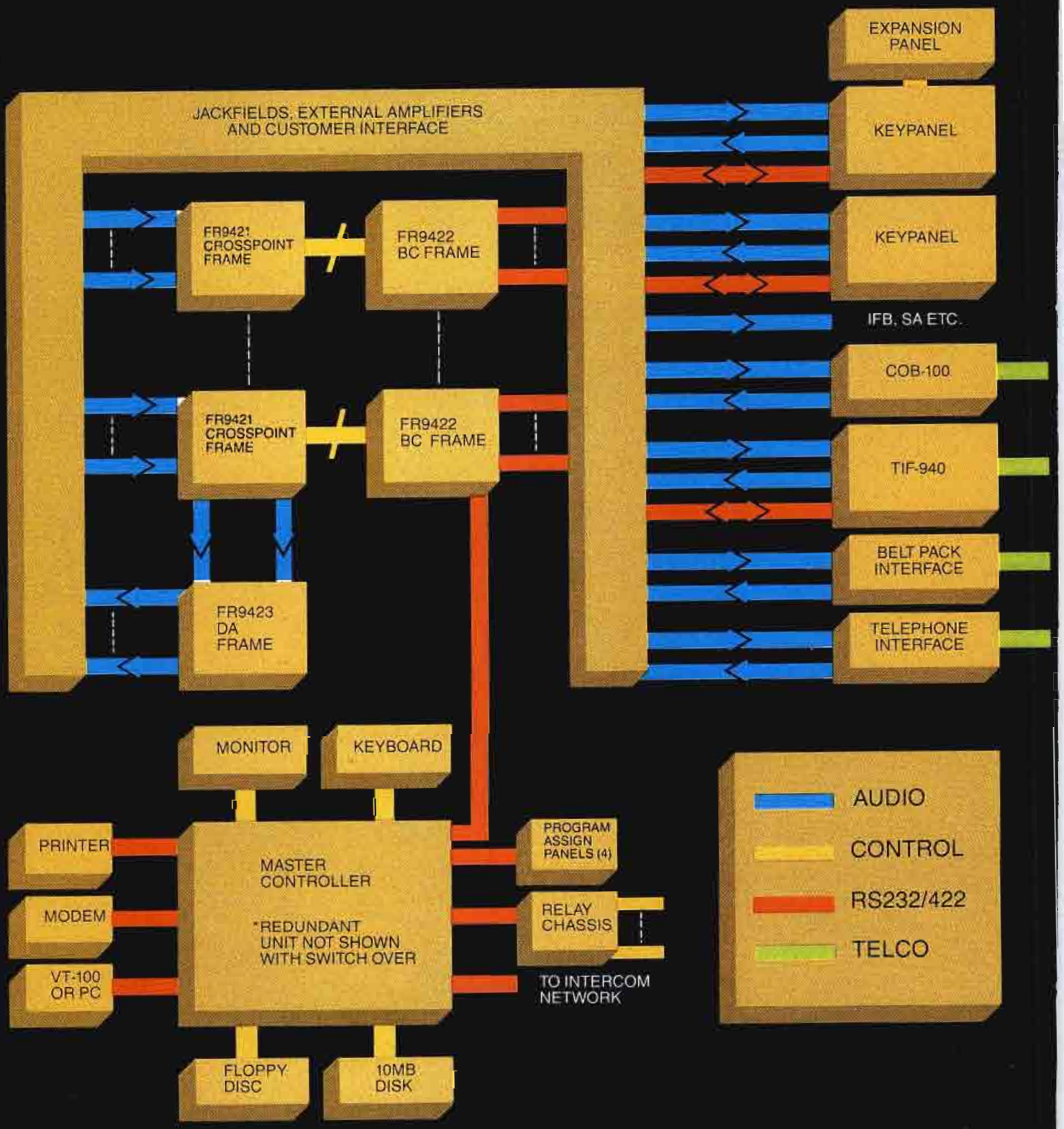
A full range of customer connect and interface panels is available to facilitate the interconnection of stations and external signal lines. Connections can be via DB-25 or RJ-type modular telephone connectors. A full range of patching and crossconnect accessories is also available.

BELTPACKS

A comprehensive range of beltpacks and interfaces is available to enhance and complement the CS9400+ system in areas where beltpack type equipment is more desireable. This can be for stage managers, floor buses, camera buses and external existing beltpack installations.

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SYSTEM BLOCK DIAGRAM



SPECIFICATIONS AND ORDERING INFORMATION

The CS9400+ meets and exceeds all industry accepted communications specifications. A detailed publication, TPR-940, outlining the test parameters and results is available on request. A detailed engineering specification, ESP-940, is also available on request.

The CS9400+ Digital Intercom System can be custom configured in sizes up to 640 x 640 (optionally expandable). A complete range of system accessories is available, including standard and custom keypanels, beltpacks, headsets, microphones, speakers and auxiliary equipment. For additional information, engineering assistance or application data, contact McCurdy Radio Industries.

McCurdy

McCurdy Radio Industries
108 Carnforth Road, Toronto, Ontario
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Telex: 06-963533 Telefax: (416) 751-6455

1051 Clinton Street, Buffalo, New York
14206 Tel: (212) 772-0719

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"I regularly remove technical articles from broadcast magazines and file them in my PC's database for future research and reference.

So far, the articles I have saved run three to one in favor of *Broadcast Engineering!*

Barry A. Chickini
Chief Engineer
Radio Station WTIX
New Orleans, LA

BROADCAST ENGINEERING

← Circle (120) on Reply Card

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Manufacturer	EELA Audio	EMT-Franz	Fostex	Graham-Patten Systems	Grass Valley Group
Model/Series	S-3000 II/VCA (S-300‡)†	EMT 30.16.2‡	450 (450-16)†‡	ESAM 608, 612, 616†	AMX-170S w/E-MEM†
Output connection	AB (& TB <40Ω)	Xfmr bal <35Ω	Unbal 600Ω	AB <30Ω	AB 60Ω
Output levels	..... (20dBm max)	+4dBm nom	10dBv into 10Ω	30dBm max	+22dBu clipping
AF response	±1dB	-1,0.5dB 30Hz-40kHz	-2,+1dB ref -10dBv	±0.5dB	±1dB 20-20k
Distortion	0.01% (0.06%)	0.1% 1kHz 4dBm	0.05% 1kHz -10dBv	<0.1% for 16dBu	0.01% 8dBu 1kHz
S/N ratio	-127dBm EIN (-126dBm)	-124dBm EIN/80dB	-126dBm EIN	100dB per input	CMRR 60dB
Crosstalk	-76dB 1kHz/(-61dB 15k)	-70dB 1kHz 0dBm	-60dB 1kHz -10dBv	<-82dB 15kHz	<-90dB 15kHz
Reader Service Number	360	361	362	363	364

Manufacturer	Grass Valley Group	Harrison Systems	JVC	McCurdy Radio	Mitsubishi Pro Audio
Model/Series	• AMX-100M, AMX-100S	PRO-790	•MI-3000U†	SS8900E‡	Westar 8000 (8200†)
Modular construction	No	Yes	No	Yes	Yes
# of mixing positions	...	20, 28, 36	9	32 std	...
# of mixing buses	3	6	Pgm, aux, mon	8 sub, 2 mstr	24
Patch points	No	Yes	No	Yes	Yes
Stereo output	Yes	Yes	Yes	Yes	2
Fader types	VCA	P&G slider w/VCA	Slider, VCAs	Slider	Slider
Equalizer	None	3-band	3-band	3/4-band	4-band
Filtering	...	High, low-pass	None	High pass	High, low-pass
Panpots	No	Yes	Yes	Yes	Yes
Groups subgroups	No	Yes	No	8 sub, 2 mstr	8 groups
Sends returns	...	Yes	Through aux	4 switch selected	8 pre, 8 post
Solo bus	No	AFL/PFL/in-place	PFL	In-place	In-place, AFL, PFL
Compression limiting	No	No	No	No	Option (No)
Talkback circuits	No	Yes	Yes	Option	Yes
Speaker muting	...	Yes	Yes	Yes	No (No)
Lineup oscillator	...	Variable	400Hz, 7kHz	No	Variable
Metering types	LED ladder	VU, PPM, LED	LED ladder	VU, PPM	VU, PPM, LED
Input connections	RB >20kΩ	AB 1.2k/10kΩ	Low-Z, 10k/50kΩ	AB/TB 150/600Ω	TB/AB 10kΩ
Output connection	AB 60Ω	AB 600Ω	Bal/unbal 600/10kΩ	AB 150/600Ω	TB/AB 30Ω(75Ω)
Output levels	+22dBu clipping	24dBm	+24dBm max	24dBm max	28dBm max (26dBm)
AF response	±1dB 20-20k	±0.2dB 4dBm	-2dB 20-20k mic	±1dB 30-20k	±0.5dB (-0.75dB)
Distortion	0.01% 8dBu 1kHz	...	<0.08% 20-20k 20dB	0.01% 18dBm	0.05%
S/N ratio	CMRR 60dB	-129dBm EIN mic	<-128dB EIN 150Ω	-125dBm EIN	-129dBm (-127dBm) EIN
Crosstalk	<-90dB 15kHz	-65dB 15kHz	<-70dB 1kHz pgm/aux	<-65dB 30-20kHz	-70dB (-90dB)
Reader Service Number	365	366	367	368	369

Manufacturer	Neve Electronics/Siemens		Orion Research	Pacific Recorders & Eng.
Model/Series	Digital transfer	V series	Model 8232	NewsMaker series	ABX series
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	.....	60	32	32	18, 26, 34 positions
# of mixing buses	1 digital, 1 analog	4+8 aux	4+6 aux	4 stereo	Pgm, Aux, Util
Patch points	No	Yes	Yes	Yes	Yes
Stereo output	Yes	Yes	2 pair	Yes	Yes
Fader types	Motorized slider	P&G slider	P&G slider	P&G slider	Slider
Equalizer	4-band digital EQ	4-band	4-band	7-band opt	3-band
Filtering	Digital hi/low-pass	High, low-pass	High, low-pass	High, low-pass	Low, high-pass
Panpots	.....	Yes	Yes	Yes	Yes
Groups subgroups	No	To 48/48	8 VCA optional	8 stereo	2 multitrack to stereo
Sends returns	Yes	8 pre/post switchable	6 pre/post switched	4 pre/post stereo	Efx/foldback, 4-telco m-m
Solo bus	.....	AFL/PFL/in-place	AFL, in-place	Stereo	Yes
Compression limiting	Limit/compress/expand	Yes	No	No	Comp/Exp/De-ess
Talkback circuits	No	Yes	Yes	Yes	Yes
Speaker muting	No	Yes	Yes	Yes	Yes
Lineup oscillator	.....	Variable	Variable	Option	w/slate
Metering types	Bar graph	VU+PPM, plasma	VU+PPM, plasma	VU	VU, PPM
Input connections	Bal digital 75/50kΩ	TB/AB 1.2k/10kΩ	TB/AB 1.2k/20kΩ	AB >1.8k/>60kΩ	Balanced
Output connection	AB 50Ω analog	AB 15Ω	TB/unbal 10Ω	Bal <75Ω source	Bal, unbal DAs
Output levels	12dBu	4/8dBm, 26dBm max	4/8dBm, 22dBm max	28dBm max	4-8dBm adj +28dBm max
AF response	.....	±0.5dB 4/8dBm	±0.5dB 4/8dBm/0VU	±0.1dB	-0.9,0dB 20Hz-20kHz
Distortion	.....	<0.04% 20-20k 20dBm	<0.06% 100-10k 20dB	0.035% 1kHz 4dBu	<0.02% mic 0.008%
S/N ratio	.....	-125dBm EIN/80dB	-124dBm EIN/76dB	-125dBm EIN	-127dBu EIN, -88dBu
Crosstalk	.....	-80dB 20kHz 20dBm	-60dB 15kHz 20dBm	-84dB 1kHz 8dBm	-85dB 1kHz
Reader Service Number	370	371	372	373	374

Manufacturer	Ramko Research	Ramsa/Panasonic Pro A/V		Solid State Logic Ltd	
Model/Series	• DC38-10S‡	WR-T820B‡	WR-8616 (WR-8428)‡	SL 4000 E series Master	SL 6000 E stereo video
Modular construction	No	Yes	Yes	Yes	Yes
# of mixing positions	10 max	20	16 (28)	64	64
# of mixing buses	2	12	11 (10)	4	6
Patch points	No	No	No	Yes	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	Slider	Matsushita MRP slider	Sliders	Slider	Slider
Equalizer	No	3-band quasi-param	3-band	4-band	4-band
Filtering	No	High pass	High, low-pass	High, low-pass	High, low-pass
Panpots	No	Yes	Yes	Yes	Yes
Groups subgroups	No	8 groups	2 (4) groups	32/8 VCA	32/8+6
Sends returns	No	4 send	2 + 2 effects	4 pre/post, 4 return	6 pre, 6 post
Solo bus	None	Post-fader	Yes	AFL, PFL, in-place	AFL, PFL, in-place
Compression limiting	No	No	No	Expander/gate	Yes
Talkback circuits	Yes	Yes	Option	Yes	Yes
Speaker muting	Yes	....	Option	Yes	Yes
Lineup oscillator	Yes	1k/10k/slate	1kHz/slate	Variable	Variable
Metering types	LED	VU, bar graph	Bar graph & VU	VU, PPM, plasma	VU, PPM, Bargraph
Input connections	Bal 150Ω, high-Z	AB 5k/10kΩ	AB 150/600Ω	TB/AB 600Ω	600/35Ω
Output connection	Bal 600	600/3k/l0kΩΩ	AB 600Ω load	AB <35Ω	Bal <35Ω
Output levels	8dBm nom	20dBu max	23(24)dBm max	26dBm 600Ω	26dBm 600Ω
AF response	-2dB ref 8dBm	-0.8,+0.5dB 20-20k	-1.5,+0.5dB 20-20k	±0.5dB 4dBm	±0.5dB

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AKG's C747. Small Size. Big Sound.

AKG's new C747 "pencil-type" condenser microphone sounds a lot bigger than it looks. In fact, its unique miniaturized transducer design and acoustically-tuned interference tube give the C747 sensitivity and uniform frequency response superior to mics many times its size. You'll like that on stage, TV, above a church choir or on a podium, where you need to capture performances without obscuring them. And you'll like it in the studio, where the C747 will go places other mics are just too big to follow. Clear lows, shimmering highs, tight pick-up pattern and mounting accessories that provide total convenience in any recording or sound reinforcement situation — with the C747 you get everything you need. Small size. Big sound.

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Circle (121) on Reply Card

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Manufacturer	Ramko Research	Ramsa/Panasonic Pro A/V		Solid State Logic Ltd	
Model/Series	• DC38-10S‡	WR-T820B‡	WR-8616 (WR-8428)‡	SL 4000 E series Master	SL 6000 E stereo video
Distortion	0.5% 8dBm	0.08% 18dB 20-20k	0.05% 1kHz	0.03% 1kHz 4dBm	0.03% 1kHz 4dBm
S/N ratio	63dB	-130dB typical	-132dB (<-127dB)	84dB	-128.5dBm EIN mic
Crosstalk	-70dB 1kHz 8dBm	60dB 1kHz	<-60dB 1kHz	-64dB 10kHz 4dBm	-64dB 10kHz 4dBm
Reader Service Number	**375**	**376**	**377**	**378**	**379**

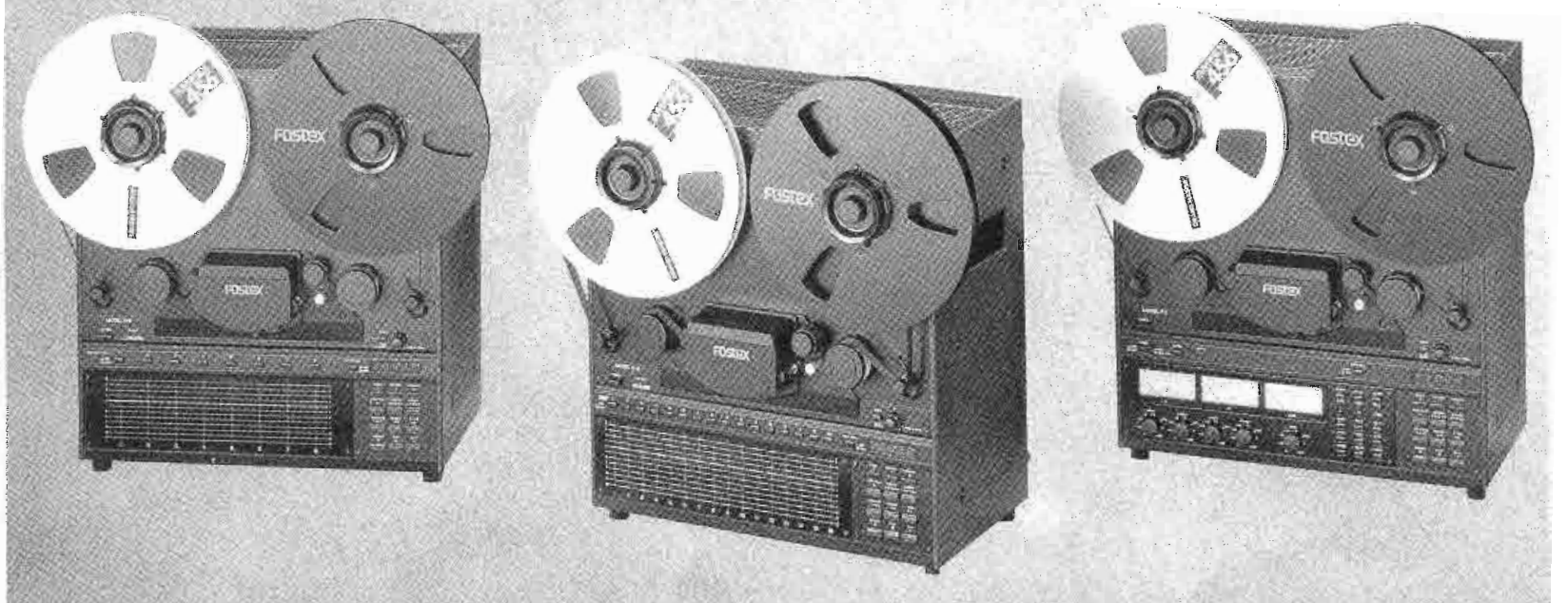
Manufacturer	Sonosax	Sony Pro Audio		Soundcraft	Soundtracs/AKG
Model/Series	SX-T	MXP-3000 series	MXP-2036	TS-12	CP6800 series
Modular construction	No	Yes	Yes	Yes	Yes
# of mixing positions	14	18-52	32	24, 36	.
# of mixing buses	10	3	4	Mix, channel	.....
Patch points	Yes	.....	.....	Yes	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	Slider	Slider	Slider	Sliders	Slider, VCA control
Equalizer	3-band	Shelving/parametric	3-band	4-band	5-band
Filtering	Low-pass	High, low-pass	High-pass	High-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Groups subgroups	Subs on request	8	4 groups	12/8	Various config
Sends returns	...	6 pre/8 post	.....	6/6	Various config
Solo bus	AFL or PFL	PFL/in-place	Yes	PFL, in-place	In-place
Compression limiting	Yes	No	Available	.....	.....
Talkback circuits	Yes	Yes	5 outputs	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes
Lineup oscillator	Fixed frequency	Variable	<0.05% THD	Yes	11-tone
Metering types	PPM, LED	VU/PPM	VU, ladder	VU	Bargraph
Input connections	TB/AB 5kΩ	TB/AB 1.5k/7kΩ	TB/AB 1.2k/10kΩ	AB 2kΩ(m)/10kΩ(l)	AB 4k/10kΩ
Output connection	TB/AB 25Ω	TB/AB 120Ω	TB/AB 60Ω nom	5kΩ/600Ω	AB 50Ω
Output levels	26dBm max	22dBm 2kΩ	0dBm nom	21dBu, 26dBu max	22dBm
AF response	±0.1dB	-0.3dB 4dBm	±0.5dB	-1dB 20-20k 10dBu	.....
Distortion	0.02% 1kHz 6dBm	0.1% 1kHz 4dBm	0.05%	0.005% 1kHz	<0.015%
S/N ratio	-129dBm EIN/-115dBm	80dB	-126dB	-128.5dBm EIN	-127.5dBm/>72dB
Crosstalk	-80dBm 1kHz 6dBm	-70dB 20kHz	<-70dB	-80dB between groups	.....
Reader Service Number	**380**	**381**	**382**	**383**	**384**

Manufacturer	Soundtracs/AKG	Studer		TASCAM	
Model/Series	MR series‡	Model 963‡	900 Series	M-500 series†‡	M-600 series
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	24+8	60-in/4sub/4-master	64	12-20	24-32
# of mixing buses	8 + 2	4-8sub/4master/4aux	24	8main/4aux/2master	16+8+4+2
Patch points	.....	To +6dB	Yes	Access patches	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	Sliders	Slider	Slider	Slider	Slider
Equalizer	4-band	3-band	4-band	3-band	3/4-band
Filtering	High-pass	High-pass	High, low-pass	No	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Groups subgroups	8	4 or 8	10 groups	8 main, 4 aux	16 pgm
Sends returns	6 pre/post	4 pre/post switched	5 pre/post switched	Yes	16 aux
Solo bus	Yes	Post-fader	In-place	In-place, PFL	PFL
Compression limiting	.....	Per channel/system	w/VCA faders	Sidechain opt	No
Talkback circuits	Yes	Yes	Yes	Yes	Yes
Speaker muting	.....	Yes	Yes	Yes	Yes
Lineup oscillator	30Hz, 1kHz	5-frequency	Variable	3-tone	4-tone
Metering types	10-seg bar graph	VU or bar graph	VU, PPM	VU meters	VU
Input connections	AB 2k/10kΩ	TB >5kΩ	TB/AB 75kΩ	Bal 2k/100kΩ	Bal 2.2k/40kΩ
Output connection	Unbal 50Ω	TB <50Ω	TB 50Ω	Bal 100Ω	Bal 100Ω
Output levels	22dBm max	24dBm	6dBm typical	18dBV maximum	4dBm nominal
AF response	.....	-0.1,0dB 30-15k	-1,0.5dB 6dBm	±1dB 20-20k	-1.5,+0.5dB 20-20k
Distortion	<0.015%	0.03% 4dBm 30-15k	0.1% 31-16k 6dBm	0.025% 1kHz	0.015% 14dBm
S/N ratio	-127dBm/>78dB	-125dBm EIN mic	-125dBm EIN mic	68dB unwtd mic-pgm	-130dB EIN DIN
Crosstalk	<-70dB	-80dB 4dBm 15kHz	-85dB	<-70dB 1kHz	<-60dB 1kHz
Reader Service Number	**385**	**386**	**387**	**388**	**389**

Manufacturer	Ward-Beck Systems	Wheatstone		Yamaha International	
Model/Series	ST3642/ST series‡	SP-5 (SP-6)‡	3224 series†	RMM2408†‡	PM3000
Modular construction	Yes	Yes	Yes	Yes	Yes
# of mixing positions	36	32+8 or 4	48	24 max	24, 32, 40
# of mixing buses	23	8 groups or 4 stereo	24	8	19
Multitrack outputs	24 as option	8	48	8	
Patch points	Yes	Yes	Yes	Yes	Yes
Stereo output	Yes	Yes	Yes	Yes	Yes
Fader types	Slider	Wheatstone M-104 slider	Slider	Slider	Slider
Equalizer	3-band	3-band	3-band	3-band	4-band
Filtering	High-pass	High-pass	12dB/oct high-pass	High-pass	High-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Groups subgroups	2-st, 2-m/4-st	8 groups	24 groups	8 groups	8, VCA control
Sends returns	6 pre/6 post	4 pro, post	2 pre/4 post	2-send switchable	Yes
Solo bus	AFL, PFL	PFL	AFL/PFL	AFL	In-place
Compression limiting	Yes	No	No	No	.....
Machine starts stops	Per request	Yes	No	No	.....
Talkback circuits	Yes	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	No	No	Yes
Lineup oscillator	Variable	Variable	Variable tone	Variable	w/pink noise
Metering types	VU, PPM	VU movement	VU	VU	VU, peak LED
Automation preparation	No	No	.....	No	.....
Input connections	TB 1.5k/20kΩ	AB 150Ω/20kΩ	AB 150/40kΩ	TB 600Ω	Bal/TB 1k/3k/10kΩ
Output connection	Bal <100Ω	AB 600Ω	AB <10Ω	Unbal 600Ω	Bal/TB opt 150Ω
Output levels	8dBm nom, 30dBm max	22dBm max	28dBm max	4dBm for 0VU	4dBu nom
AF response	<±1dB 20-20k	±0.5dB 20-20k	±0.1dB 0dBm	-3dB ref 4dBm	-3,+1dB 4dBm

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In the E-Series E is for Excellence.



Audio professionals everywhere are turning to the Fostex E-Series recorders for their production and post-production needs. So much so, you hear the results of their work nearly every day — in movie soundtracks, commercial and cable television shows, industrial and educational films and videos and, of course, hit records.

The E-Series features gapless "punching" so there's no blank space after the punch-out point. Only recorders which are much more expensive offer this sophisticated function. But since you can't run a fully automated system without it, Fostex includes gapless punch-in/out as standard equipment on the E-Series.

Also standard is a synchronizer port which will interface with all SMPTE time code based systems. When used with the Fostex synchronizer, Model 4030, you can then use our software program to perform sophisticated audio assembly editing.

Models E-8 and E-16 are multitrack recorders with built-in noise reduction.

Models E-2 and E-22 (not shown) are 2-track master recorders with a third, center channel for SMPTE time code control. This is a standard feature, not an option. You will have complete compatibility with existing 2-track tapes, plus the ability to run computer derived edit decision lists and full automation.

Servo control of the reels in the edit mode will help you pin-point cues and spot erase. When the pitch control is engaged, the exact percentage of speed deviation is displayed so that when you need to re-set the control, you can do so precisely, and the real-time counter features search-to-zero even from the negative domain.

The E-2 uses 1/4" tape at 7-1/2 & 15 Ips (15 & 30 Ips speeds are optional); the E-22 uses 1/2" tape at 15 & 30 Ips.

When an E-Series recorder is used with Fostex Model 4050 — autolocator and SMPTE to MIDI controller — you have programmable punch-in/out, 100-point autolocate capability. 10 programmable edits, a SMPTE time code generator / reader (all four formats), plus the ability to locate to the bar and beat.

So if you're looking for a professional recording instrument, there's a Fostex E-Series recorder that can help you wth two important "E" words: Efficiency and Effectiveness. The E-Series can also help you achieve the most important "E" word of all: Excellence.

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Circle (122) on Reply Card

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Manufacturer	Ward-Beck Systems	Wheatstone		Yamaha International	
Model/Series	ST3642/ST series‡	SP-5 (SP-6)‡	3224 series†	RMM2408†‡	PM3000
Distortion	<0.2% 24dBm	<0.005% 18dBm mic	0.05% 20dBm	0.1%	<0.1% 14dBm
S/N ratio	-125dBm EIN	-129dB EIN/>90dB	-129dBm EIN/90dB	-128dBm EIN	-128dBm EIN
Crosstalk	<-75dB 30-15k	<-90dB 1kHz	<-90dB 1kHz	-70dB 1kHz 4dBm	-60dB 1kHz
Reader Service Number	390	391	392	393	394

Compact Disk Players

These digital audio CD reproduction units are designed for use in the more strenuous environment of broadcast and professional on-air and production applications. In Audio Response, Hz is understood.

Manufacturer	EMT-Franz	Nakamichi	Ramsa/Panasonic	Sony/Pro Audio		Studer
Model	EMT 980	CDP-2A	SL-4300 (SL-4700)	CDP-3000CDS-3000	CDP-5000	A730
System configuration	Single	Single player	Single (6-CD magazine)	Multiplayer	Single player	Single player
Player trays	One	1	1	2 per controller	....	
Programmable	Yes	24-programs	20 (36) selection	Yes	Yes	3-event & CD memory
Output connection	Bal 50Ω source	600Ω	Bal 600Ω (1KΩ)	Balanced	Bal 600Ω <50Ω source	
Output level	+6dB (+12dB max)	2.5V 600Ω	2Vrms	+4dBm nom	+4dBm	+6dBm nom
Audio response	±0.5dB 20-20k	±0.5dB 5-20k	±0.5dB 20-20k	-1, +0.8dB 20-20k	-1, +0.5dB 20-20k	±0.1dB 20-20k
Distortion	0.004%	0.0025% 1kHz	0.003% 1kHz 0dB	0.01%	0.01%	0.006%
Dynamic range	....	>96dB	94dB	94dB	>94dB	>90dB
Crosstalk	<-60dB	>95dB separation	....	>90dB 1kHz	90dB 1kHz	>90dB
SN ratio	96dB linear rms	>100dB A-wtd	>96dB	....	....	>90dB unwtd
Access time	<1s fader start delay	....	<6s	2s	2s	<3s
Reader Service Number	656	657	658	659	660	661

Manufacturer	Studer	Studer/ReVox	TASCAM	Technics/Panasonic
Model	A727	Philips LHH-2000	B226	CD-501	SL-P990770 (-1300)
System configuration	Single player	Multiplayer	Single player	Single player	Single, 3″ & 5″ disc
Player trays	....	3 max	....	1	1
Programmable	Multiple event	To 3 events	To 19 events	Yes, remote control	32 (20) selection
Output connection	Xfmr bal <50Ω source	Xfmr balunbal <40Ω	Unbal <500Ω	XLR bal 600Ω load	600Ω bal
Output level	+15dBm max	+6dBm	0-2V	0dBm nom	2.5Vrms (or 8dBm)
Audio response	±0.1dB, 20-20k	±0.5dB 20-20k	±0.1dB 20-20k	±0.3dB, 5-20k	±0.2dB 2-20k
Distortion	<0.006%	<0.01%	<0.005%	0.0025% 1kHz	<0.0025% (0.0002%)
Dynamic range	96dB	>90dB	96dB	>96dB	100dB
Crosstalk	>90dB separation 1kHz	>80dB separation	>90dB	>95dB separation	>110dB separation
SN ratio	>100dB	>90dB	>100dB	>96dB	113dB (112dB)
Access time	3sec	<2sec	<3s random	....	....
Reader Service Number	662	663	664	665	666

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Audio Cassette Decks

These stereo audio record/playback systems use Philips type cassettes. All systems listed use dc servo drive motors for capstan and reel drives. Standard play speed is 1⅞ips. Dolby-C and dbx noise reduction systems are common in this equipment. In Audio Response, Hz is understood.

Manufacturer	a&a Systemes de Comm	Fostex		Nakamichi	Revox
Model/series	**Maj'30 Jingle Machine**	**250 (250AV)**	**X-15**	**MR-1 (MR-2)**	**B215**
Deck control logic	μP control	TTL	Mechanical	μP control	μP control
Timer	Min/sec	Yes	No	Yes	Yes
Cue track	4 tones available	No	No	No	No
Capstan motor, drive	dc-servo, direct	dc servo, belt	dc-servo, belt	dc-servo, direct	dc-servo, direct
Reel motor	2 dc-servo	dc servo	dc-servo	dc-servo	dc-servo
Play speeds	1.875, 7.5 ips	3.75 (& 1.875)ips	1-7/8ips	1.875ips ±6%	1.875ips
No. of heads	Single 4-track	2	2	3 (2)	3
Meter types	L/R VU meters	VU & peak LEDs	Bar graph	Bar graph	Bar graph
Input connection	10kΩ unbal, 600Ω bal	Unbal	Unbal	Bal or (unbal)	Unbalanced
Input level	-10dBm for 0VU	-60dBv 10kΩ	-50dBv 10kΩ	+4dBm (-10dBv 50kΩ)	-34dBm, 100kΩ
Output connection	Bal or unbal, 600Ω	Unbal	Unbal	Bal or (unbal)	Unbal
Output level	4dBm nom., +18dBm max	-10dBv, 10kΩ	-20dBv 20kΩ	+4dBm	0dBm, 47Ω
AF response	-3,0dB, 35-14k	-3,+2dB, 20-18k	±3dB, 20-12.5k	±3dB, 20-20k	-3, +2dB, 20-22k
	0VU = 250nWb/m Type II	.....	ref to -10dBm	20dB, 20nWb/m	.....
S/N ratio	50dB	71dB wtd w/Dolby C	50dB unwtd	70(68)dB A-wtd(1)	72dB A-wtd, Dolby C
Crosstalk Pgm-Pgm	>35dB separation	-50dB, 1kHz, 0VU	-40dB 1kHz, 0VU	-60dB 1kHz 0VU	-40dB, 1kHz, 0VU
Distortion	1.5%, 315Hz, 1 7/8ips	1.5%, 315Hz	1.5%, 1kHz, 0VU	0.9(1)%, 400Hz 0VU	<1.5%, 315Hz, 0VU
Wow, flutter	.....	<0.02%	±0.1%	0.048% (0.06%)	0.1%, DIN 45507
Equalization	Types I, II	3180μs+70μs	3180μs+70μs	3180μs+120μs/70μs	3180μs+12μs/70μs
Reader Service Number	**1360**	**1361**	**1362**	**1363**	**1364**

Manufacturer	Studer	TASCAM			Yamaha International
Model/series	**A721**	**122mkII (112R/112)[1]**	**238 Syncaset**	**234 Syncaset**	**MT44-D (MTIX[2])**
Deck control logic	μP control	TTL (w/reverse)	TTL	TTL	.....
Timer	Yes	Index & (tape timer)	Tape counter	Tape counter	Time & (tape) modes
Cue track	No	In FF, RWD modes	No, 3 autolocators	No	No
Capstan motor, drive	dc-servo, direct	FG-servo, direct	dc servo, direct	dc servo, belt	dc-servo
Reel motor	dc-servo	dc reel & ancillary	dc-servo, hysteresis	dc-servo	dc-servo
Play speeds	1.875ips	1.875ips ±12% (±15%)	3.75ips ±12% pitch	3.75ips ±12%	1.875ips ±10% pitch
No. of heads	3	1-E, 1-R, 1-P, Acculign	2 8-track	2 4-track	4-track R/P, E
Meter types	Peak program	L/R VU, peak LED (ladder)	VU, peak LEDs	VU, peak LEDs	LED bar graph
Input connection	Xfmr bal	XLR 40kΩ bal, RCA 30kΩ	8 RCA unbal 30kΩ	Unbal line, instr/mic	Unbal 50k(10k)Ω
Input level	+4dBu, 10kΩ	+4dBm, -10dBv	-10dBV	100kΩ mic, 22kΩ line	-10dB (+10dBu max)



Circle (124) on Reply Card

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Manufacturer	Studer	TASCAM			Yamaha International
Model/series	A721	122mkII (112R/112)[1]	238 Syncaset	234 Syncaset	MT44-D (MTIX[2])
Output connection	Xfmr bal, <50Ω source	Xfmr 100Ω bal, RCA 100Ω	Unbal, RCA	Unbal, RCA, ¼" phone	Unbal 2.5k(1k)Ω
Output level	+4dBu into 600Ω	+4dBm, -10dBv	-10dBv nominal	-10dBv nominal	-10dB (-10dBu)
AF response	-3, +2dB 20-≥18k 0dB = 200nWb/m	±3dB, 25-17k, -20VU 160nWb/m=0VU, std tape	±3dB, 30-16k	±3dB, 40-14k 0VU, 160nWb/m	≤3dB 20-12.5k 20dB, 20nWb/m
S/N ratio	72dB Dolby C, Type IV	80dB w/Dolby C >1kHz	>93dB IHF-A w/dbx NR	>95dB IHF-A dbx NR	67dB Dolby C (85 dbx)
Crosstalk Pgm-Pgm	<-40dB 1kHz	<-45dB, 1kHz, 0VU	-50dB w/o dbx	-50dB, 1kHz, 0VU	>50(55)dB separation
Distortion	<1.5% Types I, II, IV	1%, 400Hz, 0VU	0.8%, 400Hz 0VU w/dbx	1%, 1kHz, 0VU	<1%
Wow, flutter	0.1% wtd C-46 to C-90	0.04% NAB, ±0.08% DIN	0.04%	0.06%	0.06% (<0.05%)
Equalization	Types I, II, IV	3180μs+70μs, 120μs	3180μs+70μs	3180μs+70μs	3180μs+120μs/70μs
Reader Service Number	**1365**	**1366**	**1367**	**1368**	**1369**

[1]Model 112R uses operates bidirectionally and includes 2 erase heads.
[2]MITX is integral with a 4-channel portable mixer system.

Audio Cartridge Decks

Recorders using ¼" continuous-loop cartridges for spot or longer announcements. Replay-inhibit is not available on units marked with a check (✓). Models are stereo unless marked with a bullet (•). Models marked with a dagger (†) are belt-driven; others are direct drive. A double dagger (‡) indicates fast-forward mode. In Audio Response, Hz is understood.

Manufacturer	APPEL	Audi-Cord	Broadcast Electronics		
Model/series	•Model 578†	Series A, S, TDS	PT90RPS‡ (PhaseTrak90)	Series 2100C✓	Series 3000A✓
Deck control logic	Transistor	CMOS devices	.....	TTL & CMOS devices	TTL
Remote control bus	No	Yes	Simple remote	None	None
Replay inhibit	Yes	Yes	Yes	No	No
Record timer	Yes	Yes	Option	No	No
Sec, Tert tones	Yes	Yes	Sec, Tert, AFSK	Sec only	No
Phase correction	n.a.	None	Non-encoded type	No	No
Capstan motor	ac-synchronous	as-synchronous	dc-servo	ac-synchronous	ac-synchronous
Play speeds	7.5	7.5	7.5 (3.7, 15 options)	3.75, 7.5	3.75, 7.5
Sec, tert output	TTL	Solid-state	Solid-state	Relay closure	Relay closure
Meter types	VU rec/play/erase	VU movement	LED VU	Taut-band A	Taut-band A
Monaural model	.....	S21, A21	PT90P	2100RP	3200ARP, 3400ARP
Play only model	Model 557	S11/-16, A11/-16	PT90PS	2100P	3100/3200/3400AP/APS
Multideck model	Model 2214	TDS-1, TDS-6 twins	.....	None	.....
Input connection	Balanced	Xfmr bal	Active bal	Active bal	Xfmr bal bridging
Input level	-5/+20dB, 5kΩ	-22/-12dBm	+8dBm	-10dBm	-20/+20dBm, 50kΩ load
Output connection	Balanced	Xfmr bal	Active bal	Active bal	Xfmr
Output level	+12dBm nom. 110Ω source	-8dBm	+24dBm, as 75Ω source	0dBm	-54/+10dBm, 600Ω/150Ω
AF response	±1.5dB, 40-12.5k 1dB under saturation	±2dB, 50-15k 1kHz, 160nWb/m	±2dB, 40-16k 250nWb/m	±2dB, 50-15k 10dB, 160nWb/m	±2dB, 50-15k 10dB, 160nWb/m
S/N ratio	54dB	>47dB stereo	-80dB w/Dynafex NRS	>52dB	>52dB unwtd
Crosstalk L-R	.....	<-50dB	-50dB	-50dB, 1kHz	-50dB, 1kHz
Crosstalk Pgm-Cue	.....	<-50dB	-50dB	-50dB, 1kHz	-50dB, 1kHz



Circle (125) on Reply Card

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Manufacturer	APPEL	Audi-Cord	Broadcast Electronics		
Model/series	•Model 578†	Series A, S, TDS	PT90RPS‡ (PhaseTrak90)	Series 2100C✓	Series 3000A✓
Distortion	<1.5% 1kHz	1% 1kHz, 160nWb/m	<1.5% tape dependent	2%	<2%, tape dependent
Wow, flutter	±0.3% unwtd	0.15% peak wtd	0.12% DIN wtd 7.5ips	≤0.15%	≤0.15% DIN wtd 7.5ips
Reader Service Number	1370	1371	1372	1373	1374

Manufacturer	Cartridge Technology	Fidelipac		ITC/3M
Model/series	CT-1001†‡✓	CTR34 Dynamax 3-deck	Dynamax CTR10‡	Dynamax CTR100‡	Delta series‡
Deck control logic	CMOS devices	CMOS devices	CMOS devices	CMOS devices	μP
Remote control bus	15-pin D-connector	50-pin D-connector	50-pin D connector	50-pin D connector	Simple remote
Record timer	Yes	No	No	Yes	Ext timer trigger
Sec, Tert tones	Yes	Yes	Yes	Yes	Yes
Phase correction	No	No	No	Yes	No
Capstan motor	dc-servo	ac synchronous	ac-sync	dc-servo	dc-servo
Play speeds	3.75	7.5ips	7.5	3.75, 7.5, 15, var	7.5 (3.5, 15 opt)
Sec, tert output	Solid-state	Solid-state, relay	Solid-state, relay	Solid-state, relay	Solid-state, relay
Meter types	VU/PPM movement	LED bargraph VU	Bar graph VU	Bar graph	Taut-band A
Monaural model	.....	CTR33	CTR13	CTR123	Delta IV/I
Play only model	.....	No play only	CTR11/-12	CTR111/-112	Delta I-M/-S
Multideck model	.....	3-deck	Use CTR34	...	Delta III-M/-S
Input connection	Active bal (Xfmr opt)	Diff bal bridged 10kΩ	Diff bal bridge 10kΩ	Diff bal bridge 10kΩ	TB 20kΩ, AB 150/600Ω
Input level	-10/0dBm (30kΩ)	-17, +20dBm (26 max)	-17, +20dBm (26 max)	-17/+20dBm (26 max)	-18, +18dB, 20kΩ load
Output connection	Floating xfmr bal	Diff bal 440Ω source	Diff bal 440Ω source	Diff bal 440Ω source	TB 275Ω, AB 150Ω
Output level	-10/0dBm (150Ω)	+20dBm 600Ω	+20dBm 600Ω	+20dBm 600Ω load	-18, +18dBm, 150Ω source
AF response	±2dB, 20-16k 405nWb/m	±2dB, 50-16k 250nWb/m, 1kHz	±2dB, 50-16k 10dB, 250nWb/m	±2dB, 50-16k 10dB, 250nWb/m	±2dB, 50-16k 10dB, 250nWb/m
S/N ratio	>50dB 22-22k PPM	>58dB hum/noise	61dB unwtd, 0VU	51dB unwtd, 0VU	≥60dB unwtd, 0VU
Crosstalk L-R	<-35dB, 15kHz	-50dB, 1kHz	-50dB 1kHz, 0VU	-50dB 1kHz, 0VU	<-50dB, 1kHz, 0VU
Crosstalk Pgm-Cue	<-36dB, 1kHz	.....	-50dB	-50dB	<-50dB
Distortion	1.5%, 1kHz, 405nWb/m	1% max	0.8% max	0.8% max	1.5% THD, 1kHz, 0VU
Wow, flutter	<0.12% DIN wtd	0.15% DIN wtd, 7.5ips	≤0.12%	≤0.12%	0.15% DIN wtd
Reader Service Number	1375	1376	1377	1378	1379

†Options include Maxtrax head and dbx Type II Noise Reduction.

Manufacturer	International Tapetronics/3M		Otari	Pacific Recorders & Engineering	
Model/series	99B series	OMEGA series	CTM-10SR‡	Tomcat†‡✓	Micromax†‡✓
Deck control logic	μP	μP	μP	μP control	CMOS devices
Remote control bus	Simple remote	Simple remote	Yes	Yes	Yes
Record timer	Ext timer trigger	No	LED min/sec	....	....
Sec, Tert tones	Yes	Sec only	Yes	Yes	Yes
Phase correction	Yes, ELSA system	No	No automatic	None	.....
Capstan motor	dc-servo	dc-servo	dc servo	dc-servo	dc-servo
Play speeds	7.5 (3.75, 15, var opt)	7.5 (3.75 opt)	3.75, 7.5, 15ips	7.5, 15, also record	7.5 ips
Sec, tert output	Solid-state, relay	Solid-state	Solid-state	Solid-state	Solid-state



Circle (126) on Reply Card

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Manufacturer	International Tapetronics/3M		Otari	Pacific Recorders & Engineering	
Model/series	**99B series**	**OMEGA series**	**CTM-10SR‡**	**Tomcat'‡✓**	**Micromax'†‡✓**
Meter types	Taut-band A/peak LED	Taut-band A	VU, peak LEDs	VU movements	VU movements
Monaural model	RPME	OMEGA mono player	CTM-10MR	From matrix format	.....
Play only model	PM mono/PS stereo	OMEGA player M or S	CTM-10	Reproduce deck	Reproducer deck
Multideck model	None	None	None	.....	.....
Input connection	TB 20kΩ or 150/600Ω	Line, mic, bal/unbal	Active bal 10kΩ	Bal or bridging	Bal, bridging 40kΩ
Input level	-20, +28dB 20kΩ	0dB line, -70dBv mic	+28dBv max	-13,+9dBm	-1, +9dBu
Output connection	TB 180Ω source	Xfmr bal	Active bal 5Ω	Bal floating 95Ω	150Ω bal source
Output level	-18, +25dBm 600Ω	+18dBm, 180Ω source	+26dBv into 200Ω	4-8dBm adj	-1,+9dBu (24dBm max)
AF response	±1dB, 31.5-16k 250nWb/m	±2dB, 50-16k 10dB, 250nWb/m, 0VU	±2dB 20-16k	±1dB, 40-15k 7.5ips 10dB, 250nWb/m	±1dB 40-16k 10dB, 250nWb/m
S/N ratio	≥56dB bias/no signal	≥56dB bias, no signal	53dB	59dB, 62dB A wtd	56dB, 60dB A-wtd
Crosstalk L-R	-50dB 1kHz	<-50dB, 1kHz, 0VU	<48dB 1kHz	50dB separation 1kHz	<45dB separation 1kHz
Crosstalk Pgm-Cue	-50dB 1kHz	<-50dB	<48dB 1kHz	-60dB	-55dB Maxtrax -50dB NAB
Distortion	≤0.8%, 1kHz, 250nWb/m	≤1.5%, 1kHz, 0VU	<0.8% 1kHz	<0.9%	0.9%, 1kHz, 0VU
Wow, flutter	<0.12% DIN wtd	0.15% DIN wtd	<0.15% 7.5ips	<0.1%	0.08%
Reader Service Number	**1380**	**1381**	**1382**	**1383**	**1384**

'These products use the Maxtrax format head. The Micromax is available with NAB head format.

Manufacturer	Sonifex			TTC/Ampro
Model/series	**HS200R (HS ser)†‡**	**HS200RX (HS-X ser)†‡**	**CQ20-R†‡✓**	**2500, 3500, 4500‡**
Deck control logic	CMOS, cart fail	CMOS, cart fail	CMOS	TTL
Remote control bus	Simple remote	Simple remote	Simple remote	Yes
Record timer	No	LED spot, cart length	No	Yes
Sec, Tert tones	Switch selected	Yes w/LED monitoring	Sec only	Yes
Phase correction	No	No	No	No
Capstan motor	dc-servo	dc-servo	dc-servo	ac-hysteresis
Play speeds	7.5	7.5	3.75, 7.5	3.75, 7.5
Sec, tert output	Solid-state	Solid-state	Solid-state	Contact closure
Meter types	VU movement, switched	2 VU movements	LED VU	VU
Monaural model	HS100R	HS100RX	CQ10-R	Available
Play only model	HS100, HS200	HS100X, HS200X	CQ20, CQ10	Available
Multideck model	HS200ST	HS200XST	CQ20-ST	TTC/Scully 8300 3-deck
Input connection	Xfmr bal	Xfmr bal	Unbalanced	Xfmr bal
Input level	-22,+22dBm >0kΩ	-22,+22dBm >10kΩ	0dB, 10kΩ	-20, +20dBm
Output connection	Xfmr bal floating	Xfmr bal floating	Unbalanced	Xfmr bal 150-600Ω
Output level	0dBm <50Ω	0dBm <50Ω	0dB, 50Ω	+20dB max, +8dBm nom
AF response	-1.5/1dB, 40-16k 10dB, 160nWb/m	-1.5/1dB, 40-16k 10dB, 160nWb/m	±2, 40-16k 10dB below 160nWb/m	±2dB, 50Hz-15kHz
S/N ratio	-55dB 3% THD w/tape	-55dB 3% THD w/tape	45dB unwtd	>50dB
Crosstalk L-R	<-50dB 1kHz	<-50dB 1kHz	-60dB 1kHz	<-50dB, 1kHz
Crosstalk Pgm-Cue	<-50dB	<-50dB	-50dB, SOL-10dB	<-50dB, 1kHz
Distortion	<1.5% 1kHz SOL+8dB	<1.5% 1kHz SOL+8dB	<2%, +8dB	3% max NAB ref + 8dB
Wow, flutter	<0.06%	<0.06%	<0.12%	0.15% peak wtd
Reader Service Number	**1385**	**1386**	**1387**	**1388**

Audio Reel-type Decks

Audio reel-to-reel recorder/reproducer systems for various tape widths. A dc-servo capstan motor is used on all models not marked with a dagger (†). Belt-driven capstan models are marked with a bullet(•). In Audio Response, Hz is understood.

Manufacturer	AEG-Telefunken		Digitec	Fostex	
Model/series	**M-20 series**	**M-21 series**	**F500**	**•E series**	**•Model 20 (80)**
No. of tracks	2 or 2+time code	2	2, mono, stereo, sync'd	2 + CT TC	3 (8)
Tape width	¼"	¼", ½"	¼"	¼", ½"	¼"
Oeck control logic	µP 8085	µP 8085	µP system	µP	µprocessor
Edit interface type	RS-232, RS-422	Via optional remote	Sync, RS-232	Synchronizer	SMPTE port
Recording timer	LCD display	LCD display	LED readout option	Yes	Yes
Cue track	Center track TC	No	SMPTE TC center	Center track	SMPTE center track
Phase correction	Yes	No	No	No	No
Capstan drive	Direct	Direct	Direct	Belt	Belt
Reel motor	dc servo	dc servo	dc servo	dc-servo	dc-servo
Tape speeds	4-speed, ±20-50% var	2 from 3.75-30 + var	3.75, 7.5, 15, var	7.5/15 or 15/30	7.5 & (15)ips
No. of heads	3 (6 on TC model)	3 amorphous metal	2	E R/P and P	3 (2)
Meter types	VU on bridge unit	2 VU on bridge unit	VU panel	VU movements	Bar graph
Equalization	NAB, IEC1, IEC2	NAB, CCIR, DIN, AES	NAB, CCIR	AES/IEC-2, IEC-2	NAB & (IEC)
Input connection	Bal >10kΩ, 5kΩ w/xfmr	Xfmrless bal, 10kΩ	Balanced, >15kΩ	Bal, unbal 40kΩ	Active unbal 30kΩ
Input level	+6dBm, +24dBm max	0dBm min, +24dBm max	0dBu min, +22dBu max	±24dBm	-10dBv
Output connection	Bal, xfmr opt <45Ω	Xfmrless bal, <40Ω	Balanced, <50Ω source	Bal, unbal, <40Ω	Active unbal 10kΩ
Output level	+24dBm max	+24dBm max	+20dBu max	+4dBm nominal	-10dBv
AF response	±1.5dB, 20-16k 7.5ips	±1.5dB 20-16k 7.5ips	±2dB, 31-16k 7.5ips	±3dB 30-20k 7.5ips	±3dB 30-20k(40-18k)
S/N ratio	>71dB stereo 7.5ips	>70dB 1020nWb/m 7.5ips	>71dB 7.5ips	>65dB unwtd	70dB (60dB)
Crosstalk Cue-Pgm	<-80dB L/R-TC	.....	.....	80dB	-70dB
Crosstalk Pgm-Pgm	<-55dB stereo/-65dB 2-tr	<-60dB ¼" 1kHz	<-40dB stereo/-46dB mono	-55dB 1kHz 0VU	-70dB
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 7.5ips	<0.06%, 7.5ips	±0.05% peak wtd	±0.06% 15ips
Reader Service Number	**1389**	**1390**	**1391**	**1392**	**1393**

Manufacturer	Lyrec A/S	Nagra-Kudelski		Otari	
Model/series	**TR-55 (TR-533)**	**IV-STC**	**T-Audio Time Code**	**MTR-10-2**	**MTR-100A**
No. of tracks	2 (24)	3	2-track or stereo	2	24
Tape width	¼", ½" (2")	¼"	¼"	¼"	2" w/o pinchroller
Deck control logic	µP control	Mechanical	µP w/parameter memory	µprocessor	µP
Edit interface type	Audio/tape controller	To synchronizers	RS-232/422/SMPTE/Sony-2	RS-422	Serial, parallel
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 ±10x 10kHz	Yes	No, autoalign

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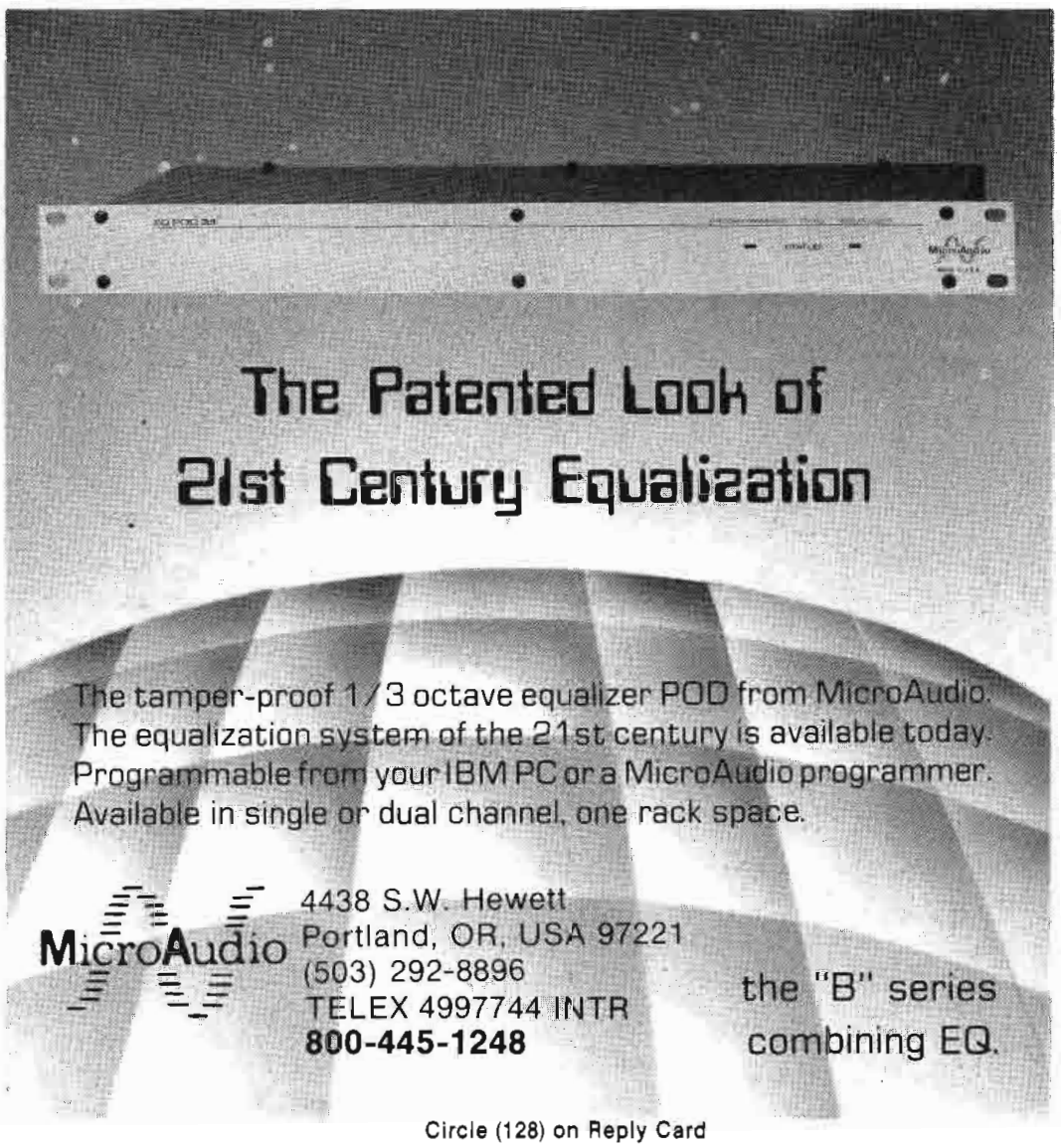
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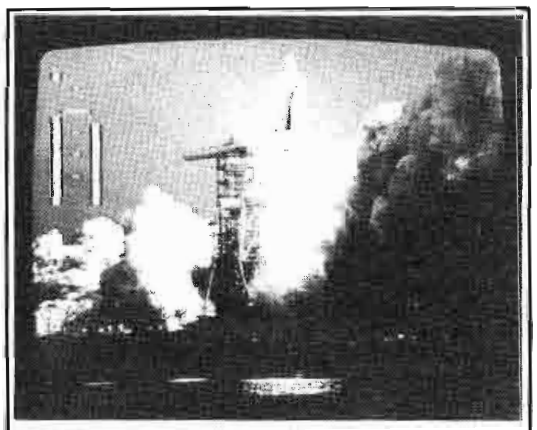
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Manufacturer	Lyrec A/S	Nagra-Kudelski		Otari	
Model/series	TR-55 (TR-533)	IV-STC	T-Audio Time Code	MTR-10-2	MTR-100A
Reel motor	dc servo (ac-servo)	dc	Servo	dc-servo	dc-servo
Tape speeds	7.5/15(15/30 ± 33%), var	3.75, 7.5, 15 ips	3.75-30ips, var	3.57-30ips, var	7.5, 15, 30
No. of heads	3	4	4	3 or 4	ERP
Meter types	VU movements	VU movements	LED indicators	VU, peak LEDs	24 VU w/peak LED
Equalization	NAB, CCIR (& AES)	NAB, CCIR, NAGRA	NAB, DIN, IEC	NAB, IEC, AES-30ips	NAB, IEC, AES-30ips
Input connection	Xfmr bal(floating) 8kΩ	Bal, unbal	Bal, floating 10kΩ	Active bal, xmtr opt	AB >10kΩ
Input level	-6, +24dBm max	Mic, line levels	390mV-4.4V	+4dBm	Switchable level
Output connection	Xfmr bal(floating) <40Ω	Resistive bal	Bal floating 30Ω	Active bal, xmtr opt	AB <5Ω source
Output level	+24dBm max	1V to 5kΩ	775mV-4.4V	+28dBm max	Switchable level
AF response	±1dB/60-18k(2dB/30-20k)	2dB 30-30k	±1.5dB 30-15k 7.5ips	±2dB, 20Hz-25kHz	±2dB, 30-22k 15ips
S/N ratio	62dB unwtd	>72dB	72dB	73dB unwtd 30ips	70dB
Crosstalk Cue-Pgm	.....	..	...	-60dB	...
Crosstalk Pgm-Pgm	-40dB 1kHz,(<-46dB)	<-60dB 1kHz	<-88dB	-60dB 1kHz 0VU	<-55dB 1kHz
Distortion	0.4%, 1kHz 0VU	<1% 810nWb/m 400Hz	0.3% NAB 7.5ips	0.25% 1kHz 0VU	0.5%, 1kHz
Wow, flutter	0.04% 15ips pk wtd	0.028% NAB, 15ips	<0.025% 7.5ips	0.04%	<±0.04%, 30ips
Reader Service Number	**1394**	**1395**	**1396**	**1397**	**1398**

Manufacturer	Otari			ReVox	
Model/series	MX-55	MX5050B-II (MX-50)	B77 Mk II	C270 (C274, C278)	PR99 Mk II
No. of tracks	1, 2, 2TC, 4	2	2 or 4	2 (4, 8)	2
Tape width	¼"	¼"	¼"	¼" (or ½")	¼"
Deck control logic	μP	TTL	....	μP	TTL, μP
Edit interface type	...	None	External option	Remote control, RS-232	Remote control
Recording timer	Yes	Yes	Yes	Yes	Yes
Cue track	Search 0/Cue/3-cue	No (Search 0 + 1 cue)	No	Zero, address locators	No
Phase correction	...	No	.....	.....	.....
Reel motor	Induction torque	ac-synchronous	Triac control	ac servo	Triac control
Tape speeds	3.75/7.5, 7.5/15	3.75/7.5/15/var	2-speed – variable	3-speed ±0.2% + var	3.75-15ips
No. of heads	ERP–P	4 (ERP)	3	3	3
Meter types	VU w/peak LED	VU, peak LEDs	VU movements	VU w/peak LEDs (LED bar)	VU movements
Equalization	IEC/NAB	NAB, IEC	NAB, IEC	NAB or CCIR	NAB, CCIR
Input connection	AB >10kΩ	AB >10kΩ	Unbal 2.2k/110k/220kΩ	Bal >1.2k/5kΩ	Bal >1.2k/5kΩ, Unb 100kΩ
Input level	–30dB max	10kΩ	0.15mV-40mV	-10, –10dBu, 22dBu max	-10, +10dBu
Output connection	AB <200Ω source	AB 600Ω load	Unbal >20kΩ load	Bal, <80Ω, XLR	Bal, <50Ω
Output level	–26dB max bal	–27dB max	1.55V/20kΩ minimum	–22dBu out, 600Ω load	+22dBu out, 600Ω load
AF response	±2dB 30-22k 15ips	±2dB 20-20k 15ips	-3, –2dB, 30-20k 7.5	±2dB, 30-18k 7.5ips	-3, +2dB, 30-20k 7.5
S/N ratio	>70dB 15ips	72dB unwtd (≥54dB)	>66dB NAB, 7.5ips	>64dB NAB, 7.5ips	>66dB NAB, 7.5ips
Crosstalk Cue-Pgm	<-55dB 1kHz	<-55dB	.....	.....	.....
Crosstalk Pgm-Pgm	....	-55dB 1kHz, 0VU	<-45dB stereo 1kHz	<-50dB stereo 1kHz	<-45dB stereo 1kHz
Distortion	<0.3% 1kHz	0.5% 1kHz (>0.3%)	<0.2%, 7.5ips	<1.2%, 7.5ips	<0.3%, 7.5ips
Wow, flutter	<±0.06% 15ips	0.04% 15ips (0.06%)	<0.08% 7.5ips	<0.07% 7.5ips	<0.08% 7.5ips
Reader Service Number	**1399**	**1400**	**1401**	**1402**	**1403**



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Manufacturer	Sony Pro Audio		Stellavox		Studer
Model/series	**APR-2003 portable**	**APR-5000 series**	**SP8**	**TD9[1]**	**A820 series (A812)**
No. of tracks	3	Full, half, halfC	3	1-5	2 to 24 (2)
Tape width	¼"	¼"	¼ ±	¼, ½	¼" to 2" (¼")
Deck control logic	.....	16-bit μprocessor	Mechanical	μprocessor, CMOS	μP, TTL, CMOS
Edit interface type	No	Serial, parallel	Manual editing	RS-422 & direct	RS-232, RS-422
Recording timer	Tape counter	.....	Option	Yes	Yes
Cue track	Yes	on APR-5003	SMPTE center track	SMPTE center	SMPTE center track[2]
Phase correction	.....	.....	No	No	Yes
Reel motor	dc	dc	dc-servo	dc-servo	dc servo
Tape speeds	3-75, 7.5ips	7.5, 15, 30ips ±50%	3.75, 7.5, 15ips. var	3.75-30ips, variable	3.75-30 ±7 semitones
No. of heads	3	.....	4	5 possible	3 or 4 (3)
Meter types	VU movement	.....	Tautband A	Tautband A	VU movement
Equalization	.....	NAB, AES	NAB, DIN, IEC	NAB, IEC, DIN	NAB, CCIR
Input connection	Bal, 10kΩ	.....	Balanced	Balanced	TB, AB 10kΩ
Input level	-70dBs, +4dBs	.....	-72dBm mic	+6dBm	0, +10dBm, +24dBm max
Output connection	Unbal 600Ω	.....	Balanced	Balanced	TB, AB <50Ω
Output level	1V to 10kΩ load	.....	+6dBm typical	+15dBm max	+24dBm max
AF response	±3dB, 30-18k, 7.5ips	-1.5, +.75dB, 30-20k	-1, +1dB, 20-20k	-2, +1dB 30-20k	±2dB, 30-16k 7.5ips
S/N ratio	.....	>67dB 7.5ips	68dB	70dB	>65dB, ¼" stereo 7.5ips
Crosstalk Cue-Pgm	<-90dB audio-TC	.....	-90dB	-90dB	.....
Crosstalk Pgm-Pgm	.....	.....	-55dB 1kHz 0VU	-55dB	<-55dB, stereo, 1kHz
Distortion	.....	Variable per bias	0.6% 1kHz 0VU	0.5% 1kHz 0VU	<0.5% NAB, 1kHz
Wow, flutter	±0.08% 7.5ips	.....	0.02%	0.02%	<0.06%, 7.5ips
Reader Service Number	**1404**	**1405**	**1406**	**1407**	**1408**

[1]Modular head block system allows the head configuration and tape width of the machine to be changed with alternate parts.
[2]Also five Locstart memories available.

Manufacturer	Studer		TASCAM		
Model/series	**A807**	**A810**	**ATR-60 series**	**ATR-80-24**	**Model 42B (44)**
No. of tracks	2 (or 4)	2	2T, 2N/2D, 2HS/4HS, 8	24	2 (4)
Tape width	¼" (or ½")	¼"	¼" or ½"	2"	¼"
Deck control logic	μP control	μP	μP control	μP control	μP control
Edit interface type	Serial, parallel	RS-232, RS-422	AQ-65 autolocator	For SMPTE synchronizer	Via synchronizer
Recording timer	LED display	5-digit LCD or LED	Yes	Yes	Yes
Cue track	Address & autolocator	SMPTE center option	Timecode on 2T, RTZ/STC	Cue by RTZ, STC	Possible
Phase correction	Yes	Yes	No	No	No
Reel motor	ac servo	ac servo (PWM)	dc servo, eddy current	dc servo	dc servo
Tape speeds	3.75, 7.5, 15 +7/-7 HT	2 or 4, ±7 semitone	7.5-15 or 15-30	15ips ±12% pitch control	7.5, 15 ±12% var
No. of heads	3 (optional 4-track)	3	3 (NAB, DIN)	3	3
Meter types	VU movement	VU	VU w/peak LEDs	8 VU	2VU (4VU)
Equalization	NAB, CCIR switched	NAB, CCIR switchable	IEC/CCIR, NAB	IEC/CCIR, NAB	NAB, IEC/CCIR
Input connection	Xfmr bal >10kΩ	Bal, float, >10kΩ	Bal 10kΩ	Bal 10kΩ, unbal 50kΩ	Bal 10kΩ, unbal 50kΩ
Input level	-30dB min, +24dBu max	0, +10d8m; +24dBm max	+4/28dBm	+4/28dBm, -10/18dBV	+4/28dBm, -10/18dBV
Output connection	Xfmr bal <50Ω	Bal, float, <50Ω	Bal <20Ω	Bal 20Ω, unbal 60Ω	Bal <20Ω, unbal 60Ω
Output level	+24dBu max to 600Ω	+24dBm max	+28dBm max	+28dBm, +18dBV max	+28dBm, +18dBV max

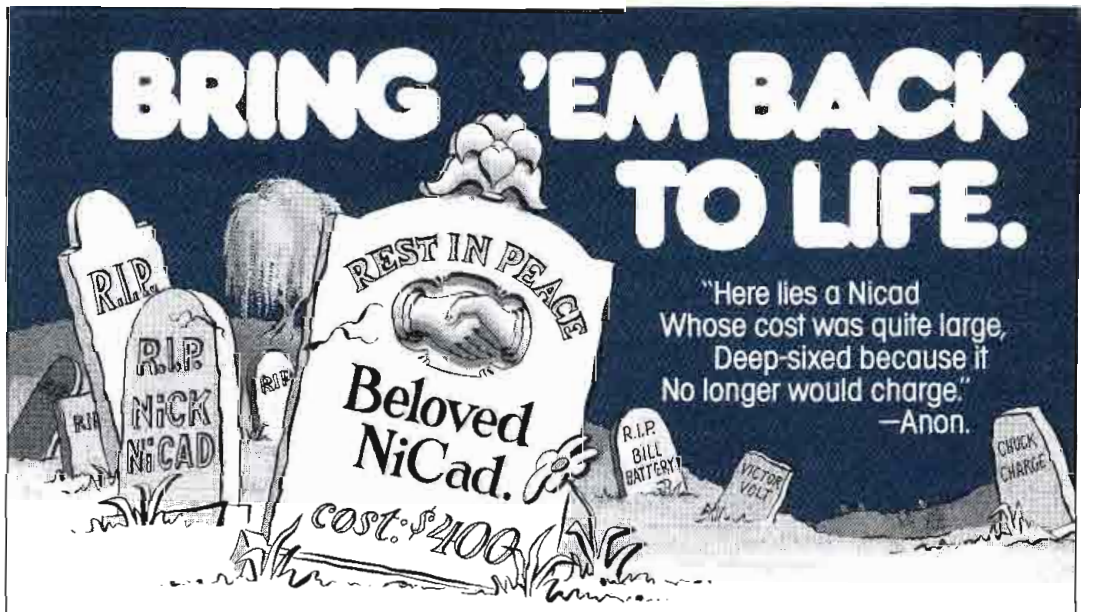
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Manufacturer	Studer		TASCAM		
Model/series	A807	A810	ATR-60 series	ATR-80-24	Model 42B (44)
AF response	±2dB, 30-16k, 7.5ips	±2dB, 20-16k, 7.5ips	±2dB, 30-16k 7.5ips	±3dB, 40-20k	±2dB 30(40)-16k
S/N ratio	72dB, ASA-A wtd 7.5ips	>65dB rms, 7.5ips stereo	72dB NAB wtd 7.5ips	69dB Q wtd	68(67)dB A-wtd 7.5ips
Crosstalk Pgm-Pgm	<-55dB separation	<-55dB stereo, 1kHz	<-57dB, 2-track	<-55dB, 1kHz 0VU	<-55dB 1kHz 0VU
Distortion	<1% NAB, 7.5ips 1kHz	0.6%, stereo, 1kHz	0.6%, 2-track 1kHz	0.8%, 0VU, 1kHz	0.8% 0VU, 1kHz
Wow, flutter	0.07% 7.5ips	<0.07% 7.5ips	0.09% 7.5ips	0.05% NAB wtd	0.06% NAB wtd
Reader Service Number	1409	1410	1411	1412	1413

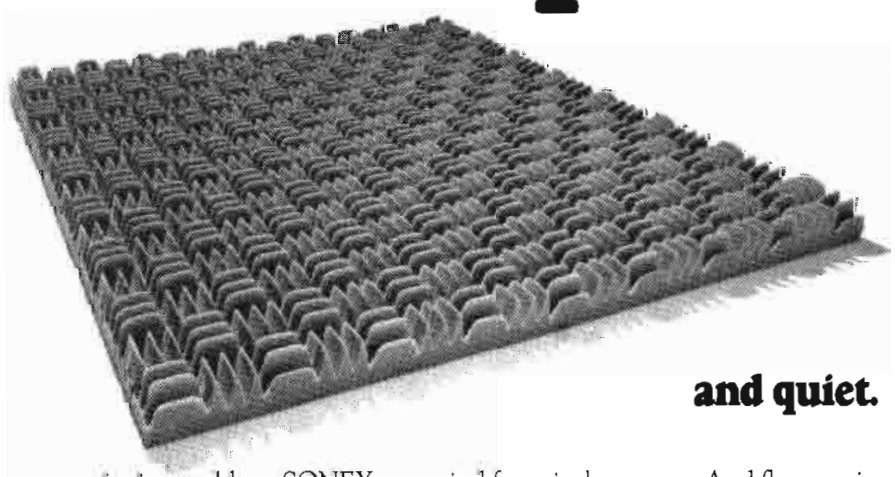
Manufacturer	TASCAM		TTC/Scully Tape	
Model/series	Model 48	ATR-80 series	280B series[1]	250 series[2]†
No. of tracks	8	24	1, 2, 4	1, 2, 3
Tape width	½"	2"	½, ¼	¼"
Deck control logic	μP control	3 8-bit μPs	Solenoid	Solenoid
Edit interface type	For SMPTE synchronizer	RS-232C/422	No	No
Recording timer	Yes	LED display	No	No
Cue track	Cue by RTZ, STC	AQ-80 autolocator	No	No
Phase correction	No	.....	No	No
Reel motor	dc servo	PWM servo	ac hysteresis	Torque
Tape speeds	15ips ±12% pitch control	15/30 ips	3.75-30 available	3.75/7.5, 7.5/15
No. of heads	3	3	3	3
Meter types	8 VU	VU movements	VU option	VU
Equalization	IEC/CCIR, NAB	NAB, IEC switched	NAB, IEC	NAB or IEC
Input connection	Bal 10kΩ, unbal 50kΩ	Bal 10kΩ or 600Ω	Xfmr bal	Bal 10Ω line
Input level	+4/28dBm, -10/18dBV	+4dBm nom, +28dBm max	200mV 10kΩ min	200mV min 250-600Ω
Output connection	Bal 20Ω, unbal 60Ω	Bal/unbal, 20Ω source	Xfmr bal 60Ω source	Unbal (xfmr bal opt)
Output level	+28dBm, +18dBV max	+4dBm, +28dBm max	+24dB max 600Ω load	+17dBm max, 600Ω
AF response	±3dB, 40-20k	35-20k (15ips)	±2dB 30-15k	±2dB, 50-15k, 7.5ips
S/N ratio	69dB Q wtd	71dB a-wtd IEC 15ips	68dB 2-TR, 7.5ips	>66dB 7.5ips
Crosstalk Pgm-Pgm	<-55dB, 1kHz 0VU	<-55dB 1kHz 0VU	<-60dB 250nWb/m 1kHz	.....
Distortion	0.8%, 0VU, 1kHz	<0.5%, 1kHz	<3%	<0.7%, 250nWb/m level
Wow, flutter	0.05% NAB wtd	±0.06% peak DIN 45507	0.05% w/dc-servo	<0.1% 7.5ips
Reader Service Number	1414	1415	1416	1417

[1]For playback only use 285B series.
[2]For playback only use 255 series.

Audio Dynamics/Level Control Processors

Functions include compression, limiting, AGC action, expansion control over audio signal levels. Multiband processing is noted with a bullet (•); digital processing is noted with a dagger (†); non-stereo products are marked with a double dagger (‡); matrix processing is indicated with a check (✓). When no product (in a group of 5) offers a specific design function, that function has been deleted.

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Circle (134) on Reply Card

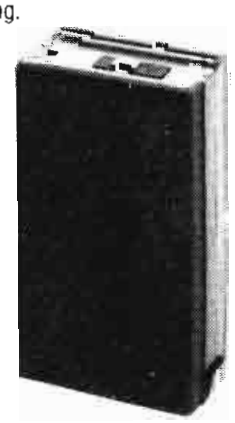
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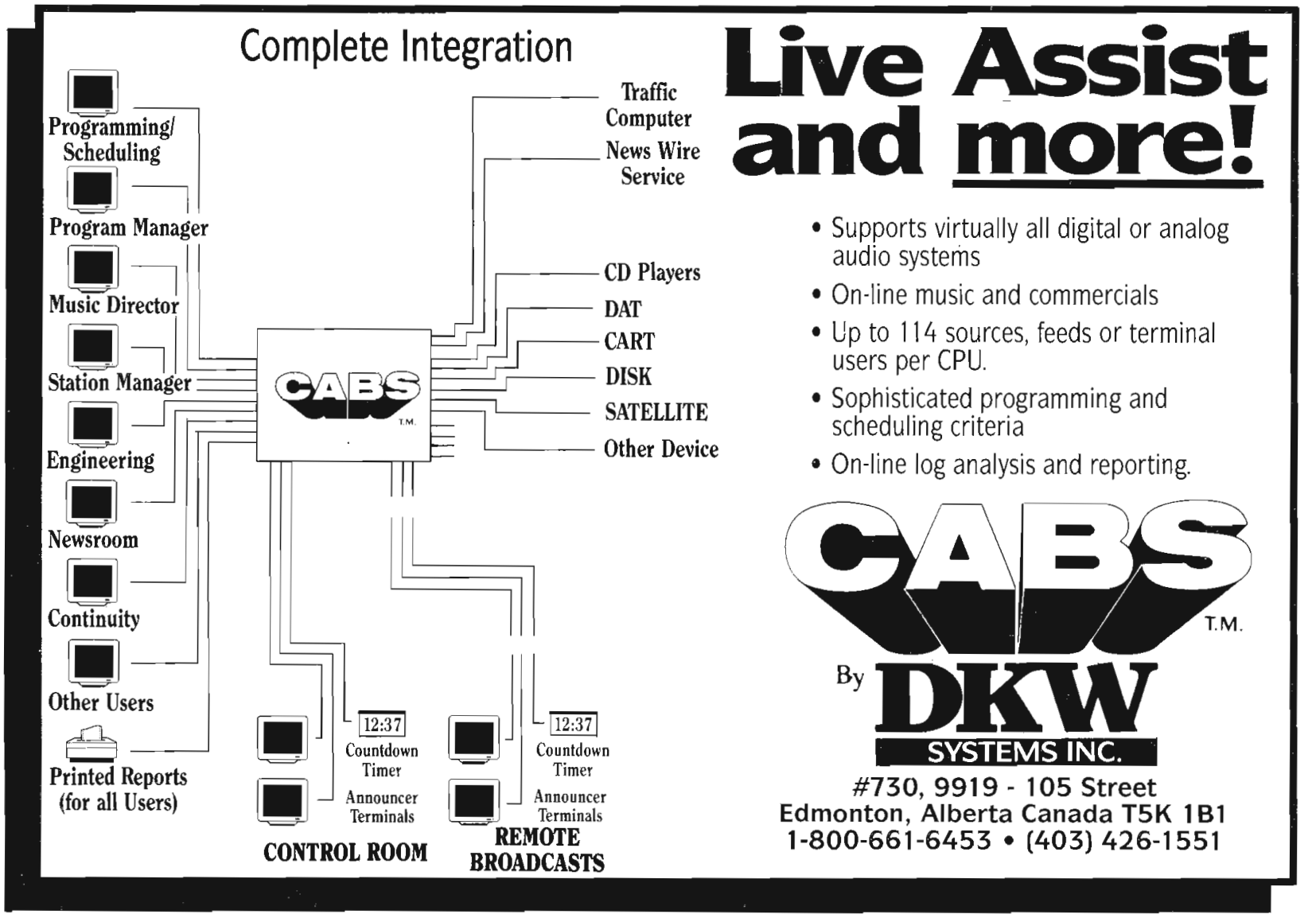
Circle (133) on Reply Card

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Manufacturer	Aphex Systems			ATI/Audio Technologies	Audio Developments
Model/Series	**#300 Compellor (•303[1])**	**• 612 expander/gate**	**•700 Dominator✓**	**Emph'a'Sizer‡**	**AD066-1 Port-a-Flex‡**
Design function					
AGC	12dB leveling	No		No	....
Compression	1.1:1 to 20:1	No	.....	Yes	2:1 to 20:1
Limiting peak	12dB ceiling	No	Zero overshoot	Yes	Yes
Limiting pre emp	No	No	Opt 703/704	Pre/post/side EQ	....
Expansion	....	Variable	....	Yes	....
Gate threshold	Yes	-50, +20dBm	....	Yes	....
Programmable	No	Adjustable	No	User	....
Meter type	LED ladder	LED indicators	LED ladder	LED bargraph	PPM
Meter functions	In/out/GR/peak/VU	Below, hold, above	Gain reduction	Output, GR	In/Out/Gain Reduction
Time constants	Program dependent	Adjustable	Program dependent	Variable	Switch selected
Input connection	AB/unbal	Servo bal 80kΩ	AB	Xfmr, AB	20kΩ diff bal
Input level	27dBm	+4dBm, +21dBm max	24dBm	Mic, line levels	+18dBv max
Output connection	AB/unbal	Servo bal 65Ω	AB/unbal	....	<75Ω xfmr bal
Output level	27dBm	+25dBm max bal	24dBm	+24dBm or mic level	+18dBm max
AF response	±1dB 5Hz-65kHz	-0.2,0dB 5Hz-100kHz	±0.5dB 20-50k	±0.25dB, 30Hz-20kHz	±0.5dB 20Hz-20kHz
Distortion	<0.1% 1kHz 20dBm	0.006% +20dBm	<0.04% 1kHz 20dBm	0.2%, +22dBm	<0.1% 1kHz 0dB
S/N ratio	95dB 27dBm unwtd	87dB w/hum unity gain	80dB unwtd 20dBm	80dB	>70dB
Reader Service Number	**1280**	**1281**	**1282**	**1283**	**1284**

[1]Model #303 includes Aphex aural exciter spectral enhancement.

Manufacturer	Broadcast Electronics	Brooke Siren Systems		CRL Systems	
Model/Series	**FM-601 limiter**	**DPR 402**	**• FDS360 limiter**	**• AM-4 (AM-4S✓)**	**•BAP-2000 FM/TV‡**
Design function					
AGC	Yes	No	No	AGC-400 (SGC-800)	2-band, pgm dep
Compression	Yes	Yes	No	SEC-400 (SEC-800)	....
Limiting peak	Yes	Yes	Yes	Yes	Yes
Limiting assym	No	No	No	Yes	....
Limiting pre emp	Flat, 25/75ms	De-ess/adj side chain	No	per NRSC	to 20dB
Expansion	Yes	Yes	No	Dynafex NR	Dynafex NR
Gate threshold	Yes	No	No	-10,-30dB adj	TV sync filter
Programmable	User	User, factory set	User	Yes	Adjustable
Meter type	3 meters	LED bargraph	None	LED ladder	LED
Meter functions	2 VU, 1 gain	In, out, GR	....	GR, peaks	GR, relative output
Time constants	Variable	Variable	Fixed	Adjustable	Adjustable
Input connection	Xfmr bal 600Ω	AB bridging	AB bridging	AB, unbal	AB, bridging 10kΩ
Input level	+20dBm	+20dBv	n.a.	4dBm	-20, +20dBm
Output connection	Xfmr bal 600Ω	Unbalanced	Unbal xfmr opt	AB, unbal	AB <100Ω
Output level	+20dBm max	+20dBv max	+20dBm max	4dBm	-20, +20dBm
AF response	±0.5dB, 30Hz-20kHz	±1dB, 25Hz-20kHz	Adjustable	±1dB 50Hz-15kHz	±1dB 50Hz-15kHz ops
Distortion	0.75%	0.15%, 1kHz	0.05%	<0.5%	<0.25% operation
S/N ratio	>60dB	86dB	85dB	65dB unwtd	>75dB ops 5kHz
Reader Service Number	**1285**	**1286**	**1287**	**1288**	**1289**



Circle (132) on Reply Card

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Manufacturer	CRL Systems		D&R Electronica	Dorrough Electronics	EMT-Franz/Gotham
Model/Series	• FM-4/-3/-2/-1	TVS-3010[1]✓ (-3001)	Compressor/limiter	•DAP-610 FM/TV/AM†	EMT 227 DX-limiter‡
Design function					
AGC	SGC-800 -4/-3/-2	30B range	No	Yes	No
Compression	SEC-800 -4/-3	CBS Loudness control	Yes	Yes	Yes
Limiting peak	SMP-850 -4/-3/-1	Yes	Yes	Yes	Yes
Limiting assym	w/SGC-800	Dn -3001	No	For AM	For AM
Limiting pre emp	w/SMP-850	Variable on -3010	No	Yes	No
Expansion	Dynafex NR SGC-800	Stereo enhancement 3010	No	No	Yes
Gate threshold	.	....	No	Yes	No
Programmable	Adjustable	No	User	Adj pgm equalization	Yes
Meter type	LED ladder	LED ladder	LEDs	4 LED level displays	LED, meter
Meter functions	Left, right	Gain reduction	GR	GR, out, level, peak	Peak, GR
Time constants	Adjustable	Program dependent	0.3/3/7ms a, var r	Per EPROM program	Program dependent
Input connection	AB, unbal	Balanced	Unbalanced	AB bridging	Xfmr bal 5kΩ
Input level	4dBm	....	-20,+20dBu	+20dBm	-20,+15dBm 24dBm max
Output connection	AB, unbal	Balanced	Unbalanced	AB	Xfmr bal <40Ω
Output level	4dBm	....	-20,+20dBu	+20dBm	+21dBm max
AF response	±1dB 50Hz-15kHz	±0.75dB 50Hz-15kHz	±0.5dB, 20Hz-20kHz	n.a.	±0.5dB, 30Hz-15kHz
Distortion	<0.5%	....	<0.046%	0.3% below clipping	<0.25% 1kHz +8dBm
S/N ratio	>65dB	>70dB S+N/N	81dB	72dB at comp threshold	72dB
Reader Service Number	**1290**	**1291**	**1292**	**1293**	**1294**

[1]TV sync filter.

Manufacturer	EMT-Franz/Gotham Audio		Eventide	Furman Sound	
Model/Series	EMT 266X transient	EMT 257/260/261‡	Omnipressor‡	LC-6	LC-3A (LC-X)
Design function					
Compression	No	261	Yes	Yes	Yes
Limiting peak	Yes	257, 260, 261	Yes	Yes	Yes
Limiting pre emp	Adaptive pre-emphasis	257, 260, 261	No	No	De-ess
Expansion	No	261	Yes	Noise gate	No
Gate threshold	No	....	Yes	Yes	No
Programmable	No	User adjustable	User	User	User
Meter type	LEDs	Analog meter	Meter	LED bargraph	LED bargraph
Meter functions	Peak	Instantaneous gain	In, out, gain	GR	GR
Time constants	Program dependent	Program dependent	Variable	0.01ms-1s a, 0.05-5s r	0.05-50ms a, 0.05-1s r
Input connection	Bal >5kΩ	Bal >10kΩ floating	AB, xfmr opt	AB bridging opt	AB bridging opt
Input level	-20,0; 0,+15	-8,+6dB	+20dBm max	+23dBv max	+18dBm max
Output connection	Bal <40Ω	Bal <40Ω floating	Unbal, xfmr opt	AB opt	AB opt
Output level	-20,0; 0,+15	+21dBm max	+18dBm max	+23dBv @ 2.5kΩ	+23dBv @ 5kΩ
AF response	±0.3dB, 30Hz-15kHz	±0.5dB, 40Hz-15kHz	-0.5dB 20Hz-15kHz	±0.5dB 20Hz-20kHz	-0.5dB, 20Hz-20kHz
Distortion	<0.2%	s0.5%, 1kHz, automode	0.5% 1kHz	<0.1% w/compression	0.05% 1kHz +18dBm
S/N ratio	92dB	r75dB	90dB	-92dBv	-86dBv
Reader Service Number	**1295**	**1296**	**1297**	**1298**	**1299**

Manufacturer	Harris Broadcast	Inovonics			ITAME SA
Model/Series	• Ulti-Mate 91‡	260 TV/FM (•255 FM)†	• 250†✓	• 222††✓	Mod. 90A‡
Design function					
AGC	110dB dynamic range	Yes	Yes	No	to 35dB, 10s recovery
Compression	Yes	Yes	Yes	No	Yes
Limiting peak	Yes	Yes	Yes	Yes	Yes
Limiting assym	....	No	for AM	Yes	Yes
Limiting pre emp	....	Yes	Yes	NRSC filter	No
Gate threshold	....	Yes	Yes	No	....
Programmable	Adjustable	No	Digital/RS-232 opt	No	No
Meter type	LED	LEDs	LEDs	LEDs	Mechanical
Meter functions	GR/limiting/overload	GR	GR	GR	VU, dB
Time constants	Adjustable	Program dependent	Programmable	n.a.	<20μs a/50-500ms rec
Input connection	AB, 20kΩ	AB bridging	AB bridging	AB bridging	Balanced 600Ω
Input level	-10,+15dB switched	+10dBm max	+10dBm	+15dBm max	-20dB,+18dBm
Output connection	60Ω source AB	AB 600Ω	AB	AB 600Ω	Balanced 600Ω
Output level	0,+20dBv	+15dBm max	0-15dBm	+15dBm max	+20dBm max
AF response	-0.25dB 20Hz-20kHz	±0.5dB, 10Hz-15kHz	±0.5dB, 10Hz-15kHz	±1dB, 10Hz-9.7kHz	±1dB 50Hz-15kHz
Distortion	0.05% 1kHz 40dB GR	<0.25%	<0.5%	1% w/limiting	<0.7%
S/N ratio	....	75dB	70dB	>75dB	>70dB
Reader Service Number	**1300**	**1301**	**1302**	**1303**	**1304**

Manufacturer	Marti	Orban Associates			
Model/Series	CLA-40A‡	Co-Operator (#424A)	• 8182A Optimod-TV[1]	• 8100A Optimod-FM[2]	• 9100A Optimod-AM[3]✓
Design function					
AGC	Yes	Yes	Loudness controller	Yes	Yes (9100B contains
Compression	Yes	Yes	Yes	Yes	Yes (NRSC Pre-emp &
Limiting peak	Yes	Yes	Yes	Yes	Yes (10kHz low-pass
Limiting assym	Yes	No	No	No	Yes (filtering per
Limiting pre emp	Yes	Yes	Yes	Yes	No (NRSC AM program
Expansion	No	No (De-essing)	No	No	No
Gate threshold	No	Yes	Yes	Yes	Yes
Programmable	Switch select	User, program dep	User, program dep	User, program dep	User, program dep
Meter type	Meter	Bargraph (VU meters)	5 meters	5 meters	8 meters
Meter functions	Output, GR	GR, output (GR, VCA lvl)	GR, VU, voltage	GR, VU, volts	GR, VU, volts
Time constants	0.8/2/5s release	Adjustable	Program dependent	Program dependent	Program dependent
Input connection	Balanced 600Ω	AB bridging	AB bridging	AB	AB bridging
Input level	+20dBm max	-10dBm	-30, +10dBm	-30,+10dBm	-30dBm
Output connection	Balanced 600Ω	AB 93Ω	AB 370Ω	Act unbal comp stereo	AB 290Ω
Output level	+20dBm max	>+20dBm	+20dBm	0-4Vp-p	+20dBm
AF response	±0.5dB, 50Hz-15kHz	±0.25dB	±0.75dB 50Hz-15kHz	±0.75dB 50Hz-15kHz	±1dB 50Hz-7.5kHz
Distortion	<1% any compr lvl	<0.05%, 1kHz	<0.25% 50Hz-15kHz	<0.25% THD system.	<0.2%

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Manufacturer	Marti	Orban Associates			
Model/Series	CLA-40A‡	Co-Operator (#424A)	• 8182A Optimod-TV[1]	• 8100A Optimod-FM[2]	• 9100A Optimod-AM[3]
S/N ratio	66dB @ +10dBm	>85dB	75dB	>75dB	75dB
Reader Service Number	**1305**	**1306**	**1307**	**1308**	**1309**

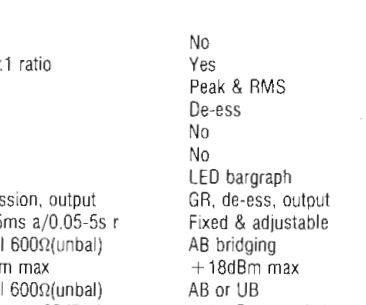
[1]Studio chassis and stereo generator are available.
[2]ACC-022 filter option.
[3]Day-night, transmitter 1-2 switch; 9100B contains NRSC pre-emp and 10kHz low-pass filtering per NTSC AM program.

Manufacturer	ProTech Audio	Symetrix			
Model/Series	663CL (663CL1)‡	CL-150B Fast RMS‡	525 dual	•528 voice‡ processor	544 quad gate
Design function					
AGC	No	No	No	No	No
Compression	20dB, 2:1 ratio	Yes	1:1-20:1	Yes	Yes
Limiting peak	No	Peak & RMS	Peak & RMS	Yes	Yes
Limiting pre emp	No	De-ess	De-ess	De-ess	No
Expansion	No	No	1:4	Downward	Downward
Programmable	User	No	Threshold, comp	Threshold/comp ratio	Threshold/comp
Meter type	Meter	LED bargraph	LED bargraph	LED bargraph	LED bargraph
Meter functions	Compression, output	GR, de-ess, output	GR, Exp, Output	GR, de-ess, output	GR, output
Time constants	0.05-0.5ms a/0.05-5s r	Fixed & adjustable	Pgm dependent	Fixed	Fixed, adjustable
Input connection	Xfmr bal 600Ω(unbal)	AB bridging	Bal, >40kΩ	AB bridging	Bal >45Ω
Input level	+27dBm max	+18dBm max	+18dBm max	+18dBm max	+18dBm max
Output connection	Xfmr bal 600Ω(unbal)	AB or UB	AB xfmr opt	AB xfmr opt	Unbal 100Ω
Output level	+27dBm (+20dBm) max	+24dBm max bal	+18dBm max	+24dBm max	+19dBm max
AF response	±0.5dB (0.25dB) 20-20k	-1,0dB 20-20k	-1,0dB 20-20k	19Hz-22kHz	20Hz-20kHz
Distortion	0.4% 6dB compression	0.03-0.09%	0.025% 10dB GR	0.05%	0.025% 10dB GR
S/N ratio	>78dB	....	....	-127dBm EIN	<-86dBm 20kHz bw
Reader Service Number	**1310**	**1311**	**1312**	**1313**	**1314**

Manufacturer	Symetrix	UREI		Valley International	
Model/Series	501‡	1176LN (1178)‡	7110‡	Commander‡	440‡
Design function					
AGC	No	No	No	Yes	Yes
Compression	Yes	No	1.5-∞:1	Yes	Yes
Limiting peak	Peak, RMS 1:∞	Yes	Yes	No	Yes
Limiting pre emp	No	No	No	No	Sibilance processor
Expansion	....	No	No	Yes	Yes
Programmable	Threshold/comp	Yser	Compression ratio	User, auto	User, auto
Meter type	LED bargraph	VU meter	VU	LED bargraph	3 LED bargraphs
Meter functions	GR, output	Output, GR	Output, GR	GR	GR comp/lim, in, out
Time constants	Fixed, adjustable	20-800*s, 0.05-1.1s	Program dependent	Variable	Adjustable
Input connection	Bal or unbal	AB bridging	AB bridging 20kΩ	AB bridging	AB bridging
Input level	+18dBm max	+20dBm max	+22dBu	+24dBm	+24dBm max
Output connection	Bal or unbal	Xfmr bal 600Ω	Xfmr bal 150Ω	AB 50Ω	AB 40Ω
Output level	+26dBm max bal	+24dBm	+22dBm into 600Ω	+24dBm into 600Ω	+24dBm max
AF response	-1,0dB 20-20k	±1dB, 20Hz-20kHz	±0.5dB, 20Hz-20kHz	n.a.	n.a.

Two Rules Every Broadcast Professional Ought to Know

RULE 1

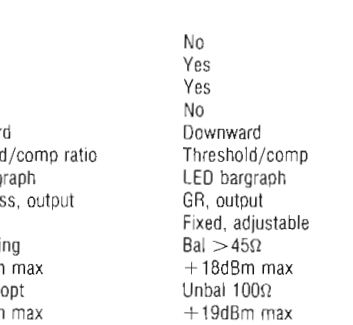


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Manufacturer	Symetrix	UREI		Valley International	
Model/Series	501‡	1176LN (1178)‡	7110‡	Commander‡	440‡
Distortion	<0.25%	+L0.5% 50-15k/1.1s	<0.25%	<0.01%, 1kHz	<0.015% 1kHz
S/N ratio	-95dBu 20dB GR	81dB	....	<-83dB 20Hz-20kHz	>78dB
Reader Service Number	1315	1316	1317	1318	1319

Manufacturer	Valley International		Wheatstone	Yamaha International
Model/Series	400 mic processor‡	• DDP Processor†	Dynamite	Model 1202	GQ2020
Design function					
AGC	No	No	No	No	
Compression	Yes	Multi-band	Yes	Yes	1:1-∞:1
Limiting peak	No	Yes	Yes	Yes	Yes
Limiting pre emp	3-band EQ	Yes	No	De-essing	....
Expansion	Yes	Multi-band	Yes	No	Yes
Gate threshold	Noise gate w/o comp	Yes	Noise gate mode	No	Yes
Programmable	User	Yes	User	User	No
Meter type	2 LED bargraphs	LED	LED bargraph	LED bargraph	5-seg LED
Meter functions	In, out, VU, GR	In, Out, GR, Comp	GR	Output, compression	GR
Time constants	Fixed	Adjustable	Variable	Variable	Adjustable
Input connection	AB bridging	AB, bridging	AB	Balanced, 20kΩ	Unbal 30kΩ
Input level	+26dBm max	+24dBm max	+24dBm max	+18dBm max	+32dB max
Output connection	AB <50Ω	AB <50Ω	Unbal	Balanced 10Ω	Unbal 600Ω
Output level	+26dBm	+24dBm max	+21dBm 600Ω	+22dBm max	+20dB max
AF response	....	....	....	±0.5dB, 20Hz-50kHz	±2dB, 20Hz-20kHz
Distortion	<0.05%	<0.01%	<0.04% 1kHz quiescent	0.04%	<0.03%
S/N ratio	-128dBm EIN	>93dB unwtd	<-83dB 20Hz-20kHz	>90dB	<-87dB IHF-A
Reader Service Number	1320	1321	1322	1323	1324

Audio Delay Systems

These systems range from simple delays to complex effects generation. Although not strictly delay units, time modifiers are included. Products with AF contouring or multiband control are noted with a dagger (†). A check (✓) denotes non-digital design. Under inputs/outputs AB refers to Actively Balanced.

Manufacturer	AKG Acoustics			AMS/Advanced Music Systems		
Model/Series	TDU-8000 + R800	MSP-126	ADR68K†	DMX15-80S (SB dual)	TIMEFLEX†	RMX 16†
Design features	Delay	Effects processor	Reverb, effects	Delay/pitch change	Time modifier	Reverb
Talkshow delay	No	No	No	Yes	No	No
Plate/room	No	No	Yes	No	No	Yes
Reverb/echo	No	Yes	Yes	No	No	Yes
Pitch change	No	No	No	Yes	Yes	No



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Manufacturer	AKG Acoustics			AMS/Advanced Music Systems		
Model/Series	**TDU-8000 +R800**	**MSP-126**	**ADR68K†**	**DMX15-80S (SB dual)**	**TIMEFLEX[1]**	**RMX 16†**
Phasing/flanging	Yes	Yes	Yes	No	No	Yes
Time reversal	No	No	No	No	No	Yes
Programmable	User	Factory, user	Factory, user	User	User	Factory, user
Delay type	Digital	Digital	Digital	Digital	Digital	Digital
Delay range	1.3s	360ms	8s	>50s	0.5-2x tape speed	1.5s
Stereo implementation	2-ch in, 8-ch out	Stereo, tapped line	Yes	Yes	Yes	n.a.
AF bandwidth	20kHz	20kHz	15kHz	18kHz	14Hz-18kHz	18kHz
Input connection	AB bridging	AB bridging	AB bridging	AB, bridging	10kΩ AB	AB, bridging
Output connection	Unbal	AB	AB	AB	100Ω AB	AB
Dynamic range	110dB a-wtd	80dB	86dB	90dB	90dB	90dB
Remote control	Yes	No	Yes	No	From interface	Yes
Interfaces	No	No	MIDI	Keyboard	RS-422/SMPTE	Barcode wand
Reader Service Number	**1240**	**1241**	**1242**	**1243**	**1244**	**1245**

[1]Performs time compression, expansion with pitch preservation, stereo imaging and correct monophonic summing. Equipment operates with through timecode lock.

Manufacturer	AMS/Advanced Music	ART/Applied Research & Technology			Audio/Digital	
Model/Series	**A/V Sync**	**DR1 (DR2a)**	**PD3**	**#1500†**	**ADD-2 (ADD-3)**	**TC-4**
Design features	A/V sync	Reverb	Delay, sync	Digital delay	Digital delay	Broadcast delay
Talkshow delay	No	No	No	No	No	Catchup opt
Plate/room	No	21(9) rooms	No	Effective	No	No
Reverb/echo	No	w/effects	Effective	Echo	Effective	No
Phasing/flanging	No	No	No	Yes	No	No
Programmable	User, automatic	Factory, user	No	User	User	User
Delay type	Digital	Digital	Digital	Digital	Digital	Digital
Delay range	1.2s	25s (12.8s) decay	255ms	0.15-1500ms	0-490ms	6.8s
Stereo implementation	3-channel	Yes (Stereo out)	1-in, 3-channel out	....	No	w/2 units
AF bandwidth	18kHz	14kHz (10kHz)	20kHz	22kHz	20kHz	15kHz
Input connection	AB, bridging	Balanced	AB	n.a.	Act bal (xfmr opt)	AB, unbal
Output connection	AB	Unbalanced	AB	n.a.	AB (xfmr opt)	AB, unbal
Dynamic range	90dB	>90dB (75dB)	90dB unwtd	>90dB	>90dB	85dB A-wtd
Remote control	Yes	Yes	No	Yes	No	Yes
Interfaces	Video, TTL	MIDI	None	....	None	....
Reader Service Number	**1246**	**1247**	**1248**	**1249**	**1250**	**1251**

Manufacturer	Audio/Digital	BEL Electronics	EMT-Franz (Gotham Audio)			Eventide
Model/Series	**TC-5**	**BD 320**	**EMT 445**	**EMT 251, 252/252S**	**EMT 246 reverb**	**BD 931 (BD 932)**
Design features	Delay processor	Delay system	Delay	Digital Reverb	Delay	Broadcast delay
Talkshow delay	No	Yes	Yes	No	Yes	Yes
Plate/room	No	Possible	No	Yes w/chorus	No	No

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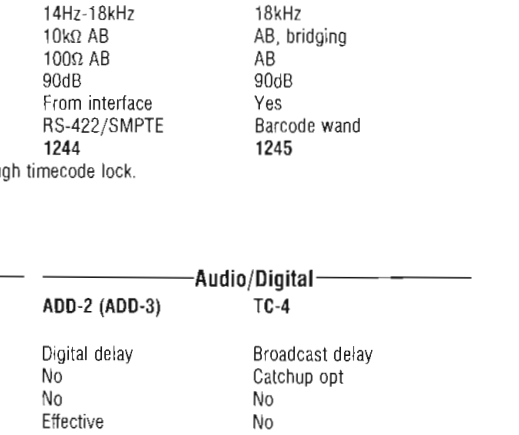
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Manufacturer	Audio/Digital	BEL Electronics	EMT-Franz (Gotham Audio)			Eventide
Model/Series	**TC-5**	**BD 320**	**EMT 445**	**EMT 251, 252/252S**	**EMT 246 reverb**	**BD 931 (BD 932)**
Reverb/echo	Effective	Yes	No	0.4s-4.5s	0.2s-20s	No
Phasing/flanging	No	Yes	No	No	No	No
Programmable	User	Manual only	99 presets	User-alterable	190 programs	No
Delay type	Digital	Digital	16-bit 48kHz	16-bit, 32.6kHz	16-bit 48/44.1kHz	Digital
Delay range	500ms, exp to >1s	8s std, expandable	Dual 1ms-10.9s	0-440ms 4-taps	Initial to 999ms	3.2, 6.4 s
Stereo implementation	No	Possible	w/2, 4, 6 outputs	Yes	2/4/6 outputs	(BD 932 only)
AF bandwidth	20kHz	15kHz for 8s	30Hz-20kHz	15kHz	0-12kHz, z	16kHz
Input connection	AB, unbal	Bal bridging	AB	Bal floating 3kΩ	AB, 10kΩ	Bal bridging
Output connection	AB, unbal	Unbal	AB	Bal floating <60Ω	AB, <50Ω	AB
Dynamic range	90dB a-wtd	....	88dB	75dB	88dB	90dB
Remote control	....	....	Yes	252S rmt ctl	246S remote control	No
Interfaces	None	....	Serial remote	No	AES/EBU interfaces	No
Reader Service Number	**1252**	**1253**	**1254**	**1255**	**1256**	**1257**

Manufacturer	Eventide			Fostex	Furman Sound	Industrial Research
Model/Series	**H3000 Ultraharmonizer**	**BD 955 (BD 980[2])**	**SP2016†**	**3180**	**RV-3†**	**DF-4015**
Design features	Effects[1]	Broadcast delay	Special effects	Reverb system	Reverb	4-tape delay line
Talkshow delay	3.06s (No)	w/catchup	3.2s	No	No	No
Plate/room	Yes	No	Yes	No	Yes	No
Reverb/echo	Yes	No	Yes	Yes	Yes	No
A/V synchronizer	No	Yes (No)	No	No	No	NO
Phasing/flanging	Yes	No	Yes	No	No	No
Time reversal	Yes	No	No	No	Yes	No
Programmable	User and factory	User	Factory, user	....	Factory	User
Delay type	Digital	Digital	Digital	Multiple spring	Digital	Digital
Delay range	To 1.5s	6.4s (10s)	3.2s	270ms	n.a.	192ms
Stereo implementation	Yes	w/2 inputs (Yes)	Yes	No	Stereo out	No
AF bandwidth	±1dB 5-20k	7.5-15kHz (20kHz)	15kHz or 8kHz	10kHz	11kHz	15kHz
Input connection	Bal, bridging, 100kΩ	Bal bridging (act)	AB	Unbalanced	n.a.	Xfmr bal bridging
Output connection	Bal <100Ω	AB	AB	Unbalanced	n.a.	Xfmr bal
Dynamic range	>92dB	90dB	87dB	.	79dB	90dB
Remote control	Keyboard, MIDI	Yes	Yes	.	On, off	No
Interfaces	IEEE, MIDI	No	IEEE, MIDI	.	No	No
Reader Service Number	**1258**	**1259**	**1260**	**1261**	**1262**	**1263**

[1]Effects processor includes -200%, 100% time modification with -3, +1-octave pitch change on 2 channels.
[2]Provides some time modification capability.

Manufacturer	JBL/UREI	Klark Teknik		Lexicon		
Model/Series	**7922**	**DN 716**	**DN 780**	**#200† (PCM60)**	**2400[1] (1200)**	**480L (224X)†**
Design features	Dual output delay	3-output delay	Digital reverb	Reverb	Time modifier	Effects processor
Talkshow delay	No	No	Yes	No	No	No

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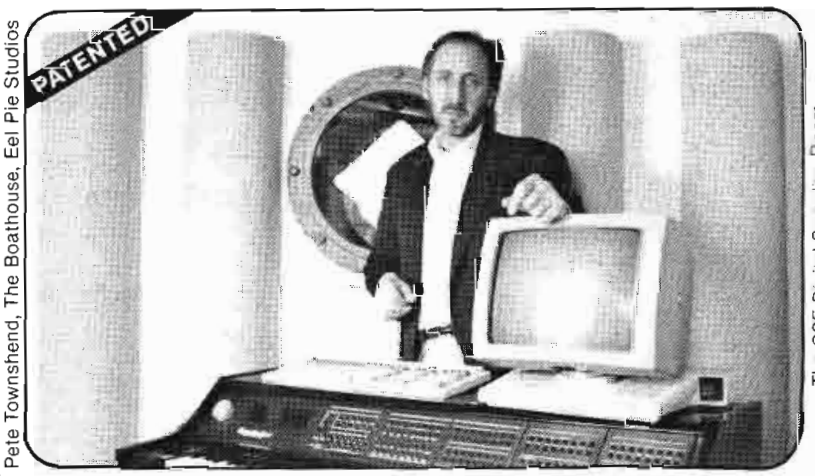
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Manufacturer	JBL/UREI	Klark Teknik		Lexicon		
Model/Series	**7922**	**DN 716**	**DN 780**	**#200† (PCM60)**	**2400[1] (1200)**	**480L (224X)†**
Plate/room	No	No	Yes	Yes	No	Yes
Reverb/echo	No	Yes	Decay adjust	Yes	No	Yes
A/V synchronizer	No	Yes	Yes	No	Yes	No
Phasing/flanging	No	No	No	No	No	Yes
Time reversal	No	No	No	No	No	Yes
Programmable	User	User	Midi/RS-232	User & (factory)	Factory, user	Factory, user
Delay type	Digital	16-bit, 50kHz	Digital	Digital	Digital	Digital
Delay range	327ms	1.31s per output	0-2s/predelay 0.99s	No	No	No
Stereo implementation	No	3 outputs	No	Yes	Yes (2-1200 needed)	Yes
AF bandwidth	20kHz	20Hz-20kHz	-2,+1dB 20Hz-20kHz	10kHz reverb	15kHz	20kHz (15kHz)
Input connection	AB bridging	AB, bridging, 20kΩ	One	AB bridging	Xfmr, active opt	AB bridging
Output connection	Xfmr	Unbal or xfmr opt	....	Xfmr (unbal)	Xfmr, active opt	AB
Dynamic range	>90dB	>90dB	....	84dB (80dB)	90dB	98dB (86dB)
Remote control	No	No	....	Yes	Yes	LARC system
Interfaces	No	No	....	....	Numerous, see Mfgr.	MIDI, RS-232
Reader Service Number	**1264**	**1265**	**1266**	**1267**	**1268**	**1269**

[1]This product is not a typical delay/effects system; primary design purpose is modification of time (0.75-1.33x range) with or without pitch change to ±10% of previously recorded audio; may operate in conjunction with variable-speed VTR/TBC. Timecode follow interface available.

Manufacturer	Lexicon			McCurdy Radio	NEC	Orban Associates
Model/Series	**PCM 41**	**1300**	**PCM 70† (LXP-1)**	**ADU-11/-11S**	**AS-18**	**111B reverb†✓**
Design features	Delay processor	A/V sync	Effects processor	Delay to 7s	AF sync	Stereo reverb
Talkshow delay	No	No	No	w/catchup	No	No
Plate/room	No	No	Yes	No	NO	No
Reverb/echo	Yes	No	Yes	No	No	Yes
Phasing/flanging	Yes	No	Yes	No	No	No
Time reversal	No	No	Yes	No	No	No
Programmable	User	User	Yes (16 programs)	User	User	User
Delay type	Digital	Digital	Digital	Digital	Digital	6-spring/channel
Delay range	400ms (4800ms)	2.048s	936ms	1-988ms	4s	30ms fixed - 2s
Stereo implementation	No	Yes (mono in)	Mono in, stereo out	ADU-10S	2-3 channel	Yes
AF bandwidth	16kHz	20kHz	15kHz	±1dB 20Hz-20kHz	20kHz	6kHz midband adj
Input connection	AB bridging	Xfmr bridging	AB bridging	Act bal, 20kΩ	Bal bridging	AB
Output connection	Unbal	Xfmr	Unbal	Act bal, 600Ω	Balanced	Xfmr bal
Dynamic range	90dB DIN	>90dB	80dB	>90dB	90dB	....
Remote control	Yes	From interface	Yes	ADR-10-L panel	HPD-6377 panel	No
Interfaces	No	RS-232/422, video control module	MIDI	RS-422	Video, frame pulses	No
Reader Service Number	**1270**	**1271**	**1272**	**1273**	**1274**	**1275**

Manufacturer	Tektronix	Yamaha International		
Model/Series	**118-AS**	**REV-7**	**YDD-2600†**	**SPX90†**
Design features	A/V sync	Reverb	Delay	Effects

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215-1 Line driver V DA, bal/unbal in-out 75/125 ohms.
220* DC 12 V powered video DA, 8 outputs.
230* 10 outputs video/2 ch audio, dubing system DA.
232* 20 outputs video/2 ch audio, dubing system DA.
233* 50 outputs video/2 ch audio, dubing system DA.
240-1 Plain vanilla audio DA, 12 outputs.
240-2 VCA audio DA, remote control system DA.
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Manufacturer	JBL/UREI	Klark Teknik		Lexicon		
Model/Series	7922	DN 716	DN 780	#200† (PCM60)	2400[1] (1200)	480L (224X)†
Talkshow delay	No	No	Yes	No		
Plate/room	No	Yes	No	Yes		
Reverb/echo	No	Early reflection	No	Early reflection		
A/V synchronization	Yes	No	Yes	No		
Pitch change	No	....	No	4 programs		
Phasing/flanging	No	Yes	No	2 programs		
Programmable	No	Factory, user	Yes	128 programs		
Delay type	Digital	Digital/LSI	Digital, analog	Digital		
Delay range	160ms, expandable	99.9ms+9.9s	2.66s adjustable	....		
Stereo implementation	No	Dual channel	Yes	Yes		
AF bandwidth	20kHz	20Hz-12kHz	20Hz-20kHz	20Hz-12kHz		
Input connection	Balanced	Bal 10kΩ +4dBm	Bal >10kΩ +4dBu	Unbal 10kΩ		
Output connection	Balanced	Bal 600Ω +4dBm	Bal 600Ω +4dBm	Unbal 600Ω		
Dynamic range	100dB	>90dB typical	≥90dB	>90dB typical		
Remote control	Yes	RC7 controller	Yes	MIDI		
Interfaces	TEK 110-S video synchronizer	MIDI bus	RS-232, serial I/O	MIDI bus		
Reader Service Number	1276	1277	1278	1279		

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Manufacturer	Comrex Corporation			Gentner Electronics	
Model	**LX-T/LX-R**	**PLXmicro/TH-X**	**PTLX/RTLX[2]**	**EFT-3000 digital**	**FT-1000A (EFT-100)**
System type	Single line	1-line, full duplex	Dual line	3-line[3]	Two or (one) line
Frequency offset	250Hz	250Hz	L-1 250Hz; L-2 2kHz	Algorithmic	250Hz
AF response	±2dB 50-3k dial line	±2dB 50-3k dial line	±2dB 50-5k dial line	50-7.5k	±0.5dB 50-3.5k
Translation error	±0.02Hz	±0.02Hz	±0.02Hz	....	0.0006Hz
Transmitter	**LX-T w/coupler**	**PLXμ/monitor-decoder**	**PTLX**	**EFT-3000 SEND**	**EFT-1000A (-100)**
Source inputs	-20,+8dBm ext adj 600Ω	Mic bal/tape unbal	+4/+8dBm ext switchable	Mic/line TB 1kΩ/>50kΩ	Mic, line
Output connection	Xfmr, telco coupler	Xfmr, telco coupler	Xfmr, telco coupler	600Ω bal Telco	Active bal
Output level	-9dBm	-9dBm	-9,+8dBm	per Telco spec	-13dBm
Packaging	Desk top (opt rack)	Portable	Portable	Rack, table-top	Portable, rack
Powering	120Vac (220Vac opt)	9Vdc, opt AC adapter	120/240Vac	110/220Vac	110-220Vac, 9Vdc
Receiver	**LX-R w/coupler**	**TH-X encoder/decoder[1]**	**RTLX**	**EFT-3000 RECEIVE**	**EFT-1000A (EFT-100)**
Input connection	Xfmr bal	Telco coupler	Unbalanced	600Ω bal Telco	Balanced
Input level	-40,+8dBm 600Ω bal	-40,+8dBm	-40,+8dBm ext adj.	per Telco spec	-25dBm
AF output connection	Balanced	Balanced	Unbalanced	AB 600Ω	Active bal



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Manufacturer	Comrex Corporation		Gentner Electronics	
Model	**LX-T/LX-R**	**PLXmicro/TH-X**	**PTLX/RTLX[2]**	**EFT-3000 digital**	**FT-1000A (EFT-100)**
AF output level	0dBm 600Ω	Auto leveling to 0dBm	0dBm	-15, +10dBm	+10dBm
Packaging	Desktop (opt rack)	Rack-mount	Rack-mount	Rack, table-top	Rack, disktop unit
Reader Service Number	**601**	**602**	**603**	**604**	**605**

[1]Wideband hybrid with manual or auto answer.
[2]Integral Telco interface; multiband companding audio control.
[3]1- and 2-line operation are possible with this unit.

Manufacturer	Rood Megatronics BV				Kahn Communications
Model/Series	**System 112M/112D**	**System 114/110[2]**	**System 2010/110D[2]**	**System 111M/111D[3]**	**LPGP-1T/R**
System type	Single 2-wire	Dual 2-wire, splitband	Dual 2-wire, splitband	Dual 4-wire[2]	2-line
Frequency offset	350Hz	350Hz, 2.1kHz	350Hz, 2.1kHz	350Hz, 2.1kHz	Harmonic decode tones.
AF response	±0.5dB 50-3k[1]	±0.5dB, 50-4.95k	±1.5dB 50-4.95k	±0.5dB 50-4.95k	50-50k
Translation error	±1Hz	±1Hz	±1Hz	±1Hz	0 error
Transmitter	**112M**	**BAX 114M (110M)**	**BAX 2010**	**111M**	**LPGP-1-T**
Source inputs	Mic, line, 10kΩ/600Ω	Mic, line 600Ω/12kΩ	Mic, line 600Ω/12kΩ	Mic, line 600Ω/12kΩ	Mic, line
Output connection	Xfmr bal, 600Ω	Xfmr bal	Xfmr bal, 600Ω	Xfmr bal	600Ω bal
Output level	-6dBm companded	0dBm ±9dBm adj.	to ±12dBm	±12dBm adj	0dBm
Packaging	Portable	Portable	Portable	Rack-mount & portable	Portable
Powering	R14S bat, 4 D cells	90-220Vac, 40-400Hz	....	110-220Vac	110-220Vac
Receiver	**112D**	**BAX 110D**	**BAX 110D**	**111D**	**LPGP-1-R**
Input connection 600 bal/unbal	Xfmr bal	Xfmr bal, 600Ω	Xfmr bal, 600Ω	Xfmr bal, 600Ω	
Input level	-30, +17dBm	-30, +17dBm	-30, +17dBm	-30, +17dBm	-20dBm
AF output connection	Active bal 600Ω	Active bal	Active bal	Active bal, 600Ω	0dBm 600Ω
AF output level	0-12dBm adj companded	±9dBm adj	±9dBm adj	0-12dBm adj	0dBm 600Ω
Packaging	Rack-mount	Rack-mount	Rack-mount	Rack-mount	
Reader Service Number	**606**	**607**	**608**	**609**	**610**

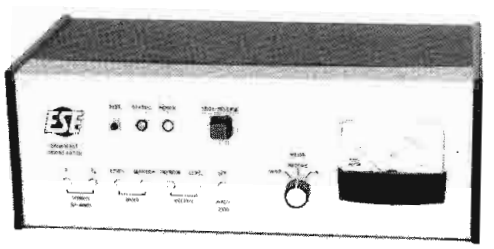
[1]With recorder response ±1dB 100Hz-6.1kHz.
[2]Systems employ integral companding circuitry.
[3]Includes 2-transmit, 2-retrieve channels.

Wireless Microphone Systems

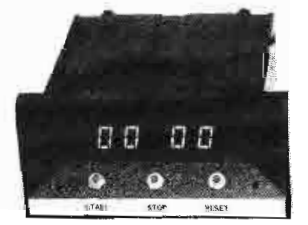
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Manufacturer	AKG Acoustics	Beyer Dynamic		Cetec Vega	
Model Series	**System 185**	**System TS185**	**System 185**	**77Dynex II/R-33 ProPlus**	**CVX "Reporter" series**
RF frequency	130-190MHz (130-225MHz)	135-240MHz	135-250MHz	150-174/174-216MHz	150-216MHz
Audio response	-2dB 40-20k(-15k)	-2dB, 40-14k	±2dB, 40-20k	±1.5dB 45-15k	±1.5dB 60-14k
S/N ratio	>90dB, >85dB[1]	>56dB (MCE-5 mic)	>56dB mic dependent	>100dB	101dB

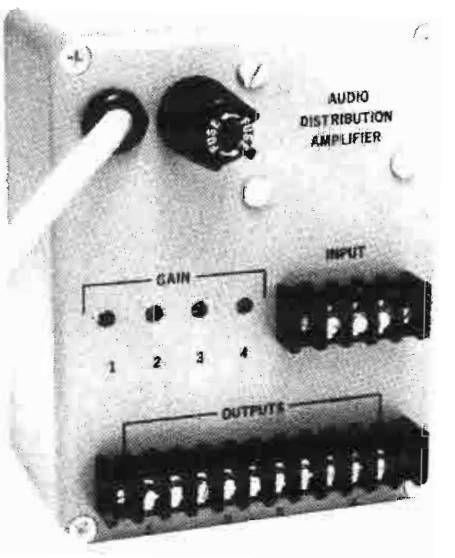
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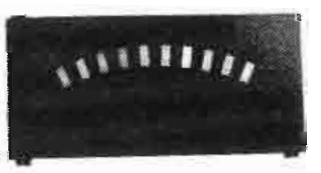
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Manufacturer	AKG Acoustics	Beyer Dynamic		Cetec Vega	
Model Series	**System 185**	**System TS185**	**System 185**	**77Dynex II/R-33 ProPlus**	**CVX "Reporter" series**
Distortion, system	<0.2%	<2%	<0.5%	<0.5%, 0.2% typical	0.5% max
Modulation control	Switchable limiter	Limiting	Limiting	Limiting/compression	.....
Companding function	Low Noise compander	Yes	Yes	Dynex II	.....
Transmitter model	**T185.10W (T185.10N)**	**TS185US**	**S-185**	**Model 77 Dynex II**	**T-23 (T-24)**
Transmitter packaging	Hand-held	Pocket transmitter	Handheld	Bodypack	Bodypack (Handheld)
RF output level	≈25mW (35mW)	50mW (3mW radiated)	2mW	50mW	50mW nom
Carrier deviation	±60Hz (±12kHz)	±12kHz nom, ±13kHz peak	±45kHz nom, ±65kHz peak	±15kHz	15kHz max
Microphone type	Dynamic, condenser	Electret, dynamic	Electret or ribbon	Electret, dyanmic	Electret
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc
Operating weight	13.6 oz w/mic, bat	220gm	360gm	5oz	7oz (9.5oz)
Receiver model	**SR185.10 [SR185.11]**	**NE 185 US**	**NE-185**	**R-33 ProPlus**	**R-26 portable**
Sensitivity	1μV for >35dB (55dB)	1μV >85dB SNR companded	1μV 35dB w/LN-compandor	<2.5μV, 50dB S/N	<1.9μV, 50dB S/N
Spurious rejection	>110dB	>110dB	>75dB	<-70dB	-80dB
Output connection	Bal 600Ω, unbal	Bal, XLR	Bal XLR <600Ω, unbal	Bal, 600Ω, 150Ω	Bal, XLR
Audio output level	+6dBm or variable	-20dBm, +6dBm	+6dBm	Line, mic selectable	Mic, line selectable
Power requirement	110-220Vac, 15-27Vdc ext	110Vac, 15-27Vdc ext	110/220Vac, 15-27Vdc	9Vdc, 10-20Vdc ext	4 9Vdc, 10.5-18Vdc ext
Metering	AF, RF, battery levels	RF/transmit level, +Vdc	+Vdc, RF/audio level	RF, AF, battery	RF, AF, battery
Panel indicators	LED ladder displays	LED ladder, points	LED displays	LED display	VU scale meter
Antenna types	50Ω SO-239 for whips	TTA 85MA whip	¼-λ whip, SO239	Various	¼-λ whip
Diversity receiving	[SR185.11]	Available	Yes	No	No
Multichannel system	No	1 or 3-channel	1- & 3-channel models	No	No
Reader Service Number	**1193**	**1194**	**1195**	**1196**	**1197**

†With companding, 1mV into the receiver.

Manufacturer	Cetec-Vega		ComTek	Edcor	
Model Series	**Pro 1B/1H systems**	**T-80 series/R-40 series**	**Model 72 (172)†**	**E COM Highband**	**E COM Highband**
RF frequency	150-216MHz	150-216MHz	170-216MHz	150-216MHz	150-216MHz
Audio response	±1.5dB, 100-13k	±1.5dB 90-15k	±3dB (-2dB) 40-15k	±2dB 200-16k	±2dB 200-16k
S/N ratio	103dB typical	>100dB	75dB (95dB) unwtd	.....	.....
Distortion, system	<0.4%	0.15% THO/IMD typical	<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	**T-37 (T-36/-39)**	**T-81/82/83/84/87**	**M72L, P, H**	**E COM 1 Lavalier**	**E COM 1**
Transmitter packaging	Bodypack (handheld)	Handheld	Pocket pack	Pocket pack	Hand-held
RF output level	50mW (40mW)	50mW	50mW	100mW	100mW
Carrier deviation	±15kHz	±15kHz	±30kHz, ±15kHz in US	±7.5kHz	±7.5kHz
Microphone type	Electret	Dynamic, electret, ribbon	Dynamic, electret	Various lavalier	EV671 element
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	12Vdc
Operating weight	6oz (10oz)	9-13.5oz per model	4 oz	10.7 oz w/o battery	8.7 oz w/o battery

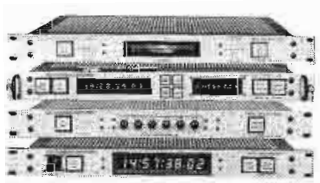
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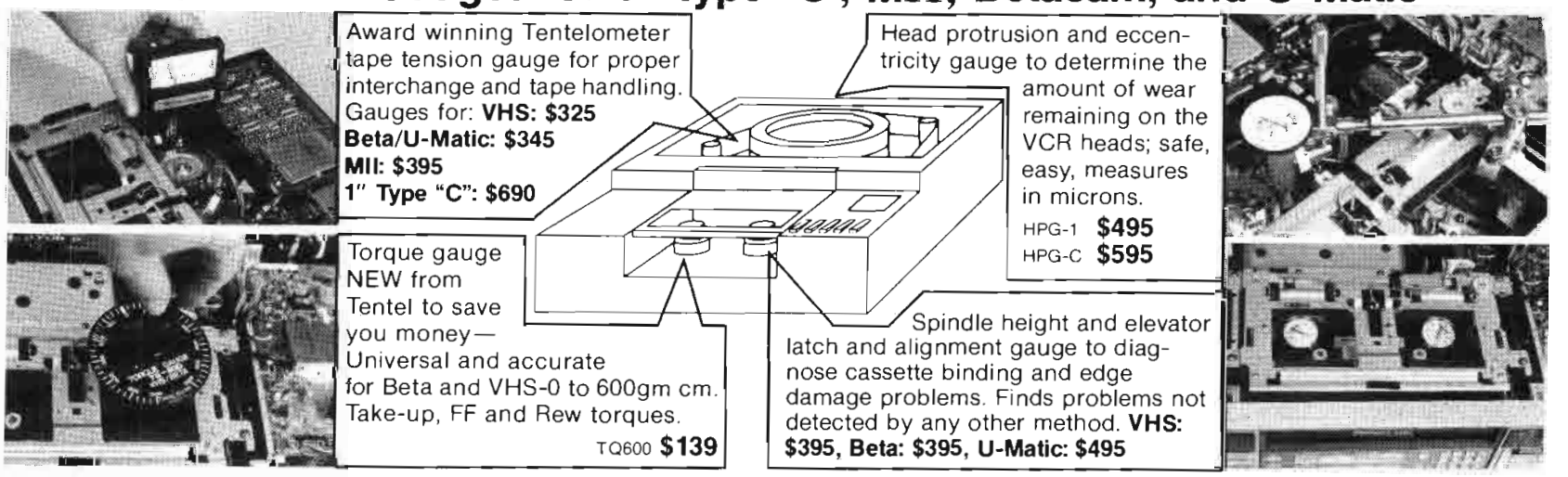
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Manufacturer	Cetec-Vega		ComTek	Edcor	
Model Series	Pro 1B/1H systems	T-80 series/R-40 series	Model 72 (172)†	E COM Highband	E COM Highband
Receiver model	**R-31A (66B portable)**	**R-4¼2/42W**	**MR-182 (PR-72B)**	**E COM 2 or 3**	**E COM 5**
Sensitivity	<2.2μV 50dB S/N	<0.7μV, 20dB quieting	1μV 20dB quieting	1μV, 12dB SINAD	1μV 20dB quieting
Spurious rejection	<-80dB	-90dB	>90dB (-60dB)	-70dB	-70dB
Output connection	Bal 600Ω, 150Ω	Bal XLR	Balanced 250-600Ω	.....	.....
Audio output level	Mic, line selectable	Mic, line selectible	10dBm (2.5Vrms)	100mV or line	3Vp-p
Power requirement	110Vac or (ext dc)	110-220Vac, +12Vdc	12-24Vdc, 115Vac (9V)	12Vdc, 115Vac	12Vdc, 115Vac
Metering	RF, AF (and battery)	RF, VU/AF proc, diversity	AF, RF, power	.....	.....
Panel indicators	LED displays (VU meter)	Meter, point LEDs	...	Carrier presence	Carrier presence
Antenna types	Whip	Whip, dipole	¼)l whip	Whip furnished	Furnished
Diversity receiving	No	R-42 only	No	No	Yes
Multichannel system	No	No	One	1 per receiver	1 per receiver
Reader Service Number	**1198**	**1199**	**1200**	**1201**	**1202**

Manufacturer	HM Electronics			Lectrosonics	
Model Series	# 42/420 (25/25RA)	# 82/820 (58/580)	# 87/870 (85/850)	Freedomike M170/R170†	VHF Pro H185/R185†
RF frequency	150-216MHz	150-216MHz	150-216MHz	150-216MHz	150-216MHz
Audio response	±1dB 100-12k	±3dB 50-15k	±3dB 50-15k	±1dB 50-18k	±1dB 50-18k
S/N ratio	>60dB A-wtd	115dB dynamic range	115dB dynamic range	106dB A-wtd	109dB A-wtd
Distortion, system	1%	0.3%	0.3%	<1% (0.7% typical)	<1% (0.7% typical)
Modulation control	Compression	.....	.....	Compression	Soft compression
Companding function	No	Yes	Yes	Yes	.....
Transmitter model	**TX425/TV (WM250/TV)**	**TX822/TV (TX580/TV)**	**TX872/TV (TX852/TV)**	**M170**	**H185**
Transmitter packaging	Pocket (hand-held)	Pocket (hand-held)	Hand-held	Beltpack	Mic Plug-on, hand-held
RF output level	50mW	50mW	50mW	50mW	50mW
Carrier deviation	±15kHz	±15kHz	±15kHz	±15kHz	±15kHz
Microphone type	Electret or (dynamic)	Electret or (dynamic)	Electret [or dynamic]	Any type	Any type
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc alkaline	9Vdc alkaline
Operating weight	4.5 oz (16 oz)	4.5 oz (15 oz)	15 oz	4 oz	7oz + mic
Receiver model	**WM125 [WM300A]**	**RS722/752**	**RX722 (RX752)**	**R170 (CR170)**	**R185 (OR185)**
Sensitivity	1μV 20[30]dB quieting	1μV 30dB quieting	1μV 30dB quieting	1μV 20dB SINAD	0.5μV 20dB quieting
Spurious rejection	>60dB	>60dB	>60dB (>65dB)	>100dB	>100dB
Output connection	Act [xfmr] bal	Xfmr bal	Xfmr bal	XLR & headphone	XLR, ¼", RCA jack
Audio output level	0dBm nominal	+18dBm & mic level	+18dBm (10dBm) & mic	100mV, 700mV, 1V	1V, 700mV, 100mV
Power requirement	10-30Vdc, 115Vac	12-30Vdc, 110Vac	12-30Vdc, 110Vac	110Vac, 12Vdc, 9Vdc	110Vac 12Vdc
Metering	RF, AF, +V on WM125A	RF, AF, battery	RF, AF, battery	RF, AF, battery	RF, AF
Panel indicators	+V, carrier	+Vdc, carrier	+Vdc, carrier	LEDs & VU meter	LEDs
Antenna types	Whip furnished	Whip furnished	Whip furnished	PL259 connector	PL259 (dual PL259)
Diversity receiving	Option	Option	Option	No	No (Yes)
Multichannel system	1 per receiver	1 per receiver	1 per receiver	No	No
Reader Service Number	**1203**	**1204**	**1205**	**1206**	**1207**

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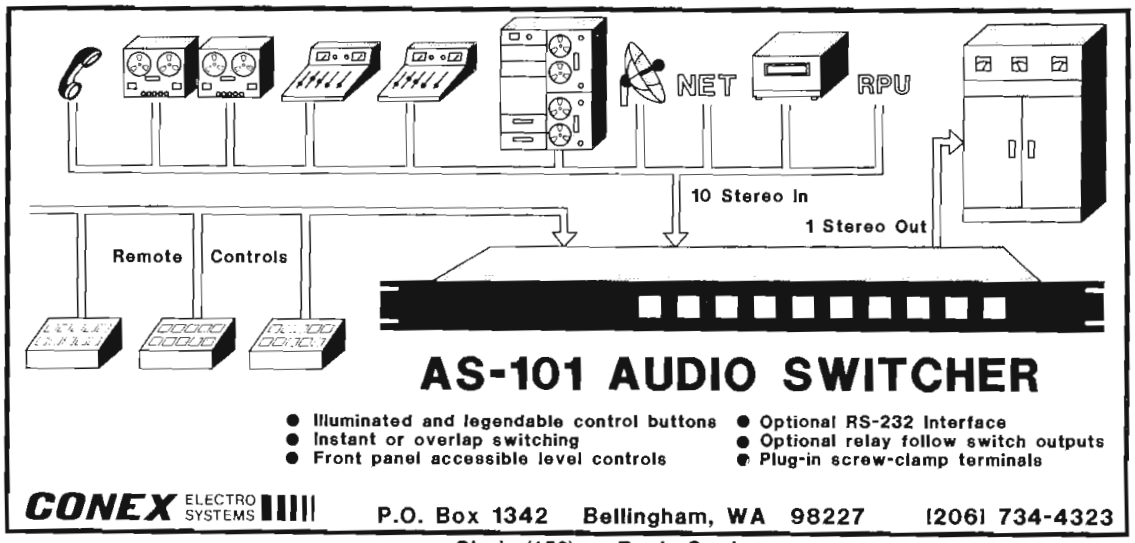
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Manufacturer	Lectrosonics	Micron Audio			Nady Systems
Model Series	**VHF Pro M185/CR185**	**TX-500†/MDR-530**	**TX-500/MDS-2**	**TX100/MR110[1]**	**101 VHF (201 VHF)**
RF frequency	150-216MHz	150-216MHz	150-216MHz	150-216MHz	170-216MHz
Audio response	±1dB 50-18k	±2dB 50-15k	<±2dB 40-15k	±1dB, 50-15k	±3dB, 25-20k
S/N ratio	102dB A-wtd	>115dB strong signal	115dB with CNS	>80dB typ noise floor	....
Distortion, system	<1% (0.7% typical)	<0.3%	<0.3%	<0.3%	<0.3%
Modulation control	Compression	Yes	Yes	50dB range	None
Companding function	2:1 comp/exp	CNS noise reduction	CNS noise reduction	No	Yes
Transmitter model	**M185**	**TX501 (TX503)**	**TX501 (TX503)**	**TX101 [TX102] (TX203)**	**101/201HT, GT, LT**
Transmitter packaging	Bodypack	Pocket (handheld)	Pocket (handheld)	Pocket (handheld)	Handheld, Instr, Body
RF output level	50mW	50mW	50mW	50mW	50mV
Carrier deviation	±15kHz	±15kHz	±15kHz	±15kHz	±15kHz
Microphone type	Any type	Various (AKG elements)	AKG electret	Various	Attached electret
Power requirement	9Vdc alkaline	9Vdc (2 batteries)	9Vdc	1-9V [2-batteries	9Vdc
Operating weight	5.3oz	8.5oz (10.5oz)	11 oz	8.5oz [10.5oz]	8.5oz, 2.5oz, 2.5oz
Receiver model	**CR185**	**MDR-530 (MDR-540)**	**MDS2 (540 system)**	**MR110 camera receiver**	**101 VHF (201 VHF)**
Sensitivity	0.6μV 20dB quieting	1.5μV for 75dB S/N	1.5μV for 75dB S/N	<20μV for 80dB S/N	1.5μV, 20dB quieting
Spurious rejection	>100dB	>80dB adj chan rej	80dB adj chan rej	80dB adj chan rej	-80dB
Output connection	XLR & headphone	XLR mic, line	XLR, Type D 600Ω	Bal, 3-pin Preh connector	Bal, unbal/XLR, phone
Audio output level	Line	-53dBV, 0dBm	Line level	-53dBv	Switchable mic/line
Power requirement	110Vac 12Vdc (9Vdc)	110-240Vac, 12-18Vdc	110-220Vac, +12Vdc	12Vdc camera, 40ma	12Vdc 150ma
Metering	RF, AF, battery	Vdc, RF, AF	RF, AF, +Vdc	RF, battery	Power, A-RF (B-RF)
Panel indicators	LEDs	Led ladder	Dual LED ladder/module	LED multifunction	LEDs
Antenna types	BNC connection	Whip, 3-element Yagi	3-element Yagi dipole	Whip on BNC 50Ω	Whip (2 for 201 VHF)
Diversity receiving	No	Yes	Yes	No	201 VHF only
Multichannel system	No	No (MDR-540	To 8 channels	No	Single channel
Reader Service Number	**1208**	**1209**	**1210**	**1211**	**1212**

[1]Without CNS Complementary Noise Suppression. Related units TX501/502 transmitters and MR510 receiver do offer CNS.

Manufacturer	Nady Systems			RF Technology	Sennheiser Electronics
Model Series	**1200 VHF systems**	**VHF 151 VR**	**VHF 501 VR**	**RM-102 (RM-100)**	**SK2012/EM1036[2]**
RF frequency	151-216MHz	170.225, 170,85MHz	170-216MHz	947-952MHz[1]	30-45MHz (138-250MHz)
Audio response	±3dB, 25-20k	±3dB, 25-20k	±3dB, 25-20k	±1dB 50-10k	40-20k
S/N ratio	....	.....	.....	60dB unwtd	>73dB (>90dB)
Distortion, system	<0.3%	<0.3%	<0.3%	1% w/AGC	<1%
Modulation control	None	None	None	Soft limiting	Switchable limiting
Companding function	Yes	Yes	Yes	No	HiDyn switchable
Transmitter model	**Various**	**151 VR/LT**	**VHF 501 LT(HT) ENG/EFP**	**Standard Unit**	**SK2012-6 (SK2012-90)**
Transmitter packaging	Pocket, handheld, instr	Pocket/belt package	Pocket (handheld)	Pocket pack	Pocket pack
RF output level	50mV	50mV	50mV	50mW	<10mW (ca 30mW)
Carrier deviation	±15kHz	±15kHz	±15kHz	±50kHz	±8-10kHz (±40-56kHz)
Microphone type	Electret	Attached electret	Electret for 501LT	External mic	Electret, lavalier
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	3-1.5V alk. Mn cells



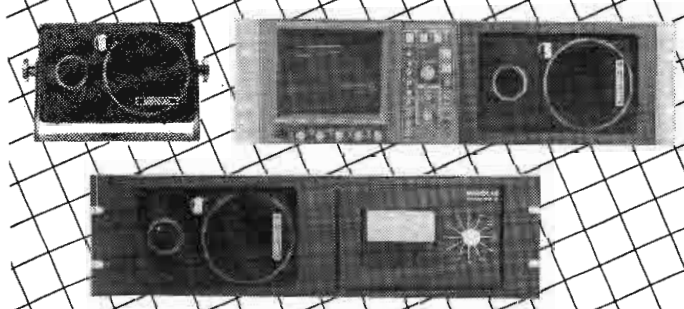
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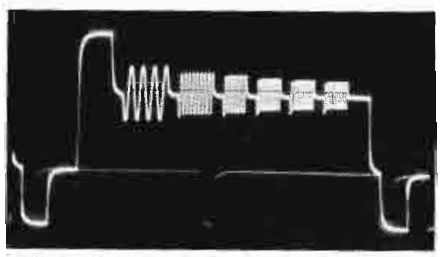


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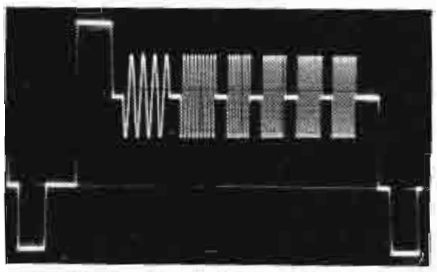
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Manufacturer	Nady Systems			RF Technology	Sennheiser Electronics
Model Series	**1200 VHF systems**	**VHF 151 VR**	**VHF 501 VR**	**RM-102 (RM-100)**	**SK2012/EM1036[2]**
Operating weight	2.6-8.5oz	....	2.6oz LT (8.5oz)	12.5 oz	200gm
Receiver model	**1200 VHF**	**VHF 151 VR**	**VHF 501 VR**	**RM-102 (RM-100)**	**EM1036**
Sensitivity	1.5μV, 20dB quieting	1.5μV, 20dB quieting	1.5μV, 20dB quieting	.....	3μV (1.5μV)
Spurious rejection	-80dB	-60dB image/spurious	<-100dB	-70dB	80dB adj channel rej
Output connection	Bal, unbal/XLR, phone	Unbal 3.5mm mini	Unbal, 3.5mm mini phone	.....	Bal DIN 20Ω (XLR 10Ω)
Audio output level	Mic/line	Mic level feeds VCR	Headphone, mic	+8dBm on RM-100	Mic and (line)
Power requirement	110Vac	9Vdc	9Vdc (12-35Vdc) 45ma	12Vdc, 115Vac	110-220Vac, 12-24Vdc ext
Metering	RF, AF, Power	RF, +Vdc	Peak, RF, +Vdc	.....	HF, audio
Panel indicators	LEDs	LED	LED	Power, carrier	LED display
Antenna types	2 whips	Softwire	Whip furnished	Furnished	Whip
Diversity receiving	Yes	No	No	Yes	Yes
Multichannel system	....	No	5-channel system	1/rcvr (5 RM-100)	3 simultaneous
Reader Service Number	**1213**	**1214**	**1215**	**1216**	**1217**

[1]Available for Canadian use in 902-928MHz spectra.
[2]Also available for 460-960MHz.

Manufacturer	Sennheiser Electronics	Shure Brothers		Sony Broadcast	
Model Series	**SKM4031/EM1001**	**W10BT/W25DR (W20R)**	**W15BT/W25DR (W20R)**	**UHF systems**	**VHF systems**
RF frequency	30-45MHz (138-250MHz)[1]	150-216MHz	150-216MHz	470-900MHz	174.6-215.4MHz
Audio response	70-20k	±1dB 50-15k	±1dB 50-15k	±2dB 75-13k	±2.5dB 100-15k
S/N ratio	>96dB per DIN 45500-A	>90dB	>90dB	60dB	>60dB
Distortion, system	<1% 1kHz	<0.5%	<0.5%	2%	<0.7% at 15kHz
Modulation control	Compression	2:1 compressor	2:1 compressor	.....	.....
Companding function	HiDyn 2:1	....	....	.....	Yes
Transmitter model	**SKM4031 (SKM4031-90)**	**W10BT**	**W15BT/87 [/58]**	**WRT27/27A**	**WRT210/WRT220**
Transmitter packaging	Handheld	Body pack	Hand-held	Body pack	Hand-held
RF output level	10mW (30mW)	50mW max	50mW max	6mW	50mW into 50Ω
Carrier deviation	40-56kHz	±12kHz 50μs pre-emp	±12kHz 50μs pre-emp	±150kHz	±1.9kHz -64dB
Microphone type	Super cardioid dynamic	Electret condenser[2]	Condensor [dynamic]	Electret	Various
Power requirement	3-1.5V alk. Mn cells	9Vdc or 8.4V Nicad	9Vdc or 8.4V Nicad	9Vdc	3Vdc
Operating weight	260gm	6 oz w/battery	10.1 oz [16.1 oz]	6 oz	14 oz
Receiver model	**EM1001, 1003 (1001-9)**	**W25DR (W20R)**	**W25DR (W20R)**	**WRR27/37/57**	**WRR210/WRR220**
Sensitivity	3μV (2.5μV)	<0.5μV for 12dB SINAD	<0.5μV for 12dB SINAD	20dBμ 30dB S/N	>65μV 20dB quieting
Spurious rejection	.....	<80dB	<80dB	<-80dB	<-70dB
Output connection	DIN or XLR bal	Mic, line (mic only)	Mic, line (mic only)	Xfmr bal	.....
Audio output level	20mV, 1.55V bal	+13.5dB max line	+13.5dB max line	20dBm	-58dBm mic level
Power requirement	110-220Vac, 12-24Vdc	13.5Vdc 200mA ext	13.5Vdc 200mA ext	9Vdc, 120Vac	9Vdc 6-AA cells
Metering	VM meter	AF, RF levels	AF, RF levels	RF, AF levels	RF, AF levels
Panel indicators	RF, battery, AF	LED ladder displays	LED ladder displays	+V, carrier, channel	.....
Antenna types	Telescoping whip	⅝-λ whips (¼-λ)	⅝-λ whips (¼-λ)	Furnished	Whip furnished
Diversity receiving	w/2003	W25DR Diversiphase (No)	W25DR Diversiphase (No)	Option	Option
Multichannel system	3 freq w/1003, 2003	No	No	1 per receiver	2 per receiver
Reader Service Number	**1218**	**1219**	**1220**	**1221**	**1222**

[1]Systems available in 470-960MHz spectra.
[2]WL83 mini lav, WL84 supercardioid lav, WM98 mini cardioid are applicable.

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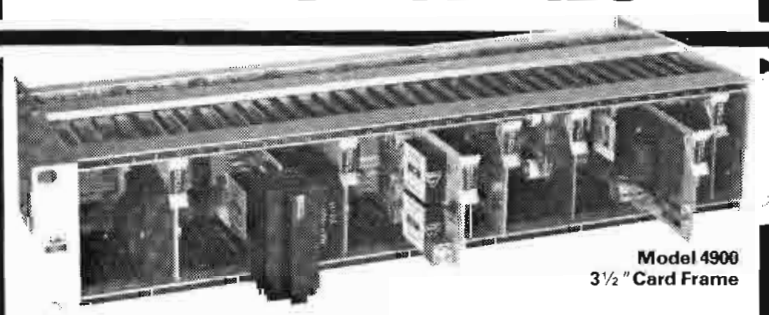
Manufacturer	Swintek Enterprises	Telex Communications			
Model Series	**Mark 2L-RFSD/50A†**	**HT-400/FMR-4**	**WHM/FMR50**	**WT-400/ENG-4**	**WT-50/FMR-2**
RF frequency	150-470MHz	165-216MHz	150-186MHz	165-216MHz	150-186MHz
Audio response	±1dB 20-12k	50-15k	±1dB 50-15k	±1dB 100-15k	±2dB 50-15k
S/N ratio	96dB	102dB w/companding	98dB A-wtd	104dB companded	>90dB ultimate
Distortion, system	1%	<0.5%	<0.5%	<1%	<0.3%
Modulation control	Compression	Compression	Compressor	Compression	Compression
Companding function	Yes	Yes	Yes	Yes	Yes
Transmitter model	**Mark 50A-dbs**	**HT-400 series**	**WHM410/WHM500**	**WT-400**	**WT-50 (WT-50G instrument)**
Transmitter packaging	Body, pocket pack	Handheld	Handheld	Pocket/body pack	Pocket/body pack
RF output level	50mW	45mW	15mW max	50mW max, 45mW typical	50mW
Carrier deviation	±10kHz	±12kHz	±12kHz	±12kHz	±12kHz
Microphone type	SM87, ECM-50	Dynamic, condenser	Dynamic/condenser	Dynamic, electret	Various
Power requirement	9Vdc	9Vdc or 8.4Vdc Nicad	9Vdc	9Vdc	8.4V Nicad or 9Vdc
Operating weight	6 oz	14.8-16.4oz	16oz/14oz	5.5oz	5.4oz
Receiver model	**Mark 2L-RFSD**	**FMR-4**	**FRM-50**	**ENG-4**	**FMR-2 (FMR-2G)**
Sensitivity	0.2μV, 20dB quieting	<0.5μV for 12dB SINAD	<0.5μV for 12dB SINAD	0.5μV for 12dB SINAD	<0.5μV, 12dB SINAD
Spurious rejection	<-80dB	<-70dB	<-75dB	<-70dB	<-70dB
Output connection	Balanced	Bal XLR 8/600/10kΩ	XLR bal 200Ω	XLR bal 600Ω	XLR bal 8/600/10kΩ
Audio output level	-40.0dBm	Mic, line selectable	Mic level	Mic, line selectable	Mic, line selectable
Power requirement	12Vdc, 115Vac	110-220Vac	110-220Vac, 13.6Vdc ext	4 AA alk/nicad, 12-24Vdc	110Vac, 13.6Vdc ext
Metering	RF, AF, battery	RF, AF, Freq	RF presence, AF	RF, AF, battery	AF, RF
Panel indicators	Carrier presence	LED ladder/7-segment	LED ladder, point	Meter	2 LED ladder displays
Antenna types	Whip furnished	¼-λ, ⅝-λ whips	Single whip	Whip	Whip
Diversity receiving	Yes	Pos-i-Phase	No	No	Pos-i-Phase
Multichannel system	2 per receiver	To 4 channels	No	4-channel	No
Reader Service Number	**1223**	**1224**	**1225**	**1226**	**1227**

Shotgun Microphones

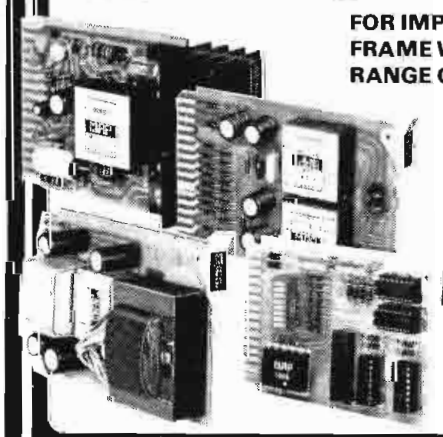
Manufacturer	AKG Acoustics		Audio-Technica	Beyer Dynamic	Electro-Voice
Model No.	**C 568EB**	**D-900E**	**CK8/CK8X/CK9 capsules**	**AT4071 (AT4073)**	**MC736 (MC737 long)**	**Model DL42**
Frequency response	20-20k	60-12k	30-20k (30-18k)	30-20k	40-20k	50-12k
Polar pattern	Hypercardioid	Hypercardioid	Hypercardioid	Lobar (narrow dir)	Cardioid/lobe	Hypercard. line
Output impedance	600Ω	200Ω	120Ω[1]	250Ω bal, no xfmr	150Ω	150Ω
Output level	11mV/Pa	-49.5dBm	10mV/Pa-15mV/Pa	62mV/Pa (56mV/Pa)	25mV/Pa	-50dB(1)
Maximum SPL	128dB 0.5% THD	50Pa (128dB SPL)	137dB for 0.5% THD	127dB (129dB)	122dB (128dB preattn)	....
Output Noise	18dB-A per DIN	-125dBm	15dB-A DIN equiv	12dB (14dB) typical	4.5fVp	-125dBm hum pickup
S/N ratio	....	....	79dB	....	74dB	....
Power required	B18 18Vdc supply	Dynamic	B18 18Vdc	12-48Vdc phantom	12-48Vdc	Dynamic, not required
Filters	Bass cut	Bass rolloff	Bass cut	Hi-pass/Lo-cut	....	....
Weight	6.2oz	18oz	4.2oz + preamp	5.8oz (4.2oz)	195g (250g)	13 oz
Accessories	Stand adapter, wind screen, options.	Stand adapter, case, other options.	Preamp, stand adapter capsule cord, opts	Clamp, carrying case.	Case, windscreens Handles, clamp, supply	Coil cord, handle Windscreen, case
Reader Service Number	**1228**	**1229**	**1230**	**1231**	**1232**	**1233**

[1]Based on C460B studio mic preamp with CK8X; CK8/CK9 operate with C451 preamp.
[2]Where 0dB = 1mW/10dynes/cm².

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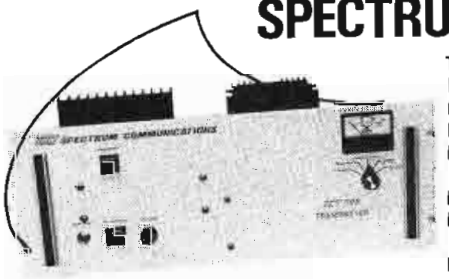
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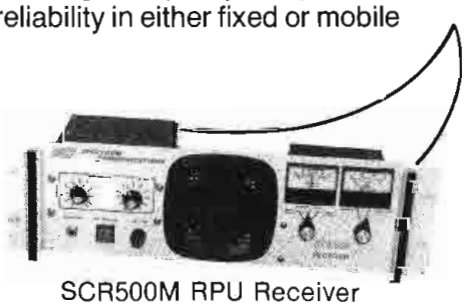


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Circle (155) on Reply Card

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Manufacturer	Electro-Voice	Georg Neumann/Gotham		Sennheiser Electronic		Shure Brothers
Model No.	RE45N/D	KMR81i (KMR82i)	RSM 190i MS-stereo	MKH 416 P48 U3	MKH-816 P48 U3	SM89 Condenser
Frequency response	150-15k	40-18k (40-20k)	40-18k	40-20k	40-20k	60-20k
Polar pattern	Cardioid-line	Hypercardioid	Hypercard + Fig-8	Super card. lobe	Super card. lobe	Hypercard. lobar
Output impedance	600Ω nominal	150Ω	50Ω	ca. 10Ω for 600Ω load	10Ω for r600Ω load	100Ω actual
Output level	5mV/Pascal 1kHz	18mV(21mV)/Pa(1)	23mV/Pa (1Pa ± 4dB SPL)	25mV/Pa ± 1dB	40mV/Pascal ± 1dB	-53dB (2.2mV)
Maximum SPL	....	>128dB (128dB)	134 mV/Pa	50Pa at 1kHz	124dB/30 Pascals	127dB SPL 800Ω load
Output noise	Hum pickup -130dBm	....	....	....	....	16dB SPL A-wtd
S/N ratio	....	82dB	78dB Mono, 72dB Stereo	....	....	79dB ref 94dB SPL
Power required	Dynamic, not required	+48Vdc ±4Vdc	+48Vdc ±4Vdc	48Vdc ± 12Vdc	48Vdc ± 12Vdc	Phantom 11-52Vdc 2mA
Filters	....	....	....	....	....	Low-cut, 15dB/octave
Weight	7.5 oz	145g (250g)	300g	375 gr	375 gr	6.9 oz
Accessories	Handle, case, clamp Shock mount, attenuator	Windscreen, case Mounting devices	MTX 190i matrix amp	Windscreen, mounting, Power supply	Windscreen, mounting, power unit.	Windscreen, shock-mount, swivel adapter
Reader Service Number	1234	1235	1236	1237	1238	1239

Remote Pickup Systems

These aural program systems consist of transmitters and receivers, generally operating in the 450-470MHz and 148-174MHz spectra. They are 2-RF channel systems with carrier tolerance ±0.00025%. Receivers are dual conversion design with a balanced audio signal output. In AF response, Hz is understood.

Manufacturer	Marti Electronics			Moseley Associates	TFT
Model/Series	RPT-15/CR-10	RPT-2/AR-10	RPT-30/CR-10	RPL-4000	8888 system
Typical range	15 miles	6 miles	25 miles	...	...
Audio response	±1.5dB 50-15k	±1.5dB 50-15k	±1.5dB 50-15k	to 7.5kHz (or 15kHz)	±1dB 50-15k (50-7.5k)
System S/N ratio	55dB 100% mod unwtd	55dB 100% mod unwtd	55dB 100% mod unwtd	55dB 100% mod	77dB, ±35kHz dev de-emp
Harmonic distortion	<0.2% 100% mod	<0.2% 100% mod	<0.2% 100% mod	<2%	<0.5%
Transmitter	RPT-15	RPT-2	RPT-30	RPL-4010	Model 8888
RF power level	15W	2.5W	45W	20W maximum	25W w/ac power
Carrier deviation	±10kHz	5kHz (or 10-35kHz)	±10-35kHz (±7.5kHz)		
Modulation control	Compressor, limiter	Compressor, limiter	Compressor, limiter	Limiter or 2:1 compand	Peak limiter or ext
Auto relay encoder	27Hz	27Hz	27Hz	Yes	Yes
Integral audio mixer	2-channel	2-channel	4-channel	3-mic, 2-mic/1-line	2-mic, 1-line
Input circuitry	Active unbal	Active unbal	Active bal	Balanced	150-500Ω, 600Ω bal
Metering functions	RF, dc, compression	RF, dc, compression	RF, dc, compression	AF, F/R-RF, V, drive	Mod, V, F/R-RF
Power requirements	120Vac, 13Vdc	120Vac, 13Vdc	120Vac, 13Vdc	13.6Vdc, 120Vac	13.8Vdc, 115/230Vac
Operating weight	9 lbs	5 lbs	12 lbs	8 lbs	18 lbs
Receiver	CR-10	AR-10	CR-10	RPL-4020	Model 8889
Sensitivity	0.5μV 28dB quieting	0.5μV 28dB quieting	0.5μV 28dB quieting	1.2μV 20dB quieting	1μV, 20dB quieting
Spurious signal reject	90dB below carrier	90dB below carrier	90dB below carrier	60dB below carrier	≤-70dB
AF output level	+10dBm	+4dBm	+10dBm	+10dBm 600Ω bal	+10dBm, 600Ω bal

TOOLS AND TOOL KITS

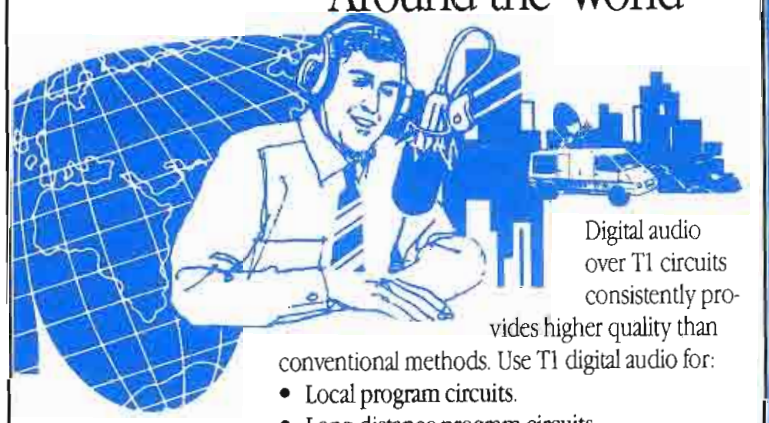


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Manufacturer	Marti Electronics			Moseley Associates	TFT
Model/Series	RPT-15/CR-10	RPT-2/AR-10	RPT-30/CR-10	RPL-4000	8888 system
Power requirements	120Vac, 13Vdc	120Vac, 13Vdc	120Vac, 13Vdc	13.6Vdc, 120Vac	1-13.8Vdc, 115/230Vac
Metering functions	AF, RF, dc, decode	AF, RF, dc, decode	AF, RF, dc, decode	AF, RF, V, LO	RF, AF, V
Auto relay decoder	27Hz	27Hz	27Hz	Yes	Yes
Reader Service Number	1486	1487	1488	1489	1490

Audio Distortion Analyzer

These systems measure total harmonic distortion (THD) in audio systems. Some also have the capability of measuring Intermodulation Distortion (IMD). Those marked with a bullet (•) have video or X-Y scope display capability. A dagger (†) indicates a port to drive an X-Y plotter or hardcopy printer; a double dagger (‡) indicates availability of an AM detector. A check (✓) denotes units with functions specifically for audio recording systems. In audio frequency ranges, Hz is understood.

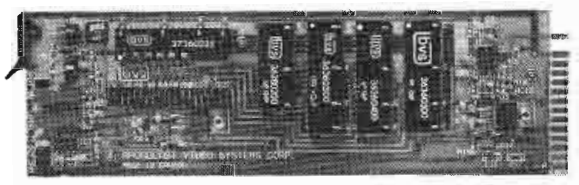
Manufacturer	Amber Electro Design			ASACA/ShibaSoku	Audio Precision
Model Number	3501 (3501a)‡	•5500 (5400)‡✓	•5300†‡✓	•725B automatic	•System One†✓[1]
Frequency range	10-100k, 4-range	10-100k	8.5->500k	5-500k	10-100k
Input level	30mV-100V, 100kΩ (300Va)	30mV-100V, 100kΩ	-100, +40dBV	0.1-100V	100μV-140V, 100kΩ
Input connection	Bal/float opt (std)	Active bal	Bal, unbal	BNC float/fixed ground	Active bal
Fundamental reject	>100dB 1kHz	>100dB @ 1kHz	Yes	>90dB	110dB
Auto level set	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes
Minimum THD figure	0.0008% or -102dB	0.001%	-100dB/0.001% THD+N	0.001% w/o noise-hum	0.0003%
THD accuracy	±1dB 20-20k	±1dB	±2dB 10-100k	....	±5%
IMD measurement	SMPTE/DIN/CCIF	SMPTE/DIN/CCIF	SMPTE, DIN, CCIF	....	SMPTE, CCIR, DIM/TIM
IMD accuracy	±1dB SMPTE/DIN	±1dB	....	....	±10%
Minimum IMD	0.001%	0.001%	<0.003% 3k-10k	....	0.0001%
ac Volts accuracy	-128, +42dBm, ±0.5dB	-100, +40dBm, ±1% fs	-100, +40dBV ±0.1dB	30μV-100V ±3%	-114, +45dBm ±1% fs
Audio noise range	-120dBm	-120dBm	to <2.5μV	>100dB	-114dBm
Signal generator range	10-100k @ +28dBm	10-100k +30dBm 600Ω	Use 5100 10-100k	No	10-204k, 30dBm
Generator stability	±1%	±0.5%	....	....	±0.5%
Generator output	Xfmr, bal/unbal	Xfmr, bal, unbal	Bal, unbal	....	Xfmr bal
Frequency counter	Option 358	5-digit	with 5200	5-500k, autorange	Yes
Meters/displays	True RMS movement	LED/7-seg display	7-seg displays	Analog meter w/LEDs	CRT bar graph
Digital design	No	Yes	Yes	Yes	IBM-PC base
Automated measurements	....	GPIB, RS-232	IEEE-488 interface	GPIB option	Through PC bus
Reader Service Number	668	669	670	671	672

[1]Software/hardware package for use with IBM PC.

Manufacturer	Boonton Electronics		Hewlett Packard	Panasonic Factory Automation	
Model Number	•1120 analyzer†	1130 analyzer	8903B/8903E†	VP-7721P	VP-7722P†
Frequency range	10-140k	10-140k	20-100k	5-159.9k	10-110k/to 10th harm
Input level	3mV-300V, 100kΩ	3mV-300V, 100kΩ	425V peak, 100kΩ	0.1V-100Vrms 100kΩ	0.05-100Vrms, 100kΩ
Input connection	Diff. bal or unbal	Diff. bal or unbal	Balanced, BNC	Floating	BNC, floating
Fundamental reject	Resid THD+noise-10dB	Resid THD+noise-10dB	>100dB	>86dB overall	>140dB
Auto level set	Yes	Yes w/autoranging	Yes	Yes	Yes

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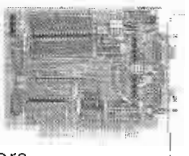
Manufacturer	Boonton Electronics		Hewlett Packard	Panasonic Factory Automation	
Model Number	**•1120 analyzer†**	**1130 analyzer**	**8903B/8903E†**	**VP-7721P**	**VP-7722P†**
Auto null set	Yes	Yes	Yes	Yes	Yes
Minimum THD figure	0.003%	0.003%	<—90dB, 0.003%	0.003% fs (10 ranges	0.001%
THD accuracy	±1dB, 20-20k	±1dB, 20-20k	±1dB, 20-20k	cover to 100%)	<±2%
IMD measurement	No IMD	No IMD	No	....	SMPTE
IMD accuracy	....	....	....	....	±1dB
Minimum IMD	....	....	....	....	0.01%
ac Volts accuracy	3mV-300V ac/dc	3mV-300V ac/dc	0.3mV-300V ±2%	0.1mV-100V 13-range	0.316mV-100V ±2%
Audio noise range	120dB S/N & SINAD	SINAD	-85dB (17μV) 80kHz BW	0-100dB SNR	0-130dB SNR
Signal generator range	10-140k	Model 1110 oscillator	20-100k for 8903B	5-159.9k	10-110k
Generator stability	10ppm±1 count	±1ppm/year	0.3% of setting	±2% overall	±3% overall
Generator output	Bal or unbal	Osc bal or unbal	0.6mV-6V open circuit	600Ω	BNC floating
Frequency counter	5-200k	5-200k	±0.004%+1 digit	No	Yes
Meters/displays	LED 7-seg displays	LED 7-seg displays	Digital readout	Input, test meters	7-segment LED displays
Digital design	Yes	Yes	Yes	μP controlled	Yes
Automated measurements	IEEE-488	IEEE-488	HP-IB	Yes	GPIB
Reader Service Number	**673**	**674**	**675**	**676**	**677**

Manufacturer	Potomac Instruments	RE Instruments	Rohde & Schwarz		Schmid Telecomm. Zurich
Model Number	**•AA-51 Analyzer‡✓**	**•RE201 dual channel✓**	**UPA analyzer†✓**	**•SUN-2 System†**	**•SZ-340 rcvr/xmtr'†**
Frequency range	20-20k	20-25k	10-100k(300kHz harm)	10-100k	20-20k
Input level	2mV-15.5V, 300kΩ	2mV-15.5V, 300kΩ	12mV to 400Hz, 1.2mV	-84,+32dBm, 1MΩ	-100,+20dB autorange
Input connection	Balanced	Active bal	Bal (600Ω), unbal (10kΩ)	Xfmr bal or unbal	Floating, bal
Fundamental reject	>80dB overall	105dB, 20Hz-12.5kHz	....	>65dB	>80dB overall
Auto level set	Autoranging	Yes	Yes	Auto ranging	Yes
Auto null set	Yes	Yes	Yes	No	Yes
Minimum THD figure	0.1% fs	0.001%	-90dB to 0dB range	0.06%	-70dB THD
THD accuracy	±5% fs	±2.5dB, THD-70dB	±1dB to 100kHz	±0.1dB	....
IMD measurement	SMPTE	SMPTE, DIN 45403	No	DIN	No
IMD accuracy	±5% fs	±2.5dB, IMD-50dB	....	....	....
Minimum IMD	0.1%	<-67dB	....	....	....
ac Volts accuracy	1mV-100Vrms	-51.8,+25.7dBu±3%	10μV-300V unbal(35V bal)	Yes	-100,+20dB ±0.1dB
Audio noise range	(Signal+noise)/noise	<-93dB 40Hz-25kHz	0-120dB SNR	Yes	Integrated over time
Signal generator range	20-20k	1-25k, 0.8m-8.87V	UPA-B6 opt (10-100k)	SUN-2/S 10-100k	20-10k
Generator stability	±1%	±20ppm	±0.01%	....	±0.03%
Generator output	Xfmrless bal, unbal	Active, floating bal	Bal, unbal	Telephone jacks	Floating bal
Frequency counter	No	4-25k by 0.1Hz	8-250k	No	Yes
Meters/displays	VU movement	CRT alphanumerics	LCD displays	LED displays	Analog meter & CRT
Digital design	No	Programmable 100 setups	Yes	μP control	Yes
Automated measurements	No	GPIB, IEEE-488	IEEE-488/IEC 625-1	No	GPIB
Reader Service Number	**678**	**679**	**680**	**681**	**682**

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Manufacturer	Schmid Telecomm. Zurich	Sound Technology			Technical Projects
Model Number	**SIAT'**	**•1710A**	**•1510A (1530A BTSC)†**	**•3100A/3200A (3200B)†**	**•MJS401D/MD404B†✓**
Frequency range	40-15k/400Hz THD	10-110k	20-40k	5-105k	10-300k
Input level	-70, +21dBm 600Ω	0.03mV-110V, 200kΩ	0.1mV-40V (245μ-42V)	1mV-100V, 200kΩ	100V, 100kΩ

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Circle (163) on Reply Card

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Manufacturer	Schmid Telecomm. Zurich	Sound Technology			Technical Projects
Model Number	**SIAT[1]**	**•1710A**	**•1510A (1530A BTSC)†**	**•3100A/3200A (3200B)†**	**•MJS401D/MD404B†✓**
Input connection	....	Active bal	Active bal 100kΩ	Active bal	Active bal
Fundamental reject	....	>100dB 1kHz	100dB, 1kHz	110dB	94dB at 1kHz
Auto level set	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	measures 2nd/3rd harm	Yes	Yes
Minimum THD figure	....	0.002%	0.01%	0.001%	0.002%
THD accuracy	....	±10%	±5% of full scale	±10%	±2%
IMD measurement	SMPTE	SMPTE, DIN	SMPTE 4:1	SMPTE	SMPTE
IMD accuracy	....	±4%	....(±5%)	±4%	±2%
Minimum IMD	....	0.0025%	....(0.01%)	0.001%	0.02%
ac Volts accuracyy-70, +21dBm	±0.2dBm ±2%	Yes	±0.15dBm, ±0.05% fs	-107, +40dBm, ±0.1dB	
Audio noise range	W/stereo crosstalk	-103dBm	-79dBm	....<-115dBm, 30kHz bw 600Ω	
Signal generator range	40-15k programmable	10-110k +26dBm	20-40k, 30dBm (opt)	1-105k @ 30dBm	10-300k, +30dBm
Generator stability	....	±2%	....(Xtal ctl)	±0.03%	±1% (-0.1, +1dB)
Generator output	....	Active bal	Act bal, floating	Active bal	Active bal/unbal
Frequency counter	....	No	No	Yes	Yes
Meters/displays	LED displays, printer	RMS, AVG, PEAK scales	Bargraph, CRT	LEDs and meter movement	Multistandard movement
Digital design	Yes	No	μP-based	Yes	In part
Automated measurements	Remote via RS-232	....	GPIB-488	GPIB, RS-232	GPIB IEEE-488 opt
Reader Service Number	**683**	**684**	**685**	**686**	**687**

[1]Short Interval Audio Test system performs battery of tests on program lines between program segments.

Manufacturer	Tektronix		Wandel & Goltermann
Model Number	**AA501**	**•AA5001†**	**•NFA-1†✓**
Frequency range	10-100k	10-100k	15-200k (receiver)
Input level	60mV-200V, 100kΩ	60mV-200V, 100kΩ	140nV-30V, 600Ω, 100kΩ
Input connection	Balanced	Balanced	Bal, unbal, BNC/XLR/CF
Fundamental reject	10dB[1]	10dB[1]	90dB at 1kHz
Auto level set	Yes	Yes	Auto range -135dB, +30dB
Auto null set	Yes	Yes	Auto tune to harmonics
Minimum THD figure	0.0025%	0.0025%	0.003% typical
THD accuracy	±10%	±10%	±0.003% absolute
IMD measurement	Opt: SMPTE/DIN/CCIF)	Opt: SMPTE/DIN/CCIF	By any procedure
IMD accuracy	±10%	±10%	±0.01%
Minimum IMD	0.0018%	0.0018%	0.01%
ac Volts accuracy	-108, +48dBm ±2% fs	-108, +48dB ±2% fs	-135dB, +30dB
Audio noise range	-108dBm	-108dBm	-100dBm A-wtd <-90 CCIR
Signal generator range	10-100k, 28dBm	10-100k, 28dBm	10-50k, full level
Generator stability	±0.01%	±0.01%	±30ppm worst case
Generator output	Balanced	Balanced	Bal, unbal, BNC/XLR/CF
Frequency counter	No	No	Yes w/SNR-10dB
Meters/displays	LED displays	LED displays	CRT graph/numeric
Digital design	Yes	Yes	Yes
Automated measurements	No	GPIB	GPIB/IEEE, IEC
Reader Service Number	**688**	**689**	**690**

[1]Value is below specified residual THD & noise or actual THD, whichever is greater.



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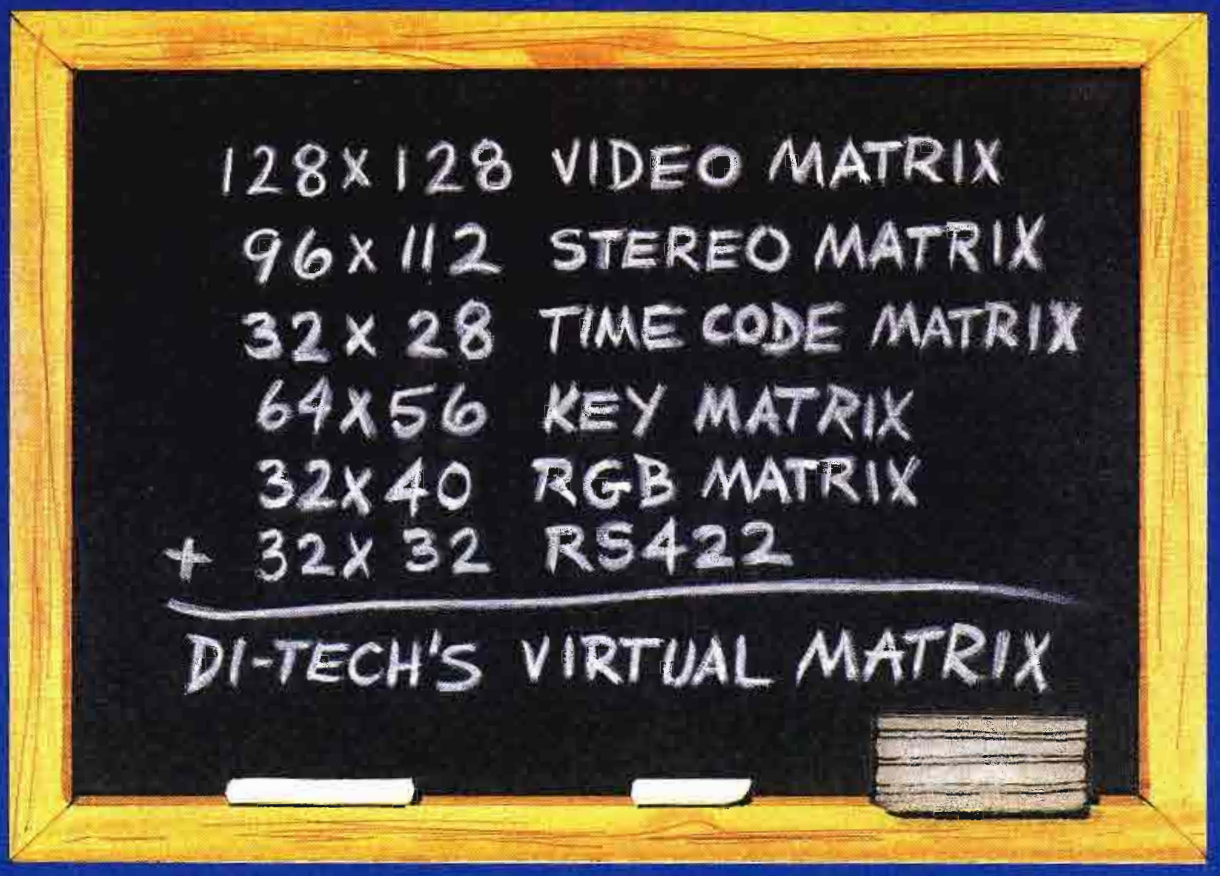
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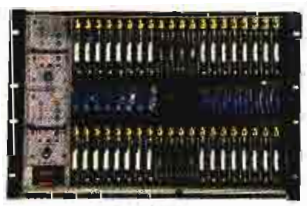
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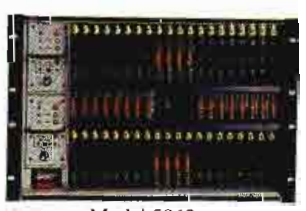


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Total Spectrum Manufacturing, Inc.	19	12	914/268-0100
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Townsend Test & Measuring Group	153	94	704/547-8378
Ultimatte Corp.	27	16	818/345-5525
United Media	162	102	714/630-8020
Utah Scientific Inc.	54-55	30	800/543-8782
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Manufacturer	Telemet		Videotek
Model	3713-A1 (-A2)	4500-B1 (-B2)[-F1]	4501-B	DM-140S
Modulation fail alarm	Yes	No	Loss of video out	No
Stereo aural type	Yes	No	Yes	Yes
Reader Service Number....Number	1496	1497	1498	1499

Automatic TV Test Systems

Manufacturer	Magni Systems	Marconi Instruments	PESA Electronica	Philips T&MI	Rohde & Schwarz
Model Series	2015 PCATS (2021[1])	2924 universal analyzer	SWAT	PM5578	UVF video analyzer
Controlling computer	MS PC-DOS	Proprietary	Proprietary	Proprietary	Proprietary
Video signal generator	Multistandard	2926, 2913, other	Uses program video	External	Bar, dot only
System control mode	IBM-PC/compatible(1)	via GPIB, serial	.....	Yes	Yes
Programmable	Yes (4 signal sets)	Yes	.....	.....	.....
Standards	NTSC/PAL/CAV/HDTV	NTSC, PAL, SECAM	NTSC, PAL	NTSC/PAL	PAL
External data storage	Yes	Possible	Printout or PC	Possible	.....
Auto logging mode	No	Yes	RS-232 link	Yes	Yes
Waveform plotting	Yes	....	.....	On CRT only	Yes
Parameter limits	No...	3 sets, upper/lower	Yes	RS-232	IEC-625/IEEE-488
Out of tolerance alarm	No...	Visual on CRT	Yes	Set via jumpers	EEPROM, user defined
Carrier failure alarm	No...	....	Per programming	Yes	Blinking LED
Modulation loss alarm	No...	....	Per programming	VITS low LED	No
Measurements per	Any reference	NTC-7/FCC/CCIR/CBC	CCIR/RS-170A	CCIR/NTC-7	CCIR-569-1
Tests made on line	Any line	Individual lines	Total signal	Lines 17/18, 2-field	Individual lines
Reader Service Number	1325	1326	1327	1328	1329

[1]2021 is designed with front-panel controls for standalone operation.

Manufacturer	Tektronix	Thomson Video
Model Series	1980 ANSWER	VM700 measurement set	TTV8400 Thom-CAT
Controlling computer	Proprietary	Motorola 68020	Apple
Video signal generator	External (TEK1910)	No (Picture mode)	TTV8410 Prodige
System control mode	Manual	Manual, programmable	Yes
Programmable	No	Yes	Yes
Standards	NTSC	NTSC, PAL	NTSC, PAL
External data storage	Yes	Also internal	Floppy disk
Auto logging mode	Yes	Via RS-232C	Yes
Waveform plotting	Yes	Raster scan display	Yes
Parameter limits	User defined	User programmable	Yes
Out of tolerance alarm	Printer	On-screen message	User defined
Carrier failure alarm	No	No	Printer, CRT
Modulation loss alarm	No	No	None
Measurements per	RS170A/NTC-7/CCIR-569	RS-170A/NTC-7/RS-250B	CCIR-569
Tests made on line	Any VBI line	Any line	1-line, 1-field
Reader Service Number	1330	1331	1332

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Manufacturer	Barco Industries	Philips T&MI	Rohde & Schwarz		Tektronix
Model	**VSD 1000BG**	**PM5560M[1].**	**EKF2D (EKF2K)**	**EMFT series[2]**	**1450-1**
Intercarrier input	No	Yes	....	....	50Ω
Split carrier mode	No	Yes	Yes	Yes	Yes
Zero-carrier reference	Internal	Internal	Int/ext trigger	Line 15/ext trigger	Int, ext
Envelope detection	Yes	Yes	Yes	Yes	Yes
Synchronous detection	Yes	Yes	Yes	Yes	Yes
Quadrature detection	No	No	....	Yes	Yes
Aural signal reject	Yes	Yes	Yes	Yes	Yes
SAW filter design	....	Nyquist filter	....	Yes	Yes
No. of video outputs	2-75Ω	2-75Ω	2-75Ω	2-75Ω	2-75Ω
Aural deviation port	....	+6dBm ±25kHz	0-50kHz	....	50mV/kHz 600Ω
Audio line out	+6dBm	+6dBm/1.55V	+6dBm ±30kHz	+6dBm ±30kHz	...
Speaker output	8Ω	None	Yes	No	Yes
Video clamp on	Back porch	0 IRE, active or VBI	Sync, blanking	Sync, blanking	Sync, blanking, other
ATS compatible	....	Yes	....	Yes	....
Carrier fail alarm	Yes	No	No	....	....
Modulation fail alarm	No	No	No	....	....
Stereo aural type	German system	....	....	Dual carrier Std B/G	US/BTSC system
Reader Service Number	**1491**	**1492**	**1493**	**1494**	**1495**

[1]Models for CCIR -B/G, -D/K and -I standards.
[2]EMFK crystal control, EMFT continuous tuning, EMTD crystal/AFC.

Manufacturer	Telemet			Videotek
Model	**3713-A1 (-A2)**	**4500-B1 (-B2)[-F1]**	**4501-B**	**DM-140S**
Service band	VHF (UHF)	VHF (UHF)	VHF, UHF	VHF, UHF, CATV
CCIR standards	I/III (IV/V)	[Any channel]	I, III, IV, V	I, III, IV, V
Channel selection	Fixed channel	Fixed channel, xtal	Fixed down-converter	Varacter, synthesized
RF input impedance	50Ω, 75Ω	75Ω F (SO-239)	50-500mV	75Ω F-connector
Direct input level	50mV-10V	300μV-30mV	50-500mV	....
Off-air input level	5mV-1V (5mV-50mV)	....	5-50mV	-15dBmv min
IF input level	...	...	No	None
Input level indicator	LEDs	None	Detector out, LED	None
Intercarrier input	No	...	Yes	No
Split carrier mode	Quasi-parallel	...	Yes	No
Zero-carrier reference	Int & ext	Internal	Internal	No
Envelope detection	Yes	No	Yes	Yes
Synchronous detection	Yes	...	w/4504B1 accessory	No
Quadrature detection	Yes	Yes	w/4504B1 accessory	No
Aural signal reject	Yes	...	Yes	No
SAW filter design	No	No	...	Yes
No. of video outputs	5-75Ω	2-75Ω	2 BNC 75Ω	2-75Ω
Aural deviation port	Shown w/LEDs	Yes	BNC	No
Audio line out	+8dBm	+3dBm 600Ω	Winchester M7 7-pin	Bal/unbal, mono/stereo
Speaker output	8Ω, headphone	Yes	Yes	Yes
Video clamp on	...	...	...	L & R
ATS compatible	...	No	No	No
Carrier fail alarm	Yes	No	Loss of video out	No



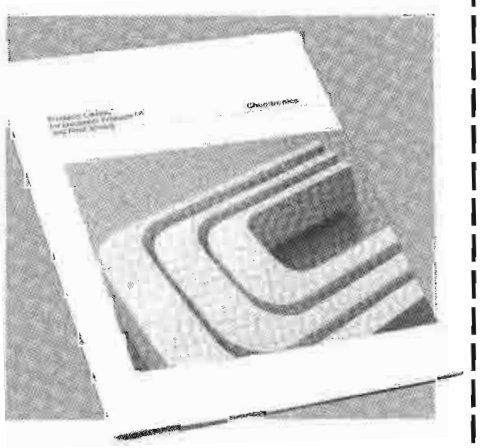
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Manufacturer	Philips T&MI	Rohde & Schwarz	Tektronix		
Model/Series	**PM5665 (5662 combo)†‡**	**ODF digital TV scope†‡**	**1480 series†‡**	**•1730 series (1730 HD)**	**•1740 series combo**
AF stereo phase mode	No	No	No	No	No
Waveform comparison	No	Yes	Overlay, parade	Yes	Parade
Reader Service Number	**1451**	**1452**	**1453**	**1454**	**1455**

Manufacturer	Tektronix			Videotek	
Model/Series	**1750 series combo**	**WFM-300 component†**	**•1710**	**TVM-620 combo**	**TSM-60 (TSM-50)**
Display size	8x10cm	8x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Electronic, accur 1%	Internal	Internal, etched	Internal, etched
Available for	NTSC (PAL)	525/60 625/50 RGB(1)	NTSC/PAL	NTSC, PAL/-M	NTSC, PAL/-M
Internal calibrator	Yes	Yes	Yes	Yes	Yes
Vertical Response	Flat, IRE (luma) chroma	"Lightning, Bowtie" displays	Flat, L-P	Flat, L-P, chroma	Flat, L-P, chroma ∂G (No ∂G)
Timebases	H, 2H, 2H mag V/2V, 2V mag	1H, 2H, 2V and 2V mag	2H/2H Mag 2V/2V Mag	H/2H/3H, V/2V/3V V-mag, H-mag	H/2H, 2V, 2V-mag, 1μs 5μs (2H, 2V, 2V-M 1μs)
Magnification factors	x2, x10, x20, x50	x20	x10	x5 V, x10 H	x20
RGB/YRGB displays	Yes	Parade, overlay	No	Yes	Int jumper (No)
DC restore	Back porch or sync	Back porch	Back porch	Back porch	Back porch
VITS line select	8-23 (6-21, 319-334)	Any line	None	No	L.14-21, F.1-2 (No)
Programmable	All functions	....	No	65C02 tactile ctl panel	No
Remote controllable	Yes	Yes	No	No	No
Composite inputs	A, B	No	A & B	A, B, C	A, B
Component inputs	No	RGB or YCrCb[1]	No	No	No
Line strobe pulse	Yes	Any 2, any 15	No	Yes	No
Vectorscope function	SC/H ϕ measurements	Yes	Burst phase	R-Y $\partial\phi$ mode	No
AF stereo phase mode	No	No	Yes	No	No
Waveform comparison	Overly vector/waveform	Overlay, parade	No	WFM/vector overlays	No
Reader Service Number	**1456**	**1457**	**1458**	**1459**	**1460**

[1]Transcoders for YiQ, YCrCb available.

TV Demodulators

TV receiving equipment for signal monitoring and examination. inputs are typically 50Ω or 75Ω. Video signal outputs are 75Ω.

Manufacturer	Barco Industries	Philips T&MI	Rohde & Schwarz		Tektronix
Model	**VSD 1000BG**	**PM5560M[1].**	**EKF2D (EKF2K)**	**EMFT series[2]**	**1450-1**
Service band	VHF, UHF	IF, VHF, UHF	IF, VHF, UHF, CATV	IF, VHF, UHF	IF, VHF, UHF
CCIR standards	I, III, IV, V	I, III, IV, V	I/II/IV/V	I/III/IV/V/IF/CATV	I/III/IV/V
Channel selection	Fixed, PLL-tuned	Thumb-wheel PLL	Tunable, crystal	Tunable, crystal	Fixed, tuneable
RF input impedance	50Ω, 75Ω	50Ω	50Ω, 75Ω	50Ω, 75Ω	50Ω
Direct input level	....	1Vrms ±6dB w/AGC	20mV-1.5V	0.1mV-30mV, 1mV-100mV	80μV-5V
Off-air input level	-30mV, +30mV	100mV ±6dB w/AGC	250μV-300mV	250μV-5mV	80mV-5V
IF input level	10-40dBmv	70mV ±3dB 50Ω	5mV-100mV	5mV-100mV	80μV-22mV
Input level indicator	LED display	Vision & IF meters	Meter	Panel meter	LED display

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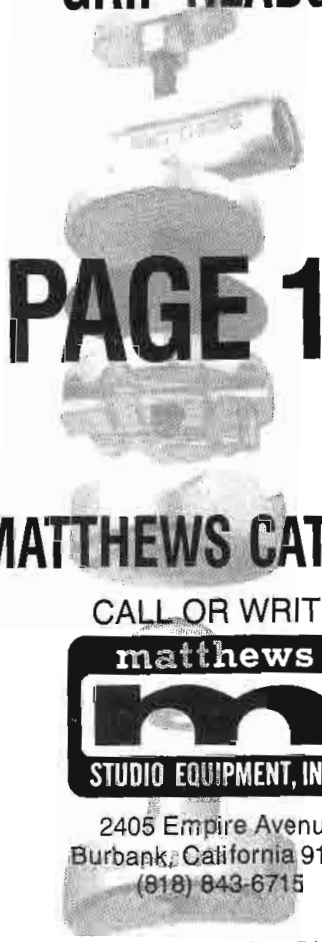
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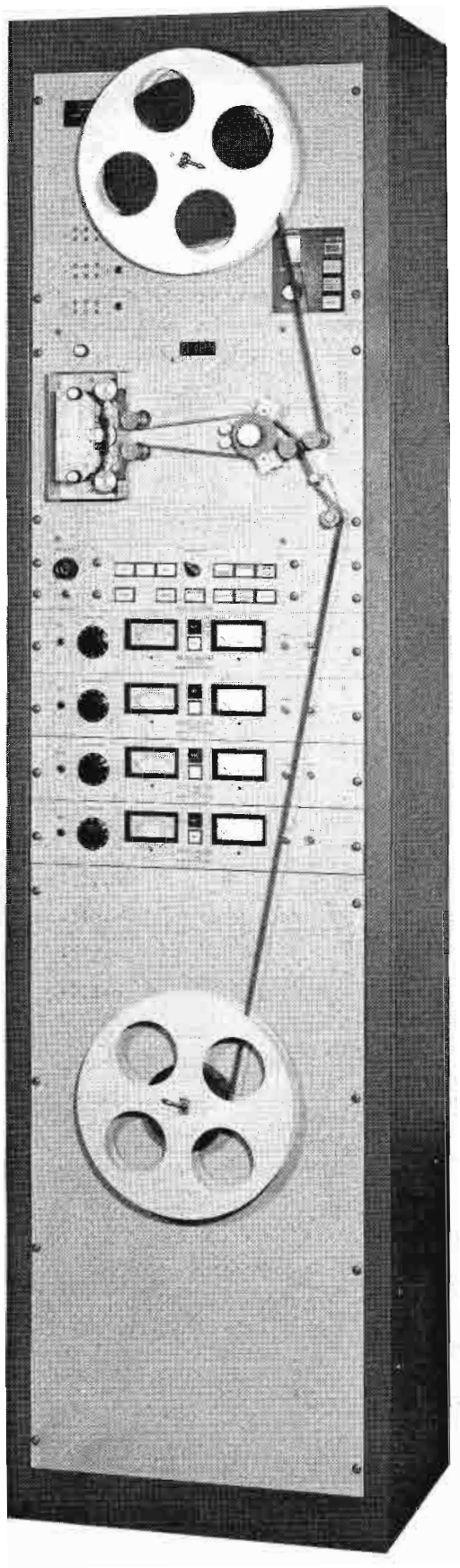
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Manufacturer	Hitachi Denshi	Leader Instruments	Magni Systems		
Model/Series	**•V-099 (-098) portable**	**LBO-5860B (5865B)**	**1527†**	**WFM-530 (WFM-531)**	**WFM-560 (WFM-561)**
Display size	3.5″ rect	8x10cm	8x10cm on 1525 display	8x10cm	8x10cm
Graticule	...	Internal	Int, ext	Internal	Internal
Available for	NTSC (PAL)	NTSC, PAL/SECAM opt	NTSC	NTSC (PAL)	NTSC/CAV (PAL/CAV)
Internal calibrator	Yes	Yes	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma ∂G possible	Flat, L-P, chroma ∂G, transients	Flat, L-P, chroma 1520 ∂G, ∂ϕ	Flat, chroma, L-P	Flat, chroma, L-P
Timebases	2H, 2V, 1μs/div 2V mag	2H, 1μs, 2V 2V mag	2-H, 2-V	H, 2H, 2V, V Mag	
Magnification factors	x20	x20	x5	x5	
RGB/YRGB displays	No	Option	No	Yes	Yes
DC restore	Blanking	Back porch	Back porch	Back porch	Back porch
VITS line select	No	7-21 (525)	No	Any line	Any line
Programmable	No	No	No	16 memories	16 memories
Remote controllable	No	No	No	RS-232	RS-232
Composite inputs	A, B	A, B	A, B	3 channels	2 inputs, 3 channels
Component inputs	No	No	No	....	2 sets
Line strobe pulse	No	Yes	No	Yes	Yes
Vectorscope function	No	No	Yes	Limited components use	Full components
AF stereo phase mode	No	No	(Tone source)	No	No
Waveform comparison	No	No	No	Yes	Yes
Reader Service Number	**1446**	**1447**	**1448**	**1449**	**1450**

Manufacturer	Philips T&MI	Rohde & Schwarz	Tektronix		
Model/Series	**PM5665 (5662 combo)†‡**	**ODF digital TV scope†‡**	**1480 series†‡**	**•1730 series (1730 HD)**	**•1740 series combo**
Display size	8x10cm	10x13cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Electronic	Int, ext	Internal	Internal
Available for	NTSC, PAL/-M/-G/-N	PAL	NTSC, PAL/-M, SECAM	NTSC, PAL (multistd)	NTSC (PAL/-M)
Internal calibrator	Yes	Yes	Yes	Yes	Yes
Vertical Response	Flat, chroma, ∂G chroma (∂ϕ)	Flat, LP, ∂-staircase	Flat, chroma, LP IRE, ∂G	Flat, LP, chroma (30MHz/dual-mode fltr)	Flat, IRE, (luma) Chroma
Timebases	H, 2H, V, 2H Mag	0.1-100ms/div, 1/2/5 steps, 54 field/s	H, 2H, 2H mag V, 2V, 2V mag	H, 2H, 2V (10ns/div) 2H/2V mag (1/2/3-line)	H, 2H, 2H mag V, 2V, 2V mag
Magnification factors	x10 (x10H/x20V)	....	x5, x10, x20, x25, x50	x25 (& x10, x20)	x10, x20
RGB/YRGB displays	Yes	....	Yes	Yes (Parade, overlay)	Yes
DC restore	Back porch	to black	Back porch or sync	Back porch	Back porch or sync
VITS line select	1-263/1-262, 1-625	1-625, F1-4, rep 2/4/8	Single & 15-line	Any one (& 14-line)	Internal jumper set
Programmable	No	Yes	No	Yes	All functions
Remote controllable	Yes	RS-488, IEC-625	Yes	Yes	Yes
Composite inputs	A, B	Yes	A, B, aux	A, B	A, B
Component inputs	No	....	No	(3 each A & B)	No
Line strobe pulse	(Yes)	10 waveform memory	Yes	Yes	....
Vectorscope function	No (with SC/H ϕ)	No	No	No	∂ϕ in R-Y mode

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Manufacturer	System Video[1]	Tektronix		Thomson Video	Videotek
Model/Series	Model 1225	R520A series	1720†	TTV 8300†	VSM-60
Display size	10x10cm	5″	5¼″	8x10cm	8x10cm
Graticule	Internal	Int, ext	Internal	External	Internal etched
Waveform monitor mode	X-Y mode	Component waveforms	Stereo audio phase	Waveform	None
Function control from	Manual	Manual	μP control	Manual	Manual
Standards	NTSC, PAL/M	NTSC, PAL/M	NTSC, PAL	None	NTSC, PAL/M
Integral calibrator	Yes	Yes	Yes	SECAM	Yes
Composite video inputs	A, B	A, B	A, B	Yes	A, B, alternate
Subcarrier input	Yes	Yes	From ext ref	No	Yes
Composite sync input	Yes	Yes	Yes	Yes	No
Display references	A, B, ext	A, B, ext	Int, ext	Yes	A, B, ext
Diff phase, gain mode	2°, 2%	<1°, <1%	≤2°, ≤2%	...	≤1°, ≤1%
VITS line selector	Lines 15-21	Lines 15-21	From 1730 WFM	...	No
Luminance measurements	No	Y/I/Q/R/G/B	No	...	None
Reader Service Number	**1436**	**1437**	**1438**	**1439**	**1440**

[1]Represented by AF Associates.

Video Waveform Monitors

Video monitoring equipment for assessment of visual signal component and signal quality. Models noted with a dagger (†) include an oscilloscope test mode, while models marked with (‡) include a test probe. All units have bench or rack-mount housings available. A bullet (•) precedes model operable by battery.

Manufacturer	Electronic Visuals (Broadcast Video Systems)				Hitachi Denshi
Model/Series	EV4011 (EV4042)	EV4031	EV4050 component	EV4061 combo	V-079 (V-078)
Display size	8x10cm	8x10cm GY phosphor	8x10cm	8x10cm	6″ rect
Graticule	External	Illuminated	External	External	Internal
Available for	NTSC, PAL/-M, SECAM	....	CAV	NTSC, PAL/-M, SECAM	NTSC (PAL)
Internal calibrator	No (Yes)	60kHz square wave	....	Yes	Yes
Vertical Response	Chroma, L-P, flat	Flat, L-P, chroma	Flat, L-P, chroma	Flat, L-P, chroma	IRE, flat, ∂G
	∂G, linearity	∂G, linear	Linear		Chroma
Timebases	H, 2H, 2H mag	H, 2H, 2H mag	V, 2V, 3V	V, 2V, 2V mag	2V, 2V mag, 2H
	V, 2V, 2V mag	V, 2V, 2V mag	H, 2H, 3H, mag	H, 2H, 2H mag	1μs/div
Magnification factors	....	....	1-line to 100ns/8 div	Blanking in 9cm	x20
RGB/YRGB displays	No (RGB/component)	No	AB, ABC parade	Yes	YRGB option
DC restore	Back porch	Back porch	Indiv restore	Black	Back porch
VITS line select	No (Lines 7-22)	No	No	No	9-22, F1/F2
Programmable	No	No	No	No	No
Remote controllable	No	No	No	No	No
Composite inputs	1-input	NTSC, PAL A & B	No	A, B	A, B
Component inputs	No	No	Y/Cr/Cb	No	No
Line strobe pulse	No	No	No	....	....
Vectorscope function	No	No	Yes	Yes	No
AF stereo phase mode	No	No	No	No	No
Waveform comparison	No	No	Superimposed	No	Parade only
Reader Service Number	**1441**	**1442**	**1443**	**1444**	**1445**

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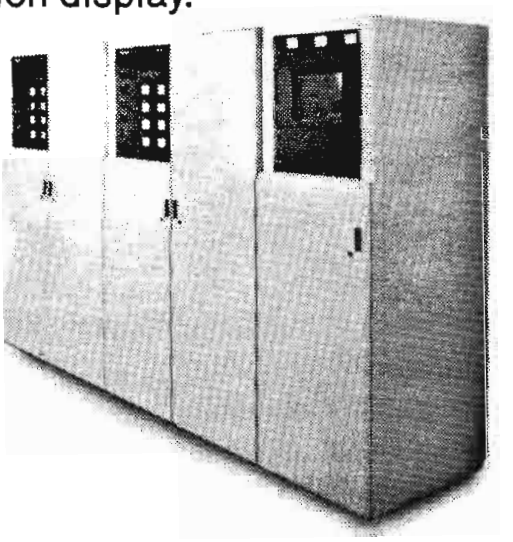
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Vectorscopes

Equipment for measurement and display of relative phase angles of color information in the video signal. Models marked with a dagger (†) provide component video inputs. All units are available in rack-mount or bench-case packages.

Manufacturer	Electronic Visuals[1]	Hamlet Video	Hitachi Denshi		Leader Instruments
Model/Series	**EV4021**	**HVI 200 Series[2]†**	**V-069 (V-068)**	**V-089 (V-088)**	**LVS-5850B (-51A)**
Display size	8x10cm rect	128-linesx8.5μs[3]	6″ rect	3.5″	8x10cm rect
Graticule	Internal	Electronic	Internal	External	Electronic (etched)
Waveform monitor mode	Yes	VCTR, WFM, dual	Vector only	Vector only	Vector only
Function control from	Manual	Front panel only	Manual	Manual	Manual
Standards	NTSC, PAL/M	NTSC or PAL	NTSC (PAL)	NTSC (PAL)	NTSC (PAL/N)
Integral calibrator	No	Yes	Yes	Yes	Yes
Composite video inputs	A, B	Model HVI 203	A, B	A, B	A, B
Subcarrier input	Yes	Video, blackburst	Blackburst	Composite sync	Yes
Composite sync input	....	Composite only	Blackburst	Composite sync	Yes
Display references	A, B, ext	Ref or display	A, B, ext	A, B	A, B, ext
Diff phase, gain mode	1°, 1%	None	2°,....	2°,....±1°, ±1%	
VITS line selector	No	No	No	No	No
Luminance measurements	No	In WFM mode	None	None	No
Reader Service Number	**1426**	**1427**	**1428**	**1429**	**1430**

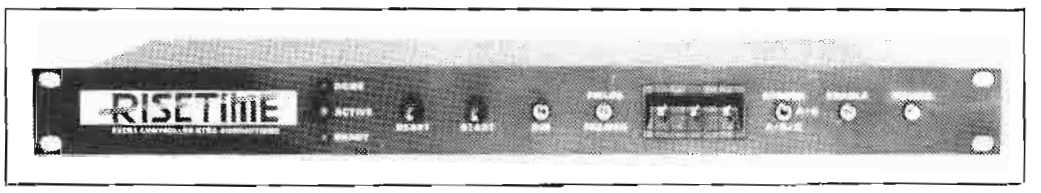
[1]Represented by Broadcast Video Systems.
[2]Unit inserts waveform and/or vector displays into the image on a video picture monitor.
[3]Expanded display of 512-linex34μs; WFM timebase includes H, 2H, 5H, V and 25V positions.

Manufacturer	Magni Systems		Philips T&M		Snell & Wilcox
Model/Series	**VS 560 (VS 561)†**	**VS 530 (VS 531)**	**PM 5667 (PM 5668)**	**PM 5661 combo**	**MSD-140, X-Y140**
Display size	8x10cm	8x10cm	8x10cm rect	8x10cm	8x10cm rect
Graticule	Internal	Internal	Internal	Internal	Ext opt
Waveform monitor mode	Vectors, audio phase	Vectors, audio phase	SC/H ϕ PM5668	Yes	Possible
Function control from	Manual, remote[1]	Manual, remote[2]	Manual, remote	Manual, remote	Manual
Standards	NTSC/CAV (PAL/CAV)	NTSC (PAL)	NTSC, PAL/G/M/N	NTSC, PAL/G/M/N	NTSC, PAL/N/M, SECAM
Integral calibrator	Yes	Yes	Yes	Yes	....
Composite video inputs	2 inputs w/3 channels	3 inputs	A, B	A, B, probe	A, B, C
Subcarrier input	Yes	Yes	Yes	Yes	....
Composite sync input	Yes	Yes	Yes	Yes	....
Display references	Int, ext	Int, ext	A, B, ext	A, B, ext	Auto std select
Diff phase, gain mode	<1°, <1%	<1°, <1%	<1°, <1%	....	
VITS line selector	On WFM560/561	On WFM530/531	No	Any line	No
Luminance measurements	No	No	None	In WFM mode	Yes
Reader Service Number	**1431**	**1432**	**1433**	**1434**	**1435**

[1]From WFM560, by RS-232.
[2]From WFM530, by RS-232.

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Manufacturer	Belar Electronics	QEI	Rohde & Schwarz	TFT
Model	FMM-2	MODEL 691	FKD/FKDL	Model 884 stereo
AGC circuitry	No	No	....	40dB range
Modulation range	±133%	±133%	77.5kHz (2.5kHz LED)	-100, +133%
AF response of meter	±0.1dB 50-75k	±0.2dB 30-75k	±0.5dB 50-65k	±0.2dB 30Hz-100kHz
Peak modulation adjustment	to 199%	199%	None	50-199%
Peak flasher accuracy	±2% all levels	±2% 5kHz	5%-	±2% 5kHz 100% mod
Residual AM monitor	Integral	Integral	...	<70dB from 100% mod
Audio output nominal	+10dBm	+10dBm	6dBm	0dBm
Audio connection	Active balanced	Xfmr bal	Bal 600Ω L-R	600Ω bal, barrier strip
Audio response	±0.01dB 50-15k	±1dB 30-15k	0.05dB 40-65k	±0.5dB 30-120k
Audio distortion	0.01% THD & IMD	0.05%	<0.5% 30-15k	0.2% max 10kHz comp
S/N ratio, mono	90dB unwtd	75dB wtd	>68dB wtd	70dB 400Hz de-emp comp
Composite output level	1.5Vrms	2Vrms	6dBm ±40kHz dev	5Vrms 100% mod 10kΩ
Metering display type	Analog mvmt, LEDs	Analog movement	Dual 32-LED bar graph	Analog meter
Oscilloscope test output	Yes	Yes	No	Yes
Modulation alarm	LED at 90% carrier	Yes	Yes	....
Stereo monitor	Use FMS-2	Integral	Integral	Integral
SCA monitor	Use SCM-1 or SCM-2	Single, dual opt	Integral	TFT-730A, 845
Reader Service Number	**1468**	**1469**	**1470**	**1471**

TV Aural Modulation Monitors

These modulation measurement instruments include remote metering outputs and internal calibrator circuitry. Peak modulation indicators are adjustable; peak flasher accuracy is ±1%.

Manufacturer	Belar Electronics		Tektronix	TFT	
Model	TVM-1	TVM-100	751 BTSC	MODEL 850	701
Frequency range	Single UHF, VHF channel	-L VHS, -H UHF	Any US TV channel	Any TV channel	Any TV channel
Off-air input level	100μV w/RFA-3 pre-amp	100mV-5Vrms	From 1450-1 demod	20μV 50Ω	250μV 50Ω
AGC circuitry	Yes	....	In demod	No-	Yes
Modulation range	±133% ±25kHz dev	133%, 100% ±73kHz dev	100% or max 73kHz	100% ±25kHz	100% ±25kHz
Meter frequency response	±0.5dB 50-75k	±0.1dB 30-50k	±0.7kHz total	±0.2dB 50-120k	±0.2dB 50-15k
Nominal audio output	10dBm xfmr bal	+10dBm bal, 5V unbal	+8dBm, 600Ω	6dBm active bal	6dBm active bal
Audio response, mono	±0.5dB 50-15k	±0.01dB 30-50k	±0.1dB 50Hz-15kHz(1)	±0.2dB 50-15k	±0.2dB 50-15k
Audio distortion, mono	0.1%	0.01% THD, IMD	<0.1% Main ch. only	0.1% 1kHz	0.25%
S/N ratio, mono	70dB	80dB min	>70dB[1]	78dB de-emphasized	75dB de-emphasized
Composite output	1V at 2kΩ	1.5V BTSC/SAP/PRD/SCA	No	3Vrms 75Ω	....
Metering display types	Analog meter	Meter & LEDs	EL bargraph, digital	Meter & LEDs	Analog meter
ATS compatible	Yes	Yes	....	Yes	No
Oscilloscope test output	Yes	Yes	....	Yes	No
Carrier alarms	None	90% power	Loss, unlocked pilot	Reduced power	Power, frequency
Modulation alarms	None	None	Stereo phase reversal	Relay closure	Shunt to ground
Stereo monitor	....	TVM-210/220 package	Integral	Integral	....
SCA monitor	Use SCM-1 or SCM-2	SCM-1 or SCM-2	SAP, PRO integral	TFT855, TFT851	...
Reader Service Number	**1472**		**1474**	**1475**	**600**

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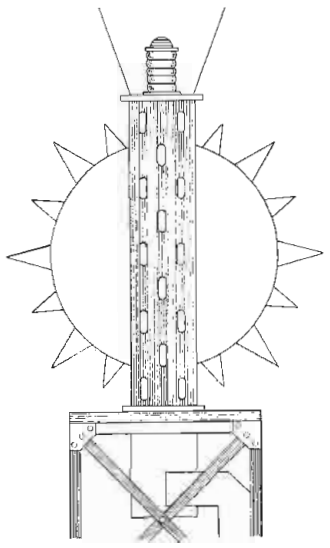
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Manufacturer	Moseley Associates			TFT	
Model	**PCL-6000 series[1]**	**CL-100 comm link**	**PCL-606/C[5] (PCL-606)**	**Model 7700B**	**Model 8600**
System type	Comp stereo or mono	Data[4]/Voice	Comp stereo (mono)	Composite	Composite
Audio response	<±0.2dB 30-53k	±20-3.2k	±0.1dB 30-53k	±0.5dB, 50-75k	±0.2dB, 30-15k
Distortion	<0.1%, 30-7.5k	2% data, 5% voice	≤0.2% 30-7.5k	0.25%, 30-75k	≤0.2% at 1kHz
S/N ratio	>75dB typical	>45dB 60μV	>75dB below 100% mod	>72dB @ 100% mod	65dB @ 100% mod wtd
Crosstalk	<-51dB	....	<-53dB	<-60dB, sub-main 150kHz	....
Stereo separation	>51dB 50-15k	....	>52dB 50-15k	60dB sub to main	....
Hot standby system	Transmitter opt	....	Transmit opt	Dption	Dption
Transmitter No.	**PCL-6010**	**CL-100**	**PCL-606/C**	**7700B**	**8600**
RF power output	7W max 890-960MHz[2]	1W (10W opt)	10W (0.89-1.71GHz)	12W	6W
RF output connector	Type N 50Ω	Type N 50Ω	Type N 50Ω	Type N 50Ω	Type N 50Ω
Frequency stability	<0.00025%	<0.00025%	<0.00025%	±0.0001%	±0.0001%
AM noise rating	<-60dB below carrier	<-60dB below carrier	<-60dB below carrier	-65dB	<-60dB spurious/harmonic
Audio level	3.5Vp-p 6kΩ	Bal, high Z line	3.5Vp-p 6kΩ unbal	1.24V, 0.53V 10kΩ	1.24V 3kΩ/.775Vrms 1kΩ
Metering	F-R power/FM lock	Peak mod bargraph	RF final/driver-I/main	RF/main ch mod	RF main ch mod
	Pgm/mux level	....	multi/AFC/mux/Vdc	Mux mod/Vdc	Mux mod/Vdc
Rack space needed	3.5″	3.5″	3.5″	5.25″	3.5″
Receiver No.	**PCL-6020 (-6030)**	**CL-100**	**PCL-606/C**	**7707**	**8601**
Signal conversion	Dual (triple)	Single	Triple	Triple	Triple
Sensitivity	<120(100)μV 60dB SNR	60μV 45dB SNR	130μV 60dB SNR	40μV 60dB S/N	14μV 55dB S/N
Bandwidth	±100(125)kHz[3]	±3kHz -3dB IF bw	±100kHz 3dB IF BW	320kHz 3dB BW	6dB to 125kHz
Metering	RF input, system status	Carrier present LED	RF, AF, AFC, LO	Vdc, RF, Pgm	LO, AF levels
	Pgm/subcarrier level	....	Vdc, subcarrier, multi	Mux1, Mux 2	Vdc, Mux
Rack space needed	3.5″	3.5″	3.5″	3.5″	3.5″
Reader Service Number	**1481**	**1482**	**1483**	**1484**	**1485**

[1]Values given for composite system.
[2]System also available for 300-470MHz.
[3]Selectible IF of 100kHz or 500kHz; value here based on 3dB IF BW.
[4]Specifications given for data model.
[5]Values given for 600kHz spacing; system available for 300kHz or 600kHz spacing.

AM Modulation Monitors

These AM modulation measurement instruments include AGC circuitry and internal calibration facilities. They are ATS compatible.

Manufacturer	Belar Electronics	Boonton Electronics	Broadcast Electronics	Harris Broadcast	ITAME SA
Model	**AMM-3 (AMM-2B)**	**8200 Analyzer[1]**	**AM-90**	**AM-90 (AS-10 stereo)**	**Mod. AM90A**
Frequency range	200k-160MHz	100k-2GHz (2.5GHz opt)	340k-30MHz	450k-30MHz (.53-1.6MHz)	530k-4MHz
Off-air RF input	100μV w/pre-amp	-47dBm, 2.3mV	....	1V (0.5Vrms)	1-10Vrms
Direct input	5Vrms 50Ω	10mVrms AM band	1Vrms 50Ω	to 10Vrms (15Vrms)	....
Input attenuator	Yes	Yes	....	No (Yes)	0-50dB, 10dB steps
Measurable modulation range	-99, +199% (±133%)	to 99%	-100, +140%	-100, +140% (0-133%)	±0-133%
Peak modulation indicator	Adjustable	Peak hold	Programmable	Programmed (adjust.)	....
Peak flasher accuracy	±2%	1% of peak	±1% 1kHz	±1% (....)	....
Audio output level	+10dBm 600Ω	1Vrms 600Ω	+10dBm	10dBm (0dBm[2])	+10dBm, 100% mod
Audio connection	Unbal	Bal	Bal, unbal	Bal/unb (Xfmr AB/unb)	600Ω bal
Audio response, mono	±0.5dB 20-25k	per carrier frequency	-0.5dB 20-20k	-0.5dB	±0.5dB 20-20k
Audio distortion, mono	0.25% 25kHz	0.1%	0.15%	0.15%	....
Audio S/N ratio, mono	75dB	0.05% res. AM	75dB unwtd	75dB unwtd	75dB 100% mod
Meter or display type	Analog meter	Digital display	LED bar graph	LED bargraph (dual)	Modulation, RF level
Oscilloscope test output	Yes	From detector	Yes	Yes (No)	....
Remote metering output	Yes	No-	Yes	Yes	Yes
Failure alarms	Carrier off or	None	Carrier, modulation	Carrier, mod (No)	Carrier failure
	-10, +5% carrier level)				
Reader service number	**1461**	**1462**	**1463**	**1464**	**1465**

[1]Equipment useable for modulation measurement of AM, FM and PM systems as well as other parameters, including THD.
[2]For R, L, L+R, L-R.

Manufacturer	Rohde & Schwarz	TFT
Model	**Model FAM[1]**	**753-755A**
Frequency range	55k-120MHz[2]	500k-4MHz
Off-air RF input	10mV-3V	100μV
Direct input	....	1-10Vrms 50Ω
Input attenuator	Programmable	Yes
Measurable modulation range	100%	-100, +125%
Peak modulation indicator	....	Adjustable
Peak flasher accuracy	....	±% 400kHz
Audio output level	350mV-1V	0dBm
Audio connection	Unbalanced	Xfmr, act bal, unbal
Audio response, mono	10Hz-200kHz	±0.5dB 20-25k
Audio distortion, mono	≤0.4%	0.05%
Audio S/N ratio, mono	≥60dB	75dB unwtd
Meter or display type	7-seg LEDs	Analog meter
Oscilloscope test output	AM, FM outputs	No
Remote metering output	IEC-bus interface	Yes
Failure alarms	No	Carrier, modulation
Reader service number	**1466**	**1467**

[1]Equipment is also capable of modulation measurements for FM and PM transmissions.
[2]Option B1 extends range to 1GHz; B2 to 1.36GHz.

FM Modulation Monitors

These FM modulation measurement instruments include remote metering outputs and are ATS compatible. Internal calibrator circuitry and carrier failure indications are standard.

Manufacturer	Belar Electronics	OEI	Rohde & Schwarz	TFT
Model	**FMM-2**	**MODEL 691**	**FKD/FKDL**	**Model 884 stereo**
FM channel selector	Xtal (88-108MHz std)	Pre-selector switch	Tuned PLL	PLL preselector
Off-air input level	100μV, opt pre-amp	5mV	3.16mV	100μV-10Vrms 75Ω
Direct input level	1-10Vrms 50Ω	0.2-10Vrms 50Ω	0.5-2Vrms 50Ω	1-10Vrms 50Ω
Input attenuator	Yes	Yes	No	Yes

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Manufacturer	PESA	Rohde & Schwarz			Thomson-LGT
Model Series	**TR-series**	**NT325A1 (NT354A1‡)**	**NT414A1 (425A1)†‡**	**NT424A1 (NT444)†‡**	**EUHF 20000S-60000S†**
Power consumption	....	11kVA (20kVA)	28kVA (60kVA)	79kVA (120kVA)	80kW-135kW
Power factor	>0.9	>0.9	>0.9	>0.9	>0.95
Reader Service Number	**923**	**924**	**925**	**926**	**927**

[1]Aural = 1/100 Visual for dual channel sound system.

Manufacturer	Thomson-LGT		Townsend	TTC/Television Technology	
Model Series	**EUHF 2000S/-DS[1]†**	**8000 series UHF[1]†**	**TA 60TA**	**UHF 60S Silverline**	**UHF 10MA(D)**
Visual peak power	2kW	2W-30kW	60kW	60kW[2]	10kW
Carrier level regulation	..	..	2%	<4%	<4%
Modulation capability	100%	100%	1%	....	....
Response vs brightness	0.7dB, 0.5dB	0.7dB, 0.5dB	±0.1dB	....	....
ICPM uncorrected	±1°	±3°	±2°	....	....
Diff phase gain	±3°, 5%	±3°, 0.95	±3°, 5%	≤±4°, ≤0.5dB	≤±2°, ≤0.25dB
LF linearity	±1%	5%	10%	1.5dB	<1.5dB
S/R ratio (AM)	>60dB	>63dB	55dB	50dB	55dB
K factor 2T, 12.5T	1.5%	1.5% 2T	2%, 5%	....	2%
Harmonics below visual	-60dB	-60dB	-60dB	-65dB	<-65dB
Visual PA device	TH-393 combined V/A	TH-382, -582 tetrode	Klystron	Klystron	Klystrode (klystron opt)
Aural power output	0.2kW (100W + 20W)(1)	1/10, 1/20, 1/100	6kW	6kW	1kW
Carrier deviation	±100kHz	±100kHz	±100kHz	±25kHz	±25kHz
AF response	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB	+1dB, 30Hz-15kHz	±1dB, 30Hz-15kHz
Harmonic distortion	<0.5%	<0.5%	-54dB THD/IMD	1%	1%
AM, FM noise	≤-50dB, -60dB	-50dB, -60dB	-50dB, -58dB	-55dB, -55dB	-55dB, -55dB
Aural PA device	Common amplification	Diplexed	Klystron	Klystron	Diplexed
Cooling system	Forced air	Forced air	Water	Vapor-phase	Forced air
Input ac power	220-380Vac 3φ	220-380Vac 3φ	480Vac, 3φ	480Vac 3φ	230Vac 1φ, 480Vac 3φ
Power consumption	24kW (19kW)	0.3-80kW	130kW	....	4.8kVA
Power factor	>0.95	>0.95	0.9	0.9	0.9
Visual PA efficiency	....	....	....	....	66% overall
Reader Service Number	**928**	**929**	**930**	**931**	**932**

[1]Solid-state systems to 2kW; tube PAs 1kW to 20kW; klystrons 20kW, 30kW.
[2]Models for 120kW, 240kW also available.

Manufacturer	TTC/Television Technology			Varian TVT	
Model Series	**Silverline UHF-30SK**	**XL1000U (XL100U)[1]**	**LDM-1740 (LDM-1741/42)**	**LDM-1790/1791[2]**	**LDM-1780 (1781)**
Visual peak power	30kW	1kW (100W)	10kW (15kW/30kW)	30kW/60kW-70kW	5kW (10kW)
Carrier level regulation	<4% black-to-white	....	±2%	±2%	2%
Modulation capability	....	95%	95%	95%	95%
Response vs brightness	....	0.5dB	±0.5dB	±0.5dB	±0.5dB
ICPM uncorrected	....	±2°	±4°	±4°	±4°
Diff phase gain	≤±4°, ≤0.25dB	±2°, 0.25dB	±3°, 0.3dB	±3°, 0.5dB	±3°, 0.5dB
LF linearity	<1.5dB	1dB	0.9dB	0.9dB	0.9dB
S/N ratio (AM)	55dB	55dB	60dB	60dB	60dB
K factor 2T, 12.5T	2%	2%	2%, 2%	2%, 2%	2%, 2%
Harmonics below visual	<-65dB	-80dB	-70dB	-70dB	-70dB
Visual PA device	Klystron	TH-347 tetrode	Klystron PT5050(5080)	Klystron PT5093/5090	TH-382 (TH-392)
Aural power output	6kW	100W (10W)	10% of visual	10% of visual	10% of visual
Carrier deviation	±25kHz	±40kHz	±100kHz	±100kHz	±100kHz
AF response	±1dB 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz
Harmonic distortion	1%	0.5%	0.5%	0.5% 100% mod 1kHz	0.5%
AM, FM noise	≤-55dB/ ≤-55dB	-55dB, -55dB	-50dB, -60dB	-50dB, -60dB	-50dB, -60dB
Aural PA device	Diplexed	Diplexed	Diplexed (PT5050/5080)	Diplexed(PT5093/5090)	Diplexed (TH 327)
Cooling system	Forced air	Forced air	Vapor phase	Vapor-phase	Forced air
Input ac power	230Vac 1φ, 480Vac 3φ	230Vac 1-3φ (110Vac)	380/220, 415/240Vac	460/226, 480/272Vac	380/220Vac
Power consumption	....	4.8kVA (500VA)	65kW (41kW/ 73kW)	130kW/112-147kW	21kVA (23kVA)
Power factor	0.9	0.9	0.9	0.9	0.9
Visual PA efficiency	....	....	15% (58%, 62%)	26%/78-68%	37% (75%)
Reader Service Number	**933**	**934**	**935**	**936**	**937**

[1]LPTV models XL20U 20W, XL10U 10W available.
[2]LDM-1790/1791 can be combined in various combinations to achieve powers of 120-140kW, 240kW, 280kW, 517kW; the systems are designed around ACE type klystrons.

Aural STL Systems

Manufacturer	ITAME		Marti		Micro Controls/MCI
Model/Series	**Mod. UHF-450A[1]**	**Mod. UHF-900A[2]**	**STL-10**	**STL-30**	**PTS-10C[3] (PTS-10DC)[4]**
System type	Composite	Composite	Dual	Dual	Composite
Audio response	±0.1dB, 30-60k	±0.1dB, 30-60k	±0.3dB, 20-15k	±0.3dB, 20-15k	±0.4dB 30-55k
Distortion	<1% 40-70k	<1% 40-70k	0.3% 20-15k	0.5% 20-15k	<0.4%, 0.25% IMD
S/N ratio	70dB 100% mod	70dB 100% mod	73dB 100% mod	70dB 100% mod	>65dB
Stereo separation	....	....	....	....	≥40dB
Hot standby system	Option	No	No	No	Yes
Transmitter No.	**UHF-900A**	**UHF-900A**	**STL-10**	**STL-30**	**PTS-10C**
RF power output	10W	9W (20W opt)	10W	30W	7-10W
RF output connector	Type N	Type N	UG-58	UG-58	SO-239 UHF
Frequency stability	<5 parts/million	<5 parts/million	±0.00025%	±0.00025%	±500Hz
AM noise rating	<-70dB spurious/harmonic	<-70dB spurious/harmonic	<-60dB spurious	<-60dB spurious	....
Audio level	+12dBm 600Ω; 3.5V 22kΩ	+12dBm 600Ω; 3.5V 22kΩ	8dB, 600Ω	....	
Metering	RF for/rev dcV	RF for/rev dcV	RF final/driver-I/dcV	RF/main ch mod/dcV	SWR/VSWR, RF, DC
	Main ch mod	Main ch mod	Main/mux mod, multiplier	Mux mod	....
Rack space needed	3.5″	3.5″	3.5″	3.5″	....
Receiver No.	**UHF-450A**	**UHF-900A**	**R-10**	**R-10**	**PRS-10**
Signal conversion	Dual	Dual	Dual	Dual	Dual superhet
Sensitivity	30μV, 65dB S/N	30μV, 65dB S/N	4μV, 50dB S/N	4μV, 50dB S/N	2μV 20dB SNR
Bandwidth	3dB IF BW 280kHz	3dB IF BW 280kHz	>200kHz for FM stereo	>200kHz for FM stereo	380kHz 3dB IF
Metering	RF/baseband/Vdc	RF/baseband/Vdc	RF/LO/subcarrier/dcV	RF/LO/subcarrier/dcV	RF/AF/DC
	Pgm	Pgm	AF levels/mixer	AF levels	....
Rack space needed	3.5″	3.5″	3.5″	3.5″	....
Reader Service Number	**1476**	**1477**	**1478**	**1479**	**1480**

[1]Range is 400-400MHz.
[2]Models available in 790-960MHz, 830-862MHz spectra.
[3]Available for 215-235MHz, 300-325MHz, 450-470MHz, 942-950MHz & 1.2GHz.
[4]For AM stereo applications.

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Manufacturer	Acrodyne			Comark/Thomson	
Model Series	**TRU 10 KVC**	**TRU 30 KV**	**FL series**	**CCT-U-60SK SK-series**	**CTT-U-60SE S-series**
Aural PA device	Diplexed	Multiplexed	External diplexed	Klystrode	Klystron
Cooling system	Vapor-phase	Vapor-phase	Air cooled to 10kW	Water	Water, air
Input ac power	230Vac 3ϕ	230Vac, 3ϕ	230Vac 3ϕ	480Vac 3ϕ	460-500Vac 3ϕ
Power consumption	26kVA	55kW	20kW, 30kW, 58kW	....	....
Visual PA efficiency	....	....	....	>120% figure of merit	>70% beam
Reader Service Number	**908**	**909**	**910**	**911**	**912**

[1]The series extends to 120kW and 240kW using hybrid combiners.
[2]Additional models are rated at 10kW and 30kW; 120kW and 240kW use hybrid combiners.

Manufacturer	Comark/Thomson	EMCEE		Harris Broadcast	
Model Series	**CCT-U-10T T-series[1]**	**TTU-5000DP (-100DP)‡**	**TU-1000EP/U[2]**	**TV-60UX (-120UX)**	**TVE-60S (-120S)**
Visual peak power	10kW	5kW (0.1kW)	1kW	60kW (120kW)	60kW (120kW)
Carrier level regulation	3%	2%	2%	ϕ3%	<2%
Modulation capability	97%	2%	2%	0%	0%
Response vs brightness	±0.5dB	±0.5dB	±0.5dB	±0.75dB	±0.75dB
ICPM uncorrected	....	±2°	±2°	±2°	±2°
Diff phase gain	±2°, 3% max	53°, 5%	±3°, 0.5dB	<±3°, <0.5dB	≤±3°, ≤0.5dB
LF linearity	±2% max	5%	5%	<1dB	<1dB
S/N ratio (AM	>55dB	55dB	55dB	55dB	55dB
K factor 2T, 12.5T	2%, 5%	2%	2%, 2%	2%, 5%	2%, 5%
Harmonics below visual	<-60dB	-60dB	-60dB	-70dB	-70dB
Visual PA device	Tetrode	TH-382 tetrode	Solid-state	Klystron, ext cav	Klystron[3]
Visual IPA type	..	TH-327 & solid-state	Solid-state	....	Solid-state
IF level modulation	Yes	Yes	Yes	Yes	Yes
Aural power output	1kW	0.5kW (0.01kW)	0.1kW	12kW	12kW (24kW)
Carrier deviation	±75kHz	>±25kHz	±100kHz	±120kHz	±120kHz
AF response	±0.5dB, 30Hz-15kHz	±0.2dB, 30Hz-110kHz	±0.5dB, 20Hz-100kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz
Harmonic distortion	0.5dB, ±25kHz dev	0.15%	0.1%	0.5%, 100% mod	0.5%, 100% mod
AM, FM noise	<-50dB, <-60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -59dB
Aural PA device	Tetrode	Diplexed	Diplexed	Klystron, ext cav	Klystron[3]
Aural IPA type	.	Solid-state	Solid-state	....	Solid-state
Cooling system	Air	Forced air	Forced air	Vapor phase	Vapor phase
Input ac power	240Vac 3ϕ	230Vac 3ϕ (115Vac 1ϕ)	220Vac 3ϕ	480Vac 3ϕ	480Vac 3ϕ
Power consumption	36kW black	20kVA (10kW)	5.5kW	137kW (253kW)	135kW (245kW)
Power factor	....	0.95	0.98	>0.95 (>0.9)	>0.95 (>0.9)
Visual PA efficiency	....	45%	53%	65%	65%
Reader Service Number	**913**	**914**	**915**	**916**	**917**

[1]Models rated 1kW, 2kW and 5kW also available.
[2]Models TTU100E, 100W, and TTU10E, 10W are of total solid-state design.
[3]Transmitters designed around integral cavity klystron, VPK-5550 series.

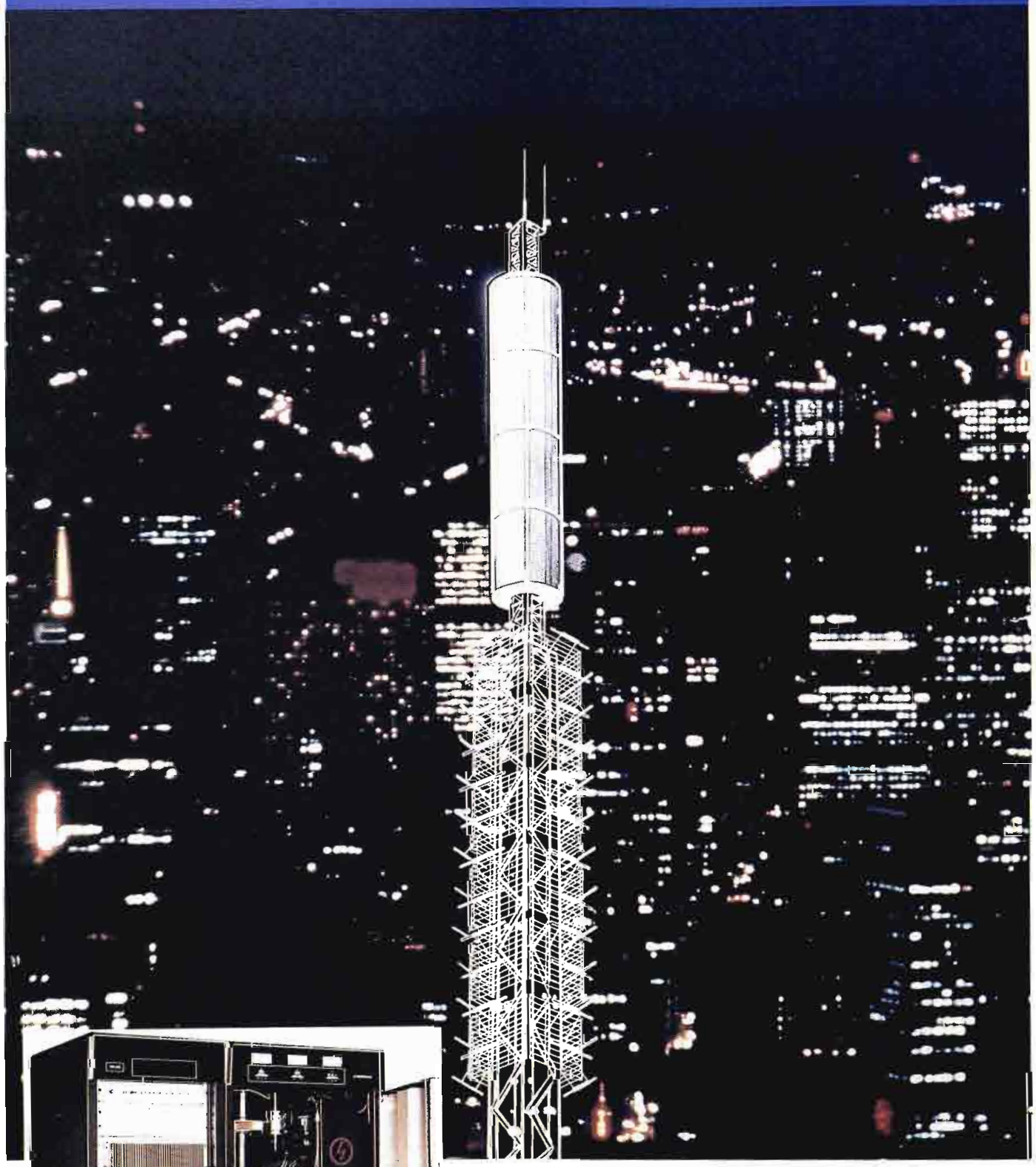
Manufacturer	Information Transmission		Midwest Communications/Technalogix		NEC
Model Series	**ITS-230 (ITS-232)**	**ITS-242 (ITS-235)**	**TX-120 RDP[1]**	**TX-120 SL[3]**	**PCU-960HC (930HC)**
Visual peak power	1kW	10kW (5kW)	120kW (60kW, 120kW MPX)	120kW (60kW, 120kW MPX)	60kW (30kW)
Carrier level regulation	2%	2%	±2%	±2%	2%
Modulation capability	1%	1%	1%	1%	0%
Response vs brightness	±0.5dB	±0.5dB	±1dB	±1dB	±0.5dB
ICPM uncorrected	±2°	±2°	....	....	ϕ±3°
Diff phase gain	±1°, 5%	±1°, 5%	±3°/5%	±3°/5%	≤±3°, ≤±0.5dB
LF linearity	5%	5%	1.0dB or better	1.0dB or better	±1dB
S/N ratio (AM)	....	55dB	55dB	55dB	60dB wtd
K factor 2T, 12.5T	2%, 2%	2%, 4%	2%, 5%	2%, 5%	1.5%
Harmonics below visual	-60dB	-60dB	≤-60dB	≤-60dB	-60dB, -80dB option
Visual PA device	9017 tetrode	TH-582 (TH-382) tetrode	EEV klystron	EEV klystron	Klystron[4]
Aural power output	0.1kW	1kW (0.5kW)	12kW (6kW, 60kW MPX)	12kW (6kW, 60kW MPX)	6kW (3kW)
Carrier deviation	±75kHz (....)	±75kHz	±25kHz	±25kHz	±150kHz
AF response	±0.5dB, 30Hz-15kHz	±0.5dB, 50Hz-15kHz	±0.5dB per pre-emp curve	±0.5dB per pre-emp curve	±0.5dB, 30Hz-15kHz
Harmonic distortion	0.5%	0.5%	0.5% to 50kHz dev.	0.5% to 50kHz dev.	0.5%
AM, FM noise	-55dB, -60dB	-55dB, -60dB	≤-50dB/ ≤-50dB	≤-50dB/ ≤-50dB	-50dB, -60dB
Aural PA device	Diplexed	Tetrode	EEV klystron	EEV klystron	Klystron[4]
Cooling system	Forced air	Vapor-phase	Water	Water	Water, vapor phase
Input ac power	240Vac 1ϕ	240Vac 1ϕ/3ϕ (1ϕ)	460/480/500Vac 3ϕ	460/480/500Vac 3ϕ	480Vac 3ϕ
Power consumption	5kW	26kW (10kW)	....	....	186/148kW (95/76kW)[5]
Power factor	....	....	0.9	0.9	0.9
Visual PA efficiency	....	....	43-48% overall[2]	43-48% overall[2]	60-75%
Reader Service Number	**918**	**919**	**920**	**921**	**922**

[1]Fully redundant system.
[2]With pulser power supply, add 15-20% to system efficiency.
[3]Reduced redundancy.
[4]Designed around Amperex YK-1265 (YK-1233) or EEV K3672 (K3271) external cavity klystrons.
[5]Power consumption indicated without/with pulser power supply in operation.

Manufacturer	PESA	Rohde & Schwarz			Thomson-LGT
Model Series	**TR-series**	**NT325A1 (NT354A1‡)**	**NT414A1 (425A1)†‡**	**NT424A1 (NT444)†‡**	**EUHF 20000S-60000S†**
Visual peak power	5kW	2kW (5kW)	10kW (20kW)	20kW (40kW)	20kW/30kW/60kW
Carrier level regulation	1% or better	±0.3dB	±0.3%	±0.3%	....
Modulation capability	....	75%	>75%	>75%	100%
Response vs brightness	<5%	<0.3dB	<0.3dB	<0.3dB	≤0.3dB
ICPM uncorrected	....	....	....	....	≤3°
Diff phase gain	≤3°, ≤5%	±3°, 5%	±3°, 5%	±3°, 5%	±3°, 0.5dB
LF linearity	≤2%	....	>0.9	>0.9	±1%
S/N ratio (AM)	>60dB L, >54dB C	>63dB wtd	>63dB wtd	>63dB wtd	>60dB
K factor 2T, 12.5T	<1%, <1%	<2% for 20T pulse	<2%, 20T pulse	<2%, 20T pulse	±1.5 2T
Harmonics below visual	<-60dB	-60dB	<20mW, <-60dB	<20mW, <-60dB	-60dB
Visual PA device	Tetrode	TH-393 (TH-382)	Tetrode	Klystron	Klystron
Aural power output	0.5kW	0.2kW (0.5kW)	1kW (2kW)	2kW (4kW)	1/10/1/20/1/100//OE[1]
Carrier deviation	>±50kHz	±30kHz	±30kHz	±30kHz	±100kHz
AF response	±0.2dB	1dB, 30Hz-15kHz	<±1dB, 30Hz-15kHz	<±1dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz
Harmonic distortion	<0.5%	0.4%	<0.4% to 50kHz dev	<0.4% to 50kHz dev	<0.5%
AM, FM noise	<3dB, <3dB	-46dB, -56dB	-46dB, -56dB unwtd	-46dB, -56dB unwtd	-50dB, -60dB
Aural PA device	Diplexed	Multiplexed	Tetrode	Klystron	Diplexed
Cooling system	Forced air	Forced air	Air (air/vapor)	Hypervapotron	Forced air
Input ac power	220-380Vac 1/2/3ϕ	220Vac 3ϕ	220-380Vac 3ϕ	220-380Vac 3ϕ	220-380Vac 3ϕ

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Manufacturer	Itelco	LDL Communications/Larcan		Marconi Communications	
Model/series	T100 (T300) series[1]	TTC 30L (TTC 50LH)	TTS22M (TS44M)	B7540 series[2]	B7530 series[4]
input ac power	110/208Vac	208-242Vac 30ϕ	208-242Vac 3ϕ	380-415Vac 3ϕ	380-415Vac 3ϕ
Power consumption	....	63kVA (120kVA)	45kW (90kW)	<38kW (to 129kW)	<4.9kW (to <59.5kW)
Power factor	>0.9	0.95	>0.95	>0.9	>0.9
Reader Service Number	**943**	**944**	**945**	**946**	**947**

[1]Series includes standard and multiplexed systems with power ranges from 2W to 20kW visual.
[2]Transmitters applicable to CCIR transmission standards G, I, M and N, using NTSC, PAL and SECAM color.
[3]Applicable klystron devices available from EEV, Thorn EMI/Varian, Valvo.
[4]Transmitters applicable to CCIR transmission standards B, M and N with NTSC, PAL and SECAM color.
[5]Models above 2kW visual operate with a tube-type visual PA. 22% visual PA efficiency is typical.

Manufacturer	NEC	PESA		Rohde & Schwarz	Thomson-LGT
Model/series	PCN-1435AH/1 (1430AL/1)	TR-series	TT-4823	NT VHF series✓	EVHF 10000S[1]✓
Frequency band	VHF CCIR III (CCIR-I)	VHF CCIR I/III	VHF CCIR III	VHF CCIR III	VHF CCIR I/III
Visual peak power	35kW (30kW)	1-5kW	2kW or 6kW	2-20kW range	10kW
Carrier level regulation	2%	1%	....		....
Modulation capability	0%	10% or better	10% or better		100%
Response vs brightness	±0.5dB	<0.1%	<0.1%	<0.3dB	<0.7dB
ICPM uncorrected	≥±3°	....	....		≈±1°
Diff phase, gain	≥±3°, ≥±3%	±3°, 5%	±2°, 2%	±3°	±3°, 3%
LF linearity	2%	5%	<1%	>0.9dB 4.43MHz	0.5%
S/N ratio	>50dB	54dB	>50dB	>63dB	60dB
K factor 2T, 12.5T	1.5%	1%	....	.... <2%	2%, 2%
Harmonics below visual	-60dB, -80dB optional	-60dB	<-60dB	<1mW	-60dB
Visual PA device	8984 tetrode (4CX25000A)	Tetrode or solid-state	Thomson TH-361 tetrode	Tetrode	TH-354 tetrode
Aural power output	3.5kW (3kW)	10% of visual	0.2kW or 0.6kW	0.2-2kW range	1kW (500W + 100W)
Carrier deviation	±100kHz	±25kHz	±25kHz	±50kHz	±100kHz
AF response	±0.5dB, 30Hz-15kHz	0.2dB, 50H-15kHz	±3dB, 30Hz-15kHz	<±1dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz
Harmonic distortion	0.5%	0.5%, -60dB IMD	<2%, ±30kHz dev	0.4%	0.5%
AM, FM noise	-50dB, -60dB	-60dB, -60dB	-65dB, -65dB	<-36dB, <-56dB	-50dB, -60dB
Aural PA device	Solid-state	Multiplexed	Diplexed	Multiplexed & tetrode	Solid-state
Cooling system	Forced air	Forced air	Forced air	Forced air	Forced air
Input ac power	240Vac (or 440Vac) 3ϕ	220Vac, 1/2/3ϕ	220-380Vac 3ϕ	220-380Vac 3ϕ	220-380Vac 3ϕ
Power consumption	66kW (60kW) black	....	20kVA, 6kW no mod	52kVA for 20kW	....
Power factor	≥0.9	0.9	>0.9	>0.9	>0.95
Visual PA efficiency	>78.4%	....	....	....	....
Reader Service Number	**948**	**949**	**950**	**951**	**952**

[1]Systems available using internal or external diplexing.

Manufacturer	Thomson-LGT	Townsend Broadcast
Model/series	8000 VHF series✓[1]	TA15TH/L
Frequency band	VHF CCIR I, II, III	VHF CCIR I/III
Visual peak power	1W-30kW(1)	15kW
Carrier level regulation	≥0.3dB	3%
Modulation capability	100%	1%
Response vs brightness	<0.7dB	±0.75dB
ICPM uncorrected	≥3°	....
Diff phase, gain	±3°, 0.95	±2°, 2%
LF linearity	5% lum non-linearity	1dB
S/N ratio	≥64dB wtd	50dB
K factor 2T, 12.5T	±1.5% 2T	2%, 5%
Harmonics below visual	-60dB	-60dB
Visual PA device	Solid-state(1)	Triode
Aural power output	1/10, 1/20 visual[2]	1.5kW
Carrier deviation	±100kHz	±75kHz
AF response	±0.5dB, 30Hz-15kHz	+0.5dB, 30Hz-15kHz
Harmonic distortion	<1%	0.5%
AM, FM noise	≥46dB hum	-55dB, -58dB
Aural PA device	Solid-state	Solid-state
Cooling system	Forced air	Forced air
Input ac power	220-380Vac 3ϕ 2kW	230Vac 3ϕ
Power consumption	0.3-85.5kW model dep	35kVA
Power factor	>0.95	0.9
Reader Service Number	**953**	**954**

[1]5kW to 30kW systems available with one tube; PA devices include TH-354, -371 tetrodes in tube-type designs.
[2]Power level in dual-aural carrier stereo systems is 1/20 and 1/100 of visual.

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RF transmission systems generally applicable to all CCIR transmission formats in frequency bands IV and V, US Channels 14-69. IF-level modulation is common to all models. MTS BTSC stereo operation is possible, however, those marked with a dagger (†) are designed for a European 2-aural carrier stereo system. IPA sections are solid-state unless marked with a double dagger (‡). These systems are typically full-service facility equipment, not for translator service.

Manufacturer	Acrodyne			Comark/Thomson	
Model Series	TRU 10 KVC	TRU 30 KV	FL series	CCT-U-60SK SK-series	CTT-U-60SE S-series
Visual peak power	10kW	30kW	5kW, 10kW, 30kW	60kW[1]	60kW[2]
Carrier level regulation	±3%	±3%	±3%	3%	3%
Modulation capability	3%	3%	3%	97%	97%
Response vs brightness	±0.75dB	±0.75dB	±0.75dB	±0.75dB	±0.75dB
ICPM uncorrected	±2°	±2°	±2°	....	....
Diff phase gain	±2°, 5%	±2°, 5%	±2°, 5%	±3°, 0.5dB	±3°, 0.5dB
LF linearity	5%	5%	5%	1dB or better	<1dB
S/N ratio (AM	....	....	52dB	>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	Tetrode	Klystrode	Klystron
Aural power output	1kW	1kW	10% or 20% of visual(1)	6kW or 12kW	6kW
Carrier deviation	....	....	±50kHz	±25kHz, ±50kHz	>±25kHz
AF response	±1dB, 10Hz-15kHz	±1dB, 10Hz-15kHz	±1dB, 10Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz
Harmonic distortion	....	....	0.5%	0.5% max, ±50kHz	0.5%, ±50kHz dev
AM, FM noise	-52dB, -60dB	-50dB, -60dB	-52dB, -60dB	<-50dB, <-60dB	-50dB, -60dB

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Manufacturer	Rohde & Schwarz		TEM-Milano[2]	Thomson-LGT	TTC/Wilkinson Div
Model Series	NU-series (NR-series)	NU-series	AR20E (AR10F)	EMF series(1)	FM-5000†
Fault logic architecture	Yes	Yes	Solid-state	CMOS/TTL	Relay
μP diagnostics	....	....	....	No	No
Reader Service Number	**749**	**750**	**751**	**752**	**753**

[1]Solid-state systems are constructed from 500W modules.
[2]Available in US through Comad Communications.
[3]Series includes options for FM mono, stereo, multiplex, RDS and SCA operations.
[4]Additional models in series include FM-10000J, 10kW; FM-25000J, 25kW.

Manufacturer	TTC/Wilkinson Div	Varian TVT		Vector Technology
Model Series	FM-2500J[1]	LDM-1239[2]	LDM-1245[2]	FMT-25 (FMT-20)[3]
RF output rating	2.5kW	1kW	5kW	25kW (20kW)
RF output connection	7/8"	Type N	1⅝"	3⅛"
Operating VSWR	....	....	....	2.0:1
Modulation capability	75kHz dev	±150kHz	±150kHz	150kHz
Final amp device	5CX1500B	Solid-state	Solid-state	3CX150000A7(1)
AF input connection	Xfmr balanced	Bal, unbal	Bal, unbal	BNC female, balanced
AF response	±0.5dB 25Hz-100kHz	±0.5dB 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB 30Hz-15kHz
THD distortion	0.5% at 100% mod	0.3%, ±75kHz dev	0.3% ±75kHz	0.35% max
Pre emphasis	75μ	Selectable	Selectable	75, 50μs
AM noise figure	-58dB	-59dB rms	-58dB rms	<-60dB
FM noise figure mono	-80dB, 75μs de-emp	-75dB rms	-75dB rms	<-65dB
Wideband composite input	.	.	.	3.5Vp-p, 30Hz-100kHz
Floor space required	25"x76"x24"	23Wx29D	23Wx44D"	..
Input ac power	240Vac 1φ	220Vac 1φ	220V 3φ	195-220Vac 3φ
Typical power factor	....	>0.9	>0.9	....
Power consumption	9.5kW	2.1kVA	7.75kVA	55.6kW (31.5kW)
System efficiency	....	48%	55%	....
Monitoring output	....	....	Yes	50Ω
Fault logic architecture	Relay	CMOS/TTL	CMOS/TTL	Solid-state, relay
μP diagnostics	No	No	No	No
Reader Service Number	**754**	**755**	**756**	**757**

[1]Other models in the series include FM-1000J 1kW and FM-1500J 1.5kW.
[2]The series includes LDM-1238, 0.5kW; LDM-1237, 0.3kW; LDM-1248, 0.1kW; LDM-1244, 4kW; LDM-1243, 3kW; LDM-1242, 2kW.
[3]The series also includes FMT-12 12kW using 3CX10000A7; FMT-5 5kW and FMT-3 3kW, both using 3CX3000A.

VHF TV Transmitters

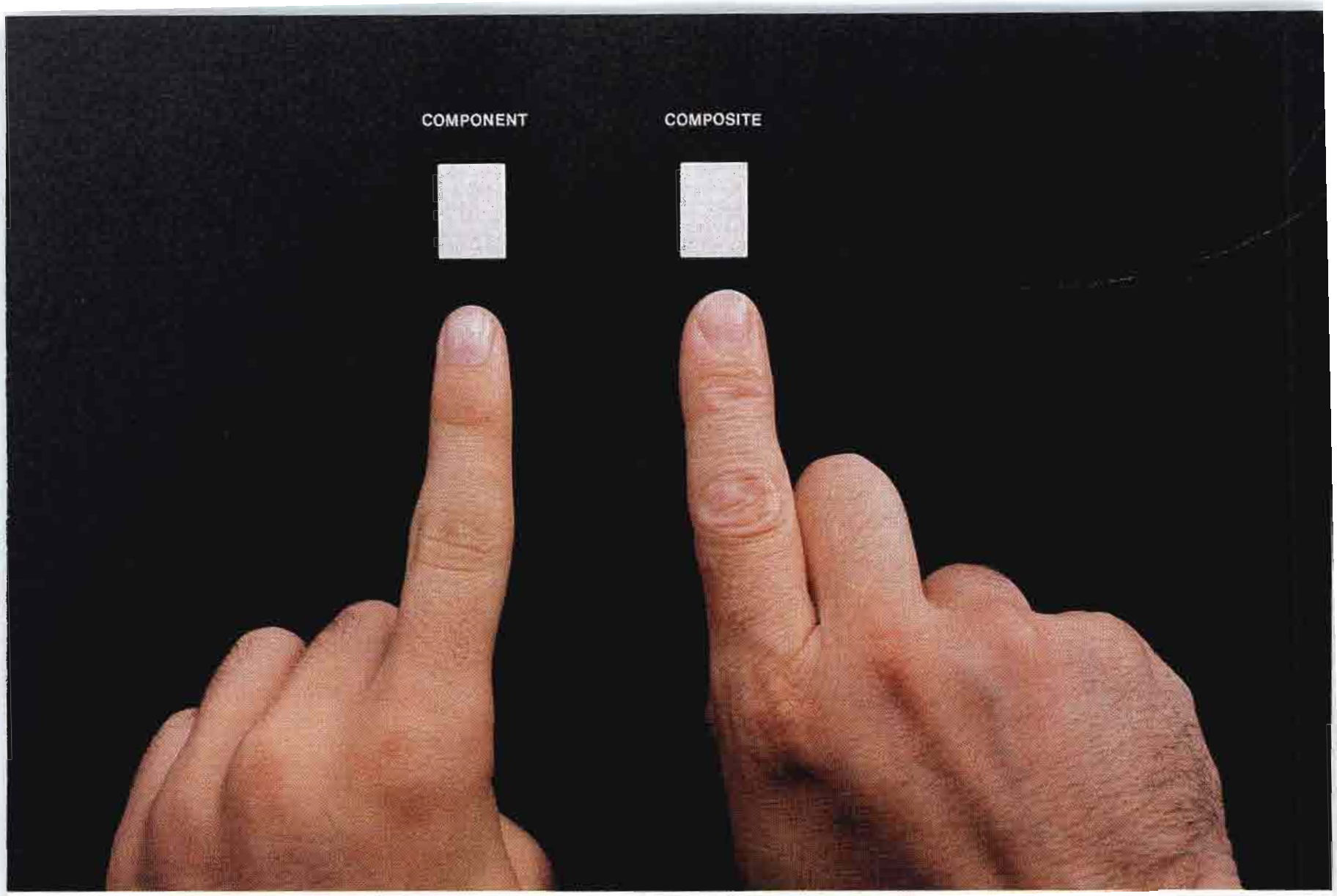
RF transmission for television signals in the low- and high-band VHF spectra. All systems use solid-state visual IPA devices, unless marked with a dagger (†); aural IPA stages are solid-state. IF level modulation is common to all systems. BTSC MTS stereo operation is common to all; systems designed for dual aural carrier stereo are noted with a check (✓). These systems are designed primarily for full service applications, not translator service.

Manufacturer	Acrodyne	Harris Broadcast			
Model/series	FL/30KL(KH) series[1]	TV 20L/30L (TVD-40L/60L)	TV 30H/35H/TVD-60H/70H	TV 50H (TVD-100H)	TV 10H
Frequency band	VHF CCIR I(III)	VHF CCIR I	VHF CCIR III	VHF CCIR III	VHF CCIR III
Visual peak power	30kW	22.5/30kW (45/60kW)	30/35kW/60/70kW	50kW (100kW)	13kW peak
Carrier level regulation	3%	≤2%	2%	2%	2%
Modulation capability	3%	0%	0%	0%	0%
Response vs brightness	±0.75dB	±0.75dB	±0.75dB	±0.75dB	±0.75dB
ICPM uncorrected	±2°	±0.5°	±0.75°	±0.57°	±0.75°
Diff phase, gain	±1.5°, 3%	±1°, 3%	±1°, 3%	±1°, 3%	±1°, 3%
LF linearity	0.5dB	1%	≥1%	≥1%	≥1%
S/N ratio	....	55dB	-55dB	≥55dB	-55dB
K factor 2T, 12.5T	2%, 5%	1%	<1%	2%, 5%	<1%
Harmonics below visual	-70dB	-80dB	-80dB	-80dB	-80dB
Visual PA device	Tetrode	9007 tetrode[2]	9007/8984 tetrode[2]	8984 tetrode[2]	8988
Aural power output	3kW	4.5/6kW	3/3.5kW/6/7kW[4]	5kW (10kW)	1.3kW or 2kW
Carrier deviation	±75kHz	±120kHz	±120kHz	±50kHz	±120kHz
AF response	±0.1dB, 30Hz-50kHz	+0.15dB, 50Hz-50kHz	±0.15dB, 50Hz-50kHz	±0.15dB, 50Hz-50kHz	±0.15dB, 50Hz-50kHz
Harmonic distortion	0.5%	≥1% THD, ≥2% IMD	≥1% THD, 2% IMD	≥1% THD, ≥2% IMD	≥1% THD, 2% IMD
AM, FM noise	-52dB, -58dB	-55dB, -60dB	-55dB, -60dB	-40d8, -55dB	-55dB, -60dB
Aural PA device	Tube or solid-state	3CX10000A7	8807 tetrode	8807 tetrode	8807 tetrode
Cooling system	Forced air	Forced air	Forced air	Forced air	Forced air
Input ac power	480Vac, 3φ	240Vac 3φ	240Vac 3φ	450Vac 3φ	240Vac 3φ
Power consumption	83kW	48kW/60kW[3]	61kW/78kW/130kW/158kW	107kW (216kW)	28.5kW
Reader Service Number	**938**	**939**	**940**	**941**	**942**

[1]Series includes models ranging from 1kW to 50kW.
[2]Visual driver is 8988 tetrode. TVD-series uses two TV- systems in parallel.
[3]TVD-series consumption is slightly greater than double that of the TV-series.
[4]Aural output optionally at 20% of visual.

Manufacturer	Itelco	LDL Communications/Larcan		Marconi Communications	
Model/series	T100 (T300) series[1]	TTC 30L (TTC 50LH)	TTS22M (TS44M)	B7540 series[2]	B7530 series[4]
Frequency band	CCIR -I (-III)	CCIR I/III (III)	CCIR I/III	UHF CCIR IV/I	VHF CCIR III
Visual peak power	20kW	30kW (50kW)	22kW (44kW)	10kW (to 60kW)	1kW (models to 30kW)
Carrier level regulation	0.3dB	2% (3%)	2%	±1%	±1%
Modulation capability	1% or 99%	1%	1%	3%	3%
Response vs brightness	<0.5dB	±0.75dB	±0.75dB	±0.5dB	±0.5dB
ICPM uncorrected	≥3°	±1°	±1°	<±4°	>±4°
Diff phase, gain	≥3°, ≥4%	±2°, 0.5dB	±2°, 0.5dB	±3°, 0.95	<±3°, 0.95
LF linearity	≥5%	0.5dB	0.5dB	95%	90%
S/N ratio	63dB wtd	55dB	55dB	60dB	60dB
K factor 2T, 12.5T	<2%	2%, 5%	2%, 5%	<2% for 2T	2% 2T
Harmonics below visual	<-80dB, <1mW	-80dB	-80dB	-60dB, 20mW	-60dB
Visual PA device	TH-371	Tetrode	Solid-state	4-cavity klystron[3]	Solid-state[5]
Aural power output	2kW	3kW (5kW)	2.2kW (4.4kW)	0.1kW (0.2kW)	0.1kW (0.2kW)
Carrier deviation	±50kHz	±200kHz	±200kHz	±50kHz	±50kHz
AF response	+0.5dB per curve	±0.5dB	±0.5dB	±1dB, 30Hz-15kHz	±1dB, 30Hz-15kHz
Harmonic distortion	<0.3%	0.5%	0.5%	<0.5%	<0.5%
AM, FM noise	<-2dB, <-0dB	-60dB, -60dB	-60dB, -60dB	-50dB, -60dB	-50dB, -60dB
Aural PA device	Solid-state	Solid-state	Solid-state	4-cavity klystron[3]	Solid-state
Cooling system	Forced air	Forced air	Forced air	Forced air	Forced air

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Manufacturer	Continental Electronics	Elcom-Bauer			Energy-Onix
Model Series	817A	610A (625A‡/610C)†	61000	605-FAT (605C†/603)[1]	MK-15 (MK-30)[2]
THD distortion	0.2%, 20Hz-15kHz	<0.25%	0.08%, 0.1% IMD	0.08% (0.1% IMD)	0.2%
Pre emphasis	25/50/75μs	75μs	75μs	25, 50, 75μs	75μs
AM noise figure	-55dB	<-50dB	<-60dB	-40dB, -50dB nonsync	-60dB
FM noise figure mono	-72dB unwtd	<-65dB	<-72dB	<-75dB	-70dB, 75μs deemp
Wideband composite input	Yes	Yes	Yes	Yes	....
Floor space required	72Hx128Wx40D"	70"Wx30"D	23"Wx30"D	23"Wx34"D (35"Wx30"D)	58x32.5x73.6"
Input ac power	200-250Vac 3φ 60Hz	208-240Vac 3φ	110-220Vac 1φ	440 or (220)Vac 3φ	230V, 60Hz, 3φ
Typical power factor	>0.95	0.9	0.9	0.9	....
Power consumption	99kVA	21kW (38kW)	2.7kVA	8.2kW (8.9kW/7.1kW)	24kW 48kW
System efficiency	64%	80% final amp	....	....	....
Monitoring output	10-40Vrms, 50Ω	2V 50Ω	Yes	Yes	....
Fault logic architecture	μP based	Relay	CMOS/TTL	Solid-state	μP
μP diagnostics	No	No	No	DTMF remote control (No)	No
Reader Service Number	734	735	736	737	738

[1]Additional models of the series include 601A, rated 1kW; 602A, rated 2kW; 603 uses 4CX3500A.
[2]Model MK-1.5, rated 1.5kW, uses 3CX300A7 triode.

Manufacturer	Harris Broadcast		ITAME SA	ITELCO
Model Series	FM-40K‡ (FM-K series)	HT-10FM (HT-FM series)	Tauro 30kW [4]	T-294 (T-234)[5]
RF output rating	40kW (1kW, 50kW[1])	10kW[3]	30kW (10k/5k/3k/1kW)	55kW (12.5kW)
RF output connection	3⅛" (1⅝", 6⅛")	3⅛" EIA	3⅛" (1⅝)	....
Operating VSWR	1.7:1 max	VSWR protected	....	....
Modulation capability	±100kHz	±200kHz	>±75kHz	±75kHz
Final amp device	4CX15000A(2)	4CX7500A tetrode	4CX5000A	Solid-state modules
AF input connection	Balanced	Bal resistive 600Ω	Bal 600Ω, 1kΩ unbal	600Ω balanced
AF response	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 40Hz-15kHz	0.2dB 20Hz-15kHz
THD distortion	0.15% THD/IMD	0.08%	0.5%	<0.05% ±75kHz dev.
Pre emphasis	25, 50, 75μs	25, 50, 75μs	50μs & options	50/75μs jumper
AM noise figure	-50dB	<-50dB	<-65dB	<-70dB
FM noise figure mono	-80dB	-80dB	>70dB	<-84dB CCIR wtd
Wideband composite input	2kΩ resistive	Yes	w/2 subcarriers	20Hz-100kHz
Floor space required	33"Wx30"D	33"Wx34"D	173cm x 98cm	86Wx32D (43Wx32D)
Input ac power	240Vac 3φ[2]	240Vac 3φ	220-380Vac 3φ	208/380Vac 3φ
Typical power factor	0.95	....	....	....
Power consumption	60kW (2.1kW, 80kW)	15.7kW	43kW	96kVA (19kVA)
Monitoring output	Yes	Yes	....	Yes
Fault logic architecture	μP	μP	μP	μP
μP diagnostics	....	ColorStat/StatusPlus	Yes	....
Reader Service Number	739	740	741	742

[1]Additional models include 100W, 300W; 1kW system uses 4CX1000A tetrode; 50kW system includes 8990 tetrode.
[2]1kW system operates on 240V, single phase supply.
[3]Series includes 3.5kW, 5kW, 20/25kW, 30/35kW systems.
[4]Other products range from 1kW to 10kW.
[5]Other products range from 50W to 27.5kW.

Manufacturer	Marconi Communications	McMartin Industries	QEI Corporation		
Model Series	B6525 (B6526)	BF- M series†	FMQ-series	FMQ-3500, -5000	695T1kW
RF output rating	10kW (20kW)[1]	50W-30kW[2]	10kW (20kW, 30kW)	3.5kW, 5kW	0.5k-1.25kW
RF output connection	3⅛" EIA	Power dependent	1⅝" (3⅛" 3⅛")	1⅝"	1⅝"
Operating VSWR	1.4:1	....	....	....	....
Modulation capability	±75kHz	±150kHz	>150kHz	>150kHz	>150kHz
Final amp device	8986 (9011) tetrode	Triode, grounded grid	YU148 (3CX15000A7)	3CX3000A7 triode GG	Solid-state
AF input connection	Xfmr bal	600Ω bal	Bal 600Ω	Bal 600Ω	Bal 600Ω
AF response	<±0.5dB 40Hz-15kHz	±0.5dB 30-15k	±0.5dB 30-15k	±0.5dB 30-15k	±0.5dB 30-15k
THD distortion	<0.4% 100% mod	<0.3% <0.2% IMD	0.025%	0.025%	0.025%
Pre emphasis	0/50μs switchable	50, 75, 150	75μs	75μs	75μs
AM noise figure	-50dB	>55dB	-55dB	-55dB	-55dB
FM noise figure mono	-70dB de-emph unwtd	>65dB	-75dB	-75dB	-75dB
Wideband composite input	Yes	Yes	Unbal 10kΩ	Unbal 10kΩ	Unbal 10kΩ
Floor space required	24Wx40D (42Wx40D)	....	....	....	....
Input ac power	380/415V 3φ	208/240Vac 3φ(2)	240V, 60Hz, 1φ (3φ)	240V, 60Hz, 1φ	240V, 60Hz, 1φ
Typical power factor	>0.9	....	....	....	....
Power consumption	<16.7kW (<33kW)	Power dependent	<17kW, 35kW, 50kW	£6.4kW, <9.5kW	2kW for 1.25kW
System efficiency	60% (61%)	....	....	....	....
Monitoring output	5Vrms 50Ω	Yes	Yes	Yes	Yes
Fault logic architecture	CMOS/TTL & relay	Relay	CMOS/TTL	CMOS/TTL	Solid-state
μP diagnostics	No	No	No	No	Optional
Reader Service Number	744	745	746	747	748

[1]Other models include 1kW and 2kW systems.
[2]Systems available with combiners to double power output with parallel configurations.

Manufacturer	Rohde & Schwarz		TEM-Milano[2]	Thomson-LGT	TTC/Wilkinson Div
Model Series	NU-series (NR-series)	NU-series	AR20E (AR10F)	EMF series(1)	FM-5000†
RF output rating	1kW to 5kW[1]	5kW,10kW	2kW (10kW)	100W-5kW	5kW
RF output connection	BNC to 1⅝" EIA	Dezifix D	⅞" 1⅝"	EIA type	1⅝"
Operating VSWR	<1.5:1	<1.5:1	<2.0:1	....	....
Modulation capability	>±75kHz	>±75kHz	±75kHz ±100kHz peak	>±150kHz max	75kHz dev
Final amp device	Solid-state (tetrode)	Siemens RS 2024 CL	Triode (tetrode)	Solid-state	4CX5000A
AF input connection	4kΩ bal L/R	600Ω bal, 2kΩ unbal	Bal, unbal 600Ω	Balanced	Xfmr balanced
AF response	<±0.3dB, 40-75k	<±0.3dB, 40-75k	±0.1dB 30-40k	±0.2dB, 40Hz-15kHz	±0.5dB 25Hz-100kHz
THD distortion	<0.4% ±75kHz dev	<0.4% ±75kHz dev	<0.4%, <0.3% IMD	<0.5%	0.5% at 100% mod
Pre emphasis	50, 75	50, 75	50, 75μs	50 (75 opt)	75μ
AM noise figure	>60dB unwtd	>60dB unwtd	>70dB	<-52dB	-58dB
FM noise figure mono	>68dB @ ±40kHz dev	>68dB @ ±40kHz dev	>70dB mono	<-60dB	-80dB, 75μs de-emp
Wideband composite input	4kΩ bal(2)	600Ω bal, 2kΩ unbal	....	Yes	.
Floor space required	70Wx98Hx29D	70Wx98Hx29D	..	23Wx30D	24.5x38
Input ac power	120-1φ 220/380-3φ	380Vac 3φ	240Vac-1φ, 380Vac-3φ	120/240Vac	240Vac 3φ
Typical power factor	>0.85 to >0.95	>0.95	>0.9	....	....
Power consumption	2kW to 8.86kW	10.5kVA, 21kVA	<3.8kVA (<21.3kVA	0.3kW-10.5kW	9.5kW
Monitoring output	Yes	Yes	Yes	Yes	....

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Manufacturer	Radio Systems	TTC/Wilkinson	
Model Series	**TR-20**	**AM-3000D[1]**	**AM-10000D[1]†**
Carrier stability	±0.002%	±10Hz	±10Hz
Carrier shift	2%	<3%	<3%
Modulation max	100%	140%	140%
AF input connection	Unbal	Xfmr bal	Xfmr bal
AF response	1dB, 20Hz-15kHz	±1.5dB, 50-10k 95% mod	±1.5dB, 40Hz-10kHz
THD distortion	2%	<3%, 100Hz-10kHz	<3%, 100% mod
AM noise figure	-60dB	<-60dB unwtd	<-60dB unwtd
Final amp device	Solid-state	4-1000A	3CX10000A3
Modulator final device	Solid-state	4-1000A	4CX3000
Stereo exciter preferred	....	C-Quam sep to 33dB	C-Quam sep to 33dB
Floor space required	Rack-mount	34″Wx38″D	40″Wx42″D
Input ac power required	110Vac 1φ	240Vac 3φ	240Vac 3φ
Power factor	....	0.9	0.9
Power consumption	0.1kVA	9.6kW 100% mod	27kW 100% mod
System efficiency	....	80%	80%
Fault logic architecture	....	Relay	Relay
μP diagnostics	No	No	No
Reader Service Number	**721**	**722**	**723**

[1]Other models in the series include: AM-1000B, 1kW; AM-2500B, 2.5kW; AM-5000C, 5kW; AM-25000C, 25kW; AM-50000C, 50kW.

FM Radio Transmitters

RF transmitting equipment using frequency modulation and operating in the 88-108MHz spectrum (CCIR II band). Intermediate power amplifiers are solid-state unless the model is marked with a dagger (†). All models are capable of operating in FM multiplex stereo service, with each manufacturer providing appropriate exciters and generators. All systems include an auto recycle feature. When a separate power supply cabinet is needed, the model is marked with a double dagger (‡).

Manufacturer	AEG/Bayly		Broadcast Electronics		CCA
Model Series	**S-3206 (-3185/-3175)**	**S-3217**	**FM-10A (FM-35A)[1]‡**	**FM-3.5A (-5A)[2]**	**FM500G**
RF output rating	5kW (1.5kW/1kW)	10kW (3k/5k modes)	10kW (35kW)	3.5kW (5kW, 1.5kW, 1kW)	500W
RF output connection	13/20 female	1⅝″	3⅛″	1⅝″ (1⅝″)	50Ω type N
Operating VSWR	....	....	<1.8:1	<2:1 (1.8:1)	....
Modulation capability	±100kHz	±100kHz	>±200kHz	>±200kHz	±150kHz
Final amp device	Solid-state modular	RS 2032CL retrode	4CX7500A tetrode(1)	4CX3500A tetrode(1)	3CX800A7 GG triode
AF input connection	Unbalanced >2kΩ	Unbalanced	Bal 600Ω, unbal 10kΩ	Bal/unbal resistive	150/600Ω bal
AF response	<±0.3dB 40Hz-75kHz	±0.2dB 40Hz-43kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	....
THD distortion	<0.4%	<0.4%	0.08%, 0.08% IMD	0.08%, 100% mod	<0.2%, <0.5% IMD
Pre emphasis	50μs (75μs option)	50μs, 75μs	Switch selected	75/50/25μs switched	
AM noise figure	<-60dB unwtd (<-50)	<-50dB unwtd	-45dB (-55)	-40dB	<-60dB
FM noise figure mono	<-64dB unwtd	<-62dB unwtd	-72dB 75μs deemp	-75dB 75μs deemp	<-70dB
Wideband composite input	Yes	Yes	Yes	Yes	10kΩ unbal
Floor space required	23.6Wx39.4D	23.6Wx39.4D	33.7x37.2x69.8″	34.5x37.25x70″	....
Input ac power	380Vac 3φ (220)	380Vac 3φ (110/220)	240V, 60Hz, 3φ	240V, 60Hz, 1φ	110/220Vac
Typical power factor	....	....	>0.94	>0.90	....
Power consumption	9kW (2.5kW/1.9kW)	19kVA	17.2kW (51kW)	6.8kW (8.3)	....
Monitoring output	Driver, transmitter	Driver, transmitter	50Ω test port	....	Yes
Fault logic architecture	BCD encoded	BCD encoded	μP system	μP system	Solid-state
μP diagnostics	Yes w/memory	Yes w/memory	MVDS w/remote control	MVDS w/remote control	....
Reader Service Number	**724**	**725**	**726**	**727**	**728**

[1]Additional models in this series and their final output device include: FM-20A, 4CX12000A/8989; FM-30A, 4CX20000A/8990. The FM-35A uses a 4CX20000C tetrode in the power amplifier.
[2]Additional models in this series and their final output device include: FM-1A, 3CX1500A7; FM1.5A, 3CX1500A7/8877.

Manufacturer	Cemtys	Continental Electronics, division of Varian			
Model Series	**EF-5KX/80 (10KX/20KX)**	**816R-5B (817R-5B)‡**	**814C solid-state**	**814R-1 (814B/815A)**	**816-2B (817R-2B)[1]**
RF output rating	5kW (10kW/20kW)	35kW (70kW)	3.8kW	2.4kW (4.3kW/5kW)	20kW (40kW)
RF output connection	1⅝″ (1⅝″, 3⅛″)	3⅛″, 6⅛″	1⅝″ EIA	1⅝″ EIA male	3⅛″, 6⅛″
Operating VSWR	1.8:1	<2:1	<2:1	<2:1	<2:1
Modulation capability	±150kHz	±150kHz	±150kHz	±150kHz	±150kHz
Final amp device	YL-1631 cer. tetrode	9019/YC130 (2 tubes)	Solid-state	5CX1500B (4CX3500A)	4CX15,000A
IPA amp device	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
AF input connection	Bal/unbal 600Ω, 1kΩ	Active bal	Active bal	Active bal	Active bal
AF response	±0.5dB 40Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz	0.5dB, 20Hz-15kHz
THD distortion	<0.25%	<0.1%, 20Hz-15kHz	....	0.08%, 20Hz-15kHz	0.08%, 20Hz-15kHz
Pre emphasis	25/50/75μs	25/50/75μs	25/50/75μs	25/50/75μs	25/50/75μs
AM noise figure	<-55dB	-55dB	....	-40dB (-50dB)	-55dB
FM noise figure mono	-70dB unwtd	-72dB (-75dB)	....	-75dB	-75dB unwtd (-72dB)
Wideband composite input	1-4V (40Hz-75kHz)	Yes	Yes	Yes	Yes
Floor space required	123.6cmx90cm	69Hx72(160)Wx28D″	69Hx35Wx34D″	69Hx35Wx24D″ (x34D″)	69Hx72(160)Wx28D″
Input ac power	220-380Vac 50/60Hz 3φ	200-250Vac 3φ 60Hz	200-250Vac 1φ 60Hz	200-250Vac 1φ 60Hz	200-250Vac 3φ 60Hz
Typical power factor	>0.93	>0.92	....	>0.94 (>0.92)	>0.92
Power consumption	....	57kVA (114kVA)	....	4.9kVA (7.6kVA/9.7kVA)	33.5 (67.3)kVA
System efficiency	....	66%	....	57% (55%)	58% (57%)
Monitoring output	Yes	10-40Vrms, 50Ω	10-40Vrms, 50Ω	10-40Vrms, 50Ω	10-40Vrms, 50Ω
Fault logic architecture	CMOS	Relay	Solid-state	Relay	Relay
μP diagnostics	....	No	No	No	No
Reader Service Number	**729**	**730**	**731**	**732**	**733**

[1]Additional models in this series include 816-3, rated 25kW; 816-4, rated 27.5kW; 817R-1, rated 50kW; and 817-R4 rated 55kW.

Manufacturer	Continental Electronics	Elcom-Bauer			Energy-Onix
Model Series	**817A**	**610A (625A‡/610C)†**	**61000**	**605-FAT (605C†/603)[1]**	**MK-15 (MK-30)[2]**
RF output rating	60kW	10kW (25kW/10kW)	1kW w/Fluorinert cooling	5kW (5kW/3kW)	15kW 30kW
RF output connection	6⅛″ EIA male	3⅛″	⅞″	1⅝″	1⅝″ 3⅛″
Operating VSWR	<2:1	....	....	....	....
Modulation capability	±150kHz	±150kHz	±200kHz	±200kHz (±150kHz)	±200kHz
Final amp device	4CX40,000G	3CX10000A7 (15000A7)	Solid-state modules	4CX3500A (3CX3000A7)	3CX10000A7 (-20000A7)
AF input connection	Active bal	Bal 600Ω, unbal 10kΩ	Bal, unbal, 10kΩ	Bal 600Ω, unbal 10kΩ	Balanced
AF response	0.5dB, 20Hz-15kHz	±0.1dB 30Hz-100kHz	±0.1dB 30Hz-100kHz	±0.1dB 30Hz-100kHz	0.2dB, 30-100k

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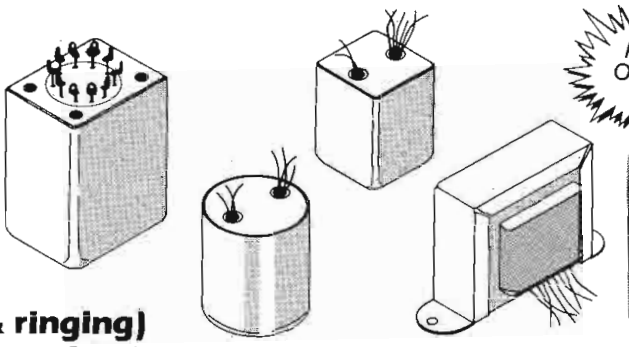
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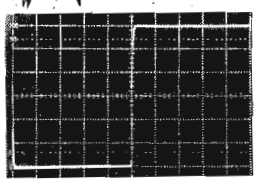
Low distortion

Wide bandwidth

Minimum transient distortion (overshoot & ringing)



REVISED OCTOBER 1988



JE-16A
2 kHz Square Wave

INPUT TRANSFORMERS AND SPECIAL TYPES

Model	Application	Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20Hz Max Input Level[1]	Typical THD Below Saturation (%) 20 Hz / 1 kHz	Frequency Response (dB ref. 1 kHz) 20 Hz / 20 kHz	Band-Width[2] –3 dB @(kHz)	20 kHz Phase[6] (degrees)	Over-Shoot (%)	Noise Figure (dB)	Magnetic Shield[4] (dB)	Number of Faraday[4] Shields	Package[5]	PRICES 1-19	100-249	1000
MICROPHONE INPUT																
JE-16-A JE-16-B	Mic in for 990 opamp	150-600	1:2	+8	0.036/0.003	−0.08/−0.05	230	<1	<1	1.7	−30	1	A=1 B=2	79.19 87.04	52.36 57.55	36.12 39.70
JE-13K7-A	Mic in for 990 or I.C.	150-3750	1:5	+8	0.036/0.003	−0.09/−0.21	85	<1	<2	2.3	−30	1	1	80.55	53.26	36.87
JE-115K-E (Improved)	Mic in for I.C. opamp	150-15 K	1:10	−2.5	0.125/0.010	−0.25/−0.06	95	<1	<1	1.5	−30	1	3	58.09	38.41	30.11
LINE INPUT																
JE-11P-9	Line in	15 K-15 K	1:1	+26	0.025/0.003	−0.03/−0.30	52	<1	<3		−30	1	1	128.33	84.86	58.54
JE-11P-1	Line in	15 K-15 K	1:1	+17	0.045/0.003	−0.03/−0.25	85	<1	<1		−30	1	3	54.93	36.32	28.46
JE-6110K-B	Line in bridging	36 K-2200 (10 K-600)	4:1	+24	0.005/0.002	−0.02/−0.09	125	<1	<1		−30	1	1	77.65	51.34	37.68
JE-10KB-C	Line in bridging	30 K-1800 (10 K-600)	4:1	+19	0.033/0.003	−0.11/−0.08	160	<1	<2		−30	1	3	55.83	36.91	25.76
JE-11SSP-8M	Line in/ repeat coil	600/150-600/150	1:1 split	+22	0.035/0.003	−0.03/−0.00	120	<1	<3.5		−30	1	4	204.36	135.12	93.22
JE-11SSP-6M	Line in/ repeat coil	600/150-600/150	1:1 split	+17	0.035/0.003	−0.25/−0.00	160	<1	<3		−30	1	5	103.31	68.31	47.13
SPECIAL TYPES																
JE-MB-C	2-way[3] mic split	150-150	1:1	+1	0.050/0.003	−0.16/−0.13	100	<1	<1		−30	2	3	47.09	31.14	24.41
JE-MB-D	3-way[3] mic split	150-150-150	1:1:1	+2	0.044/0.003	−0.14/−0.16	100	<1	<1		−30	3	3	80.54	53.25	41.69
JE-MB-E	4-way[3] mic split	150-150-150-150	1:1:1:1	+10	0.050/0.002	−0.10/−1.00	40	<1	<1		−30	4	1	121.48	80.32	55.54
JE-DB-E	Direct box for guitar	20 K-150	12:1	+19	0.096/0.005	−0.20/−0.20	80	<1	<1		−30	2	6	57.29	37.88	29.64

1. (dBu) Max input level = 1% THD; dBu = dBv ref. 0.775 V
2. With recommended secondary termination
3. Specifications shown are for max. number of secondaries terminated in 1000 ohm (typical mic preamp)
4. Separate lead supplied for case and for each faraday shield
5. Except as noted, above transformers are cased in 80% nickel mu-metal cans with wire leads.
6. Deviation from linear phase, referenced to 1 kHz.

PACKAGE DIMENSIONS:

	W	L	H
1 =	1 5/16" Diam.		× 1 9/16"
2 =	1 3/16"	× 1 3/16"	× 1 5/8"
3 =	1 1/8" Diam.		× 1 1/16"
4 =	1 1/2"	× 1 3/4"	2 1/2" w/solder terminals
5 =	1 5/8" Diam.		× 1 3/4"
6 =	1 1/8" Diam.		× 15/16"

NICKEL CORE OUTPUT TRANSFORMERS[7]

Model	Construction	Nominal Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20 Hz Max Output Level[8] (dBu)	across (n) windings	600 Ω Load Loss (dB)	DC Resistance per Winding	Typical THD Below Saturation (%) 20 Hz / 1 kHz	Frequency Response (dB ref. 1 kHz) 20 Hz / 20 kHz	Band-Width –3 dB @ (kHz)	20 kHz Phase[6] (degrees)	Over-Shoot (%)	Package[11]	PRICES 1-19	100-249	1000
JE-11-BMCF	Bifilar 80% nickel	600-600	1:1	+26	1	−1.1	40 Ω	0.002/0.002	−0.02/−0.00	>10MHz	<0.5	<1[10]	7	92.38	61.08	43.47
JE-11-DMCF	Bifilar 80% nickel	600-600	1:1	+21	1	−1.0	38 Ω	0.004/0.002	−0.02/−0.00	>10MHz	<0.5	<1[10]	8	63.71	42.12	29.49
JE-11-EMCF	Bifilar 80% nickel	600-600	1:1	+18	1	−1.1	40 Ω	0.007/0.002	−0.02/−0.00	>10MHz	<0.5	<1[10]	9	51.24	33.88	23.38
JE-123-BLCF	Quadfilar	600-600 150-600	1:1 1:2	+32	2	−1.1	20 Ω	0.041/0.003	−0.02/−0.01	>450 170	<0.5 <1	<1[9]	7	77.55	45.29	31.25
JE-11SS-DLCF	Bifilar split/split	600-600 150-600	1:1 1:2	+27	2	−1.0	19 Ω	0.065/0.003	−0.02/−0.01	>10MHz 245	<0.5 <0.5	<1[9]	8	56.30	37.22	25.68
JE-11-ELCF	Bifilar	600-600	1:1	+23.5	1	−1.1	40 Ω	0.088/0.003	−0.03/−0.00	>10MHz	<0.5	<1[10]	9	38.18	25.24	17.41
JE-11-FLCF	Bifilar	600-600	1:1	+20.4	1	−1.6	58 Ω	0.114/0.003	−0.03/−0.00	>10MHz	<0.5	<1[10]	10	28.72	18.99	13.10
JE-112-LCF	Quadfilar	600-600 150-600	1:1 1:2	+20.4	2	−1.6	29 Ω	0.114/0.003	−0.03/−0.01	>450 205	<0.5 <1	<1[9]	10	34.44	22.77	15.71
JE-123-ALCF	Quadfilar	66.7-600	1:3	+26.5	3	−1.3	8 Ω	0.125/0.003	−0.04/+0.06	190	<1	<6[9]	8	71.86	36.60	25.42
JE-11S-LCF	Bifilar w/ split pri.	600-600 150-600	1:1 1:2	+30	1 (sec)	−1.7	63 Ω	0.058/0.002	−0.02/+0.01 −0.02/−0.05	>10MHz 155	<0.5 <1	<1[9]	8	70.01	35.38	24.41

7. Multifilar construction has no faraday shield: cannot be used as input transformer. All specifications are for 0 Ω source, 600 Ω load.
8. Max output level = 1% THD; dBu = dBv ref. 0.775 V
9. Source amplifier −3 dB @ 100 kHz
10. Source amplifier −3 dB @ 200 kHz
11. Output transformers are horizontal channel frame type with wire leads, vertical channel frames available. PC types available.

PACKAGE DIMENSIONS:

	W	L	H	Mounting Centers
7 =	1 1/2"	× 2 5/16"	× 1 15/16"	2 13/16"
8 =	1 5/16"	× 1 15/16"	× 1 5/8"	2 3/8"
9 =	1 1/8"	× 1 11/16"	× 1 3/8"	2"
10 =	1 1/16"	× 1 7/16"	× 1 3/16"	1 3/4"

These charts include the most popular types which are usually available from stock. Many other types are available from stock or custom designs for OEM orders of 100 pieces or more can be made to order. Certified computer testing is available for OEM orders. Call or write for applications assistance and/or detailed data sheets on individual models.

Prices shown are effective 10/1/88 and are subject to change without notice. Packing, shipping, and applicable sales taxes additional.

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Manufacturer	CSI Electronics		Elcom Bauer		Harris Broadcast
Model Series	**T-100-A1[1]†‡**	**T-10-A1[1]†**	**725 (715C)[2]‡**	**710C[3]**	**SX-A series[4]**
Power consumption	295kW	27kW	56kW 100% mod (28kW)	25kW	11.6kW at 100% mod
System efficiency	64%	56%	54%	54%	>65%
Fault logic architecture	Relay	Relay	Relay	Relay	μP
Reader Service Number	**701**	**702**	**703**	**704**	**705**

[1]Other models in this series include: T-25-A1, 27.5kW; T-1-A1, 1.1kW; T-50-A1,55kW; T-3-A1, 3kW; T-5-A1, 6kW.
[2]Model 715C includes two 4CX5000A modulators driving a 4CX15000A final.
[3]Other similar models in the series include 701B, 1kW; 705C, 5kW.
[4]The 1kW and 2.5kW systems may operate from 220Vac 1φ; dissipation for 1kW, 22.5kW; for 2.5kW, 5.8kW.

Manufacturer	Harris Broadcast				ITAME SA
Model Series	**SW-100B (SW-50B)†**	**VP-100B† (VPD-200A)**	**DX-10 Digital AM**	**MW-50C3†**	**Tauro-S series‡**
Service band	Shortwave	Broadcast	Broadcast	Broadcast	Broadcast
RF output rating	100kW (50kW)	100kW (200kW[1])	10kW	50kW rated	10kW (5kW, 2kW)
RF output connector	300Ω bal	230Ω unbal	1⅝"	3⅛" EIA	1⅝" (LC female)
Carrier stability	±1x10⁻⁶Hz Xtal	±10Hz (±20Hz)	±10Hz	±10Hz	±5Hz & options
Carrier shift	<2% 95% mod 1kHz	<2% 100% mod (≤2.5%)	2%	<2% 100% mod 1kHz	<3% 1kHz
Modulation max	100% 60 min PDM mod	95% 10 min	140% at 10kW	125% PWM modulation	125% max, PDM
AF input connection	Bal/unbal 600Ω/150Ω	600Ω bal	Act bal 600Ω	Bal 600Ω	Balanced 600Ω
AF response	±1.5dB 50-10k	±1(1.5)dB 40Hz-10kHz	-0.6dB 30Hz-10kHz	±1dB 20Hz-12.5kHz	±1dB, 20Hz-10kHz
THD distortion	≤3% 95% mod	≤3%	≤1%	≤2.4% 4:1 SMPTE	<2%
AM noise figure	-55dB	-55dB	≤-60dB	<-60dB	>60dB
Final amp device	4CV100000E/P	4CV100000CP	Solid-state 48 modules	2-4CX35000C	3CX10000A(3000F7/1200A7)
Modulator final device	4CV100000E/P	4CV100000CP	Solid-state	Solid-state	4CX15000A(3000F7/1200A7)
Stereo exciter preferred	....	Yes	Harris exciter STX-1B	Yes	Ready
Floor space required	....	....	72"Wx30"D	....	115cmx95cm
Input ac power required	440Vac 3φ	440Vac 3φ	220/440Vac 3φ	480Vac 3φ(1)	220-380Vac 3φ
Power factor	>0.95	0.95%	....	0.95	....
Power consumption	250kW (130kW) 100%	155kW (315kW)	≤17.9kW 100% mod	110kW 100% mod	23.5kVA (13.5, 5.5)
System efficiency	>55% ave mod	>65%	≥84%	≥60% ave mod	....
Fault logic architecture	Solid-state, relay	Relay, solid-state	μP system	Solid-state, relay	Solid-state
μP diagnostics	No	....	ColorStat system	LED panel	....
Reader Service Number	**706**	**707**	**708**	**709**	**710**

[1]VPD-200A combines two VP-100B systems, doubling tube count; vapor-phase cooling is used in both systems.

Manufacturer	LPB Inc	Marconi Communications			
Model Series	**AM-60 (AM-30, AM-5)**	**B6034 (6035/-36/-37)[1]**	**B6140 (B6141/6142)**	**B6127 (B6126[2])**	**B6038**
Service band	Broadcast	Broadcast	Shortwave	Shortwave	Broadcast
RF output rating	60W (30W, 5W)	50kW (100/150/200kW)	3kW (7.5kW, 12.5kW)	500kW (300kW)	1kW
RF output connector	SO-230 UHF	3⅛" (6⅛") 50Ω	50Ω unbal	300Ω bal, 50-75Ω unbal	7/16" 50Ω
Carrier stability	±10Hz	±10Hz (hi stab opt)	<±1ppm/year	<±10Hz	±10Hz
Carrier shift	2% 100% mod	<4%, 100% mod	....	2.5% 100% mod 400Hz	<5% 100% mod
Modulation max	110-120%	125%	100%	100% Pulsam Modulation	100%
AF input connection	Xfmr bal	Xfmr bal	600Ω bal	600Ω bal	600Ω bal
AF response	±1dB, 20Hz-15kHz	±1dB, 30Hz-6kHz	-2,+1 60Hz-6kHz	±1dB, 50Hz-6kHz	±2dB, 40Hz-10kHz
THD distortion	<2%	<3%, 90% mod	<2.5% 90% mod	<4% 90% mod	<3%, 90% mod
AM noise figure	-55dB	-58dB unwtd	<-55dB	<-56dB	-60dB unwtd
Final amp device	Solid-state	2 4CX35000C tetrode	Power tetrode	TH558 Hypervapotron	Solid-state modules
Modulator final device	Solid-state	2 4CX1500B tetrode	Solid-state	4CW25000A water cooled	Solid-state
Stereo exciter preferred	Motorola or Kahn	Motorola	Not applicable	Not applicable	....
Floor space required	Rack, wall mount	144"Wx61"D	....	181"Wx189"D	32"Wx22"D
Input ac power required	110Vac 1φ	380-415Vac 3φ	100-250/380-440Vac	308-415Vac 3φ	230Vac 3φ
Power factor	....	>0.9	>0.9	>0.9	>0.9
Power consumption	250W (150W, 45W)	<129kVA	....	...(429kW)	3.5kW 100% mod
System efficiency	25%	52% at carrier	....	>62% (64%)	48%
Fault logic architecture	Relay	CMOS, TTL, relay	MOS/TTL, relay	MOS/TTL, relay	CMOS/TTL
μP diagnostics	No	No	Yes	Yes	No
Reader Service Number	**711**	**712**	**713**	**714**	**715**

[1]Combinations of 50kW units with bridged-T circuits form 100kW, 150kW and 200kW. Values are given for 50kW equipment.
[2]The 300kW system uses Thomson TH537 and EIMAC 4CW25000A tetrodes.

Manufacturer	Marconi Communications	McMartin Industries	Nautel		
Model Series	**B6040**	**BA- K series**	**AMPFET ND 10 (ND 5)‡**	**AMPFET 2.5 (1, P400)‡**	**AMPFET-25‡ (-50)**
Service band	Broadcast	Broadcast, SW opt	531kHz-1620kHz	Broadcast	531kHz-1620kHz
RF output rating	5kW or 10kW	1kW-50kW	10kW (5kW)	2.5kW (1kW, 400W)	25kW (50kW)
RF output connector	Coaxial cable	Power dependent	1⅝" (⅞")	50Ω unbalanced	3⅛" EIA flange
Carrier stability	±10Hz (hi stab opt)	±5Hz	±5Hz	±5Hz	greater of ±5Hz or ±5ppm
Carrier shift	<5%	....	<3%	<3% (<2%, <1%)	<1%, 100% mod, 400Hz
Modulation max	125%	+125%	125%	125%	125% pos peak to 55kW
AF input connection	Active bal	150/600Ω bal	Active balanced	Balanced	Active balanced
AF response	±1dB, 50Hz-6kHz	±1.5dB 50-10k	±0.5dB, 50Hz-10kHz	±0.5dB, 50Hz-10kHz	±0.5dB, dc-10kHz
THD distortion	<3%, 90% mod	±2.5%	<2%, 95% mod overall	<2%, 95% mod overall	≤2%, 95% mod overall
AM noise figure	-58dB unwtd	>60dB	-60dB unwtd	-60dB unwtd	-60dB unwtd 50kW
Final amp device	2 4CX1500A tetrode	Tube type	8 (4) 1.25kW s-s modules	12 (6) 250W modulesy	6 (12) 5kW s-s modules
Modulator final device	Solid-state	Tube type	Solid-state	Solid-state	Solid-state
Stereo exciter preferred	Motorola	Yes	Any exciter	Any exciter	Any exciter
Floor space required	65"Wx33"D	....	....	....	....
Input ac power required	380-415Vac 3φ	208-240Vac 3φ	220/440V 3φ 3-4 wire	220/440V 1-3φyy	208V (480V) 3φ WYE 60Hz
Power factor	>0.9	....	0.98 typical	0.90/.95 (0.82, 0.8)	0.98 typical
Power consumption	30kW 100% mod	27kW/10kW 100% mod	20kW (10kW) 100% mod sine	5.2kW (2.14kW, 923W)	50kW (100kW) 100% mod Sin
System efficiency	42%	....	>75%	>75% (>70%, 65%)	>75%
Fault logic architecture	CMOS, TTL, relay	Yes	CMOS/TTL	CMOX/TTL	CMOS, TTL
μP diagnostics	No	No	No	No	No
Reader Service Number	**716**	**717**	**718**	**719**	**720**

Manufacturer	Radio Systems	TTC/Wilkinson	
Model Series	**TR-20**	**AM-3000D[1]**	**AM-10000D[1]†**
Service band	Broadcast	Broadcast, shortwave	Broadcast, shortwave
RF output rating	20W	3kW	10kW
RF output connector	UHF SO-239	⅞"	1⅝"

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RF/Test and measurement specs

AM/SW Radio Transmitters

These RF transmitting systems, using amplitude modulation, operate in standard broadcast spectra (550-1650kHz) or on international broadcast frequencies (3-30MHz). All systems use a solid-state IPA-driver stage, unless marked with a dagger (†) to indicate a type-type driver circuit. Auto recycling is standard on systems rated greater than 1kW. A 50Ω monitor connection is available on all systems. Models marked with a double dagger (‡) require a separate power supply rack.

Manufacturer	**CCA Electronics**	**Cemtys**		**Continental Electronics/Varian**	
Model Series	**AM-15000FHF†**	**EB-VD/70 (EB-DT/70)†**	**EB-KV/70 (EB-2VK/70)[1]†**	**316F-1**	**XL-301 solid-state**
Service band	Broadcast, SW opt	Broadcast	Broadcast	Broadcast	Broadcast
RF output rating	15kW	5kW (2kW)	10kW (20kW)	10kW	1kW
RF output connector	50Ω	50Ω unbal	1⅝" 50Ω	1⅝"	L/C, type N
Carrier stability	±10Hz	±5Hz	±5Hz	±5Hz	±5Hz
Carrier shift	....	....	....	<2%, 100% mod	0.5% 100% mod
Modulation max	+125%	125% max	125% max	125%	125%
AF input connection	150/600Ω bal	Bal, 600Ω	Bal 600Ω	Active bal	Active bal
AF response	±1dB 50-10k	±1dB 100Hz-9kHz	±1dB 40Hz-8.5kHz	1.5, 30Hz-15kHz	±1dB, 20Hz-12kHz, 95% mo
THD distortion	<3% 95% mod	<2% 95% mod	<1.5% 100% mod	<3%, 100%, 50Hz-10kHz	<2%, 100% mod
AM noise figure	>60dB	-60dB	<-65dB	<-60dB unwtd	<-60dB unwtd
Final amp device	4CX15000A tetrode	3CX2500F3	2 - 3CX2500F3 (2 pairs)	4CX15000A	Solid-state
Modulator final device	4CX5000A tetrode	2 5CX1500A	2 - 4CX3000A (2 pairs)	Solid-state	Solid-state
Stereo exciter preferred	Yes	....	....	Any exciter	Any exciter
Floor space required	....	170cmx87cm (159cmx78.5cm)	16"Wx37"D	78Hx67Wx26D"	69Hx22Wx26D
Input ac power required	240/400/480Vac 3φ	220Vac 50/60Hz 3φ	220Vac 50/60Hz 3φ	208-230Vac 3φ 50/60	180-250Vac 1φ
Power factor	≥0.9	>0.92	>0.94	0.93	....
Power consumption	32.5kW 95% mod	15.6kW (6kVA) 100% mod	54kVA for 20kW	28.4kW 100% mod	2.6kW, 100% mod
System efficiency	....	(80% final)	80% final, 40% modulator	53%	>57%, 100% mod
Fault logic architecture	Yes	Solid-state, relay	Solid-state, relay	Relay	Digital relay
μP diagnostics	No	....	No	No	Option
Reader Service Number	**691**	**692**	**693**	**694**	**695**

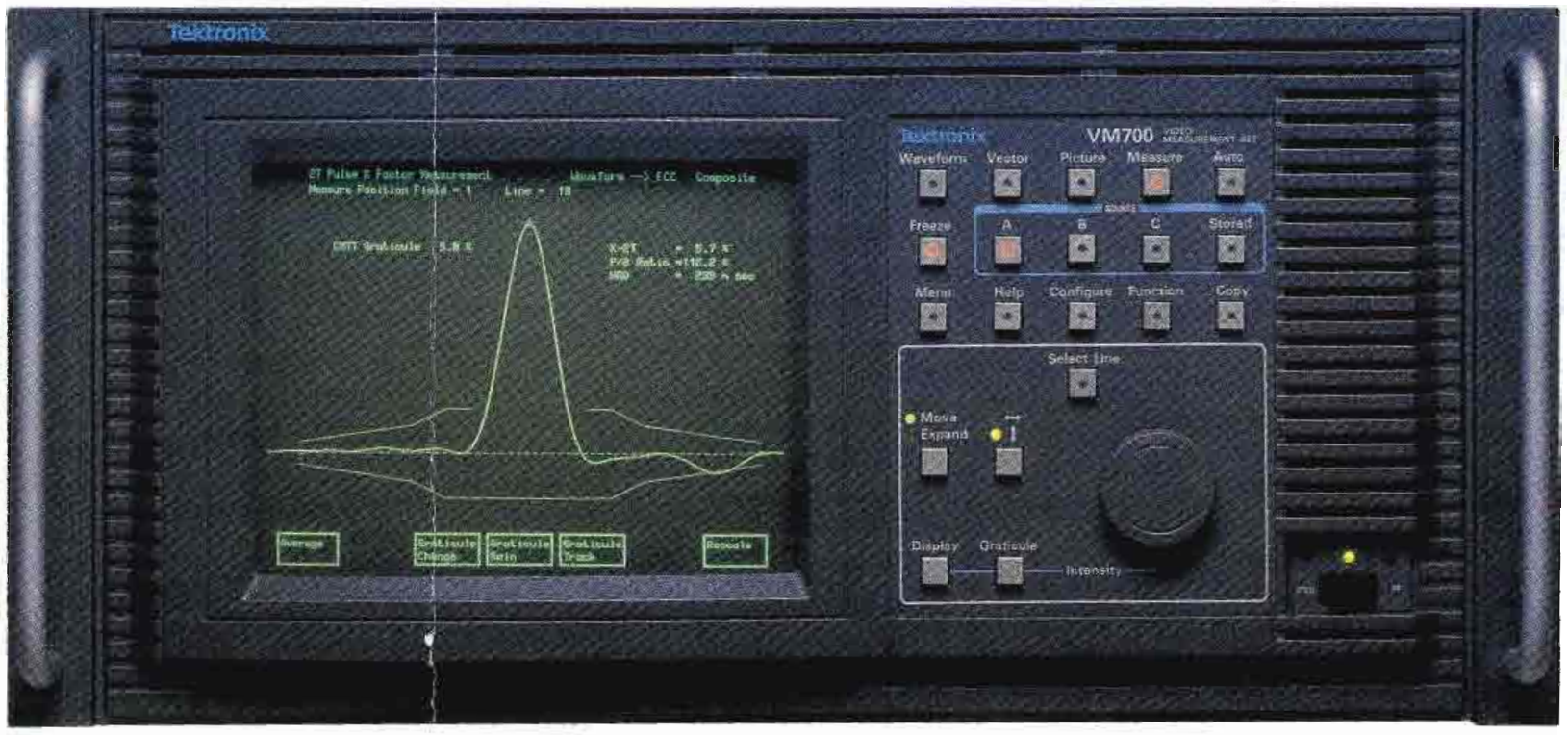
[1]20kW system uses two 10kW units with the PS-10/77 combiner.

Manufacturer	**Continental Electronics/Varian**				
Model Series	**317C-3‡**	**315-R1**	**418D-2†‡**	**420B†‡**	**419F-2†‡**
Service band	Broadcast	Broadcast	Shortwave	Shortwave	Shortwave
RF output rating	50kW	5kW	100kW	500kW	250kW
RF output connector	3⅛" EIA female	1⅝"	6" EIA 75/300Ω	9" EIA 75/300Ω	9" EIA 75/300Ω
Carrier stability	±5Hz	±5Hz	±1x10^{-6}Hz	±1x10^{-6}Hz	±1x10^{-6}Hz
Carrier shift	<2%	2%, 100% mod	<5%, 100% mod	<5%, 100% mod	<5%, 100% mod
Modulation max	125%	125%	100%	100%	100%
AF input connection	Active bal	Active bal	Bal, unbal	Bal, unbal	Bal, unbal
AF response	0.5dB, 10H-7.5kHz	1, 20Hz-20kHz, 95% mod	1dB 50Hz-7.5kHz	1dB, 50Hz-7.5kHz	1dB, 50Hz-7.5kHz
THD distortion	<2%, 100% mod	<2%, 100% mod	<3%, 90% mod	<4%, 95% mod, 50Hz-7.5kH	<3%, 90% mod
AM noise figure	<-60dB unwtd	<-60dB unwtd	<-60dB below 100% mod	<-55dB	<-55dB
Final amp device	4CX35000C	3CX3000F7	4CV100,000C	4CM400,000	4CV250,000B
Modulator final device	3CX000A	3CX3000F7	2-4CV100,000C	4CM400,000	2-4CV250,000B
Stereo exciter preferred	Any exciter	Any exciter	Not applicable	Not applicable	Not applicable
Floor space required	78Hx144Wx54D"	69Hx35Wx34D"	20m²	42m²	35m²
Input ac power required	460Vac, 3φ 50/60Hz	208-250Vac, 3φ	480Vac, 3φ, 50/60Hz	4160V, 3φ 50/60Hz	480V, 3φ, 50/60Hz
Power factor	0.95	0.95	0.9	0.9	0.9
Power consumption	118kVA	12.8kVA	275kVA	1075kVA	625kVA
System efficiency	60% @ 100% mod	>55%	55%	70% typical	60%
Fault logic architecture	Relay	Relay	Relay	μP system	Relay
μP diagnostics	No	No	No	Yes	No
Reader Service Number	**696**	**697**	**698**	**699**	**700**

Manufacturer	**CSI Electronics**		**Elcom Bauer**		**Harris Broadcast**
Model Series	**T-100-A1[1]†‡**	**T-10-A1[1]†**	**725 (715C)[2]‡**	**710C[3]**	**SX-A series[4]**
Service band	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast
RF output rating	110kW	12kW	25kW (15kW)	10kW	5kW (2.5kW, 1kW)
RF output connector	6⅛"	1⅝"	....	1⅝"	⅞" (⅞", Type N)
Carrier stability	±5Hz	±5Hz	±5Hz	±5Hz	±20Hz
Carrier shift	3% 100% mod, 400Hz	3%, 100% mod 400Hz	3%, 100% mod, 400Hz	3%	2%
Modulation max	125%	125%	125%	125%	125%.
AF input connection	Xfmr bal	Xfmr bal	....	Xfmr bal	Act bal 600Ω
AF response	±1.5dB, 50Hz-10kHz	±1.5dB, 50Hz-10kHz	±1dB, 50Hz-7.5kHz	±1dB, 50Hz-10kHz	-1.5,+.5dB 20Hz-12.5kHz
THD distortion	3% 95% mod	2.5% 95% mod	<2.5%	<2% 95% mod	≤1%
AM noise figure	-55dB unwtd	-55dB unwtd	-60dB unwtd	-60dB unwtd	<-60dB
Final amp device	4CV100000E	3CX10000A3	4CX20000B/8990 tetrode	4CX15000	Modular MOSFET
Modulator final device	4CV50000E	4CX3000A	4CX20000B/8990 tetrode	4CX5000A	Solid-state
Stereo exciter preferred	Motorola	Motorola	Any exciter	Any exciter	Harris STX-1B exciter
Floor space required	237"Wx55"D	76.5"Wx34"D	140"Wx30D	70"Wx31"D	28"Wx30"D
Input ac power required	460Vac 3φ	240Vac 3φ	380-450Vac 3φ (220Vac)	208-240Vac 3φ	220/440Vac 3φ
Power factor	0.89	0.89	0.9	0.9	....

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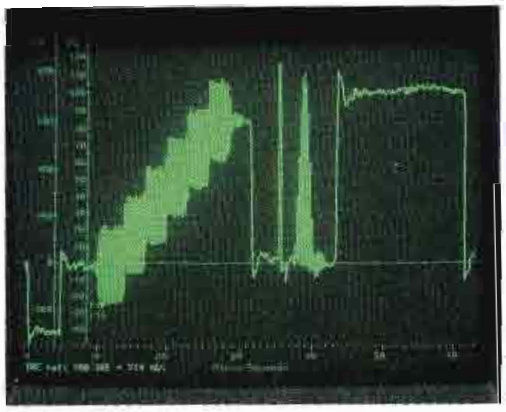
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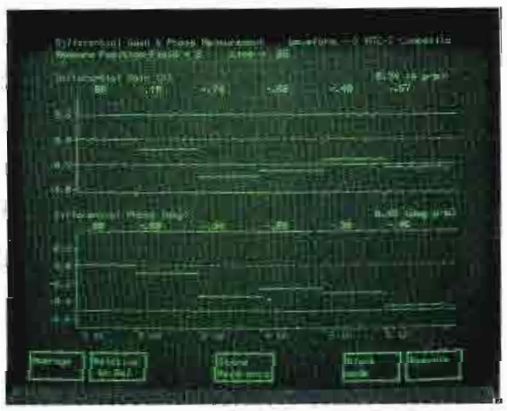
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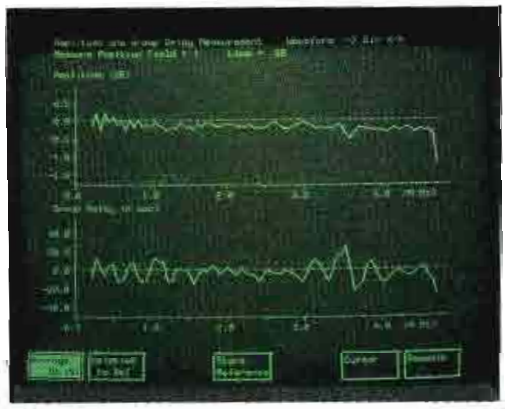


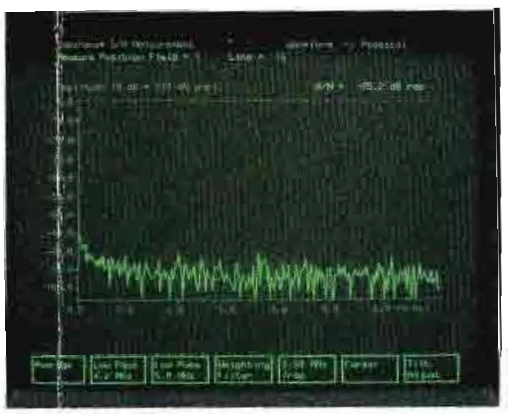


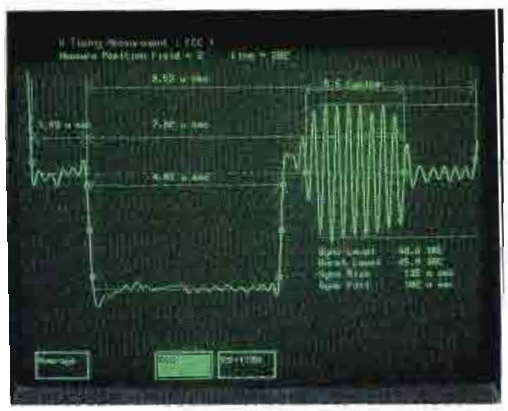


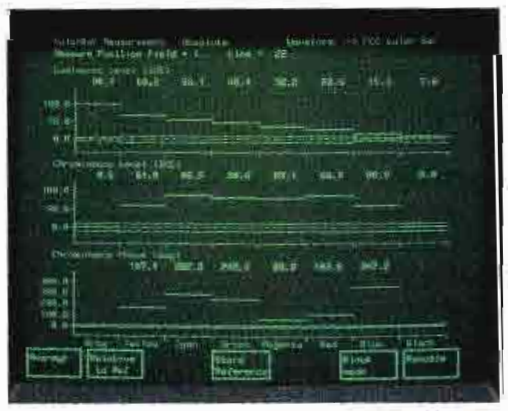
Video courtesy of KOIN-TV, Portland, OR.

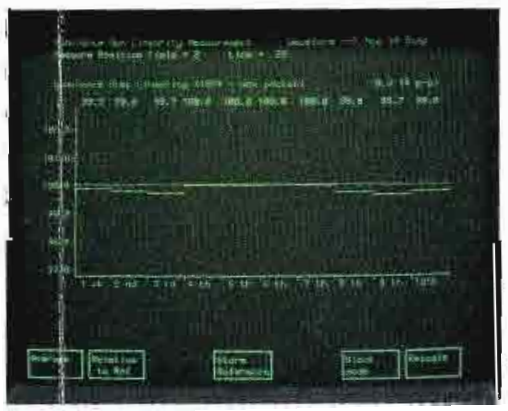


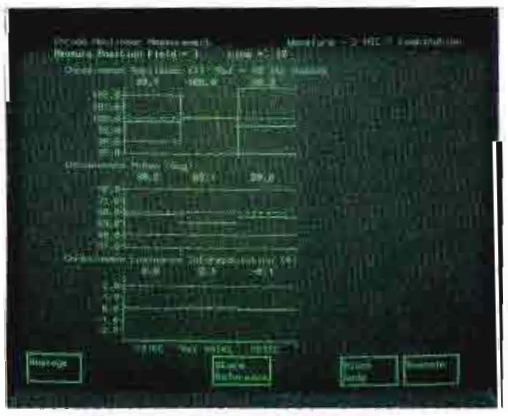


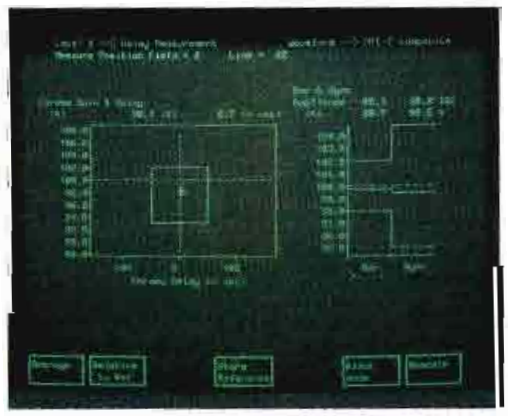


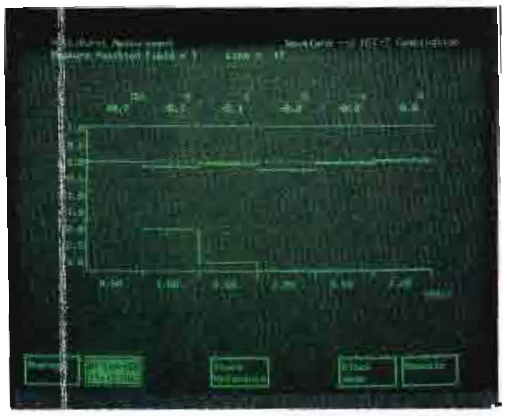












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