

BROADCAST³ engineering

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1989 Annual Issue/\$20

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1989
Buyers' Guide/
Spec Book

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 . . .

- Dolby HX Pro® Headroom Extension and proprietary phase compensated audio electronics
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- Plug-in record and reproduce equalizers for optimal performance and easy speed pair conversion
- 3 peak LED indicators: +6, +9, +12 dB (C270)
- 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
- 1-year parts and labor warranty

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

The C270, 274 and 278 all have 3 tape speeds (3 3/4, 7 1/2 & 15 ips), any pair of which can be selected and quickly changed in the field.

Low speed versions (15/32, 15/16 & 1 7/8 ips) of the C274 and C278—especially suited for logging applications—come with a built-in time and date code generator and reader with search capabilities.



All audio electronics fully accessible through front panel.

The C270 Series is designed to give you what you need, *included* on every machine . . . pro transport functions, pro audio quality and pro construction (rugged die-cast deck-plate, head assembly and chassis). Add overall value too because that's very much what the C270 Series is about—giving the professionals more for less. (Accessories and options, if you need them, *are* available—autolocators, remote controls, floor consoles and SMPTE center track time code.)

But one feature built into the C270 Series no one else has *ever* been able to offer . . . the Studer Revox 40-year reputation for reliability and unequalled performance.

Available from Studer Revox Professional Products Dealers. Or contact: Studer Revox America Inc. 1425 Elm Hill Pike, Nashville, TN 37210. (615) 254-5651

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THE DPS-270 Time Base Corrector. True S-VHS Y/C component processing – at a more than affordable price. The DPS-270 offers S-VHS Y/C and NTSC composite inputs and outputs, as well as a 5.5 MHz bandwidth. This makes the DPS-270 compatible with any 3/4" VTR that accepts external sync and subcarrier. And the unit also provides Y/C to NTSC encoding and NTSC to Y/C decoding.

A Quasi-infinite window shuttling circuit gives you a stable picture during tape shuttle and horizontal and vertical Y/C delay controls compensate for the Y/C offset inherent in some S-VHS recorders.

The DPS-270 also offers many available and affordable interface options. Like automatic field correction, chrominance noise reduction and remote control.

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BUYERS' GUIDE

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A listing of more than 1,000 broadcast manufacturers provides you with the companies that offer the equipment you need. The blue listings indicate advertisers in this issue and the page number of their ads.

61 Manufacturers' addresses

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.)

Editorial and advertising correspondence should be addressed to: P.O. Box 12901, Overland Park, KS 66212-9981 (a suburb of Kansas City, MO); (913) 888-4664. Telex: 42-4156 Intertec OLPK. Circulation correspondence should be sent to the above address, under P.O. Box 12937. RAPIDFAX: (913) 541-6697.

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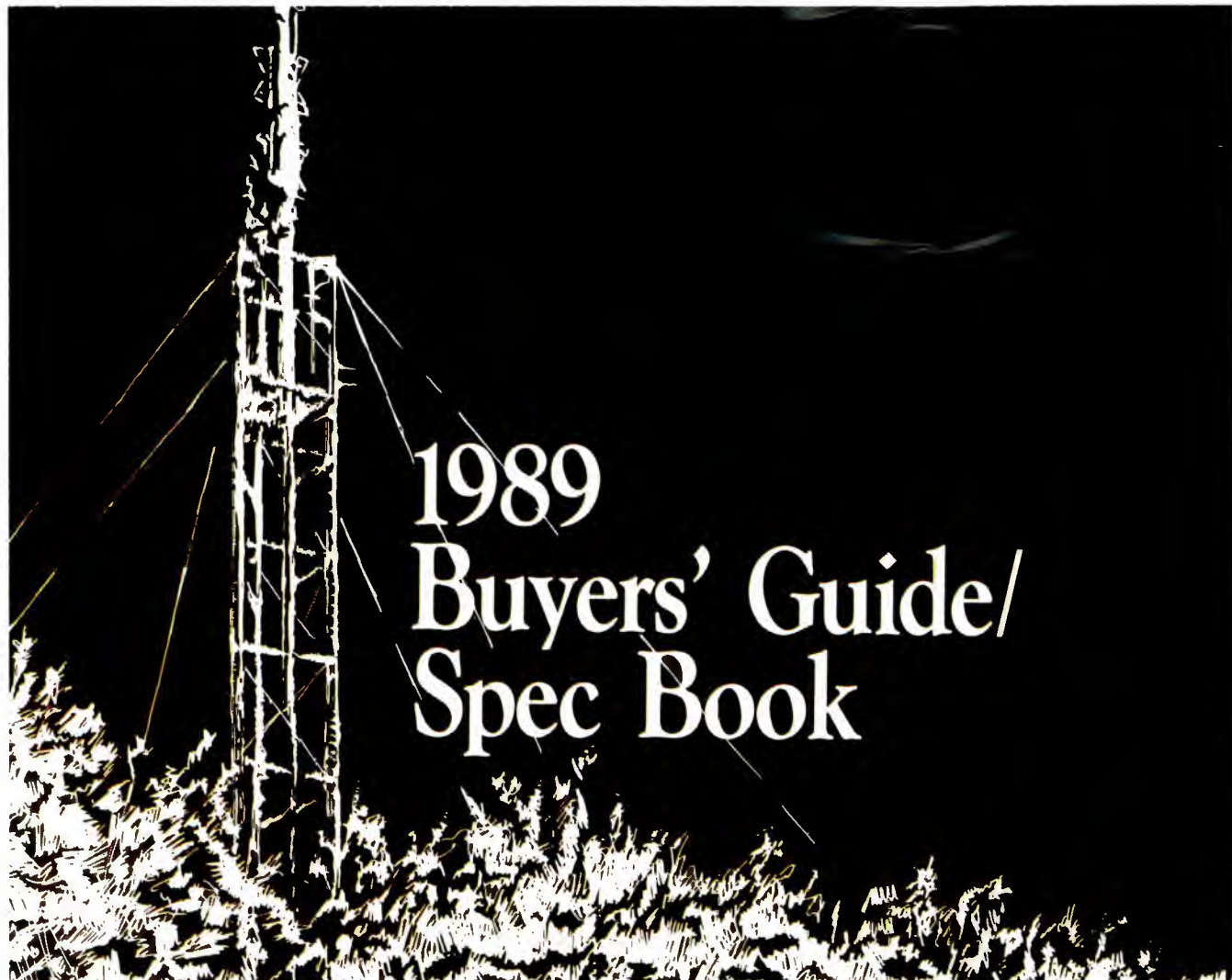
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1989 Buyers' Guide/ Spec Book

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

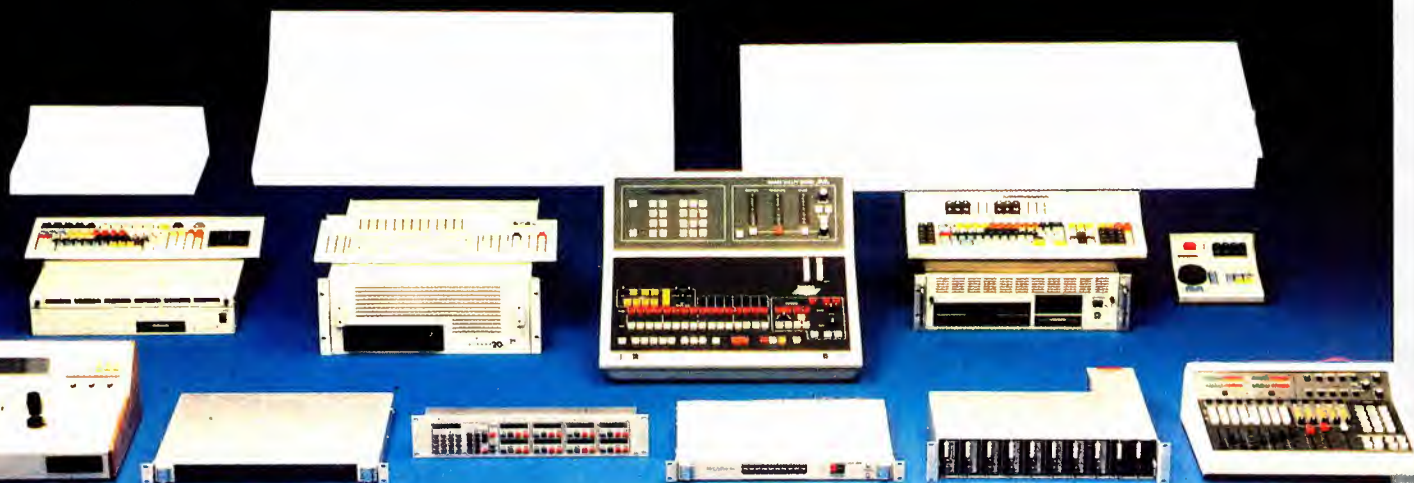
the manufacturers. Every effort has been made to present accurate information, but we suggest you check with manufacturers for possible changes resulting from equipment upgrades. For numerous reasons, pricing information cannot be included.

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.

The Editors.

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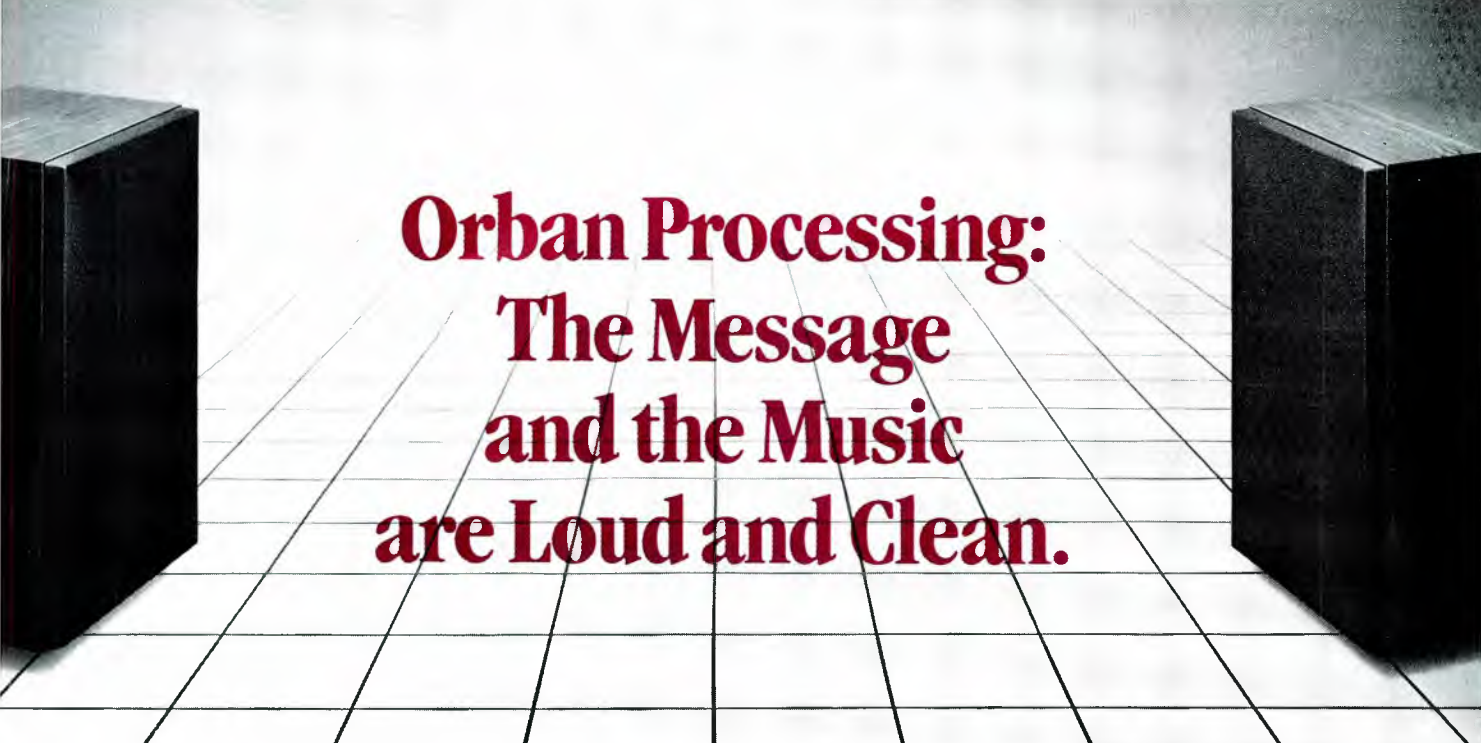
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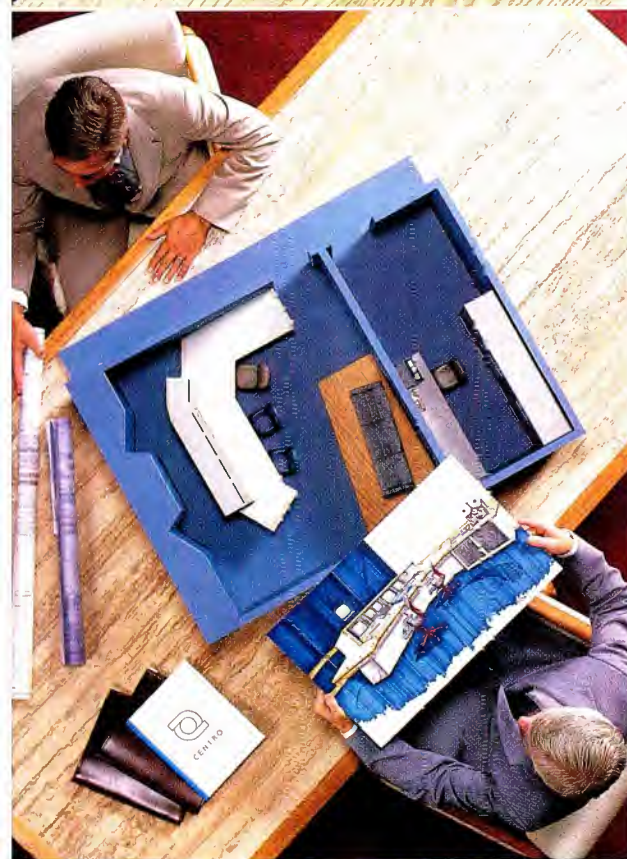
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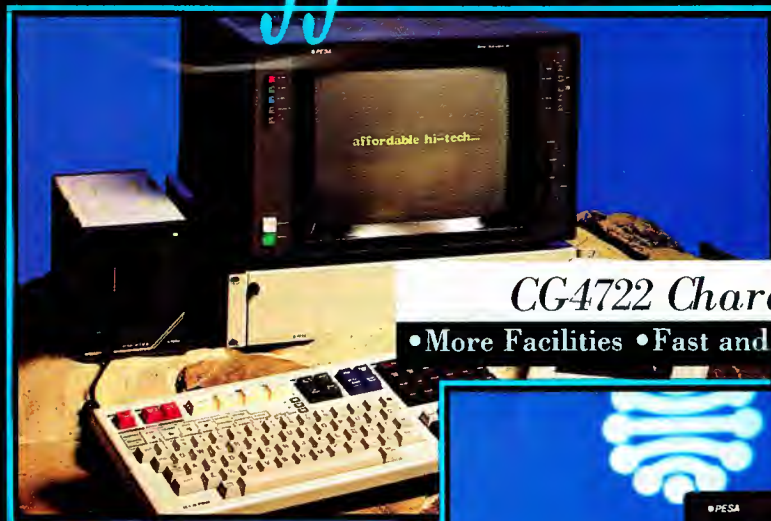
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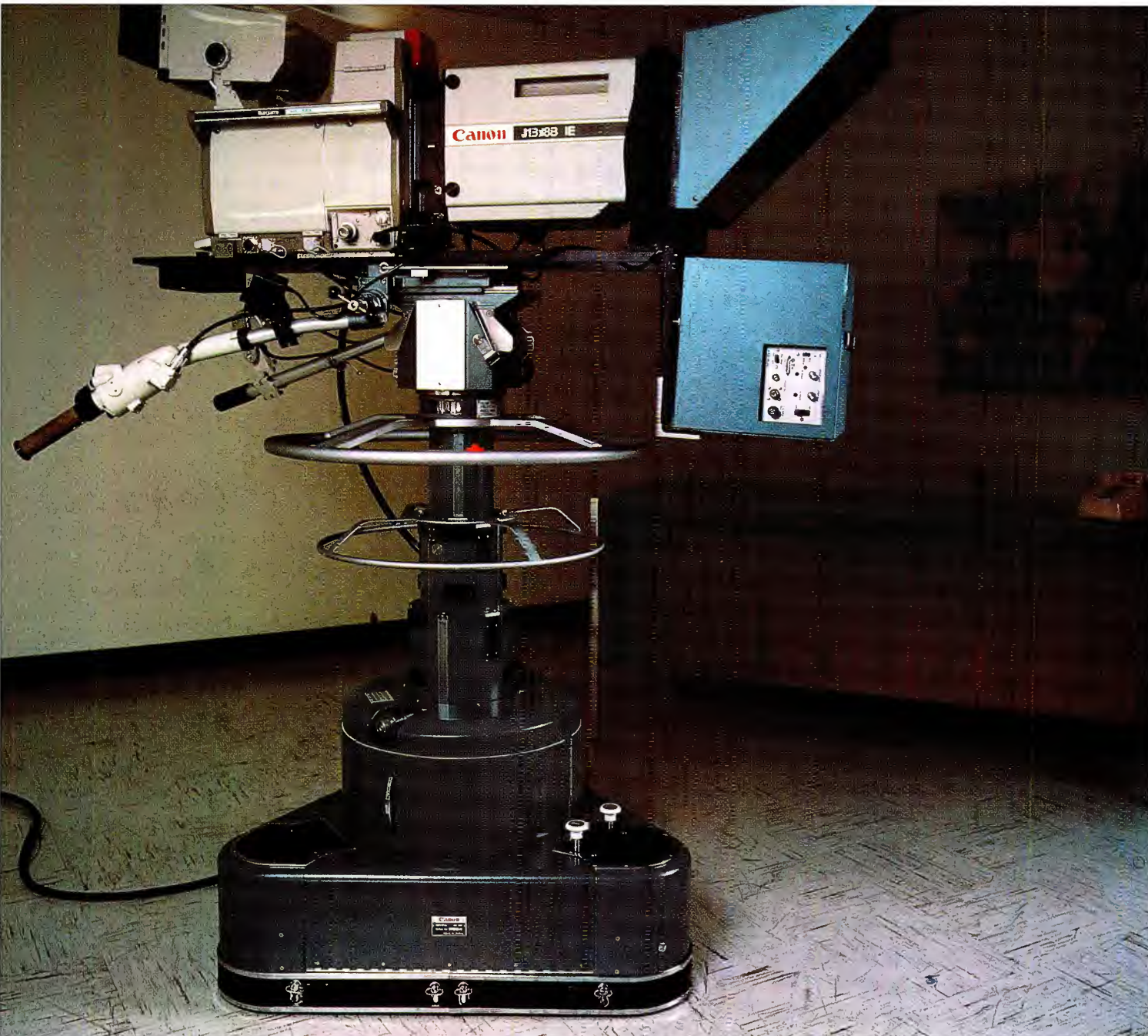
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International Microwave Corp.
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M/A-COM Mac, Inc.
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International Microwave Corp.
Kahn Communications, Inc.
Lee Dan Communications, Inc.
Motorola Inc. AM Stereo
Potomac Instruments, Inc.
Toshiba Corp.

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R.L. Drake Co.
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Modulation Associates Inc.
Nexus Engineering Corp.
Pinzone Communications Products Inc.
Radiation Systems, Inc. SatCom Technologies Div.
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Standard Communications
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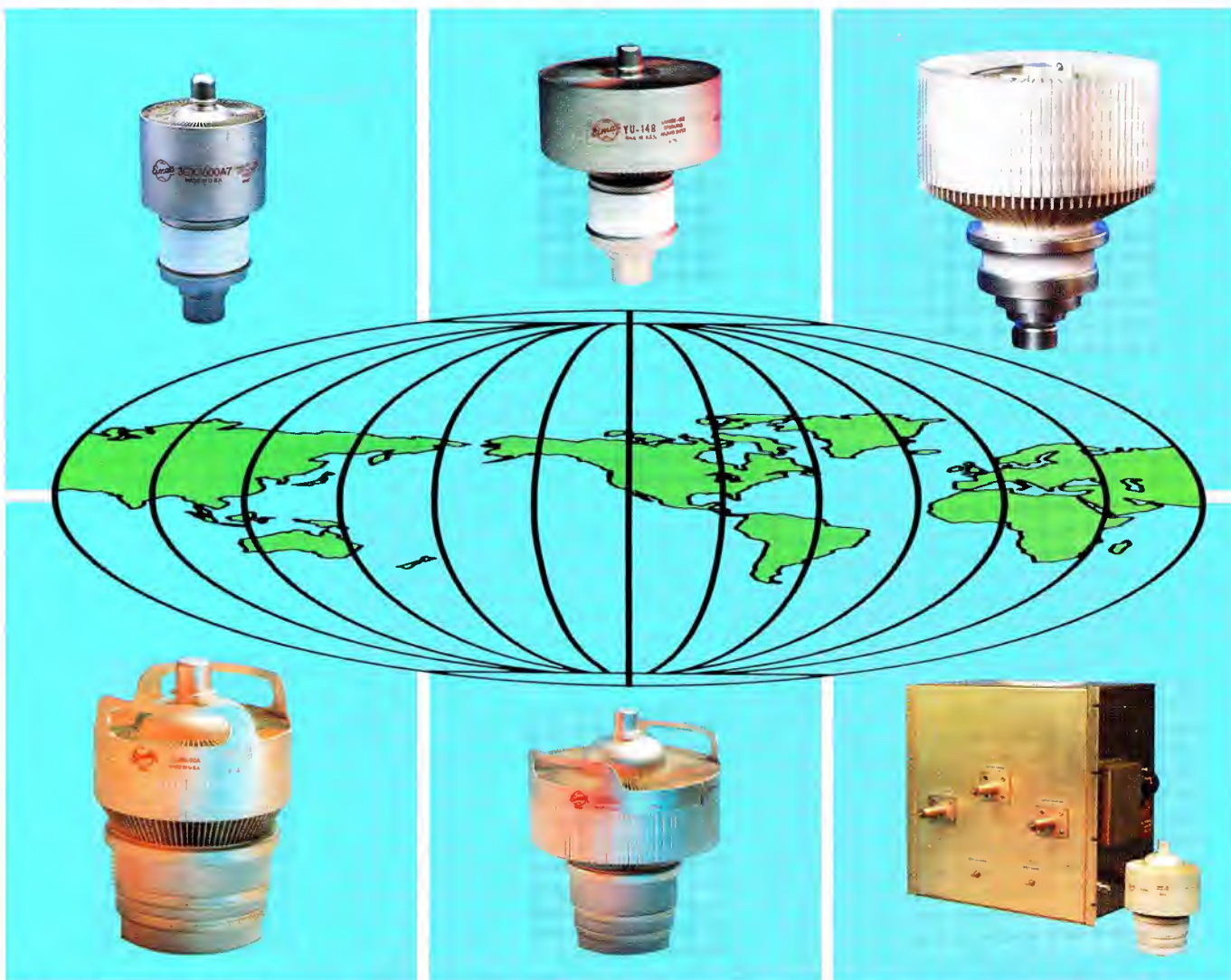
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Vector TV, Stockport, UK.

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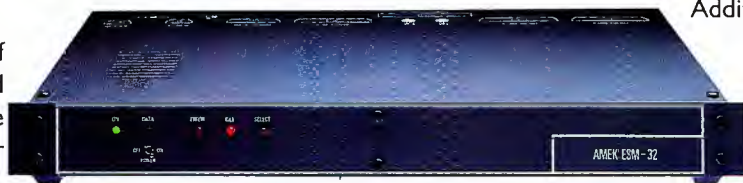
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The Narda Microwave Corp.

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F2.1 (14-210mm); F2.8 (280mm)

R20x10.5ESM

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F1.6 (10.5-161mm); F2.1 (210mm)

Minimum Object Distance: 0.75m Weight: 20.5kg

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P17x16.5ESM

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F2.1 (16.5-223mm); F2.7 (280mm)

R17x12.5ESM

12.5-215mm (18.75-318mm; 25-424mm)

F1.6 (12.5-170mm); F2.0 (215mm)

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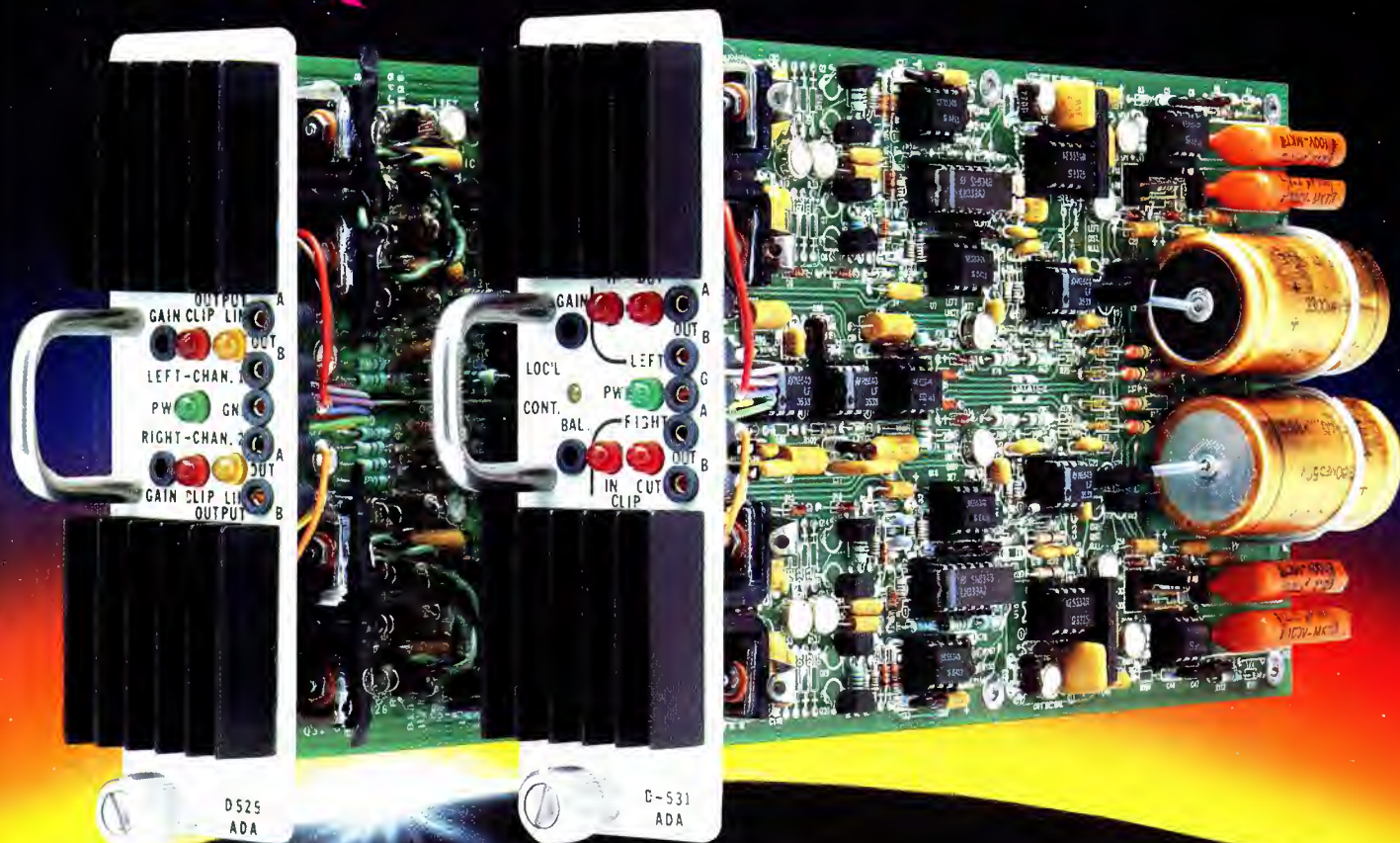
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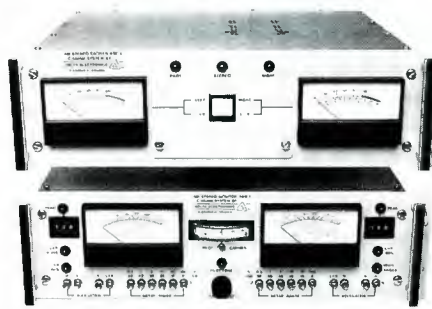
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AM Splatter Monitor—Spectrum analyzer performance at a significantly reduced price! An inexpensive means of verifying FCC and NRSC spectral compliance. This frequency agile instrument tunes from 1700 kHz down to 450 kHz, with 9 or 10 kHz channel spacing. The monitor also measures incidental phase modulation (IPM). Designed to be rack-mounted or operated from a vehicle's 12 volt supply using an optional antenna.



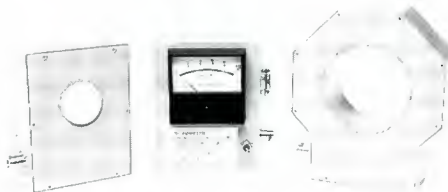
C-QUAM® AM Stereo—The Above Standard Industry Standard is easy to install and maintain with its modular design and construction. Offers standard features other manufacturers charge as options. A sound value, built to last.



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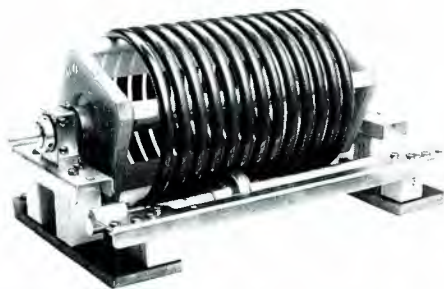
Coaxial Transfer Switches—These 1 7/8" and 3 1/8" motorized four port switches are designed to switch between antennas, transmitters, or dummy loads both quickly and efficiently. The switches can also be operated manually and are fully interlocked.



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.



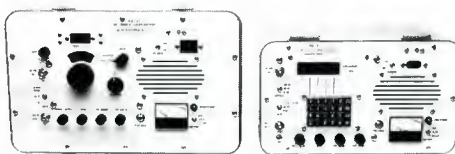
Low Power RF Ammeters—When every milliamp of current counts, depend on the accuracy of the TCA-Jr. This portable RF ammeter is designed to plug into either a Delta MJ-50 Meter Jack (pictured above), or a standard J-plug jack. Two current ranges are available: 0.2 to 1.0 Ampere, or 0.4 to 2.0 Amperes.



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The Above Standard
Industry Standards.

DELTA ELECTRONICS

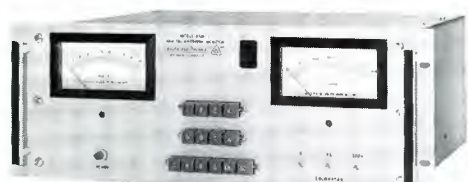


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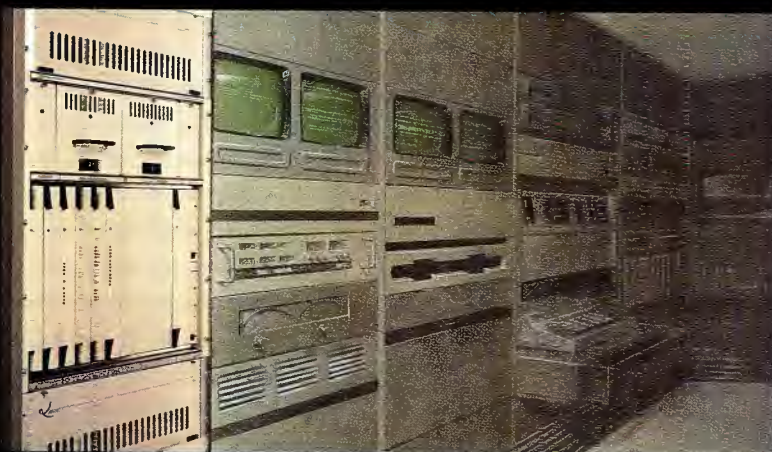
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Once you try the 5650 component digital mixer from Thomson, you risk to see your current mixer in a slightly different light. Not just because the 5650 is the first real time, multi-level component digital 4 : 2 : 2 mixer that allows you multi-processing 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.

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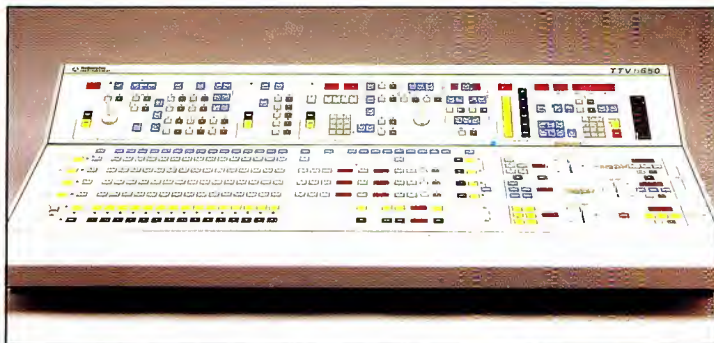
Multi-format input/outputs in both analog and

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.



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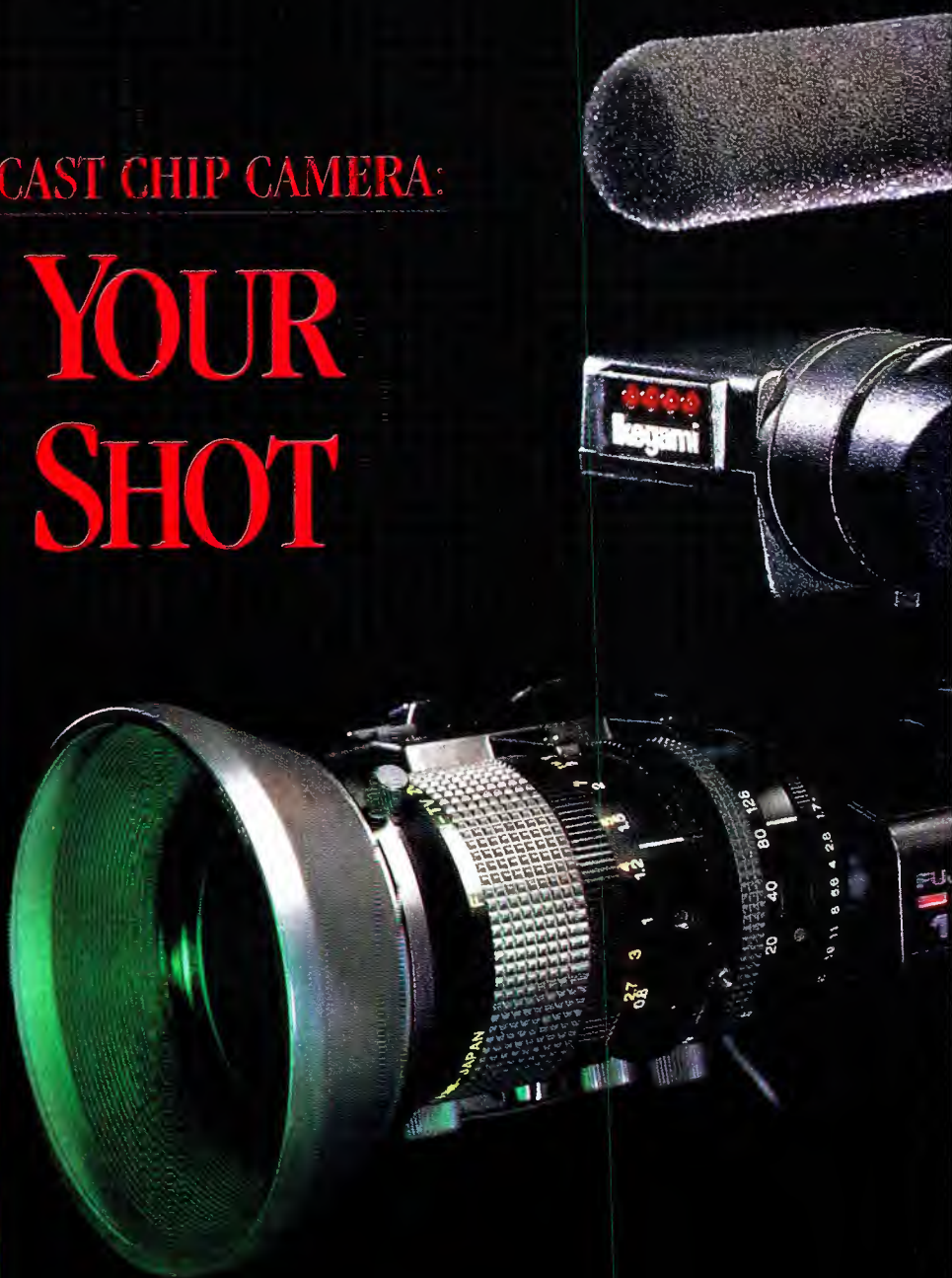
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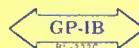
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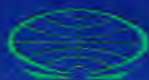
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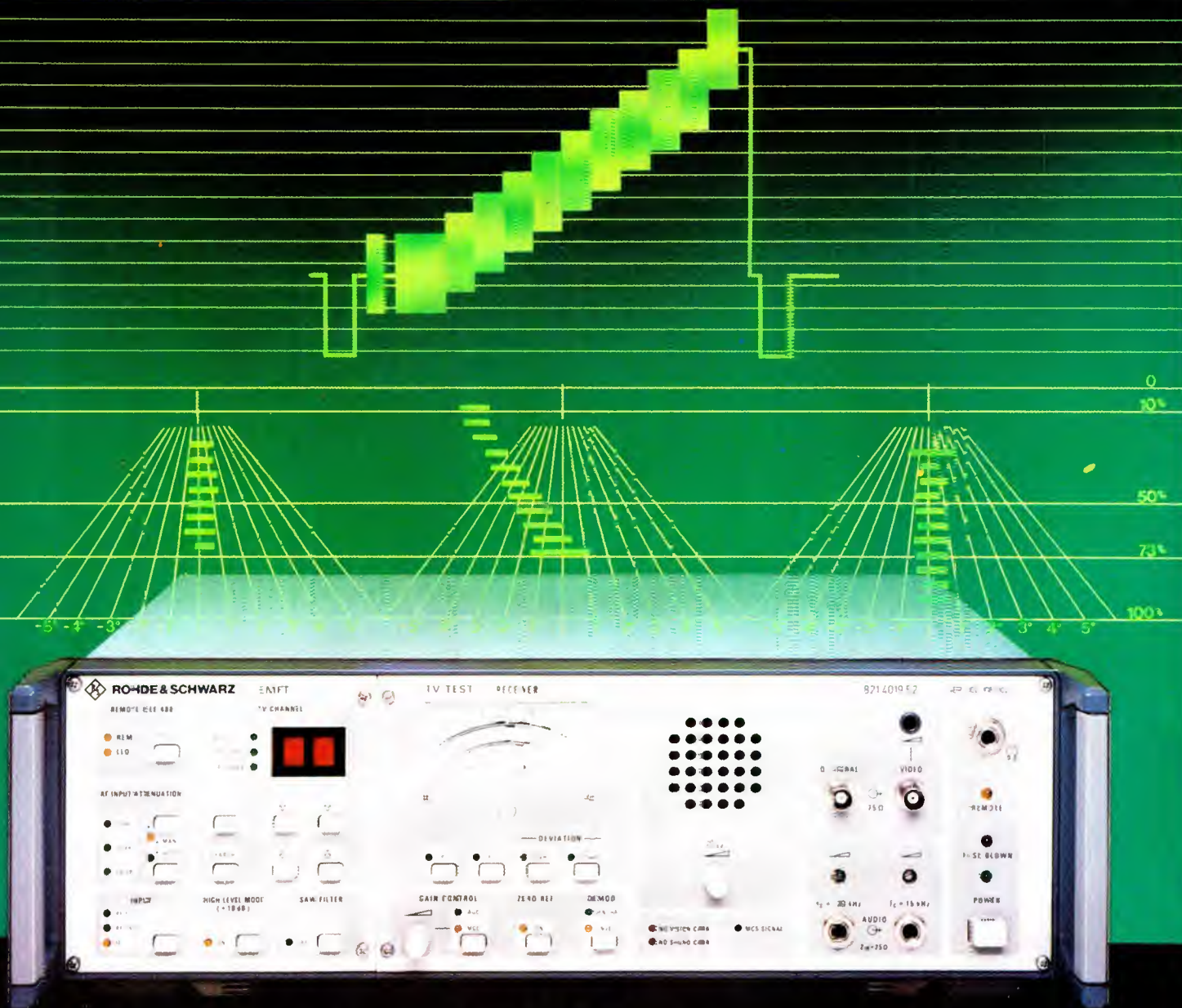
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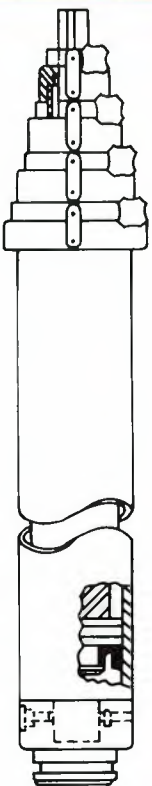
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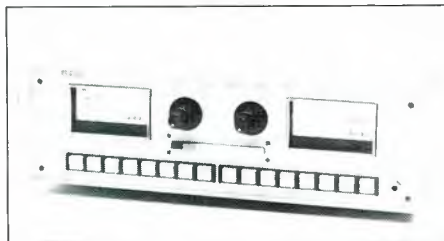
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 Austin, TX 78725-2100
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 01-572-0100

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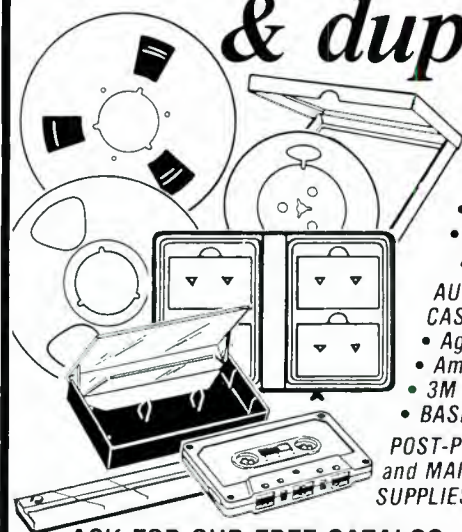
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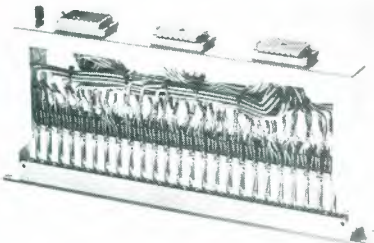
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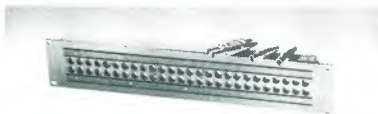
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Product Directory begins on page 11

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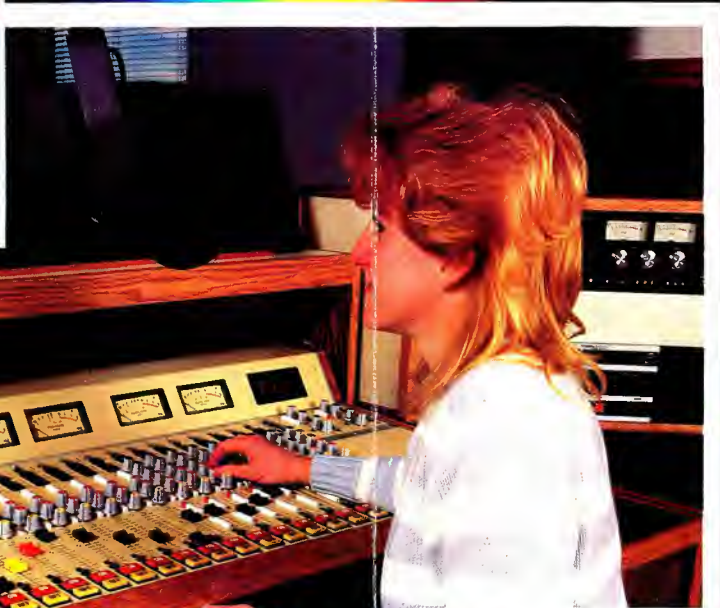
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512-346-5781

Video Data Systems

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Hauppauge, NY 11788
516-231-4400

Video Design Pro

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Video Display Corp.

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Stone Mountain, GA 30086
404-938-2080

Video Int'l. Development Corp.

1280 Sunrise Highway
Copiague, NY 11726
516-842-1815

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D-3013 Barsinghausen, West
Germany
49 05105 81144

Video Masters, Inc.

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Kansas City, MO 64141
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Torrance, CA 90501
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Hauppauge, NY 11788-2001
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PA, North Wales, (215) 641-1954

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Suffolk, England IP33 3TB
0284-2121

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Consulting Engineers
3137 W. Kentucky Ave.
Denver, CO 80219
303-937-1900

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343 Gibraltar Drive
Sunnyvale, CA 94089
408-745-1551

Vistek Electronics Ltd.

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VMI-Visual Methods Inc.

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Voodoo Technology

3109 Scotts Valley Drive, Suite 101
Scotts Valley, CA 95066
408-438-7412

VTR Associates, Inc.

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Huntsville, AL 35805
205-533-0571

W

Wallach & Associates Inc.

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Cleveland, OH 44118
216-575-0765

Wandel & Goltermann GmbH & Co.

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D-7412 Eningen, West Germany
07121 86-1570

Ward-Beck Systems Ltd.

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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

ALASKA

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

Spencer Broadcast, Inc., 7003 W. Union Hills Drive, Peoria, AZ 85345 (602-242-2211; 800-221-6941) 50 State '800' Service, Worldwide, Over 150 Lines; Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; System Design; Towers, Station Turnkey Services; Consulting Services Div.

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

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

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

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Bexel Corp., 801 S. Main St., Burbank, CA 91506 (818-841-5051) Worldwide, The premier TV production equip. rental organization on the west coast. Real 24-hour service.

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Broadcast Cartridge Service, 15131 Triton Lane, Suite 108, Huntington Beach, CA 92649 (714-898-7224) USA, Tape; Broadcast Cartridges Reel-to-Reel; Alignment Tools, Storage Systems; Reloading Service

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 Sys-

tems; 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

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

Martel Electronics, Inc., 920 E. Orangethorpe, Suite A, Anaheim, CA 92801 (714-871-7102) USA, Audio Equip. including all types of Recorders, Microphones, Mixers, & Audio Tape

Meyer & Ross, Inc., 1485 Hollins Road, Burlingame, CA 94010 (415-348-6800) CA, HI, NV, Audio & Video Equip.; Test & Measurement Equip.

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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Care Products; Head Refurbish-
ment Services

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Camarillo, CA 93011 (805-
482-9884) AZ, CA, CO, NV, Au-
dio & Video Equip.; Test & Meas-
urement Equip.; Tape; Service &
Repair; System Design, Installation
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System Associates, 10375 Jefferson
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(213-836-1111) North America,
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urement 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)
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Transmitters, Antennas & Trans-
mission Systems; Service & Repair

TVA/Television Associates, 2410

Charleston Road, Mountain View,
CA 94043 (415-967-6040)
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sional & Industrial Products; Video
Equip. System Design; Video Pro-
duction & Duplication Facilities

U.S. Instrument Rentals, 2988 Cam-
pus Drive, San Mateo, CA 94403
(800-824-2873) USA &
Canada, Equip. Leasing, Rental &
Sales

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erators; Lighting; System Design,
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mats of video & audio tape. Pro
Industrial Video Equip.; Test &
Measurement Equip.; Sales & Ser-
vice

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Santa Clara, CA 95054 (408-
727-9898) AK, CA, HI, NV, OR,
WA, Audio & Video Equip.; Test &
Measurement Equip.; Tape; Film
Equip.; Service & Repair; System
Design

Whitehouse Audio Visual, 11511 W.
Pico Blvd., Los Angeles, CA
90064 (213-479-8313) AZ,
CA, CO, KY, MI, NV, OR, WA, WY,
Video Equip.; Test & Measurement
Equip.; Film Equip.; Service & Re-
pair; Used Equip.

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Didier Broadcast Associates, 9775
W. Cornell Place, Lakewood, CO
80227 (303-987-0256) CO, ID,
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Video Equip.; Test & Measurement
Equip.; Transmitters, Antennas &
Transmission Equip.

Film/Video Equipment Service Co.,
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Penstock Rocky Mountain, 9940 E.
Costilla Ave., Suite L, Englewood,
CO 80112 (303-792-0777)
CO, RF & Microwave Active & Pas-
sive Components; Cable Assem-
blies & Connectors

2001 Enterprises, Inc., 180 Cook
St., Suite 209, Denver, CO 80206
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MT, NM, EL Paso-TX, UT, WY, Au-
dio & Video Equip.; Tape

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National Video Services, Commerce
Park, Finance Drive, Danbury, CT
06810 (203-792-3862) CT,
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Bencsik Associates Inc., 3730 N.E. 42nd Ave., Ocala, FL 32670 (904-732-9775) FL, PR, Pro Audio Equip.; CCTV

Comex Corp., 1645 N.W. 79th Ave., Miami, FL 33126 (305-594-0850) Worldwide, MMDS/ITFS Systems; Satellite Earth Stations & Associated Origination Equip.; Engineer, Furnish & Install

Control Technology, Inc., 2950 S.W. 2nd Ave., Fort Lauderdale, FL 33315 (305-761-1106; Outside FL 800-327-4121) U.S.A., Audio Tape Recorders; Consoles, Mixers; Turntables, Preamps; Mics & Accessories; Power Amps; Speakers, Audio Processing & Loggers; Heads & Accessories; Studio Furniture; STL Systems; Transmitters, Transmission & Antennas; Automation Sys./Equip.

Electrex Co., 18620 N.E. Second Ave., Miami, FL 33179 (305-651-5752) USA and Latin America, Audio Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape, Vacuum Tubes; System Design

Gendra International Inc., Broadcast & Communications Div., 2800 Biscayne Blvd., Suite 700, Miami, FL 33137 (305-372-8845) FL, Caribbean, So. America, Audio, Video & Test Equip.; Transmissions; Microwave

Gray Communications Consultants, Inc., 5130 Eisenhower Blvd., Tampa, FL 33634 (813-885-8989) FL, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Vans & Accessories; Service & Repair; System Design; Tape

Lauderdale Electronic Labs, 16 S.W. 13th St., Fort Lauderdale, FL 33315 (305-764-7755) 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

Midwest Communications Corp., 3305 Bartlett Blvd., Orlando, FL 32809 (407-841-0602) FL

Midwest Communications Corp., 6302 Benjamin Road, Suite 403, Tampa, FL 33634 (813-885-9308) FL, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design

MPCS Video South, 4100 North 28th Terrace, Hollywood, FL 33021 (305-923-3446) 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

Nemal Electronics Int'l. Inc., 12240 N.E. 14th Ave., North Miami, FL 33161 (305-899-0900) Worldwide, Audio & Video Wire, Cables, Connectors; Transmitters, Antennas Wire, Cables, Connectors and Accessories; Patch Panels

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.

Vaughn Broadcast Rentals, Vaughn Duplication Service, 5426 Beaumont Center Drive, Suite 330, Tampa, FL 33634 (813-887-3141) FL, Audio, Video, Test &

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ment Equip.; Antennas & Trans-
mission Systems; Tape

Victor Duncan, Inc.-Atlanta, 1575
Northside Drive N.W., Suite 355,
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3001) USA and Canada, Audio,
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lanta, GA 30341 (404-455-
7610; 800-554-5440) GA, SC,
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Vica Associates, Inc., 4296-A
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30032 (404-292-7506) AL, FL,
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Omega Pacific, 222 Kaelepu 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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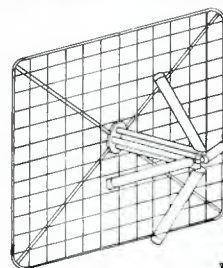
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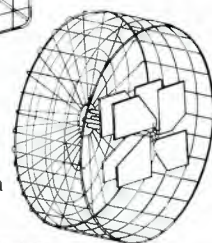


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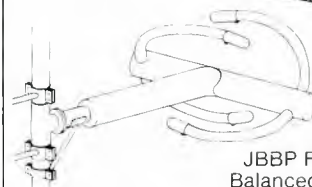
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Joseph Electronics, 8830 N. Milwaukee Ave., Niles, IL 60648 (312-297-4200; 800-323-5925) IL, IN, WI, National by Mail Order, Test Equip.; Tools; Cases; Wire; Connectors; Batteries; Camera Tubes; Hardware; Components; Chemicals; Cabinets; Solder & Equip.;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

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tem Design; Used Equip.; Service & Repair

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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 communication 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; Vacuum Tubes; Service & Repair; System Design; Used & Rental Equip.; Duplications

KANSAS

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

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

Smith Audio-Visual, Inc., 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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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

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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 Cabinetry - Turnkey Systems

CM Sales, 31700 W. 12 Mile Road, Suite 206, Farmington Hills, MI 48018 (313-553-8070) MI, Audio & Video Equip.

Cruise 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.; Ser-

vice & 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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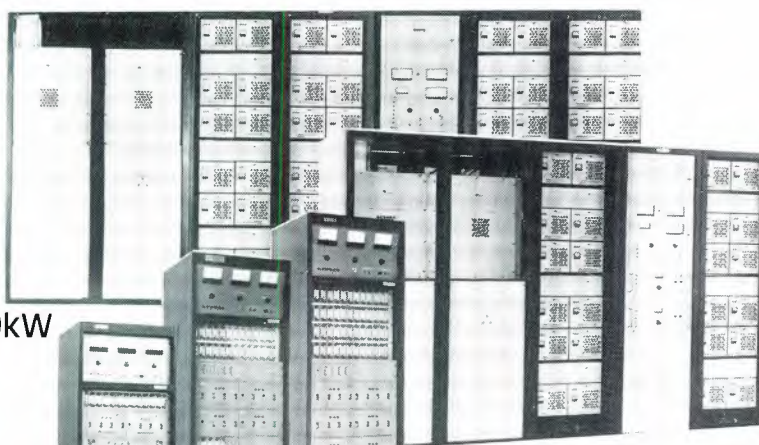


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Digi-Key Corp., 701 Brooks Ave. S., Thief River Falls, MN 56701-0677 (800-344-4539) USA, Electronic Components

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

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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

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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,

KY, LA, MO, NE, OK, TN, TX, Audio, Video, Test & Measurement Equip.; Eng & Production Vans; Service Repair; System Design & Installation; Cassette Tape; Used Equip.

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 & Measurement 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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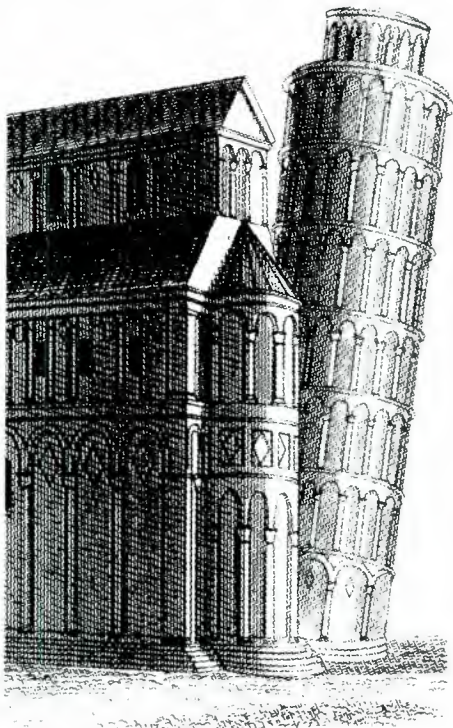
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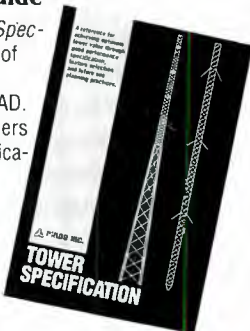
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Audiotechniques Inc., 1619 Broad-

way, 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.

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Bi-Tronics, Inc., 76 Main St., Tuck-

ahoe, 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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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.

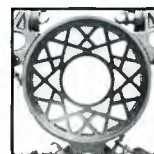
Markertek Video Supply, 145 Ulster Ave., Saugerties, NY 12477 (800-522-2025; 914-246-3036) Nationwide, Audio, Video, Test & Measurement Equip.; Tape; Vans & Accessories

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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 &

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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

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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; Analyzers; Frequency Counters; Power Meters, Voltmeters; Test & Measurement Equip.; Distortion Analyzers; STL DVES, CCD Cameras

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

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.

NORTH DAKOTA

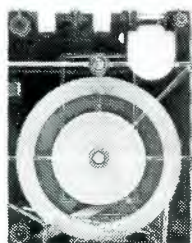
Audiovisual Inc., 1818 E. Broadway, Bismarck, ND 58502 (701-258-6360) CO, ID, IA, KS, MN, MT, NE, ND, SD, WY, Audio & Video Equip.; Test & Measuring Equip.; Transmitters; Tape; Vacuum Tubes; Film Equip.; Service & Repair; System Design; Used Equip.; Rentals

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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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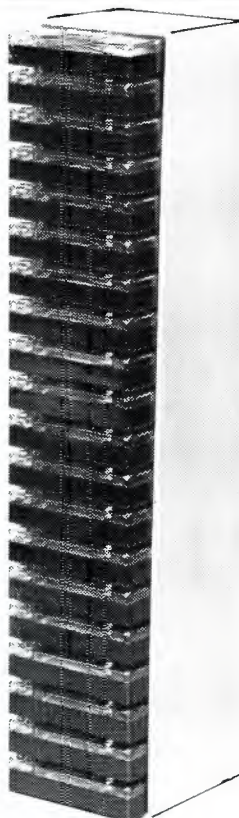
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ters, Antennas & Transmission
Systems; Service & Repair; Sys-
tems Design

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enth Ave., Portland, OR 97232
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4557) AK, CA, GU, ID, MT, OR,
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Mechanical Products; Motion Con-
trol & Video Systems; Power Con-
ditioning Lab Bench/Test Equip.
Products; Passive & Discrete Pro-
ducts

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dio & Video Equip.; Test & Meas-
urement 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.; Trans-
mitters, Antennas & Transmission

Systems; System Design

Maxima Magnetics, Inc., 300 Bonair
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ME, MD, MA, MI, MN, MS, MO, NE,
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processed Tape all formats; Cus-
tom Loaded 1/2" Video Cassettes
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rot St., Philadelphia, PA 19130
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MO, NH, NJ, NY, OH, VA, WV, WI,

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tenna equip.; Audio, Test &
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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

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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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TEXAS

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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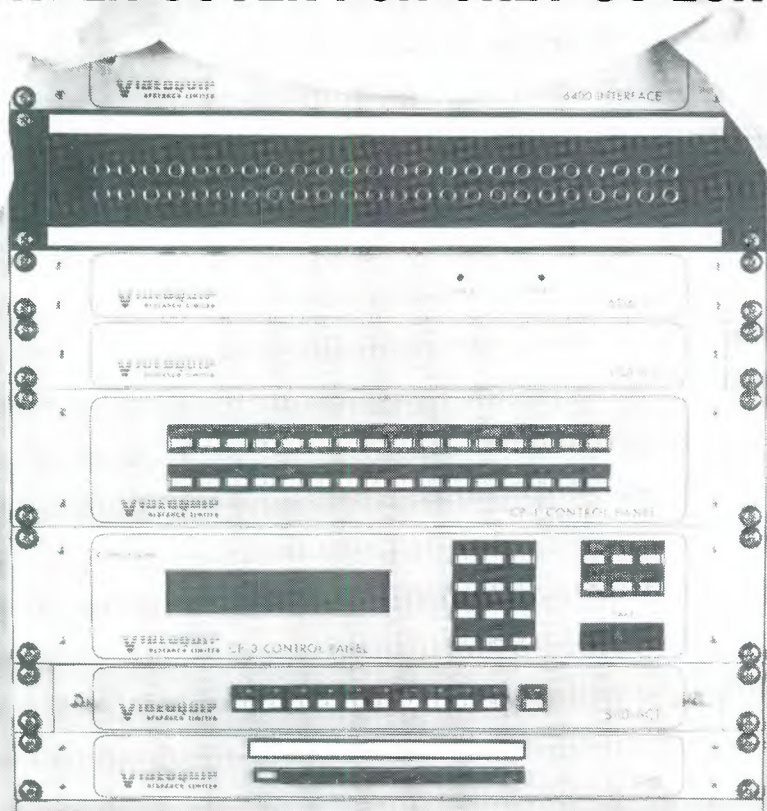
Graphics/Animation; Routing Switchers; Master Clock Sys.; Racks/Consoles; CCD Cameras; Digital Video Effects; ENG Microwave Equip.; Intercom Sys.

International Music Co., 1316 E. Lancaster, Fort Worth, TX 76102 (817-336-5114) Worldwide, Sound Reinforcement, Samplers & Recording Gear

Linrose Broadcast Equipment, 5702 E. Loop 820 S., Fort Worth, TX 76119 (817-483-3936; Outside TX-800-523-7360) Worldwide, Complete line of audio equip. & supplies

MZB & Associates, 6221 N. O'Connor, #6 Suite 110, Irving, TX 75063 (214-869-4500) AR, KS, LA, MO, NE, NM, OK, TX, Audio, Video, Test & Measurement Equip.; Transmitters, Antennas & Transmission Systems; Tape; Vans & Accessories; Service & Repair; System Design; Used Equip.

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

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

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, Belling-

ham, 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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Full Compass Systems, Ltd., 6729 Seybold Road, Madison, WI 53719 (608-271-1100; 49 states:

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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

VIRGINIA

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

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See advertisement on page 104

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.

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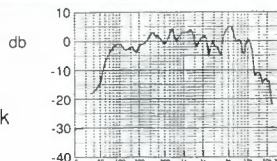
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Video Images-Milwaukee, 285 N. Janacek Road, Waukesha, WI 53186 (414-785-8998) IL, IA, MI, WI, Audio & Video Equip.; Test & Measurement; Transmitters, Antennas & Transmission Systems; Tape; Vacuum Tubes; Vans & Accessories; Service & Repair; System Design; Used Equip.

CANADA

Allied Broadcast Equipment, Canada Ltd., 10 W. Pearce St., Unit 6, Richmond Hill, Ont., Canada L4B 1B6 (416-731-3697) Canada, Independent distributor of audio, RF broadcast & professional equip.

DKW Systems, 9919 105th St., Suite 730, Edmonton, Alta, Canada T5K 1B1 (403-426-1551; 800-661-6453) USA & Canada, Audio Computer Equip.; Live Assist & Automation Software & Hardware

GERR Electro Acoustics Ltd., 363 Adelaide St. E., Toronto, Ont., Canada M5A 1N3 (416-868-0528) Canada, Audio & Video Equip.; Test & Measurement Equip.; Service & Repair; System Design

Lumitrol, Ltd., 253 Merton St., Toronto, Ont., Canada M4S 1A7 (416-485-4817) Canada, Video Studio; Lights, Dimmers, Drapes; Studio Grids, Power Distribution

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

Penstock Canada, 133 W. Fifth Ave., Vancouver, BC, Canada V5Y 3X1 (604-662-3475) Alta, BC, Yuk., RF & Microwave Active & Passive Components; Cable Assemblies & Connectors

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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. Equipband 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	Amplex 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	3/4"	3/4" 500x582 pix P/S	3/4" spatial offset	3/4"	1/2"
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, 1/4	1/16, 1/4	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	Betacom 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	3/4"	3/4"	1", 1 1/4" (3/4")	3/4"
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†	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 OG SAT or PbO
Optical format	1" f/1.5 (3/4" HS PbO)	3/4"	3/4"	3/4" w/bias	3/4" 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/14(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	1/4 ND	Internal 1/4 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, YIQ, 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

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

¹Software 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	1/2" f/1.2 w/bias	1/2" f/1.8	3/4"	3/4"	3/4"
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	1/4 ND, 1/8 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 1/4", 1/2"
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	1/2"	3/4"	3/4"	3/4"	1" or (3/4")
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	1/2 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)	1 1/4"	1 1/4"	3/4"	3/4"
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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SONY BVW-507 CCD BETACAM

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Circle (74) on Reply Card

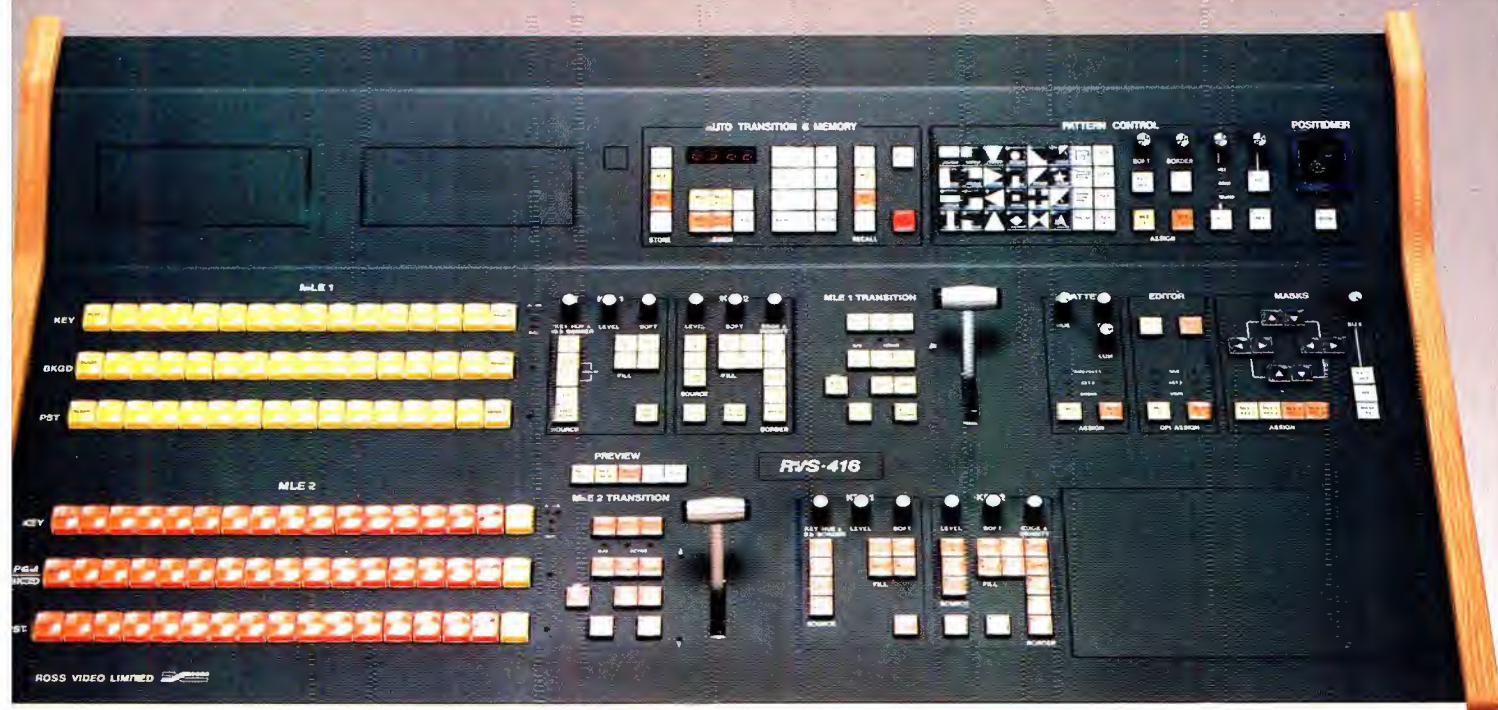
Manufacturer	Ikegami Electronics			JVC Company	
Model Series	HK-322	EC-1125 HiVision	BY-110U	KY-210BU	KY-320U
Diagnostic display	At CCU, printer	Yes	No	In viewfinder	In viewfinder
Cable types	TV24(81), triax	28-core	14-core, triax	Multicore, coax, triax	Multicore, triax
Portable unit	No	No	Yes	Yes	Yes
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	$\frac{3}{4}$ " f/1.4	$\frac{3}{4}$ "	$\frac{3}{4}$ " 2-G, 1-R/B	$\frac{3}{4}$ " 2-G, 1-R/B	$\frac{3}{4}$ " 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
μ P 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)†	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	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "
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	WC-RC36 option	XC-B10RP, XC-B10TRX	XC-A1RP, XC-A1TCP
μ P 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

†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	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ " 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†)	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)
μ P control	Single	Yes	Single	Single	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)



RVS 416

Two 4-bus Multi-Level Effects systems
& Trans Preview
Linear Keying
Key over
Rotary and matrix wipe patterns
Dual serial interface
Four mask generators
Pattern library



RVS 216A

16 inputs
Wipe to downstream key
Multi-Level Effects and Transition Preview
Encoded chroma keyer
Linear key border generator
Pattern limits
Wide or narrow drop shadow widths on DSK

MEET the Performers



RVS 210A

10 inputs including black and color
Multi-Level Effects system
Ross Transition Preview
Pulse regenerator
Wipe to downstream key
Linear key border generator
Function button for increased flexibility



Circle (185) on Reply Card

Ross Video Limited, PO Box 220, 500 John St., Iroquois, Ont. Canada K0E 1K0 613-652-4886 Telex 05-811579
Ross Video Inc., PO Box 880, Ogdensburg, New York, USA 13669-0880

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

¹BVP-50, -50P are similar to BVP-5, but include a 7-speed electronic shutter.

²Based on 510Hx492V pixel array in NTSC.

³Based on 768Hx493V pixel array.

Manufacturer	Sony Broadcast			Thomson Video Equipment	
Model Series	BVP-3000 SuperMotion	HDC-100	TTV 1530 (1532)	TTV 1525C (1525PC ³)	TTV 1640
Application	EFF, 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	$\frac{2}{3}$ "	1"	$\frac{2}{3}$ "	1"	$\frac{2}{3}$ " 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 opt	Int opt	Internal	Internal w/effects	Internal
Color correction	Int opt	Int opt	Optic	Electronic	Electronic
Color standards	NTSC & 90fr/s	NTSC, PAL, SECAM	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
μ P 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

¹Camera operation requires CCU-3000/DPU-3000 CCU equipment as well as BVH-2700 VTR and BFT-2700 TBC.

²HDCO-100 CCU, HDV-1000 VTR and HDT-1000 TBC are required for operation.

³Includes 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	$\frac{2}{3}$ "	$\frac{2}{3}$ "
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	$\frac{1}{8}$, $\frac{1}{4}$
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
μ P 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/adaptor
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 $\frac{1}{2}$ ", $\frac{2}{3}$ ", 1" and $1\frac{1}{4}$ " 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 μ P 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, $\frac{1}{2}$ "

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/1.4-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

TV Camera Zoom Lenses, $\frac{2}{3}$ "

Manufacturer	Angenieux				Canon
Model	14x6 (14x7)	15x9 (15x9.5)	20x8.5††	40x9.5††	J13x9BIE-II (IRS-IIA)
Application	ENG/EPF w/CCD	ENG/EPF	Studio/OB	EPF/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)	49.75"-1.33"	52.1"-4.3" (27.5"-2.2")
Horiz angle wide-tele	58°-4.5° (52-4)	51°-3.75° (63.5-5 diag)	55°-3°	Manual, electronic	22.1-48.3 cam.dep.
Back focus distance	Adjustable	Adjustable	Electronic, manual	....	72.6mm, 31.7mm
Clear apertures f-r	....	... (64mm/13mm)	....	....	2x available
Integral extenders	2, WAC41	2, 0.76, WA²	1.2, 1.4, 1.6³	2.1 std, 1.45 opt	Yes
Macro focus feature	To front of glass	....	No	....	Cover removal
Maintenance access	Screwdriver adjust	Screwdriver adjust	Remove cover	Remove cover	3.2 lbs (2.84 lbs)
Assembly weight	4.2 lbs (3.1 lbs)	4.7 lbs (5.5 lbs)	39 lbs	43 lbs	561
Reader Service Number	557	558	559	560	

¹Tele attachment & retrozoom available.

²1.66 tele attachment & retrozoom available. Detachable pistol-grip handle for 15x9.5.

31.8 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)
Application	ENG, EPF	OB, studio, sports	EPF	ENG/EPF
Zoom range (basic)	9-126 (8.5-153)	9.5-380 (9.5-430)	9.5-475mm	10-340mm (20.5-70)
Aperture wide-tele	1.7-2.4	1.4-2 (1.7-3)	f/1.4-3	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	1.8m (5m)
MOD image area HxV	45x34mm (49x36)	50x38mm (33x25)	3.6x2.7cm	43x32mm (59x44)
Horiz angle wide-tele	52.1°-3.1° (54.7°-3.3°)	49.7°-1.3° (-1.2°)	49.7°-0.8°	47°30'x1°29'(24°14'x43')
Back focus distance	40.6-48.6mm cam dep	48.9-41.7mm (48.3-42)	Adjustable	Adjustable
Clear apertures f-r	82.8mm, 31.2mm	200mm, 37mm (146.8, 33)	....	....
Integral extenders	2	2 (w/1.5 opt)	2	2
Macro focus feature	Yes	No	Yes	For 10mm MOD
Maintenance access	Remove cover	Remove housing	Remove cover	Screwdriver access
Assembly weight	3.75 (3.46 lbs)	66 (30.8) lbs	39.7 lbs, 18kg	3.53 lbs (3.3 lbs)
Reader Service Number	562	563	564	565

¹Lens 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†
Application	EPF	EPF	ENG, EPF	Studio (EPF)
Zoom range (basic)	8.5-145mm	8-144mm (7-140mm)	12.5-275mm	9.5-420mm
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/1.2-2.1¹
MOD distance	0.75m (0.9m)	0.7m (0.75)	1.8m	2.5m (2.2m)
MOD image area HxV	59x44mm (49x37mm)	51x38mm (58x44mm)	54x41mm	50x37mm (42x32)
Horiz angle wide-tele	54°44'x3°29'(x3°17')	57°37'x3°30'(64°18'x3°36')	38°47'x1°50'	49°42'x1°12'
Back focus distance	Adjustable	Adjustable	Adjustable	Adjustable
Clear apertures f-r	....	....	....	....
Integral extenders	1.5, 2 (2)	2	2	2
Macro focus feature	(Yes)	(Yes)	Yes	....
Maintenance access	Remove cover (screw adj)	Remove cover	Screw adjust	Remove cover
Assembly weight	44 lbs (3.4 lbs)	28.6 lbs (33 lbs)	8 lbs	55 lbs (32 lbs)
Reader Service Number	567	568	569	570

¹The 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
Application	ENG, EPF	ENG/EPF	ENG/EPF	ENG/EPF
Zoom range (basic)	9-112mm (8-126mm)	8.5-127mm	9-117mm	9-126mm
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
MOD distance	0.8m (0.7m)	0.8m	0.8m	31.5"/0.8m
MOD image area HxV	52x39mm (47x63)	5.3x4.0cm	5.6x4.2cm	54x41mm
Horiz angle wide-tele	52.1°-4° (57.62°-4.5°)	54.7°-4.0°	52.1°-4.3°	52°-4°, 27°-2.2°
Back focus distance	Adjustable	Various	Various	42.5-47.6mm
Clear apertures f-r	....	....	....	72mm, 29.5mm
Integral extenders	2	2	2	2
Macro focus feature	Yes	Yes	Yes	....
Maintenance access	Screw adjust	Screwdriver adj.	Screwdriver adj	Screwdriver adjusts
Assembly weight	5 lbs	2.86 lbs/ 1.3kg	2.42 lbs/1.1kg	3.96 lbs, 1.8 kg
Reader Service Number	572	573	574	575

Manufacturer	Schneider Optics	Schwem Technology	Tamron Industries	
Model	TV66	TV80	Gyrozoom 60/300 (FP-1)	456H (H14x9BI)
Application	EPF	Studio, OB	ENG/EPF/OB¹	ENG
Zoom range (basic)	8.8-130mm	8.5-150	60-300mm	9-126
Aperture wide-tele	f/1.4-3.4	f/1.4-4	f/6.2 (range to f/32)	1.6-1.9
MOD distance	17.7"/0.45m	27.5"/0.7m	10'/3.048m	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°
Back focus distance	43.6mm	42.4mm	Adjustable	38.98mm
Clear apertures f-r	134mm, 35.8mm	133mm, 33mm	....	76.5mm, 24.8mm
Integral extenders	2	2	....	No
Macro focus feature	....	....	....	Yes
Maintenance access	Remove covers	Remove covers	....	Screwdriver adjusts
Assembly weight	41.8 lbs, 19 kg	33 lbs, 15 kg	7.25 lbs	3.33
Reader Service Number	577	578	579	580

¹These 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.

TV Camera Zoom Lenses, 1"

Manufacturer	Angenieux					Canon
Model	14x7	14x8	14x9	40x14††	40x9.5††	PV18x11BIE
Application	ENG/EPF	ENG/EPF	ENG/EPF	EPF/sports	EPF/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, WA¹	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

¹Also 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/1.7-2.8	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"

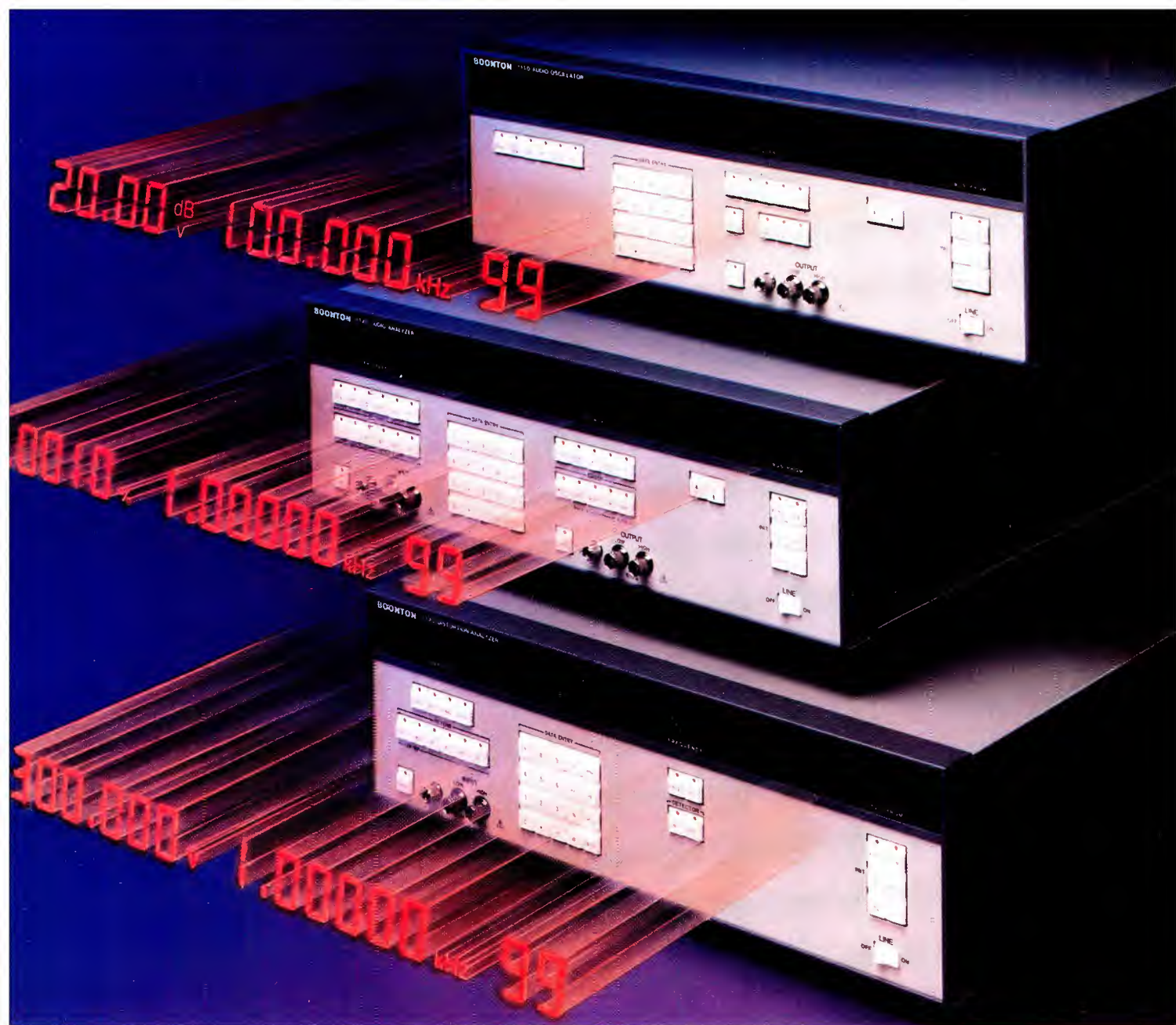
Manufacturer	Angenieux	Canon		Fujinon	
Model	18x16.5HP†	P18x15BIE†	P40x18BIE	P17x16.5ESM†	P20x14ESM†
Application	Studio/OB	Studio, OB	OB, EPF, sports	Studio, OB	Studio, OB
Zoom range (basic)	16.5-297mm	15-270mm	18-720	16.5-280mm	14-280mm
Aperture wide-tele	.....	2.1-2.7	2.3-3.8	f/2.1-2.7	f/2.1-2.8
MOD 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	EPF, 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	CVS series†✓
Application	Master, utility	Master, HDTV	Master control	Master control
CRT diagonal (inches)	21 (15) [14]	20 (26)	20 (14, 26)	14 (20)
Preferred CRT type	Inline dot, flat sq	Inline (delta) dot	Delta-dot	Inline dot
Dot/stripe pitch		0.26mm (0.27)	0.31mm (0.37, 0.43)	0.31mm
Beam feedback design	Yes	No	No	Yes



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Circle (76) on Reply Card

Signal Generators ■ Modulation Analyzers ■ RF Power Meters ■ RF Millivoltmeters ■ Capacitance Meters and Bridges ■ Audio Test Instruments

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

¹Color analyzer available as optional equipment.

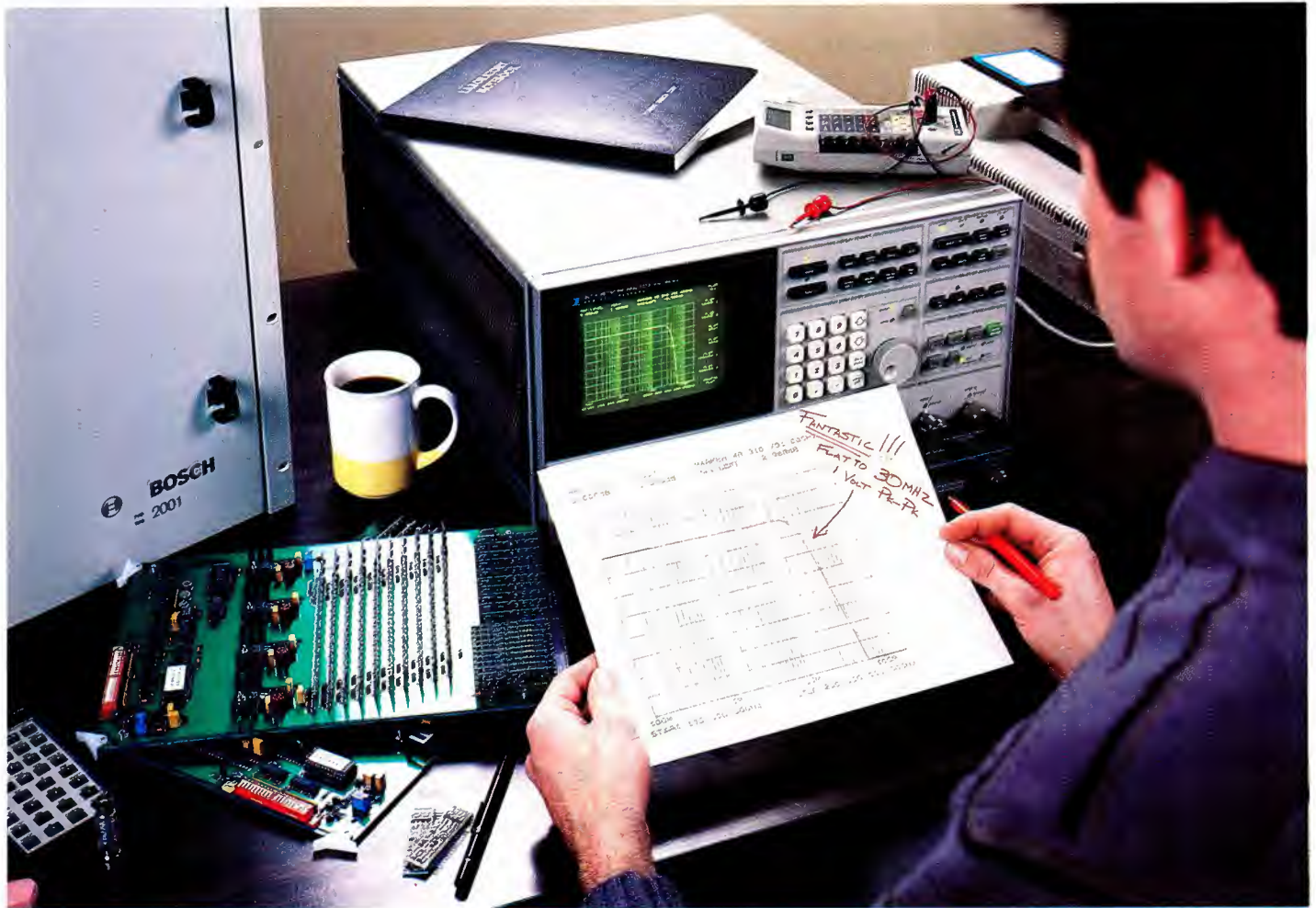
Manufacturer	Barco Industries			Brabury ¹	BTS Broadcast TV Systems
Model/Series	CTVM 4 series	CM22 (CM33, CM51)✓	•HDTV series‡	MCM37B (MCM series)	LDH6200/6220‡(LDK7020‡)
Application	Master control	Master, utility	...	Utility	Master, utility
CRT diagonal (Inches)	14 (20, 26)	9 (14, 19)	20, 26, 30, 40	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

¹Available 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	Delta-dot	Inline dot	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	...	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.)

Wide band switchers for any size system.

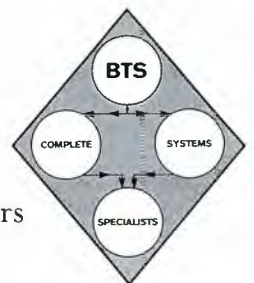
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Circle (77) on Reply Card

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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/stripe 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, Y/Cb/Cr 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

¹TM-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‡¹²	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)	0.68mm (0.47)	0.39mm	0.92mm	0.39mm (0.55)
Beam feedback design	No	...	Yes	...	No
Resolution at center	450 TVL (650)	100 char/inch¹	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

¹per 6MHz (5.5MHz) test signal.

²Video, computer 620x240-pixel RGB.

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

¹Series includes models BT-S1300N, 1900N, S700N, 701N, 702N.

²2010Y & 2580VY models are 20" and 25" diagonal CRT, respectively.

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

†

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Other designs give you "either/or." The DC 24 gives you "AND": Two limiters AND two compressors AND two gates AND a built-in crossover, all in one compact unit.

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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, 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	Yes	Option
Underscan	To 20%	90%	90%	No	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	Dedicated, 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	Dual 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	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	Infinite tile sizes
Programmable sequences	Yes	Yes	No	Yes	Yes
Reader Service Number	758	759	760	761	762

¹Also 4 GPI in, 1GPI out and diagnostic test patterns.

²Multiple frames of 4, 9, 16 per screen.

³Warp option & diagnostic test patterns.

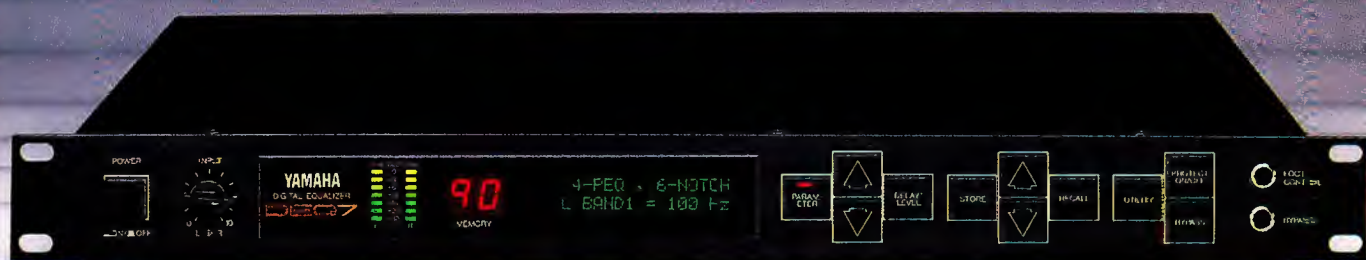
⁴Integral still-store with removable disk, S-VHS output.

⁵Includes audio control and mixing.

⁶Also 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

¹Systems 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 Multiflex (-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 (Variable axis spins)	....
Rotation around axes	Z	X, Y, Z	....	Variable aspect ratio	No
Perspective effects	H, V, optional	2-D only	Double pseudo-cube	Fld, frm, strobe	Fld, frm, update, 2-pic
Image freeze	Fld, frm, strobe	w/multifreeze	Field, frame	Yes, quad repeats	H, V 4-quadrants
Picture splits	Yes	Yes, w/keys	H & V	H, V, w/re-enter	H, V
Mirror effects	H, V, diagonal	....	H & V	Yes	Yes
Push-on/push-off	Yes	Yes	Trajectory paths	Yes, colorize	10 level w/false color
Posterization	2 levels w/false color	Yes	Yes	Yes	7 tile sizes
Mosaic tiling	10 levels	Yes	Yes	Yes (w/Keyframe traj.)	Yes
Programmable sequences	Yes	Multiple	Yes	771	772
Reader Service Number	768	769	770		

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

²Variable 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	58dB	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

¹Composite, 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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FM Transmitter

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

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

¹A/V model for standard videotape editing; CC for use in audio-for-video applications.

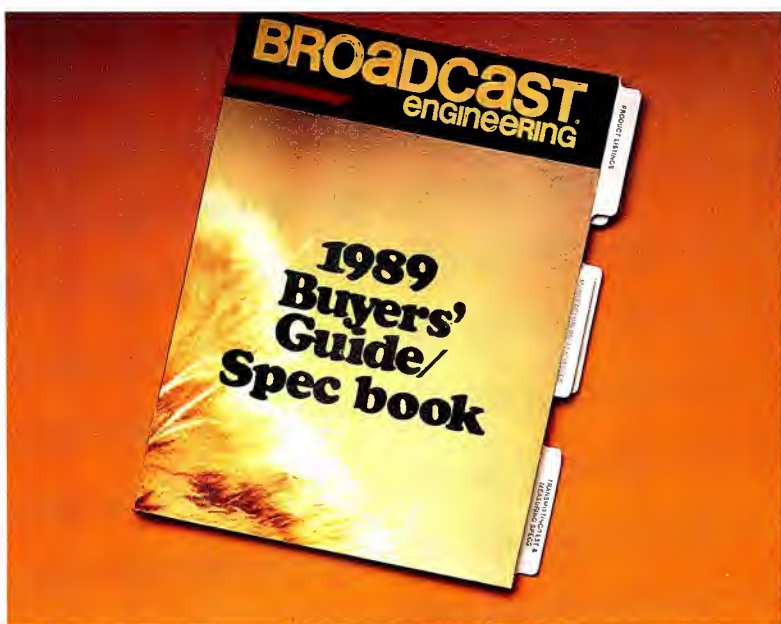
²System allows multiple non-interacting work stations.

³Deck 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)	Master Mix✓
Suggested for	On-line, off-line	On, off line	On-line
VTRs ATRs record/play	1-R, 2-P	2R, 14P transports	1R, 3P transports
Videodisc interface	Yes	Yes	Yes
Microprocessor	IBM PC/AT or clone	Distributed 16-bit	Distributed 16-bit
Internal storage	2 999-event lists	9,999-event, 2Mbyte RAM	To 9,999 events
Ext storage type	Yes	F.disk, paper tape	F.disk, paper tape
Edit decision list	Yes	6000-line	300-line
Edit data display	Computer CRT	CRT	CRT
Printer interface	Yes	RS-232C	RS-232C
Animation mode	Yes	Yes	Yes
Time code reader	Yes	Yes	Yes
Time code generator	Yes	Yes	Yes
Time code types	SMPTE, EBU longit.	LTC, VITC	LTC, VITC
Color framing use	Yes	NTSC, PAL(M)	NTSC, PAL(M)
Device interfaces	AM2100, CTX1000	Switcher, mixer, stills	Switcher, mixer,
Control bus	Serial, parallel	graphics, effects	effects
Reader Service Number	843	RS-422, GPI	RS-422, GPI
		844	846

¹Integral 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	Yes	Multiple	No	No	Yes
Microprocessor	Proprietary	Floppy disk	Centralized 8-bit	Centralized 8(16)bit	Distributed
Internal storage	80-event, 100 loops	Yes	128	1,000	Multiple
Ext storage type	Yes	CRT	None	Floppy disk	Ext memory cartridges
Edit decision list	80-event	Yes	Yes	Yes	Yes
Edit data display	EL panel	CRT	CRT	CRT	LED displays
Printer interface	Yes	Possible	None	RS-232	No
Animation mode	Yes	Yes	No	Yes	Dialog replacement
Time code reader	w/transport	Yes	Yes	In interface	Yes
Time code generator	Yes	SMPTE VITC	No	In interface	Yes
Time code types	All standards	NTSC	LTC/VITC/ctl-trk/sync	LTC/VITC/Ctl-Trk/sync	LTC, VITC
Color framing use	Yes	Programmable	NTSC, PAL	NTSC, PAL	NTSC, EBY
Device interfaces	Yes	RS-422/232	Switcher, mixer	Switcher, mixer,	5 com ports
Control bus	RS-232, RS-422	849	GPI equipment	graphic titler	
Reader Service Number	848		RS-422, EBus, GPI	RS-422/-232, GPI	RS-422/232
			850	851	852



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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, cti-trk	LTC	LTC, VITC	LTC, VITC	LTC
Color framing use	NTSC, PAL	NTSC, PAL	NTSC, PAL	Yes	....
Device interfaces	Switcher, mixer	4 GPI, ROM VTR software	Switcher, mixer	Switcher opt, mixer	Mixer, TimeLine Lynx
Control bus	RS-422/232, GPI	RS-422	RS-422/232, GPI	RS-422, GPI	Adams-Smith, others
Reader Service Number	853	854	855	856	857

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

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

Manufacturer		Comprehensive Video	Editron		EECO/Convergence	
Model Series		EditMaster ¹	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, cti trk	LTC	LTC	LTC, cti-trk	LTC, cti-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, EBus,	RS-422, EBus,	RS-422/232, GPI	RS-422/232, GPI
Reader Service Number		858	859	860	861	862

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

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*)†
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, cti-trk	LTC, cti-trk	LTC, cti-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
Control bus		RS-422, GPI	RS-422, GPI	RS-422/232, GPI	RS-422	Dubner titler
Reader Service Number		863	864	865	866	867

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

Manufacturer	Grass Valley Group		JVC Company	JVC/Pallex	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, cti-trk	LTC, VIFC
Color framing use	NTSC, PAL	NTSC, PAL	525/60, 625/50	NTSC, PAL	NTSC, PAL
Device interfaces	Switcher, effects, Stills, titler, 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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Circle (86) on Reply Card

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

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

¹BKE 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		Eagle series I/II/III	
Suggested for	On, off-line	On, off-line	On, off-line	Any	Any
VTRs ATRs record/play	2 to 8-machine	2 to 8-machine	2 to 9	6 transports total	5 source, 1 record
Videodisc interface	Yes	Yes	Yes	.....	.....
Microprocessor	Distributed 16-bit	Distributed 16-bit	Distributed 16-bit	Z80A distributed	Z80As distributed
Internal storage	500 event	500 event	500 event	250 event	250 event
Ext storage type	F-disk, P-tape	F-disk, P-tape	F-disk, P-tape	Floppy disk	Floppy disk
Edit decision list	Yes	Yes	Yes	Management on I/II/III	Yes
Edit data display	CRT	CRT	CRT	RS-232 serial	CRT
Printer interface	RS-232	RS-232	RS-232	Yes	RS-232C/serial
Animation mode	Yes	Yes	Yes	In interfacing	Possible
Time code reader	Yes	Yes	Yes	.....	In interfacing
Time code generator	Yes	Yes	Yes	.....	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	NTSC, PAL	Yes	Yes
Device interfaces	Switcher, mixer, title	Switcher, mixer, title	Switcher, mixer, title	Switcher	Switcher, transports
	Effects, still, graphics	Effects, still, graphics	Effects, still, graphics	.....	printer
Control bus	RS-232/422, UMI-bus	RS-232/422, UMI-bus	RS-232/422, UMI-bus	Serial, parallel	RS-232C, ser/parallel
Reader Service Number	883	883	884	885	886

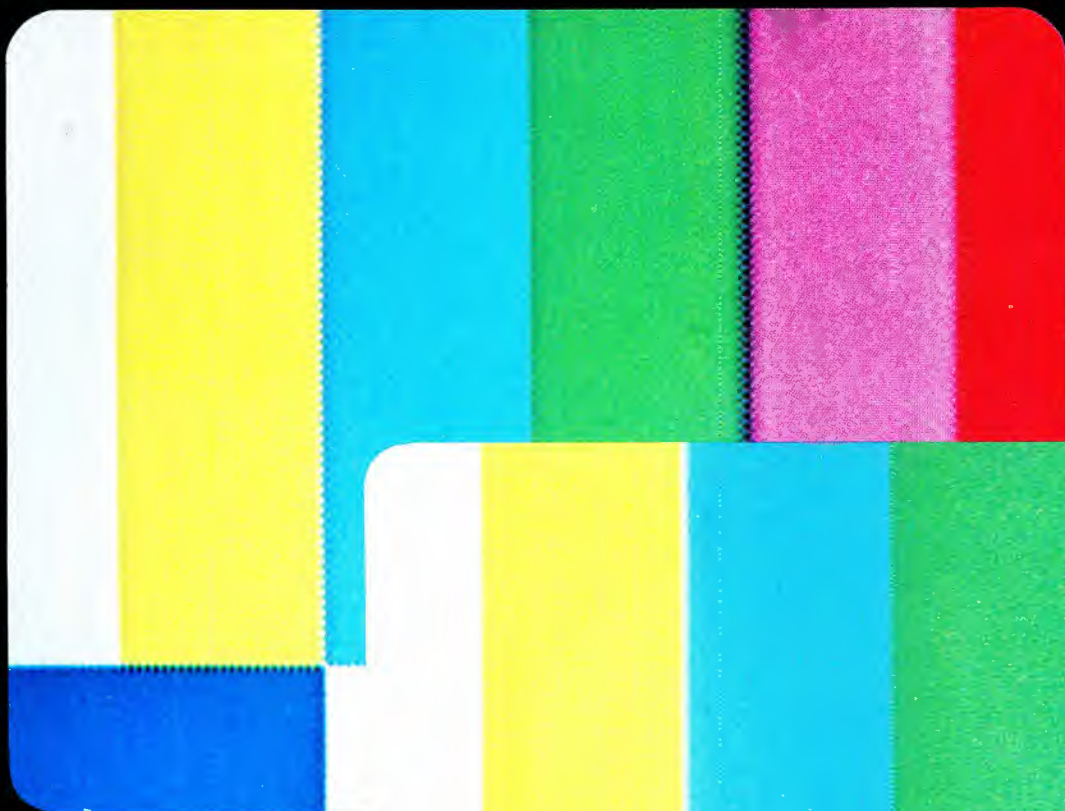
¹COMM-ETTE A/B roll, Mini-COMM 2-6 roll, Commander II, 2-8 roll.

²MT30 AB roll; MT60 2-6 roll; MT90 2-9 roll.

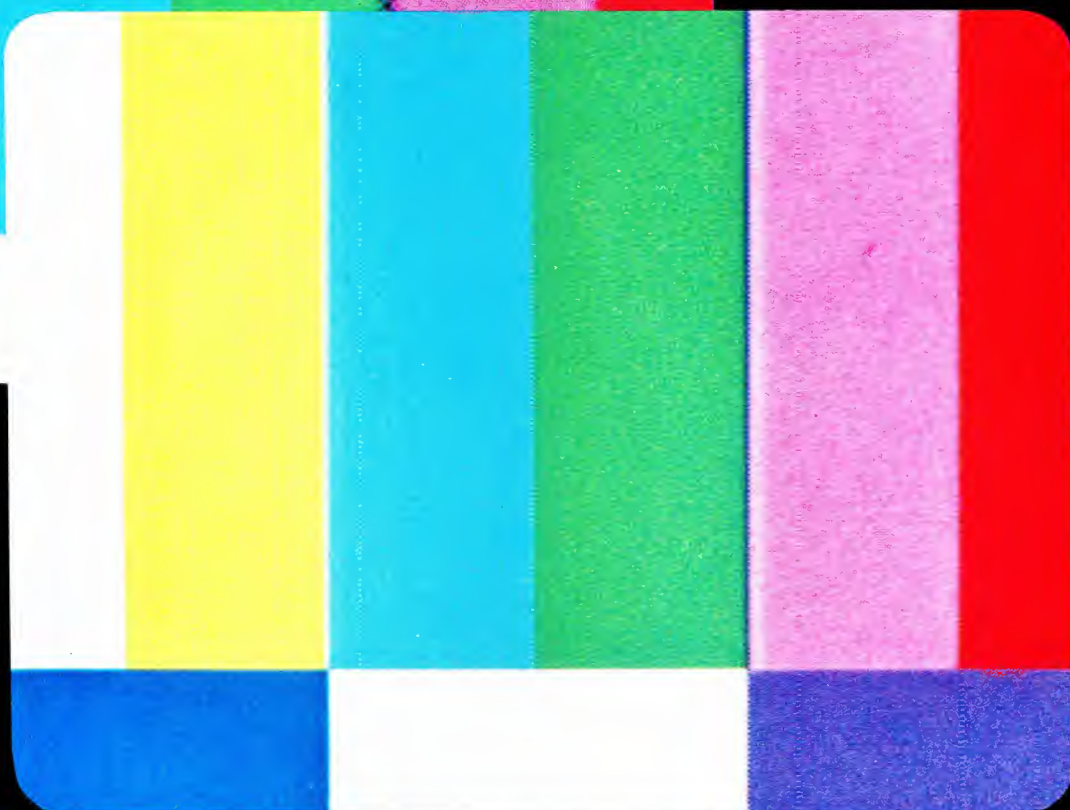
Graphic Production Titlers

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		Aston 4		Viditext II ¹	
Subtitles	Yes	Yes	option	option	Any screen area	Any part of screen	Screen 3rds	Screen 3rds	Screen 3rds
Tab	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Underlining	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Italicize function	Yes	Yes	Yes	Yes	4" to 30"	Yes	No	No	No
Page format	.....	.....	Free-form	Free-form	Free-form	56 char/14 line	64 char/31 line	64 char/31 line	64 char/31 line
Resolution	.....	.....	4.6ns effective	4.6ns effective	<10ns	10ns	48ns	48ns	48ns
Anti-aliasing	256-level	256-level	256 levels	256 levels	Software	Hardware, software	Hardware, software	Hardware, software	Hardware, software



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Manufacturer		Aston Electronics		BTS Broadcast TV Systems	
Model/Series		Aston 4		Viditext II ¹	
On-line type faces	15 master faces	Multiple	8	8	
Type styles	Instant resizing	Instant resizing	A/B/V/D	A/B/C/D	
Non-Arabic faces	Yes	Yes	Yes	Yes	
Type face storage	Disk	Disk	Disk	Disk, RAM	
Face-font compose	Yes	Option	Logo compose opt	option	
Display flash	Yes	Yes	Yes	Char/word/line/page	
Edging effects	Yes	Full edging control	Full edging control	Full edge control	
Auto centering	Yes	Yes	Yes	Assignable center	
Roll/crawl control	Yes	VECTOR effects	8 speeds	Variable	
Keyer/colorizer	Yes	External keyer	External keyer	Integral	
Color palette	16.7 million	16.7 million	4,096	4,096	
Colors per screen	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	16-bit/bit-slice	
Integral still store	3.5" floppy	optical, H.disk	No	Graphic Store opt	
Off-line storage	100MByte Winchester	optical, H.disk	Floppy/Winchester	Floppy/Winchester	
Access time page	.....	<1s	<1s	<0.9s	
Effective planes	Multiple channel	4 plane	3	32 planes	
Remote control	RS-232/-422	RS-232/422, Ethernet	RS-232/422	RS-232/422	
Image sources	RGB, CCIR 601	Any video	.....	RGB, composite	
Multi-user system	Possible	1 or 2-channel	2-station	2 keyboard on-line	
Automation interface	RS-232/-422/GPI	GPI	Various	No	
Reader Service Number	330	331	333	334	

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

Manufacturer		Chyron		Comprehensive Video	
Model/Series		Scribe series ¹		PC-2	
Subtitles	Any screen area	Any screen area	Any screen area	Possible	
Tab	256 position	256 positions	256 positions	Yes	
Underlining	Yes	Yes	Yes	.....	
Italicize function	.....	Yes	Yes	Yes	
Page format	62 char/20 line	Free-form (63cx24r)	62 char/24 line	10-62 char x 13 lines	
Resolution	27ns	(0.84ns HD)	27ns	1000x512-pixel 40ns	
Anti-aliasing	Yes..	Hardware (16-lvl HD)	Yes	Yes	
On-line type faces	4 load positions	8 w/auto size, kerning	12 font positions	30	
Type styles	Various proportional	1500 in library	Proportional, kerning	30 in library	
Non-Arabic faces	International faces	International sets	.....	.....	
Type face storage	Disk, RAM	Disk, 512k, 2MB opt	Disk, 45 font	.....	
Face-font compose	Option	000Option	Option, paint opt	Possible	
Display flash	Yes, also effects	Yes & 3D modeling	Yes, also effects	Yes	
Edging effects	Surround/shadow	Full edge control	Full edge control	Various controls	
Auto centering	Horizontal	Yes	Horizontal	Yes	
Roll/crawl control	Variable	Variable	Variable	Yes	
Keyer/colorizer	Integral	Integral	Integral	Integral	
Color palette	64	16.7 million	512	64	
Colors per screen	8/screen	256 (32 Jr)	185/screen	64	
Internal memory	2 page	2 pages	2 page	H.Disk	
Memory architecture	16-bit	32-bit	16-bit	16-bit, XT/AT	
Integral still store	No	No	Vididisc	Winchester	
Off-line storage	Floppy	Floppy/Winchester	Floppy/Winchester	F.Disk	
Access time page	1s page/frame	0.5s	1s	.....	
Effective planes	2	2	3	1	
Remote control	RS-232	RS-232/422	RS-232	.....	
Image sources	Camera	Camera	Camera, tablet/Wx	Composite video	
Multi-user system	2 stations	2 stations	3 stations	No	
Automation interface	No	No	Weather service opt	.....	
Reader Service Number	335	337	338	339	

¹Scribe series includes Scribe Jr., Super Scribe and High Definition Scribe.

²Chyron IV series includes 4200 w/Motion II and 410CEXB.

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

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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
Tab	.....	.....	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	Integral facilities
Color palette	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	OCG-38 Orion
Subtitles	Yes	Yes (Possible)	Yes	Yes
Tab	Yes	Yes	Yes	Yes
Underlining	Yes	Yes	Yes	Yes
Italicize function	Yes	Yes	Yes	Yes
Page format	768x483 pixels	32 char/10 lines	32 char/16 rows	40 char/13 lines
Resolution	35ns	35ns (70ns)	35ns	18ns
Anti-aliasing	.....	.....	.....	.....
On-line type faces	Unlimited (15 std)	5, 16 sizes, reverse	8	8, 8 sizes
Type styles	A/B/C/D	A/B/C/D	A/C/D	A/B/C
Non-Arabic faces	.....	.....	.....	.....
Type face storage	ROM, Disk	ROM & (disk)	Disk	ROM
Face-font compose	Yes	No	Yes	No
Display flash	Yes	Yes	Yes	Yes
Edging effects	Yes	Yes	Yes	Yes
Auto centering	Yes	Yes	Yes	Yes
Roll/crawl control	Variable speeds	Multiple speeds	8 speeds	10 speeds
Keyer/colorizer	Integral	Integral	Integral	Integral
Color palette	128 char/1024 bknd	4,096 (512)	112	512
Colors per screen	16 char/256 bknd	16 char/16 bknd (8/8)	.....	13 ch/13 bknd/8 edge
Internal memory	1 page	1 page	15 pages	20 pages
Memory architecture	8-bit	8-bit	8-bit	8-bit
Integral still store	No	No	No	No
Off-line storage	100 pages/disk	1,000 pages/disk	128 pages/disk	Disk
Access time page	1/2s	1/2s	<1s	0.5s
Effective planes	Background, title	Background, title	1	Background, title
Remote control	RS-232	RS-232	RS-232	RS-232/422
Image sources	Digitizer, tablet	Background video	Camera	Input video
Multi-user system	Multiple keyboards	No	.....	.....
Automation interface	.....	Closure switch	Yes	No
Reader Service Number	898	899	900	901

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

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 palette	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-sensitive 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	Amplex 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	Any video source,	RGB, modem, tablet	RGB, tablet, modem	Any including U-matic,
	Eikonix hi-res camera		Ethernet		VHS, RGB, YUV
Output drivers	NTSC, Betacam, DigVid	Digital I/O option	RGB F.buffer, NTSC	RGB F.buffer, modem	PAL, RGB, CCIR-601
	Film recorder		Film recorder	Film recorders	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	Skew/perspective/stretch	Perspective/stretch/copy	Yes
		Comp/exp/rot	Rot/reflect/move/cpy/scale	Rot/reflect/move/scale	
Artist's tools	All standard	Geom/grid/zooms	Geom/curve/trace/writon	Geo/curve trace/write on	Brushes, cut/paste
	Opt 3D modeling	Cut-paste	Fill/brdr/magnify	Fill/brdr/magnify	matte, screen print
Texture mapping	Animated/bump/natural	....	....	....	Yes
Shading	Lambert, Phong, Blinn	....	Reflectance	Reflectance	Tint, merge
Animation features	Obj's, light, camera	Obj's/lights/camera	Options	Options	Yes
3D render features	Wireframe prvw/PIXAR	Wireframe prvw/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

¹Of 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	RGB/NTSC F.buffer	RGB F.buffer, Scitex	F.buffer, film printer	F.buffer
	Film recorder		Film recorder, DigVid	Film recorder	
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	All standard types	Std 2D manipulations	Scale/rotate/mirror
		Crop, geom./mosaic/montage		Perspective/transforms	Copy/move
Artist's tools	TIPS, Media Logic, NPS paint	All standard types	Geom/retouch	Geom/grids/std tools/ mosaic/posterization	Color correction, crop
Texture mapping	Yes	....	Texture/bump	....	Enhance
Shading	Gouraud, Phong	....	Gouraud, Phong, others	....	No
Animation features	Dynamic Imaging module	Color cycle, 2D	Obj's/lights/camera	2D motion, color cycle	50 ind 2D objects
3D render features	Model software module	No	Wireframepv/fulclr 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

¹Of a 16.7 million color palette, more than 2,000 can be used on one screen.

²PIXELATOR rendering engine option greatly improves 3D rendering speed.

³All of a palette of 32,780 colors may be used simultaneously on one screen.

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	RGB, tablet, library	RGB, tablet	RGB/composite video
Output drivers	Video printer	Encoder	RGB F.buffer	Frame buffer, DigVid	Tablet, ASCII files
Encoder/Decoder/Sync-gen	Internal encoder	Integral	Ext/ext/ext	Ext/ext/ext	RGB F.buffer
VTR controller	....	Yes	Diaguest	Internal	Film recorder
Image manipulations	Zoom, pan, scroll	Cut-paste, wash	All std/stencil/crop	All standard types	Ext/ext/ext
Artist's tools	Rotate, flip, other	Overlay, pix repeat	geom/mosaic	....	Lyon-Lamb MiniVAS
Texture mapping	2-D paint software	3D Plus paint software	All standard types	....	Perspective/translation
Shading	....	GEOS images	Yes	Texture/bump	Effects module opt
Animation features	No	....	Gouraud, Phong	Texture/bump	Digital matte
3D render features	No	3D Plus software	Objs, lights, camera	Gouraud, Phong, others	Transparency 256-lvl
CRTs used for	Canvas	Canvas-menu	Wireframe prvw	Objs, lights, camera	Texture/reflct/bump/shdw
Multiple user	No	Yes	Canvas, system	Wireframe prvw/PIXAR	DGS Animate module
Remote/Data input by	....	RS-232/422	Yes	Canvas	2D/3D Build modules
Reader Service Number	1069	1070	RS-232/422	....	Menu, RGB
			1071	RS-232, modem	No
				1072	....
					1073

¹Of a palette of 4,096, 256 colors can be used simultaneously on one screen.

²Optional Pixar rendering engine.

Manufacturer	Dubner Computer	Getris Images	3M Company	Magni Systems	Microtime
Model Series	DPS-1†	Atalis	Specter systems	Series 4000†	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	....	HD, FD	....	FD disk
Image resolution	768x525-pixel	765x576-pixel	1024x768 pixel	768x480 (IBM) NTSC	8x8k pixel
Image sources	Camera, video	Any video source	RGB/NTSC, tablet	VCR, video	RGB source, tablet
Output drivers	Encoder	Composite & DVTR	Component scan-in	....	....
Encoder/Decoder/Sync-gen	....	....	Video F.buffer	NTSC	RGB Fbuffer, film
VTR controller	....	Yes	Film recorder	Ext/ext/ext	recorder, Bernoulli
Image manipulations	Standard effects	Real time effects	Lyon Lamb MiniVAS	....	Ext./ext/ext
Artist's tools	Standard tools	Geometrics, others	Standard, flips, digvid	Per software package	Internal
Texture mapping	....	Yes	Multi-freeze	....	Perspective
Shading	....	Yes	Grid, all std tools	Per software package	Cut-paste, move
3D render features	....	Yes	TIPS paint software	....	Transparency
CRTs used for	Canvas	....	....	Per software package	Texture, reflectance
Multiple user	No	....	Ray-tracing	Per software package	Gouraud, Phong, metallic
Remote/Data input by	RS-232	....	...(Yes)	Menu, NTSC	Obj, light, 3D metal
Reader Service Number	1074	1075	Menu-canvas	No	Menu, RGB
			RS-232, Ethernet LAN	....	Yes
			1076	1077	Modem, LAN, renderer
					1078

¹Two 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	Model 3000E
Base computer	Proprietary	Proprietary	TI 34010 series w/math
Internal memory	....	....	8MByte
Memory architecture	32-bit	32-bit	32-bit
Off-line storage	FreezFile option	3000E-20 option	FD disk
Image resolution	4.2MHz NTSC equiv.	768x484-pixel	756x486 pixel
Image sources	RGB/NTSC source, Tablet	RGB/NTSC source, tablet	RGB/NTSC, CCIR-601 4:2:2
Output drivers	Component video scan-in	Component video opt	Tablet, other
Encoder/Decoder/Sync-gen	Frame buffer for video	Frame buffer for video	RGB f.buffer, encoder
VTR controller	Int/int/int	Int/int/int	Network
Image manipulations	Yes	w/serial protocol	Int/int/int
Artist's tools	Standard, flips, digvid	3000E-10 option	RS-422
Texture mapping	Multifreeze, PRIZM	PRIZM option	Mosaic, duplicate, move
Shading	Geom, grids, std tools	Geom, grids, std tools,	Posterize, emboss
Animation features	mosaics, posterization	Mosaics, posterization	Geom/paint, mix, fixative
3D render features	Yes	Yes	magnify, graph
CRTs used for	With upgrade 2040	Gouraud, Phong, flat	....
Multiple user	With upgrade 2033	3000E-40 option	Phong, gamma correction
Remote/Data input by	Menu, canvas	Yes	TOPAS-32 processor
Reader Service Number	1079	Menu-canvas	TOPAS-32 processor
		....	System, canvas
		....	Yes
		....	RS-232/422
		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



CVM is the newest addition to the intelligent professional color monitors. Like its big brother, the CVS auto-alignment monitor, it is completely microprocessor controlled. CVM delivers full broadcast features, exceptional stability and brightness, future expandability and much, much more... For less than \$ 3000⁽¹⁾.

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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

¹Of 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 unwd	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

¹Data 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

Manufacturer	Faroudja Laboratories
Model Series	CTC-N transcoder
Color correction	Color balance
Contrast correction	From setup/gain
Sync regeneration	Yes
Standards conversion	No
Dubbing application	Yes
Production application	Yes
On-air application	....
Format conversions	YCrCb, RGB, bidir.
Video response	± 0.3dB to 8MHz
S/N ratio	60dB
Envelop delay	<5ns relative
Diff phase, gain	....
Video level adjust	± 2dB
Chroma level adjust	± 5 IRE balance
Pedestal level adjust	± 15 IRE
Chroma phase adjust	No
Subcarrier phase range	± 2μs genlock
Sync level adjust	± 10 IRE
RGB gain/pedestal adjust	Pedestal black bal
Programmable system	No
Component formats	Yes
Remote control type	.....
Reader Service Number	985

For-A Corporation	
Model Series	CT-600 transcoder
CCS-4300/4350 (-4400)	
RGB gain, setup, gamma	No
Yes	No
Yes	No
No	Format
Yes	Yes
Yes	Yes
Yes	No
4400 YCrCb to encoded	RGB, YPrPb, YC358, YC688
± 0.1dB 4.2 (± 0.5 to 8MHz)	-1dB to 5MHz
60dB random, 50dB hum	....
YC delay 40ns/K(2T) 0.5	1% H/V Tilt
<0.5/ <0.5	1°, 1%
± 3dB (± 3dB YCrCb)	No
± 3dB (± 3dB CrCb)	No
± 20IRE (± 10% Y)	No
± 15°	No
± 1° on 4350	No
Fixed	No
± 30dB (± 30%G, ± 15%Ped)	No
No	No
4400 only	All forms
Proprietary	None
986	987

Fortel	Laird Telemedia
Interpreter	VC-2000 video corrector
....	Yes
....	Yes
....	Yes
....	No
Yes	From ½-¾" tape
Yes	Yes
Yes	....
RGB/YCrCb/Y688/Y629(1)	No
to 5.5MHz	± 3dB 5MHz
60dB	60dB
2° chroma linearity	....
2° 2%	± 1.5°, 1.5%
....	0 IRE-3x input
{Y/3.58 with	½ to 1½x input
[output only	-15, +20IRE ref 7.5IRE
{for NTSC.	....
....	± 65°
....	
....	No
No	No
All component formats	No, includes audio
....	No
988	989

Manufacturer	Leitch Video
Model Series	VPA-330N (VPA-331N)
Enhancement	No
Noise reduction	No
Color correction	Chroma AGC
Contrast correction	Luminance AGC
Sync regeneration	RS-170A phasing
Standards conversion	No
Dubbing application	Yes
Production application	Yes
On-air application	Yes
Format conversions	Yes
Video response	± 0.1dB 5MHz luma
S/N ratio	> 60dB
Envelop delay	....
Diff phase, gain	< 0.2°, < 0.5%
Video level adjust	± 2.5dB
Chroma level adjust	± 2.5dB
Pedestal level adjust	± 10 IRE
Chroma phase adjust	± 20°
Subcarrier phase range	360°
Sync level adjust	± 10 IRE
RGB gain/pedestal adjust	No
Programmable system	No
Component formats	No
Remote control type	Conductor/function
Reader Service Number	990

Lenco	
Model Series	PRC-465 (PRC-365)
PCD-473	
No	In white clip areas
Inherent in comb filter	No
Hue, gain	Gain, phase
....	With setup
No	Yes
Component only	No
Yes	Yes
Yes	Yes
No	Yes
Encoded to RGB/YCrCb/YIQ	No
± 0.5dB 30H-5MHz Y	± 1dB to 15MHz
> 55dB non-coherent	> 50dB below 1Vp-p
....	< 10ns
....	< 0.5°, < 0.5%
± 6dB	-40dB, +6dB
+6dB saturation	-30dB, +6dB
....	± 20 IRE
± 22°	....
....	± 20°
....	20-80IRE
No	No
No	No
Component outputs	No
No	No
991	992

Magni Systems	Merlin Snell & Wilcox
125AD/125DA	ME 8700 Triple
(Operation in 8-bit	Yes
(& 10-bit modes with	Temporal recursive
(13.5MHz sampling	....
Setup adj, removal	Inherent
....	TBC, Synchro features
No	NTSC, PAL, SECAM
Yes	Yes (Motion adaption)
Yes	Yes (4/-8-field)
No	Yes (± 15ns stability)
Digital 4:2:2/CAV	Composite, Y-C
± 0.2 5MHz Y-channel(1)	± 1dB to 3.3MHz
> 60dB to 5MHz	> 56dB CCIR wtd
....	-100, +500ns adj
1% K factor 2T pulse	....
± 3dB on input	± 6dB continuous
....	Yes
7.5 IRE or 0 IRE	Yes {Single direction
{Chroma response:	{conversion only
[-90.2dB to 2.75MHz	{between any 2
{in R-Y/B-Y	{standards.
{signal channels	....
....	No (Freeze, fades
SMPTE, BETA, M-II, RGB	M-II, S-VHS, ED-Beta
Yes	None
993	994

Manufacturer	Merlin Snell & Wilcox
Model Series	DIP 9800/ME-888B
Enhancement	H/V aperture
Noise reduction	Temporal recursive
Color correction	Color balance
Contrast correction	Inherent, Y-C delay
Sync regeneration	Inherent
Standards conversion	All, automatic select
Dubbing application	Yes (4-field with
Production application	Yes (motion
On-air application	Yes (interpolation.
Format conversions	Composite, RGB, YCrCb
Video response	± 0.5dB 3.3MHz NTSC
S/N ratio	52dB wtd flatfield
Envelop delay	-100, +600ns horiz
Diff phase, gain	....
Video level adjust	± 6dB continuous
Chroma level adjust	Yes
Pedestal level adjust	± 150mV continuous
Chroma phase adjust	NTSC only
Subcarrier phase range	Yes
Sync level adjust	Fixed
RGB gain/pedestal adjust	Color balance
Programmable system	No
Component formats	RGB, YUV outputs
Remote control type	Duplicates ctl panel
Reader Service Number	995

Merlin Snell & Wilcox	Oki Electric
DIP 9700A/ME-808	LT1210 (LT1250)
ME 8500 Unidirectional	
Yes	Yes
Luma, chroma	No
....	Level, hue
Inherent	Setup level
TBC, Synchro features	Yes
NTSC, PAL, SECAM	Yes¹
Yes (Motion adaption)	Yes
Yes	....
Yes	Yes
Composite, Y-C	No
± 1dB to 3.3MHz	....
> 56dB CCIR wtd	....
(4-field NTSC	Adjustable
(8-field PAL	....
± 6dB continuous	Yes
....	Yes
....[Single direction	Yes
....[conversion only	Yes
....[between any 2	Yes
....[standards.	> ± 3dB
....	
Color balance	....
....	
YUV out for SECAM	No
Duplicates ctl panel	None
996	997

Quantel	Video International
Satin, Satin 601	DTC 4500¹
Yes	Continuous adj
Yes	7-stage, Y & UV
....	Full control, 4-field
....	Setup adj
TBC functions	....
NTSC, PAL, SECAM	....
Yes	....
Yes	....
Yes	....
RGB to composite	....
> 4.2MHz NTSC	....
....	
....	
....	
....	
No	....
Yes	....
CCIR 601 compatible	....
RS-422	....
999	998

Manufacturer	Shintron
Model Series	MC-1 intermatrix
Enhancement	No
Noise reduction	No
Color correction	(MC-1CC ± 6dB/channel)
Contrast correction	(MC-1WC white clipper)

Sony Broadcast	Utah Scientific/ADC
Model Series	da Vinci
BVX-30 system	
H-V detail	....
15dB luma	Grain reduction
RGB gain, lift, gamma	16-vector system
No	Yes

Video International	DTC 3602 (DTC 3502²)
DTC 4500¹	
Continuous adj	Continuously adj
7-stage, Y & UV	3-stage
Full control, 4-field	Full control
Setup adj	Setup level adj

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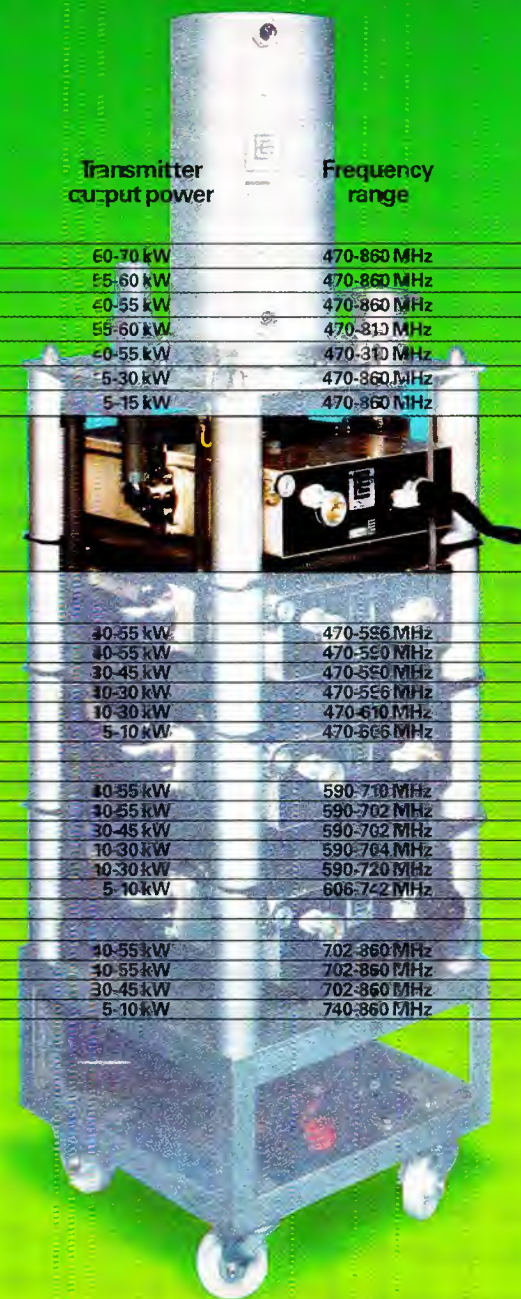
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WIDEBAND SERIES

	Transmitter output power	Frequency range	Typical Sync efficiency
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	5-30 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	470-556 MHz	38% to 43%
K3382BCD	40-55 kW	470-550 MHz	38% to 42%
K3217HBCD	30-45 kW	470-550 MHz	40% to 42%
K3230BCD	40-55 kW	470-556 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	40-55 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

¹An 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 patterns	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)	8 (12), 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

¹Automation functions determined by model 7203 or 7239 Auto-Drive controls.

²Switcher 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

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

¹Number 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 keys	.....	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 keys	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	.....	No	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	Kaitronics	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 keys	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	.....	2
Pattern generator	No	.....	No	None	Yes 22 standard wipes

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	Empress 2000 (EC2000)
Control application	Production	Production (component)
# of inputs	16V	10 + key + spare
Integral matte source	6 generators	Yes
Key sources	Int, ext	Int, ext
Chroma keys	RGB & encoded opts	RGB
Downstream keyer	3 sources	Option
Switching buses	6 primary	4 primary
Mix Effects amps	2 4-bus multilevel	1 MLE
Pattern generator	2 w/rotary, matrix, spin	12 patterns
Wipe effects	Hard, soft-edge	9 rotary, hard, soft edge
Spotlight effects	w/Linear key	----
Border effects	Opt/analog key border	Yes
Shadow effects	Yes	No
Automation interface	RS-422 optional	RS-422 & Empress
Programmable functions	X-fade, fade-black	Yes
Memory backup battery	Yes	No
Diagnostic software	----	No
Digital effects port	----	No
Path length or deviation	1.5µs differential	50ns
Crosstalk at subcarrier	< -53dB NTSC, PAL	< -50dB
Audio preview, follow	----	A270 AFV switcher
Audio level control	----	via RS-422
Audio mixer interface	----	A270 AFV switcher
Edit control interface	Expanded GPI	RS-422, SMPTE
Reader Service Number	1123	1127

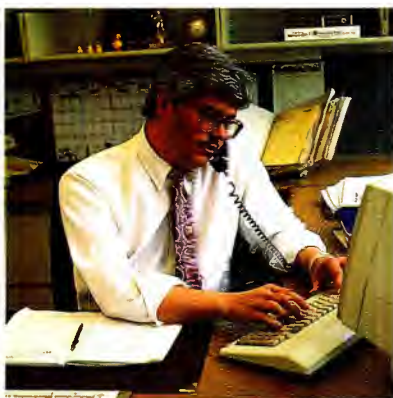
¹Series also includes models 504 and 505.

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

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	Datalek
Model/Series	Modula/Mini Modula	TVS/TAS-2000	BSX-350	P169V/P169A
Crosspoint matrix	8x8 (8x8)	10x10	10x10	8x4
Typical system size	256x256 (24x32)	450x150	----	8x4x3



Larry Broome
Product Manager/Broadcast

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Circle (92) on Reply Card

Manufacturer		BTS Broadcast Television Systems		CEL/Grunder	Datatek
Model/Series		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	±0.1dB 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		Di-Tech		Dynair Electronics	
Model/Series		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	±0.5-3dB 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

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

Manufacturer		Dynamic Technology/DTL		Grass Valley Group	
Model/Series		Routemaster	3900 series	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-20kHz	<±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

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

Manufacturer		Image Video	
Model/Series		Model 9520/9521	Model 9600
Crosspoint matrix	10x20, 20x10	20x10/20x10	40x40 + 2 audio
Typical system size	10x40, 20x20	20x10 w/dual audio	40x40-320x320/multilevel
Audio response	±0.1dB 20-20k	-0.25,0dB 20Hz-20kHz	-1,0dB 20Hz-100kHz
Harmonic distortion	0.05% +24dBu	<0.02% +18dBm	<0.02% +18dB
S/N ratio	110dB 20Hz-80kHz	>96dB	105dB typical
Audio crosstalk worst	80dB 20Hz-20kHz	<75dB 20kHz	>75dB 20kHz
Video response	±0.5dB to 10MHz	-2.5,0.05dB to 30MHz	-1,0dB to 20MHz
Differential phase/gain	0.1°, 0.1%	<0.15°, <0.15%	<0.1°, <0.1%
C/L delay	0.25% 2T Pulse/Bar	.....	.....
Video S/N ratio	75dB to 5MHz	>70dB	75dB typical
Video crosstalk worst	-50dB 10MHz	.....	-70dB typical, 5MHz
Control format	RS232/422, 9-pin D	RS-232/422, BCD	Various methods
Applicable to CAV	Possible	Not suggested	Also MAC, HDTV
Reader Service Number	1163	1164	1165

Manufacturer		Kaitronics	
Model/Series		RS-10 series ¹	RGB-component series
Crosspoint matrix	10x10 AFV, 20x10 A/V	10x1	10x1
Typical system size	80x80	10x5, 10x10 ¹	10x5, 10x10 ²
Audio response	±0.1dB 30-15k	±0.3dB 20Hz-20kHz	±0.3dB to 20kHz
Harmonic distortion	<0.025%	0.1% +4dBm wtd	0.1% +4dBm
S/N ratio	>78dB	>90dB 0dBm	>60dB
Audio crosstalk worst	≤-70dB	<-90dB 1kHz 20dBm	>70dB isolation
Video response	±0.25dB to 8MHz	[Includes memory	30dB bandwidth
Differential phase/gain	<0.25°, <0.25%	[backup, system	<0.25°, <0.25%
C/L delay	.....	[status monitors;	.....
Video S/N ratio	≥65dB	[alerts operator	>70dB
Video crosstalk worst	≤62dB	[of failures,	<-60dB
Control format	Various types	To 31 remote controls	RS-232C/-422
Applicable to CAV	Yes	.....	Yes
Reader Service Number	1168	1169	1170

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

Manufacturer		Key Video	
Model/Series		AVS-series ³	
Crosspoint matrix	10x1	10x1	
Typical system size	Various, multilevel	Various, multilevel	
Audio response	±0.2dB 20Hz-20kHz	±0.2dB 20Hz-20kHz	
Harmonic distortion	<0.05% +18dBm	<0.05% +18dBm	
S/N ratio	>90dB below +18dBm	>90dB below +18dBm	
Audio crosstalk worst	>80dB below +18dBm	>80dB below +18dBm	
Video response	±0.1dB to 5MHz	±0.1dB to 5MHz	
Differential phase/gain	<0.1°, 0.1%, 4.43MHz(2)	<0.1°, 0.1%, 4.43MHz(2)	
C/L delay	<10ns, <0.1dB	<10ns, <0.1dB	
Video S/N ratio	>70dB unwd	>70dB unwd	
Video crosstalk worst	>60dB at 4.43MHz	>60dB at 4.43MHz	
Control format	RS-422, RS-232	RS-422, RS-232	
Applicable to CAV	Possible	Possible	
Reader Service Number	1172	1172	

30 band $\frac{1}{2}$ octave graphic equaliser – Frequency response $\pm 0.5\text{dB}$ (20Hz – 20kHz), Distortion ($+4\text{dBm}$) $< 0.01\%$ at 1kHz, Equivalent input noise $< -90\text{dBm}$, Auto-bypass failsafe, Low and High pass variable filters, Balanced XLR input and output.

Also available for stereo applications DN360 Dual Channel 30 band $\frac{1}{2}$ octave graphic equaliser.

DN300

GRAPHIC EQUALISER



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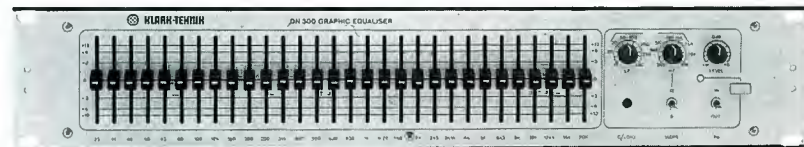
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Dual channel 5 band parametric equaliser – Frequency response $\pm 0.5\text{dB}$ (20Hz – 20kHz), Distortion ($+4\text{dBm}$) $< 0.01\%$ at 1kHz, Equivalent input noise $< -90\text{dBm}$, 100% Frequency overlap for each filter + variable bandwidth,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

Also available DN405 Single Channel 5 band parametric equaliser.

DN410

PARAMETRIC EQUALISER



Real time audio spectrum analyser – 30 band $\frac{1}{2}$ 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 $\pm 1\text{dB}$ (20Hz-20kHz), Distortion $< 0.01\%$ at 1kHz, Dynamic range $> 90\text{dB}$, 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 model) 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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Circle (93) on Reply Card

Manufacturer	Key Video
Model/Series	SRS-1000
Crosspoint matrix	10x1
Typical system size	80x512
Audio response	± 0.2dB 20Hz-20kHz
Harmonic distortion	< 0.05% + 18dBm
S/N ratio	> 90dB below + 18dBm
Audio crosstalk worst	> 80dB below + 18dBm
Video response	± 0.1dB to 5MHz
Differential phase/gain	< 0.3°, 0.3%, 4.43MHz
C/L delay	< 10ns, < 0.1dB
Video S/N ratio	> 70dB unwtd
Video crosstalk worst	> 60dB at 4.43MHz
Control format	RS-422, RS-232
Applicable to CAV	Possible
Reader Service Number	1173

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

Manufacturer	McCurdy Radio
Model/Series	ACP-1 (ACP-24)
Crosspoint matrix	200x2 (24x2)
Typical system size	200x> 200 (24x24)
Audio response	± 0.2dB 20-20k
Harmonic distortion	< 0.1% -10, +24dBu
S/N ratio	> 95dB wideband
Audio crosstalk worst	< -80dB worst case
Video response	[Unit for audio
Differential phase/gain	[only, input and
C/L delay	[output modules
Video S/N ratio	[required.
Video crosstalk worst	
Control format	X-Y, DTMF, other
Applicable to CAV	
Reader Service Number	1178

Manufacturer	pro-bel
Model/Series	Analog systems
Crosspoint matrix	8x1/8x8
Typical system size	256x64/144x256
Audio response	< ± 0.2dB 15-20k
Harmonic distortion	< 0.05% 8dBu
S/N ratio	> 90dB true RMS DIN
Audio crosstalk worst	< -90dB worst
Video response	-0.5, +0.25dB 8MHz
Differential phase/gain	-L0.2°, < 0.2% 4.43MHz
C/L delay	< 0.5%
Video S/N ratio	> 73dB wtd luminance
Video crosstalk worst	< -60dB adjacent
Control format	RS-232C/422/485
Applicable to CAV	Possible
Reader Service Number	1183

Manufacturer	Sigma Electronics
Model/Series	SVC212/SVC213
Crosspoint matrix	10x1 component
Typical system size	10x2, 10x3
Audio response	
Harmonic distortion	
S/N ratio	
Audio crosstalk worst	
Video response	1dB to 20MHz
Differential phase/gain	< 0.5%, 0.2°
Video S/N ratio	> 70dB hum+noise
Video crosstalk worst	> 60dB worst
Control format	Serial, parallel
Applicable to CAV	Yes
Reader Service Number	1188

¹Allows master switching with any number of slave units.

²Video crosstalk rated -70dB for a 40MHz bandwidth.

3M Company		
AX series	Series H	Model 40X
20x10	16x2 V/A	10x1 (40x1)
40x10 m/20x10 s	64x64 V w/3A ¹	40x20 Vw/2A
± 0.25dB 20-20k	± 0.15dB to 20kHz	± 0.25dB 20-20k
<0.15%	0.15%, 0.1% IMD	<0.3%
65dB hum + noise	76dB 300kHz bw	>85dB to 15kHz
>65dB 20-20k	79dB	>70dB 20kHz 21dBm
....	-1.8, +5dB to 20MHz	± 0.5dB to 12MHz
....	0.1%, 0.1° 3.58MHz	0.4%, 0.4°
....	± 10ns max	....
....	> 73dB	>60dB hum + noise
....	-60dB 4.43MHz	60dB at 3.58MHz
RS-232	RS-422	RS-232
No	....	No
1174	1176	1177

NEC America
TKA-500B/AKA-500B
8x16
512x512 A/V 6-level
± 0.2dB 20-20k
< 0.01% 8dBu
-85dBu
-85dB 20-20k worst
-0.5, +0.2dB 10MHz
± 0.2°, ± 0.2%
± 5ns
64dB unwtd 10MHz
< -50dB 10MHz worst
BSNET lan, RS-422
Yes
1179

Omicron Video
553-20/10-4V/A
10x1
20x10 4V/1A
± 0.5dB 30-20k
< 0.1% 18dBm
> 105dB + 25dBv output
< -80dB 15kHz
± 0.2dB 300k=5MHz
< 0.25°, < 0.25%
> 65dB
< -60dB at Fsc
RS-232/-422
Possible
1180

PESA
SIM-4032
16x2
32x32
0.5dB 100-10k
≤ 0.1%
≥ 65dB
< -75dB
[Design intent is
[for intercom use.
[Possible program
[audio use.
RS-232C
1181

pro-bel
ADAM mixed A/D
4-in, 4-out buffers
128x128, 256x256
± 0.25dB 20-20k
< 0.1% 30-20k 8dBu
> 80dB wtd
< -96dB 20kHz
[Mixed analog &
[digital in/out,
[48kHz sampling
[per CCIR, AES, EBU
RS-422/485/232
1182

ROH/Anchor Audio
ARMS-7000
16x16
48x48, mono, stereo
± 0.2dB 20Hz-20kHz
0.01% Max THD/IMD
> 85dB, 20kHz bw
< -85dB, 1kHz
[Audio signal
[routing only.
IBM PC/AT
1184

Shintron
12X-Q4 (12xQ4-12xV4)
4-RGB/pulsex4
12x4
[For analog video
[component use only
-3dB to 30MHz
< 0.25°, < 0.25%
10ns
63dB typical
< -60dB, 5MHz
RS-422 bus
Yes
1185

Siemens AG
Crossmatic D Audio
32x32
32x96, 96x96
± 0.4dB 40Hz-15kHz
≤ 0.5% + 22dBu 40Hz
< -92dBq
> 100dB
[System for
[audio applications
[only.
RS-232C, RS-422
Not applicable
1186

Sierra Video Systems
Series 8/16
8x8, 16x4
16x24 V/SA/TC
± 0.1dB 20-20k
0.1% 24dBm
100dB 24dBm
-80dB
-0.5, +0.1dB 8MHz
≤ 0.25°, 0.25%
≥ 50dB 3.58MHz
RS-232
Yes
1187

Telemet
Series 7900
30x4, 12x8, 6x12
300x300
± 0.5dB 30Hz-15kHz
0.5% + 18dBm
-65dBm
-65dB 15kHz
± 0.2dB to 8MHz
< 0.5°, 0.5%
70dB
-60dB to 3.58MHz
RS-232, other
Possible
1189

Utah Scientific	
AVS-1B	CAA/CAV-20/10
10x10	10x10
320x300x8-level	10x10, 20x10, 4-level
± 0.5dB 30-20k	± 0.05dB 30Hz-20kHz
0.05% 24dBm	0.05% 24dBm
-85dBm 15kHz bw	70dBm 15kHz bw
-90dB 30dBm	-75dB 30dBm dc-20kHz
± 0.5dB to 20MHz	± 0.1dB to 10MHz
0.05°, 0.05%	± 0.5°, 0.05%
80dB hum & noise, wtd	75dB w/5MHz BW
-60dB at 4.43MHz	-58dB 1Hz-3.58MHz
RS-422/-232/Dynabus	RS-232/422
Yes	Yes
1190	1191

Vortex Communications
GC series
64x64, 4-level ¹
± 3dB 10Hz-200kHz
< 0.1% wtd 4-Hz-30kHz
-95dBu true rms
90dB at 15kHz
± 3dB to 25MHz
< 0.4°, < 0.4%
> 70dB
-92dB 3.58/4.43MHz ²
RS-422
MAC, RGB, Packet, HDTV
1192

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
Model Series	A42 video slide proj
Storage medium	Winchester disk
# of work stations	1
Output channels	2-pgm, 1-prvw
Color standards	NTSC

Ampex AVSD
ESS-3
Winchester, floppy
To 10
10-pgm, 15-prvw
NTSC, PAL

ASACA/ShibaSoku
ADS-6000 HDTV
Magneto-optical
1
1-prg, 1 prvw
CCIR 601, NTSC

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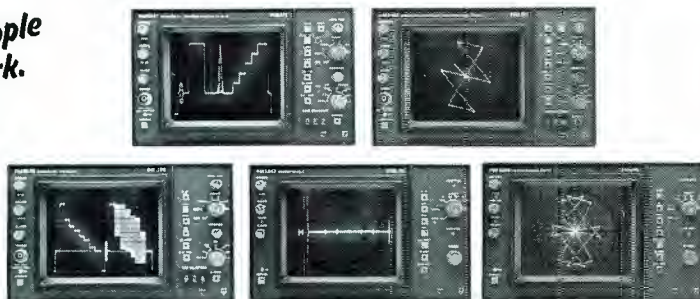
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PHILIPS

Circle (94) on Reply Card

Manufacturer	Abekas Video Systems	Ampeg AVSD	ASACA/ShibaSoku
Model Series	A42 video slide proj	ESS-3	ADS-6000 HDTV
Directory catalog	Data list, proof sheet	List, proof sheet	Data list
Integral effects	Yes	Yes	....
Editing control port	GPiB	GPI	RS-422, VME bus
Portable system	Yes	No	No
Video response	±0.25dB to 4.2MHz	±0.5dB to 5MHz	±5dB to 5.9MHz
S/N ratio	52dB	....	....
Diff. phase, gain	2=0, 2%	1=0, 1%	≤2°, ≤2%
K factor	1%	....	≤1% 2T
Chroma luma delay	5ns	....	≤10ns
Time base stability	....	....	(4:2:2 13.5MHz proc)
TBC requirement	....	External required	No
Composite digital	Yes	Yes	Composite analog I/O
Component digital	No	4:2:2 encoded	RGB outputs
# of drives max	3	25 possible	1 + 4 outboard
Streaming tape	Yes	No	Yes
Frames per disk	350	100 on 80MByte drive	200 NTSC/160 PAL std
Frames per systems	1050 (2100 fields)	25,000	....
Worst case access	0.8s	3s	≤0.8s
Programmed sequences	Yes	Yes	Yes
Reader Service Number	955	957	958

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



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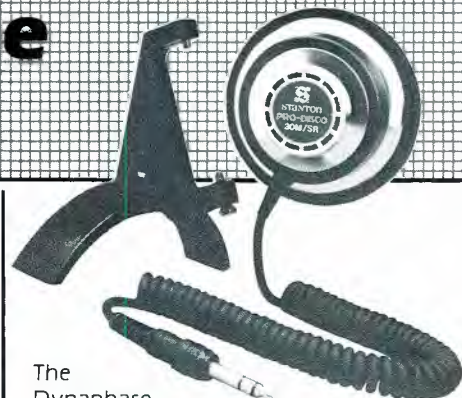
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Circle (95) on Reply Card

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	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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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.	×television 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†✓	TBC-6	Zeus ² (TBC-7)†	501 TBC†	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

¹System includes a 4-input audio/video switcher.

²Zeus available in NTSC, PAL, PAL-M, SECAM; TBC-7 available in NTSC, PAL.

³Effective enhancement results from Multi-Gen setup with Zeus.

*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/ ± 5.5MHz	± 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		

Trip le Play

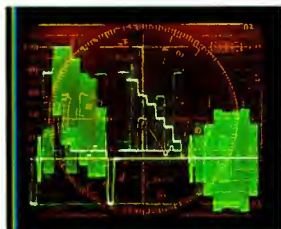
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Circle (97) on Reply Card

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	

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

Manufacturer	Fortel			Fougerolle SA	
Model Series	SuperPro-200†✓	Turbo 2✓ (NTSC, PAL)	DHP525S (625)	MPV 1100 series2✓	MPV 1000†✓
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

¹Or interpreted fields.

²For use in parallel configured 4:2:2 systems.

³Appropriate for in PAL, SECAM applications.

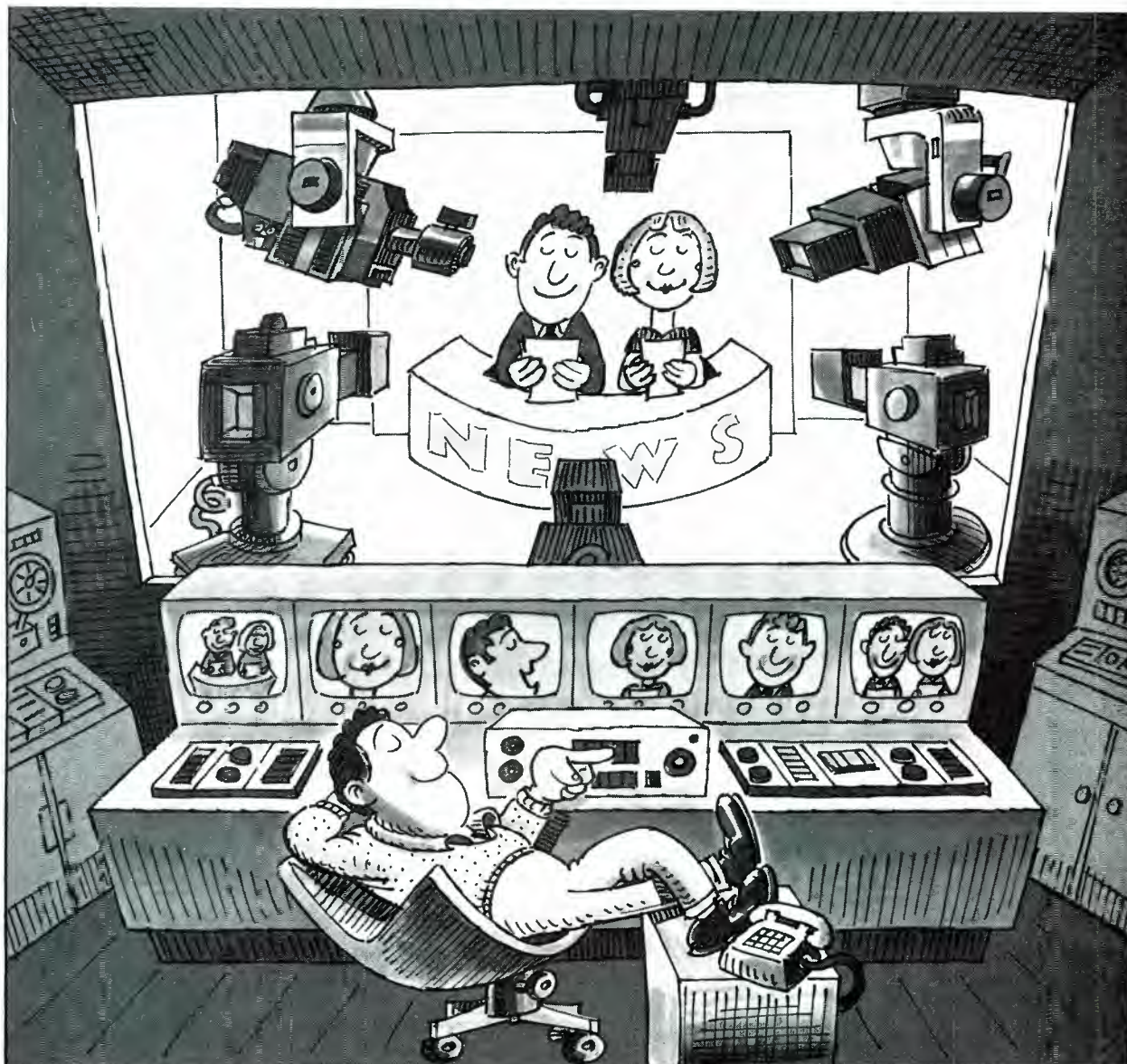
Manufacturer	GML Grove	GML/Gunnerfield Mktg	Harris Video		
Model Series	SYSTEM DVP†	GML4004S PAL/SECAM†	632 NTSC (631 PAL)✓	Model 642	VW-3
Function	TBC, synchronizer ¹	Dual TBC w/effects	Synchronizer	TBC, synchronizer	TBC, synchronizer
Sample freq/bits	8-bit Y/U/V	13.5MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	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 unwt'd	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/psition	No	Field, frame freeze
Reader Service Number	803	804	805	806	807

¹Single & dual channel configurations possible.

³W2Conceals, 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	32-128 frame
Correction window	16 TVL	1-frame	16 TVL	4-field	±0.5dB to 4.2MHz
Video bandwidth	±0.5dB 4.2MHz #540	0.2dB 4.2MHz Luma	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	58dB
S/N ratio	>59dB (56dB)	57dB	58dB	58dB	<1.5°, <1.5%
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 550	....	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†✓	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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Circle (98) on Reply Card

Manufacturer	JVC Company			Leitch Video	Lenco
Model Series	SA-T3000U (SA-T400U)	SA-T300U, -350U	KM-F250U Multiformat	DFS-3000N ^{††}	Starflex 4500 Ministore [✓]
Differential phase/gain	<2° / <2%	<2° / <2%	< ±2° error Y/C separate	<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

[†]Values given for composite configuration; 5.5MHz bandwidth for Y component.

^{††}Applicable to both U-Matic and S-VHS VCRs.

[‡]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 [†]	S-130 (S-230)	Tx2 ^{††}
Function	TBC	Synchronizer	Synchronizer (& TBC)	TBC
Sample freq/bits	14.3MHz/8-bit	3xFsc, 9-bit	4xFsc/8-bit (3x PAL-B)	14.3MHz/8-bit
Correction window	16-line	2-fields	4-field	1-field
Video bandwidth	±0.5dB to 4.2MHz	±0.25dB to 5MHz	±0.3dB, 5MHz ²	2.6MHz NTSC, 5MHz Y/C
S/N ratio	58dB 100IRE flat field	.....	>58dB NTSC >53dB PAL-B	58dB
Differential phase/gain	<2° / <2%	<2° / <3%	2°/2	2°/2
Residual error	±20ns	±2°	< ±30ns C/L delay	<15ns luminance
Coherent 3.58 out	Yes	No	S-234 only	Key signal
Advanced sync out	Yes	No	S-234 only	Yes
Component in	No	Composite only	Composite	Composite/YC/YCrCb/S-VHS
Component out	No	Composite only	Composite	Composite/YC/YCrCb/S-VHS
Velocity compensation	.....	No	.....	.....
Heterodyne processing	Yes or 3.58 feedback	No	Yes	Yes
Non-servo capstan	.....	No	Yes	.....
Dynamic tracking	.....	No	No	VariTrak
Noise reduction	No	No	No	To 5dB
Image enhancement	No	No	Scramble option	No
Production effects	No	Black on input failure	Auto mode sensing	Production effects
Reader Service Number	818	819	820	821

[†]VITS, Teletext pass facility is an optional available through software change.

²Video response -3dB to 2.6MHz in TBC mode of S-234; includes 3.58MHz output.

³Available for NTSC, PAL-B, PAL-M; offers PAL high-/low-band dubbing.

⁴Offers low-, high-band PAL, NTSC use.

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Circle (99) on Reply Card

Manufacturer	Microtime
Model Series	T-300 (T-320) [T-320D]
Function	TBC
Sample freq/bits	14.3MHz/8-bit
Correction window	35 TVL [Field]
Video bandwidth	±0.5dB to 4.2MHz
S/N ratio	58dB
Differential phase/gain	2°/2
Residual error	±10ns
Coherent 3.58 out	Yes
Advanced sync out	Yes
Component in	Composite
Component out	Composite
Velocity compensation	Averaging ([Yes])
Heterodyne processing	Yes
Non-servo capstan	Yes
Dynamic tracking	[VariTrak T-320D]
Noise reduction	No
Image enhancement	No
Production effects	No
Reader Service Number	823

¹AS-18 audio synchronizer interface; 4-field option; integral diagnostics features.

Manufacturer	NEC America
Model Series	FS-18 ¹ (FS-19)
Function	Synchronizer, TBC opt
Sample freq/bits	14.3MHz/8-bit (10-bit)
Correction window	Infinite
Video bandwidth	Y 5MHz (2.4MHz hetero)
S/N ratio	53dB (60dB)
Differential phase/gain	<2°/ <2 (<1°/ <1%)
Residual error	---
Coherent 3.58 out	No (Yes)
Advanced sync out	Yes
Component in	No
Component out	No
Velocity compensation	Yes
Heterodyne processing	Opt for U, Beta, M, C
Non-servo capstan	Yes
Dynamic tracking	No
Noise reduction	No
Image enhancement	No
Production effects	Opt Freeze
Reader Service Number	824

Manufacturer	Nova Systems
Model Series	Model 700 ¹ (700S)
Function	TBC
Sample freq/bits	14.3MHz/8-bit
Correction window	32-line
Video bandwidth	2.5MHz-Y, 1.1MHz-C
S/N ratio	58dB
Differential phase/gain	<2°/ <2°
Residual error	±10ns
Coherent 3.58 out	No
Advanced sync out	Yes
Component in	Composite (Y/C-3.58)
Component out	Composite RS-170A
Velocity compensation	No
Heterodyne processing	Yes
Non-servo capstan	No
Dynamic tracking	No
Noise reduction	No
Image enhancement	No
Production effects	No
Reader Service Number	825

Manufacturer	Nova Systems
Model Series	Model 511
Function	TBC
Sample freq/bits	14.3MHz/8-bit
Correction window	32 TVL
Video bandwidth	±0.5dB to 4.2MHz
S/N ratio	58dB
Differential phase/gain	2°/2
Residual error	2° C, ±10ns Y
Coherent 3.58 out	Yes
Advanced sync out	Yes
Component in	Composite
Component out	Composite
Velocity compensation	Yes
Heterodyne processing	Yes
Non-servo capstan	No
Dynamic tracking	Yes
Noise reduction	No
Image enhancement	No
Production effects	No
Reader Service Number	827

Manufacturer	Nova Systems
Model Series	Model 620 (620S)
Function	TBC, framestore
Sample freq/bits	14.3MHz/8-bit
Correction window	2-field, 525-line
Video bandwidth	±0.5dB to 4.2MHz
S/N ratio	58dB
Differential phase/gain	<2°/ <2
Residual error	±2°, ±10ns
Advanced sync out	Yes
Component in	Composite (Y/C-3.58)
Component out	Composite RS-170A
Velocity compensation	No
Heterodyne processing	Also direct
Non-servo capstan	Also servo
Dynamic tracking	Yes
Noise reduction	3dB chroma noise
Image enhancement	No
Production effects	Freeze, var rate strobe
Reader Service Number	828

Manufacturer	Panasonic AV
Model Series	TBC-100 (TBC-200) ¹
Function	S-VHS TBC
Sample freq/bits	14.3(13.5)MHz 8-bit
Correction window	16-line window
Video bandwidth	5.5MHz-Y/C 2.2MHz-Enc
S/N ratio	58dB
Differential phase/gain	2°, 2%
Residual error	---
Advanced sync out	Yes
Component in	Y/3.58, Y/629
Component out	Y/3.58, Y/629
Velocity compensation	---
Heterodyne processing	---
Non-servo capstan	---
Dynamic tracking	No
Noise reduction	For chroma
Image enhancement	In chroma
Production effects	No
Reader Service Number	829

Manufacturer	Panasonic Broadcast
Model Series	AU-TB50 ¹
Function	TBC
Sample freq/bits	13.5MHz/8-bit
Correction window	32-line
Video bandwidth	Y 4.5MHz, C 1.5MHz
S/N ratio	>54dB component
Differential phase/gain	1°/1%
Residual error	---
Advanced sync out	10H-21H
Component in	CTCM Y-C (YPrPb)
Component out	YPrPb
Velocity compensation	---
Heterodyne processing	---
Non-servo capstan	---
Dynamic tracking	-1x, +2x
Noise reduction	No
Image enhancement	No
Production effects	No
Reader Service Number	830

Manufacturer	Polar Video
Model Series	Roger - Dual Channel
Function	TBC/synchronizer/store
Sample freq/bits	17.72MHz, 8-bit
Correction window	1 field, each channel
Video bandwidth	Chroma -3dB at 3.58MHz
S/N ratio	---
Differential phase/gain	2°, 1%
Residual error	±25ns rel. to sync in
Advanced sync out	No
Component in	PAL, VHS, U-matic
Component out	Composite PAL
Velocity compensation	---
Heterodyne processing	Yes
Non-servo capstan	Yes
Dynamic tracking	---
Noise reduction	By Y/U/V processing
Image enhancement	Detail, each channel
Production effects	Field freeze/channel
Reader Service Number	831

Manufacturer	Prime Image
Model Series	S TBC+ (S TBC-SYNC+) ¹
Function	TBC (synchronizer)
Sample freq/bits	8-bit luma, chroma
Correction window	16 line (1-frame)
Video bandwidth	4.2MHz
S/N ratio	58dB
Differential phase/gain	1.5°/1.5%
Residual error	±15ns
Advanced sync out	Yes
Component in	Y/C S-VHS
Component out	Y/C S-VHS
Velocity compensation	---
Heterodyne processing	Yes
Non-servo capstan	No
Dynamic tracking	Yes
Noise reduction	No
Image enhancement	No
Production effects	Yes
Reader Service Number	832

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Circle (100) on Reply Card

Manufacturer	Sony Broadcast	Tektronix	Video International		Videotek
Model Series	BKH-3010 (BKH-3050)	110-S✓	TBC 3000 NTSC/PAL-M	DTC 2602 (DTC 2502) [†]	VDP-8000 ^{†2} ✓
Function	TBC (for BVH-3000/3100)	TBC, synchronizer	TBC, synchronizer	TBC, synchronizer	Synchronizer
Sample freq/bits	14.3MHz/9-bit	~4.3MHz/10-bit	13.5MHz-Y/6.75MHz-C 8-bit	13.5, 6.75MHz/8-bit	4x Fsc, 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 unwt'd	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	827

[†]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.

²Audio 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	890✓
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, ktal	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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Manufacturer	Adams-Smith
Model Series	System 2600†
VITC code output	SMPTE, EBU
LTC output signal	0dBm, 1Vp-p 600Ω
Synchronizer function	Yes
Power requirement	110/220Vac
User bit recognition	Yes
Time code comparator	Yes
Video display keyer	16-char/10-100TVL
Display window	2-line
Reader Service Number	1005

Albrecht Elektronik	
TCU-1	TCU-M3†
VITC reader	EBU standard
LTC reader	0-4V
No	Yes
220Vac	220Vac
....	Yes
....	Yes
Yes	Yes
....	2-line
1006	1807

Amtel Systems
800✓
No
Yes
No
Battery
No
No
No
No
1009

Manufacturer	Amtel Systems
Model Series	Model 6000
Operating modes	All modes
Standards supported	SMPTE
Time reference	Video/sync
Data entry for	Time, User bits
Data display of	Time, User bits
Reading speed range	± 5x play
Editor interface	....
VITC code output	No
LTC output signal	Yes
Synchronizer function	No
Power requirement	110Vac
User bit recognition	....
Time code comparator	....
Video display keyer	Yes
Display window	Variable position
Reader Service Number	1010

Audio Kinetics	
Striper w/Quickstripe	VTL translator‡
All modes	Translator/editor
SMPTE/EBU	PAL, NTSC
Video, xtal	Video, sync
Time presetable	None
Time, user bits	Time, user bits
....	0-20x
....	
No	No
0-17V p-p	750Ω bal
No	No
110/220Vac	110/220Vac
[System allows pre-	....
striping of tape	....
[with time code at	No
[2x/4x playspeed	No
1011	1012

Cipher Digital	
GEARBOX TC converter†	CDI-735CD/V/L
DF/NDF	DF/NDF/CF
SMPTE, EBU	SMPTE, EBU
Input code	Video
No	Time -735CD
None	Time, user bit -CD/L
Play speed	1/50x-80x
....	RS-422/232
....	No
Std levels	Restored +4dBm
No	-CD/8 control channels
110/220Vac	110/220Vac
[Reshapes TC signal	-CD
[and converts from	-CD
[one time reference	-V
[to another.	Variable
1013	1014

Manufacturer	Cipher Digital
Model Series	CDI-750 master
Operating modes	DF/NDF/CF/JS
Standards supported	SMPTE, EBU
Time reference	Video, tach, xtal
Data entry for	Time, user bits
Data display of	Time, user bits
Reading speed range	1/50x-80x
Editor interface	RS-232/422

Cipher Digital	
CDI-700A, -710A readers	CDI-716A generator
DF/NDF/CF	DF/NDF/CF/JS + offset
SMPTE, EBU	SMPTE, EBU
Video	Video, 60Hz, xtal
....	Time, user bits
Time, user bits	Time, user bits
1/50x-80x	1x-256x tack frame rate
Data output options	RS-232/422

Datum	
5360 reader (5370 VCG)	5350TC generator
DF/NDF/CF	DF/NDF/CF
SMPTE, EBU	SMPTE, EBU
Video	Video, 60Hz
None	Time
Time, user bits	Time, user bits
1/50x-90x	
Yes	Yes

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Circle (103) on Reply Card

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	No
LTC output signal	+4dBm (0.5-2Vp-p)	Restored +4dBm 600Ω	+4dBm (0.5-1Vp-p)	2Vp-p, 600Ω	2Vp-p, 600Ω	2Vp-p, 600Ω
Synchronizer function	Event controller	No	No	No	No	No
Power requirement	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac
User bit recognition	Yes	No	No	No	No	No
Time code comparator	Yes	No	No	No	No	No
Video display keyer	Variable format	Variable format	No	(8-char/variable)	No	No
Display window	Variable	Variable	No	(1-line)	No	No
Reader Service Number	1015	1016	1017	1018	1019	

Manufacturer		Denecke		ECCO/Convergence	
Model Series	Datum	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	1/20x-80x	± 1/20x-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		ESE		Evertz Microsystems	
Model Series	ECCO/Convergence	727 (257/258) readers	ES 461 generator	453 (456) readers	ECM 4010 master†
Operating modes	DF/NDF/CF/JS (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	1/20x-30x -56/-57	....	....	Std (1/20, 20x)	1/20-70x, 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 master¹	EV-Bloc 610†	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 bits	Time, user bits	Time, user bits	Time, ub, reel #s	Time, user bits
Reading speed range	1/20-70x	± 1/20x, 70x L, 0-20x V	± 1/20x-70x	....	1/20-110x 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 1/4" 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

¹Companion unit 3600D is a reader with timecode character generator.

²Series includes 611/622 reader modules, 612/621 generator modules and 613 TC character generator with keyer.

Manufacturer		Gray Engineering Labs		JVC Company	
Model Series	Fostex	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/NDF/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	1/200-100x 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

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	No
Time code comparator	Yes	No	No	No
Video display keyer	4011	No	DT-213 only, variable	No
Display window	....	No	DT-213 variable	No
Reader Service Number	1035	1036	1037	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 modes¹
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE/EBU (EBU only)	SMPTE, EBU
Time reference	Video, xtal	Video	Video	Composite video
Data entry for	Time, user bits	Time, user bits (None)	Time, user bits	Time, User bits
Data display of	Time, user bits	Time, user bits	Time, user bits	Time, User bits
Reading speed range	± 1/16-80x	(1/16x-40x)	n.a.	± 10% play
Editor interface	RS-422 interface	No	No	....
VITC code output	Yes	No	No	Option 008, 006
LTC output signal	0dBm, <10Ω source	0dB @ 30Ω	No	0.5-5Vp-p <100Ω
Synchronizer function	Yes	No	0dB ± 2dB 2kΩ	No
Power requirement	110/220Vac	110/220Vac	3 AA cells, 4.5Vdc	110Vac
User bit recognition	Yes	No	No	....
Time code comparator	Yes	No	No	....
Video display keyer	Yes	(646 only variable)	No	Yes
Display window	15-char/5-line	(Variable)	No	Variable
Reader Service Number	1040	1041	1042	1043

¹80N-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 EBU/SMPTE	All modes SMPTE	DF/NDF/CF EBU/SMPTE	DF/NDF/CF/JS SMPTE/EBU
Standards supported	Video	....	Video	Video
Time reference	Time, user bits	No	Time, user bits	Time/user bits
Data entry for	LEDs, time, user bits	Time, User bits	Time, user bits	8-digit time/user
Data display of	1/16x-40x play	1/16x-40x, ± 45X play	1/16x-40x play	1/16x-110x
Reading speed range	....	....	....	BVG-1500 only
Editor interface	RS-232/422 on 111C	Looped only, TCR-80V	TCR-132 only	SMPTE/EBU
VITC code output	No	Bridged	Reshaped	2.5Vp-p 10kΩ
LTC output signal	Reshaped	No	No	No
Synchronizer function	No	110Vac	110Vac	9-18Vdc
Power requirement	110Vac	....	Yes	No
User bit recognition	Yes	....	Yes	No
Time code comparator	Yes	....	No	BVG-1500
Video display keyer	No	Yes	No	BVG-1500
Display window	No	Variable	Var size/position	No
Reader Service Number	1045	1046	1047	1048

Manufacturer	Telcom Research			
Model Series	TCG-550/TCR-660✓	T5010 R/G¹	T-7000A R/G✓	T800/T900 translators† TCR680✓ (T6020²)
Operating modes	All mode	All modes	All modes	24/25/30fr, DF mode
Standards supported	SMPTE, EBU	SMPTE, EBU	EBU, SMPTE	Auto NTSC, PAL select
Time reference	Video or sync	Video, sync	Video, sync	....
Data entry for	Time	Time, User bits	Time, User bits	None
Data display of	Time, User bits	Time, User bits	Time, User bits	Status only
Reading speed range	0.1-10x TCR660	....	0.1-5x	....
Editor interface	No	No	....	No
VITC code output	No	No	No	T800
LTC output signal	11dB 600Ω TCG550	Dual 11dBm 600Ω	11dBm 600Ω bal	11dBm 600Ω bal
Synchronizer function	No	No	No	No
Power requirement	ac or dc	110Vac	5 AA cells	110Vac
User bit recognition	No	....	No	No
Time code comparator	No	....	No	No
Video display keyer	No	Yes	No	No
Display window	No	Variable attributes	No	No
Reader Service Number	1050	1051	1052	1053

¹Companion unit T6010 includes reader, timecode character inserter.

²Provides facilities for 4 video signals.

Manufacturer	TimeLine	United Media	
Model Series	Lynx/VS1 module	305 (310) reader	205 (210) Generator Model 500 sequencer
Operating modes	DR/NDF/CF/JS	DF/NDF/CF	DF/NDF/CF
Standards supported	SMPTE, EBU	SMPTE/EBU	SMPTE/EBU
Time reference	Video, 60Hz, xtal	Video	Video
Data entry for	Time, user bits	Timer, user bits	Timer, user bits
Data display of	Time, user bits	Dual 8-digit	Dual 8-digit
Reading speed range	± 1/16x-60x	1/16x-120x	....
Editor interface	RS-422/232C	....	Yes
VITC code output	No	No	No
LTC output signal	-10, + 8dBm	....	+ 8dBm
Synchronizer function	Yes	No	No
Power requirement	110/220Vac	100-240Vac	100-240Vac
User bit recognition	Yes	....	Yes
Time code comparator	No	....	Yes
Video display keyer	No	305 (opt 310)	No
Display window	No	Variable format	Variable format
Reader Service Number	1055	1056	1058

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 μ P. Most provide individual meters for each audio channel; video metering includes tracking. Luminance bandwidth is ± 0.5 dB to 4.2MHz; except PAL/SECAM models which extend response to >5 MHz. 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	Ampeg 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	>47 dB NTSC, >43 dB PAL
Diff phase/gain	4°/4% max	4°/4%	4°/4%	4°/4%	$<4^\circ$ / $<4\%$
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	± 2 dB, 50Hz-18kHz	± 2 dB, 50Hz-18kHz	± 2 dB, 50Hz-15kHz	± 2 dB, 50Hz-15kHz	-3, +2dB, 40Hz-14kHz
AF S/N ratio	56dB (+16dBm out Ch 1/2)	56dB unwdt + 16dBm out	56dB, +16dBm output	56dB, +8dBm out	>57 dB NTSC, >54 dB 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	μ P 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	>44 dB	>48 dB	48dB unwdt	48dB unwdt
Diff phase/gain	$<4^\circ$ / $<4\%$	$<4^\circ$ / $<4\%$	3°/3%	$<\pm 4^\circ$, $<4\%$	$<4^\circ$, $<4\%$
K factor 2T	$<1.5\%$	<20 ns	$<1\%$	$<1\%$	$<1\%$
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	>7 dB w/o Dolby or Telcom	56dB unwdt, +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	-1/4x, +1/2x	.....	-1x, +3x	Yes	Still, step, slow
Slow motion mode	No	-1/4, +1x play	No	-1x, +3x	-1x, +3x
Single frame mode	Yes	No	No	No	Yes
Reel diameter max.	12", 196 min.	12.5" 2 1/2 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 Motion†)	BVH-3000/3010†	BVH-500A	TTV 3705 P/S
S/N ratio L/C	47(47)dB	>49 dB unwdt V1-K tape	47dB p-pV/RMS noise	>44 dB unwdt
Diff phase/gain	4° 4% (6°, 6%)	$<4^\circ$ / $<4\%$	$<4^\circ$, $<4\%$	$<4^\circ$, $<4\%$
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	>56 dB	>56 dB 3% THD, Ch 1/2	56dB 3% distortion	>56 dB
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	.....

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

¹The 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 (3/4") and 1/2" 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 1/2", 3/4"	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

¹TCP1000 play only system excludes record hardware, software; TCA3000 on-air automation system, plays, records events under control of real-time, interactive station automation controller.

Manufacturer	Panasonic Broadcast	Sony Broadcast
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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

¹Option 352-cassette rotary-bin expansion units for 472, 824, 1176-cassette library;

Type III VTR expansion module provides 5 additional VCR decks.

Videocassette Systems, 3/4" U-matic

Record and/or play equipment using 3/4" 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 Equipment	
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	>52dB
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

Small Format VCRs

These video recorders use 1/2" 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

¹Integral TBC circuitry.

²For PAL and SECAM use only.

Manufacturer Ampex BTS Sony Thomson

1-piece camcorder	CVR-200	...	BVW-200	...
Docking recorder	CVR-5	BCB-5	BVW-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

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 ¹

Audio parameters¹:

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

¹S-VHS specification provide.

²Values based on AFM audio channels.

Manufacturer JVC Panasonic

Docking recorder	KR-M260U	AU-400
Portable recorder	KR-M460U	AU-500
Portable player	...	AU-505
Studio player	...	AU-620 ¹
Studio player/VT	...	AU-630 ¹
Studio recorder	...	AU-640 ¹
Studio recorder/VT	KR-860U	AU-650 ¹
...	...	AU-660 ¹
Studio editor	KR-880U	AU-X80 ¹
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)	...	...
Duplicator	BR-8711U	...	...	...
Reader Service No	1143	1144	1146	...



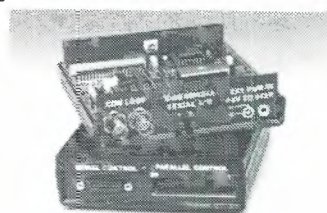
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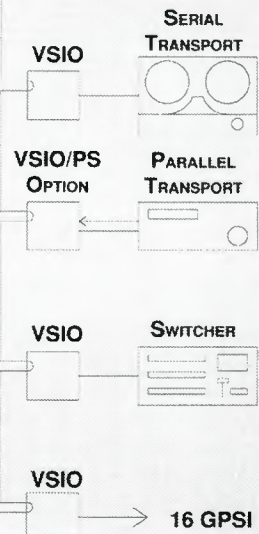
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OTARI

Circle (106) on Reply Card

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†	Vanguard series†	200 series
Modular construction	Yes	No	Yes	Yes
# of mixing positions	24	6-ch rack-mount	8	24
Output channels	Pgm/aud/aux/cue/mono	Pgm/aux/mono	Pgm/aud/cue/mono	Pgm/aud/mono/cue
Fader types	Slider, VCA	Rotary/VCA	Slider, rotary	Slider, VCA
Bus switching by	Push button	Push button	Membrane	Push button
Input patch points	Yes	No	No	Yes
Internal switching by	Electronic	Solid-state	Solid-state	Mechanical, VCA
Machine starts stops	Relay	Relay	Yes	Yes
Cue circuits	On fader, bus switch	On fader	On fader	On fader
Metering types	VU, PPM	VU meters	VU, VFD opt	VU
Int cue amp speaker	Yes	Amp only	Yes	Yes
Int headphone amp	No	No	Yes	Yes
Input connections	TB 600Ω	AB 1k/100kΩ	AB 20kΩ	AB 150/10kΩ
Output connections	TB 600Ω	Bal 600Ω	AB 600Ω	TB/AB 50Ω
Output level	8dBm	27dBm max	4dBm, 26dBm max	4dBm, 30dBm max
AF response	±1dB	±0.5dB 20-20k	±0.25dB	0-1dB 8dBm
Distortion	0.07% 1kHz 24dBm	0.02% 8dBm	0.15% 18dBm	<0.01% 1kHz 24dBm
S/N ratio, mic/line	-125dBm EIN/72dB	72dB mic/82dB line	-124dBm EIN/92dB	-128.5dBm EIN/>82dB
Crosstalk (worst)	-72dB 8dBm 100-10k	-90dB 2kHz	-74dB 10kHz	<-83dB 20kHz
Reader Service Number	1418	1419	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†‡
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

†Also 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/uti/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/VCA's	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

Manufacturer	EELA Audio	Hallikainen & Friends	Harris Broadcast	Harrison Systems
Model Series	SBM series	TVA142/TVA132‡	Medalist series‡	Medalist-AU‡
Modular construction	Yes	Yes	Yes	Yes
# of mixing positions	16	36 max	8, 10, 12	12 max
Output channels	Pgm/aud/cue/mono	Pgm/aud/cue	Pgm/aud/mono opt	Pgm/aud/mono
Fader types	Slider, VCA	Rotary	Slider or rotary	Slider, VCA
Bus switching by	Push button	Keyswitch	Push button	Push button
Input patch points	No	No	No	No
Internal switching by	Solid-state	Solid-state	Solid-state	Solid-state
Machine starts stops	Yes	No	Yes	Yes
Cue circuits	PFL bus switch	On fader	On-fader, push button	On-fader, push button
Metering types	LED, other	VU w/peak LED	VU	VU
Int cue amp speaker	Yes	No	Yes	Yes
Int headphone amp	Yes	No	Yes	Yes
Input connections	AB/TB 5k/40k Ω	TB 150/15k Ω	AB 150/600 Ω	AB 5k/8k Ω
Output connections	TB/unbal 600 Ω	Bal 600 Ω	AB 20 Ω	AB 200 Ω
Output level	6dBm nom	8dBm, 22dBm max	24dBm max	24dBm max
AF response	-1dB 6dBm	$\pm$ dB 8dBu	$\pm$ 0.5dB 8dBm	$\pm$ 0.5dB
Distortion	0.05%	0.25% 1kHz 22dBm	0.05% 8dBm	0.05% 8dBm
S/N ratio, mic/line	< -126dBm EIN	-1.5dBm EIN/74dB	-127dBm EIN/>95dB	-127dBv EIN
Crosstalk (worst)	< -66dB 16kHz 6dBm	-82dB 1kHz 8dBm	-85dB 15kHz 18dBm	-85dB 15kHz 18dBm
Reader Service Number	466	467	468	469

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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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		McCurdy Radio		McMartin Industries	Neve Electronics/Siemens
Model Series	LPB Inc 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/tb/aux/cue	Pgm/aud/cue/mono	Pgm, aud, mono, cue
Fader types	Slider	Slider	Slider	Slider	P&G slider w/VCA's
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		Schafer World Communications		Solid State Logic	Sonosax
Model Series	SATT Communications 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	Yes	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 mvmt	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		Soundtracs	Southern Broadcasting	Studer	Tore Seem Audio A/S
Model Series	Soundcraft SAC-2000	FM Broadcast	Aldesign console†	970	SEECOM
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/aud/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	Allidesign 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	< -125dB 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	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

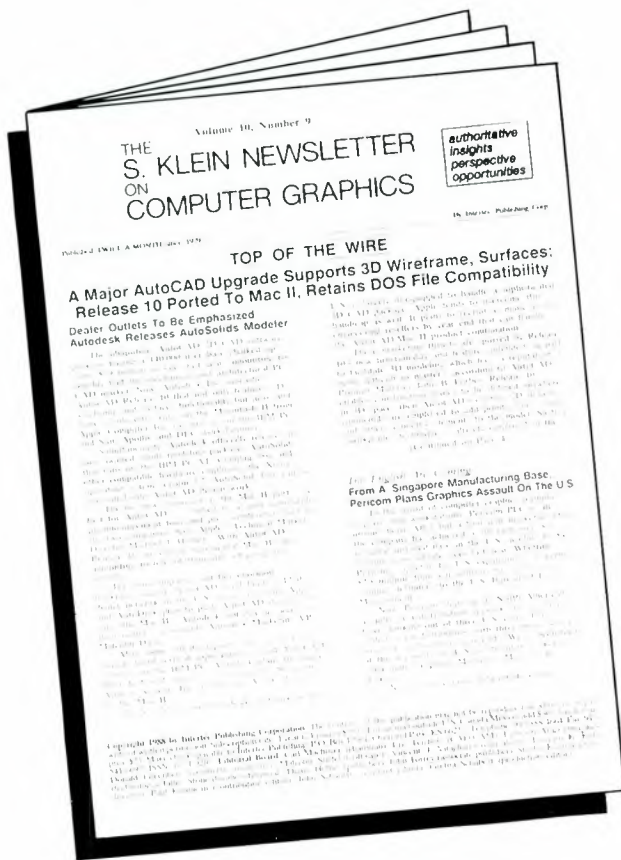
Audio Mixers, Portable

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	-125dBm 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	Switchable, 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)	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	<0.005%, 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	-124dB EIN, 80dB	-127.5dB 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	16
# 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	-126.5dB EIN >80dB	-126.5dB EIN, 83dB	-127dBv, 84dB	-125dBu EIN
Crosstalk	<-60dB 1kHz	.....	<-80dB 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†	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 lb
AF input connections	Xfmr bal	Active bal	Xfmr bal	Unbal	XL R 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	-1.05dB, +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	-128dB EIN, 150Ω in	>74dB	≥70dB wtd	>70dB
Crosstalk	.....	.....	<-70dB 1kHz 60dBm	≥50dB separation	.....
Reader Service Number	415	416	417	418	419

†Values based on system integral with 4-track cassette recorder.



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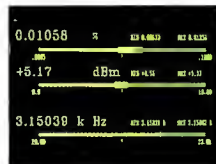
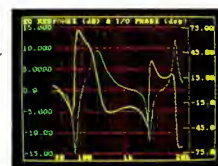
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Manufacturer	Harrison Systems	Ikegami Electronics	JVC Company	Kaitronics	Logitek
Model Series	MX-8 (Pro-7)	ABX-160A	MI-2000U	AM-8000 (VAS-ST)	Stereorack (Audiorack)
Modular system	Yes	Yes	No	No	No
# of mixing positions	10 (36)	16	8	8 (8A+8B)	6
# of 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	Rotary	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	110V ac 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, 10kΩ 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	-129dB EIN	>56dB mic, >75dB line	-128dB EIN IHF-Awtd 150Ω	-128dB 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	Mix/1/2, 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	Active 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	-126dB 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)
Modular system	No	No	No	No
# of mixing positions	4 max	8	6	6
# of inputs	2-line, 2-mic/line	18 (8/12)	4 mono, 6 stereo	6 mic/line/stereo(phonos)
# of mixing buses	1	3	2	Pgm, aux
Stereo output	No	Yes (3)	Yes	Yes
Output provisions	Line, phones	Mono/main/rec (1 pr)	Main, record, monitor	Pgm, aux send, channel
Channel fader type	Rotary	Proprietary slider	Rotary, slider	Slider/VCA, rotary pan
EQ, filtering	No	2-band peaking	2-band peaking EQ	LF, HF shelving
Test oscillator	Yes	No	No	In expander
Metering types	Vu	Dual VU movement	Signal, Peak, Clip LEDs	LED ladder PPM
Power requirements	9Vdc	120Vac (or 12Vdc)	120Vac, 10W	110-240Vac
Operating weight	2.5 lbs	22 lbs	13.2 lbs	24.2 lbs
AF input connections	Balanced	Bal/unbal XLR/RCA	Active bal, unbal	Bal mono, unbal stereo
Input impedance load	.....	10k/20kΩ (600/10kΩ)	>5kΩ, >20kΩ, >50kΩ	>1.2kΩ (m); 4.7kΩ (l)
Input levels	Switchable mic/line	-80, +20dB (-70, +4)	-60,-6dBu; line, phono	-66,-6dBu; -26, +10dBv
Output connections	Balanced	Bal/unbal, XLR/RCA	Xfmr floating, isolated	Bal, unbal
Output impedance	Low Z source	600Ω, 10kΩ	600Ω actual Z, 10kΩ	1kΩ unbal, 50Ω bal
Output level	+16dBm, 0dBm=0VU	+4dBm, -10dB record	+4dBu, -10dB recorder	+6,+10,+14dBu bal
AF response	<+1.5dB, 20-20k	-2,+0.5dB, 20-20k	-1,+0.5dB, 20-20k	±1dB, 20-20k
Distortion	0.08%, +8dBm	<0.1% (<0.3%) 18dBm	0.1% THD/0.1% IMD	<0.03%
S/N ratio	72dB(m)/90dB(l)	-129dBm EIN (-128)	-125dBm EIN IHF A-wtd	-125dBv EIN, 86dB line
Crosstalk	.....	<-65dB 1kHz	-65dB max 1kHz	.....
Reader Service Number	430	431	432	433

Manufacturer	Tore Seem Audio A/S	Shure Brothers
Model Series	SEESAM 2††	FP42 (FP51)‡
Modular system	Yes, multunit possible	No
# of mixing positions	8 expandable to 24	4 max
# of inputs	8 (to 24)	4 mic-line, mix-bus
# of mixing buses	10	2 (1)
Stereo output	Yes	Yes (Mono only)
Output provisions	line, aux, subgroups	Line, phones, mic
Channel fader type	P&G sliders	Rotary w/pan (Rotary)
EQ, filtering	Yes	Low cut
Model Series		M268 mix mixer
Modular system		No
# of mixing positions		4
# of inputs		4 mic, aux, mix-bus
# of mixing buses		mix-bus
Stereo output		No
Output provisions		Hi/Lo-z mic, aux, mix
Channel fader type		Rotary
EQ, filtering		No
Model Series		M267‡
Modular system		No
# of mixing positions		4 max
# of inputs		4 mic-line/mix-bus
# of mixing buses		1
Stereo output		No
Output provisions		Line, mic, phones
Channel fader type		Rotary
EQ, filtering		Low-cut filter

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Circle (111) on Reply Card

EMCOR

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	> 1k Ω , 600 Ω , > 10k Ω	1k Ω (m), 10k Ω (l)	1k Ω , 66k Ω , 3.5k Ω	1k Ω , 140k Ω , 43k Ω , 3.3k Ω	150 Ω , > 10k Ω , 3.5k Ω
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	< 40 Ω	< 40 Ω	$\leq$ 1 Ω , 185 Ω , 3.5k Ω	50 Ω , 5k Ω , 2.5k Ω , 3.3k Ω	0.5 Ω , 150 Ω , 3.5k Ω
Output level	+20dBu into 600 Ω	+9dB limiting level	-33dBV to +18dBm	-20dBm, +18dBv	+18dBm, -34dBv mic
AF response	$\pm$ 0.5dB	$\pm$ 0.5dB, 40-15k	$\pm$ 0.2dB 30-20k	$\pm$ 3dB 40-20k	$\pm$ 2dB 30-20k
Distortion	< 0.1% 20-20k 20dBu	0.15% 40-15k +9dB	0.4% +15dBm/0.5% IMD	$\leq$ $\pm$ 0.2%	$\leq$ 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	4.3 lbs	8.6 lbs (28 lbs)
AF input connections	Xfmr bal	Xfmr & (active bal)	Active bal	Active bal	Xfmr (active bal)
Input impedance load	1k Ω , 66k Ω , 24k Ω	600 Ω (5k Ω /10k Ω)	10k Ω	10k Ω	600 Ω
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	1 Ω , 330 Ω , 7.5k Ω	50 Ω	2k Ω , 10k Ω	150 Ω	For 600 Ω load
Output level	-34dBV, +16dBm (+18dBm)	+18dBm	+18dBu, +21dBu max	+24dBm	+4dBm
AF response	$\pm$ 2dB 50-15k (30-20k)	$\pm$ 0.5dB, +6dBm	$\pm$ 0.5dB, 30-20k	$\pm$ 0.5dB, 30-20k	$\pm$ 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 150 Ω 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	$\pm$ 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/10k Ω mic/line	600 Ω	.....	2.8k Ω , 22k Ω	45k Ω , 10k Ω
Input levels	Mic, line switched	Switched mic/line	-70, -10dBu: -10, +20dBu	-70dBV, +24dBV range	-70, +4dBV nom.
Output connections	Unbalanced	Balanced	Unbalanced	Unbalanced	Unbal
Output impedance	50 Ω source	200 Ω , 600 Ω	< 50 Ω source	< 100 Ω source	100 Ω
Output level	+22dBm max	+6 or +15dBm	24dBm, 2.4dBu 300 Ω	+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	-135dBm 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†	246 Portastudio	338 Studio 8	Ten 32 (Ten 44)††	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	5k Ω and 50k Ω	10k Ω	2.4k Ω , 50k Ω	150 Ω (m), 600 Ω (l)	150/10k/47k Ω
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	100 Ω source	100 Ω	100 Ω source, 10k Ω load	600 Ω , 10k Ω , 150 Ω	< 50 Ω
Output level	-10dBV	10dBV	+4dBm nom.	+4dBm = 0VU	+20dB max in 200 Ω

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Circle (182) on Reply Card

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

¹Series includes Porta One, Porta Two and 05.
²Ten-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, EQ, phone, FB	Line/phone/grp/FB/echo	Line/FB/phones/echo
Channel fader type	Slider	Slider	Slider	Slider
EQ, filtering	Yes	3-band EQ	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	-125dB 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	48 (64)
# of mixing buses	2	3	8 + 2 + 1 typical	64	24 (24)‡aux
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/VCA's
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	With routing	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	Audiotronics		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	Accessory	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

Model/Series	Model 10000‡
Metering types	VU
Input connections	AB low/high-Z
Output connection	AB 600Ω
Output levels	27dB
AF response	±1dB 20-20k
Distortion	0.1%
S/N ratio	-100dB line
Crosstalk	-80dB 20kHz
Reader Service Number	345

Auditronics

400 series	Series 310
VU (bargraph opt)	VU (PPM opt)
AB <1.5kΩ/50kΩ	AB <1.5kΩ/50kΩ
AB 60Ω	AB 60Ω
4dBv ref 0.775Vrms	4dBv ref 0.775Vrms
≤0.5dB 20-20k	0.5dB 20-20k
≤0.05% THD 20-20k	<0.05% THD 20-20k
≤-129dB EIN, >84dB	<-129dB EIN, >84dB
≤-65dB 20-20k	<-65dB 20-20k
346	347

Audix Ltd

AAT3000 assignable	MXT 1200 series‡
VU, bargraph	VU, LED PPM
Bal/unbal 1.2k/10kΩ	TB 1.2k/10kΩ
Bal/unbal 150Ω	TB 150Ω
24dBm max	24dBm max
±0.5dB 24dBm	±0.5dB 24dBm
0.05% 18dBm	0.1% 18dBm
<-125dB EIN	-125dB EIN/80dB
<-70dB 18dBm	-70dB 18dBm
348	349

Manufacturer**Model/Series UA8000**

Modular construction	Yes
# of mixing positions	64 max
# of mixing buses	32
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	4-band
Filtering	High, low-pass
Panpots	Yes
Groups subgroups	32 S/9 R
Sends returns	Pre & post
Solo bus	AFL/PFL/in-place
Compression limiting	Yes
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Variable
Metering types	Bargraph
Input connections	TB/AB 20kΩ
Output connection	AB <22Ω
Output levels	26dBm max
AF response	±0.25dB 4dBm
Distortion	0.007% 1kHz 20dBm
S/N ratio	80dB
Crosstalk	-80dB 100-10k 4dBm
Reader Service Number	350

Calrec by AMS

Logic 1	Assignable console
Yes	Yes
8 + 2	48, 72 (128 max)
32	8 grp + 8 aux + 4 main
Yes	Computer control
Yes	4 pair
Motorized slider	Slider
4-band	4-band
High, low-pass	.....
Yes	Yes
32 S/9 R	8 stereo/8 aux
Pre & post	Multiple, pre/post
AFL/PFL/in-place	Yes
Yes	Yes
Yes	Yes
Variable	.....
LEDs in Knob	LED bargraph, VU
TB/AB 20kΩ	TB/AB >1.2k/10kΩ
AB <22Ω	AB <75Ω
26dBm max	24dBu max
±0.25dB 4dBm	-0.25dB 20-20k
0.007% 1kHz 20dBm	<0.005% 20dBm
80dB	<-128.5dBu/-90dBu
-80dB 100-10k 4dBm	<-90dB 100-10k
351	352

D&R Electronics b.v.

8000 series III
Yes
24 + 8
8 groups
96 points
Possible
ALPS slider (P&G opt)
4-band
High-pass
Yes
8 groups
8 aux send, pre/post
PFL/in-place
Accessory
Yes
Yes
9-tone, slate
LED bargraph
AB >4kΩ
100Ω
22dB, 1kΩ
-0.5dB 20-20k
0.009% 1kHz
-128dB EIN/-96.5dB
<-79dB 100-10k
354

Manufacturer**Model/Series DCM 232**

Modular construction	Yes
# of mixing positions	32
# of mixing buses	32
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	4-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	24 groups
Sends returns	4 mono, 2 st, 1 st
Solo bus	AFL/PFL/in-place
Compression limiting	No
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	5 tones
Metering types	VU movements
Input connections	AB >2k/10kΩ
Output connection	AB <75Ω
Output levels	26dBv
AF response	-0.25dB 20-20k
Distortion	<0.05%
S/N ratio	-127dBv/-80dBv
Crosstalk	<-80dBv 1kHz
Reader Service Number	355

DDA/Klark-Teknik

AMR-24	D-series‡
Yes	Yes
24	30/38/42 positions
24	8 + 2
Yes	Yes
Yes	Yes
Slider	Slider
4-band	4-band & 2-band
High-pass	High-pass
Yes	Yes
24 groups	8 groups
2 st, 4m pre/post	8 stereo
AFL/PFL/in-place	AFL/PFL
No	No
Yes	Yes
Yes	Yes
Variable	4 frequencies
VU	VU & 5-seg LED
AB >2k/10kΩ	AB >2kΩ/>10kΩ
AB <75Ω	AB <75Ω
26dBv	26dBv
-0.25dB 20-20k	-0.25dB 20-20k
<0.05%	<0.05%
-127dBv/-82dBv	-127dBv/-82dBv
<-80dBv 1kHz	<-80dBv 1kHz
356	357

Digitec

UPS6500
μP control
24-48
8-16
μP controlled
Yes
Slider/VCA control
3-band
High, low-pass
Yes
8-16 groups
6/in monitor system
Yes
.....
Yes
Yes
6-frequency
VU (PPM/bar graph)
TB >1k/5kΩ
TB <20Ω
12dB nom, 22dB max
-1, +0.5dB 30-20k
<0.2% typical
<-125dBm EIN
<-80dB 20kHz
358

Manufacturer EELA Audio**Model/Series S-3000 II/VCA (S-300‡)†**

Modular construction	Yes
# of mixing positions . . . . .	.....
# of mixing buses	30 (13)
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	Shelving, swept
Filtering	High, low-pass
Panpots	Yes
Groups subgroups	9 grps (variable)
Sends returns	4 each
Solo bus	AFL (PFL)
Compression limiting	No (Yes)
Talkback circuits	Yes
Speaker muting	No (Yes)
Lineup oscillator	Yes
Metering types	VU, PPM
Input connections	AB (& TB) 1.2k/10kΩ
Input levels IGNORE	Mic, line switchable

EMT-Franz**EMT 30.16.‡**

Yes
30
2
Yes
Yes
Slider
3-band parametric
Hi-pass
Yes
None
Echos pre/post
Yes
A 113 module
Yes
63Hz, 1kHz, 10kHz
Analog, LED
Xfmr bal
Mic, line switched

Fostex**450 (450-16)†‡**

No
8 (16)
7
.....
Yes
Slider
3-band
No
Yes
4x2
2 pre/3 post
AFL
No
None
No
No
VU/PPM/LED
AB/unbal 1.2k/10kΩ
Switchable mic, line

Graham-Patten Systems**ESAM 608, 612, 616†**

No
8, 12, 16 channel
Stereo pgm, pvw
No
Yes
Slider w/VCA
Sidechain
.....
No
No
700 ser sidechain
No
No
No
4 VU, PPM
AB >20kΩ
+30dBu max

Grass Valley Group**AMX-170S w/E-MEM†**

No
10
4 + 2 + 1
.....
Yes (PGM A, B)
Slider w/VCA
4-band EQ per input
Hi-/lo-cut
.....
Effectively 4
No
No
No
.....
400Hz, 1kHz
LED ladder
RB >20kΩ
-10, +8dBu

CS400
Digital
Intercom
System



40
YEARS OF EXCELLENCE

McCurdy

Advanced Communication System

Challenged by the need to find a complete communication solution for the broadcast industry allowing for a truly software based and reprogrammable system that meets the requirements of two-wire (party line or conference) and four-wire (point-to-point) systems, McCurdy Radio Industries Limited is pleased to introduce the **CS9400+ Digital Intercom System**. Utilizing field proven audio switching and distribution hardware from the highly acclaimed CS9400 system coupled with advanced software and comprehensive accessories, the CS9400+ will meet all studio, plant and truck communications needs.

In today's complex and fast paced broadcasting world, just meeting standards is no longer good enough. It is the ability to improve them that is essential. The CS9400+ has set a new world standard for communications equipment.

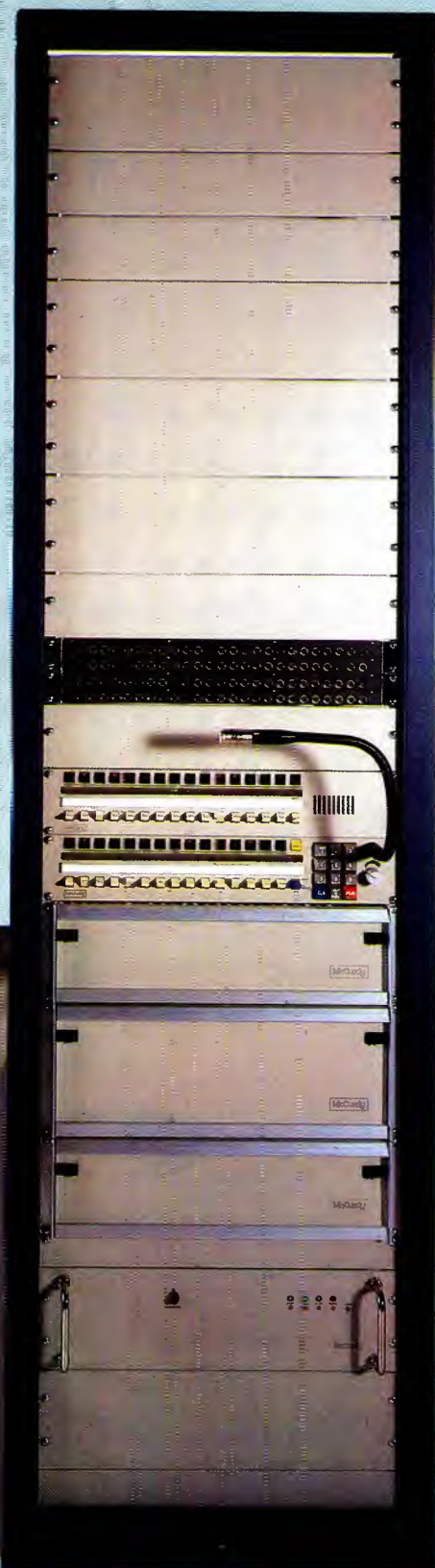
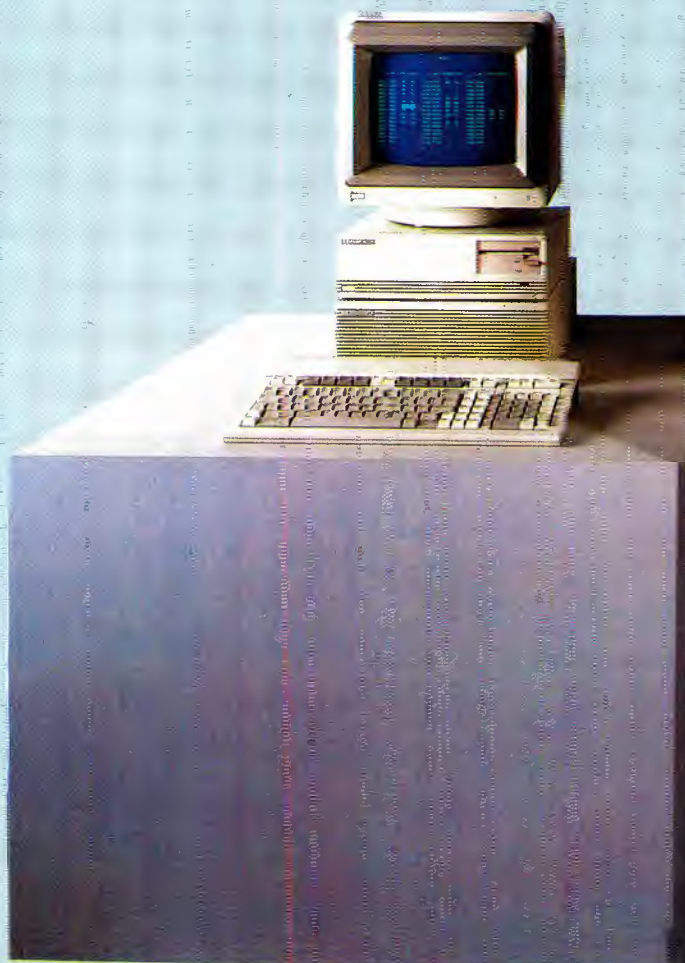
The versatile CS9400+ provides complete point-to-point communications, dynamic Party Lines, interrupted fold-backs (IFB), radio interface, telephone interface and two-wire beltbacks.

Impressive. But the CS9400+ is capable of much more! The advanced high speed microprocessor and control system provides instantaneous crosspoint access regardless of system size up to 640x640 (optionally expandable).

The superior software capabilities allow the system's parameters (Party Lines, IFB's, crosspoint assignments etc.) to be adapted easily and quickly to everchanging daily needs simply by reprogramming through the system terminal. In addition, key assignments and functions when not restricted, can also be implemented via the keypad's front mounted or external keypad. All changes can be implemented instantaneously or saved as a file for later "batch change". Moreover, off-line editing of data can also be accomplished on a standard PC.

The CS9400+ is already in use at major television facilities worldwide and has already met and exceeded the rigorous production requirements at the 1988 Winter Games in Calgary.

McCurdy Radio's expertise in this complex communications field coupled with our system experience in external interfaces makes the CS9400+ and McCurdy Radio the only choice for your communications needs.





HARDWARE FEATURES

- 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 beltacks
 - 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



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.

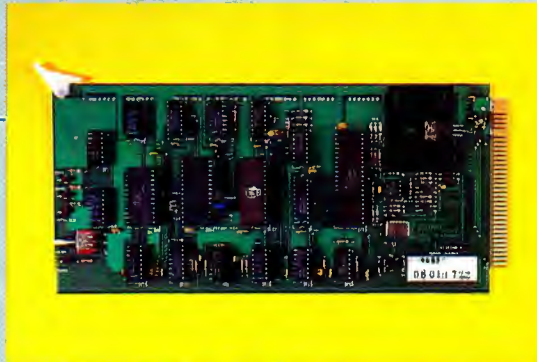
FR9423 DISTRIBUTION AMPLIFIER FRAME

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

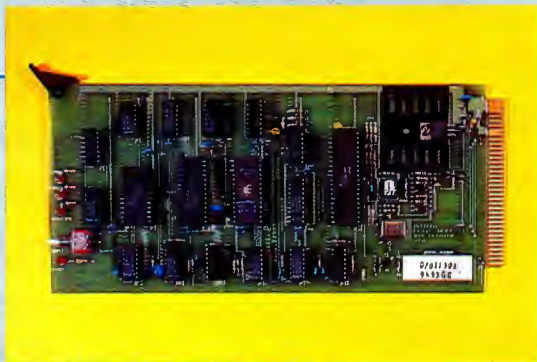
This 3 R.U. (5.25 inches) unit consists of three industry standard high frequency switch mode power supplies. These extremely cool running supplies provide bi-polar 15 volts DC for the analog elements and +12 volts DC for the digital elements. Distribution to the various frames is via gold plated power 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.





BC9453 BUS CONTROLLER CARD

This high performance 8-bit micro-processor 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.



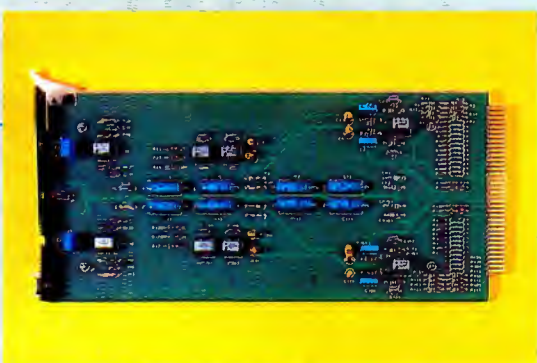
GC9453 GROUP CONTROLLER CARD

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.



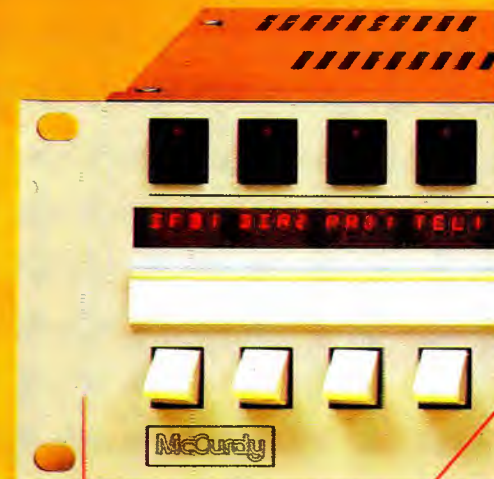
DA9403/9404 DISTRIBUTION AMPLIFIER CARDS

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.

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

HIGH QUALITY NOISE
CANCELLING MICROPHONE
ON 7", 14", or 20"
LENGTH GOOSENECK



PANEL FINISH
IN GREY CR
BLACK

TELEPHONE TYPE
LEVER TALK
KEYS
(MOMENTARY &
LOCK)

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.

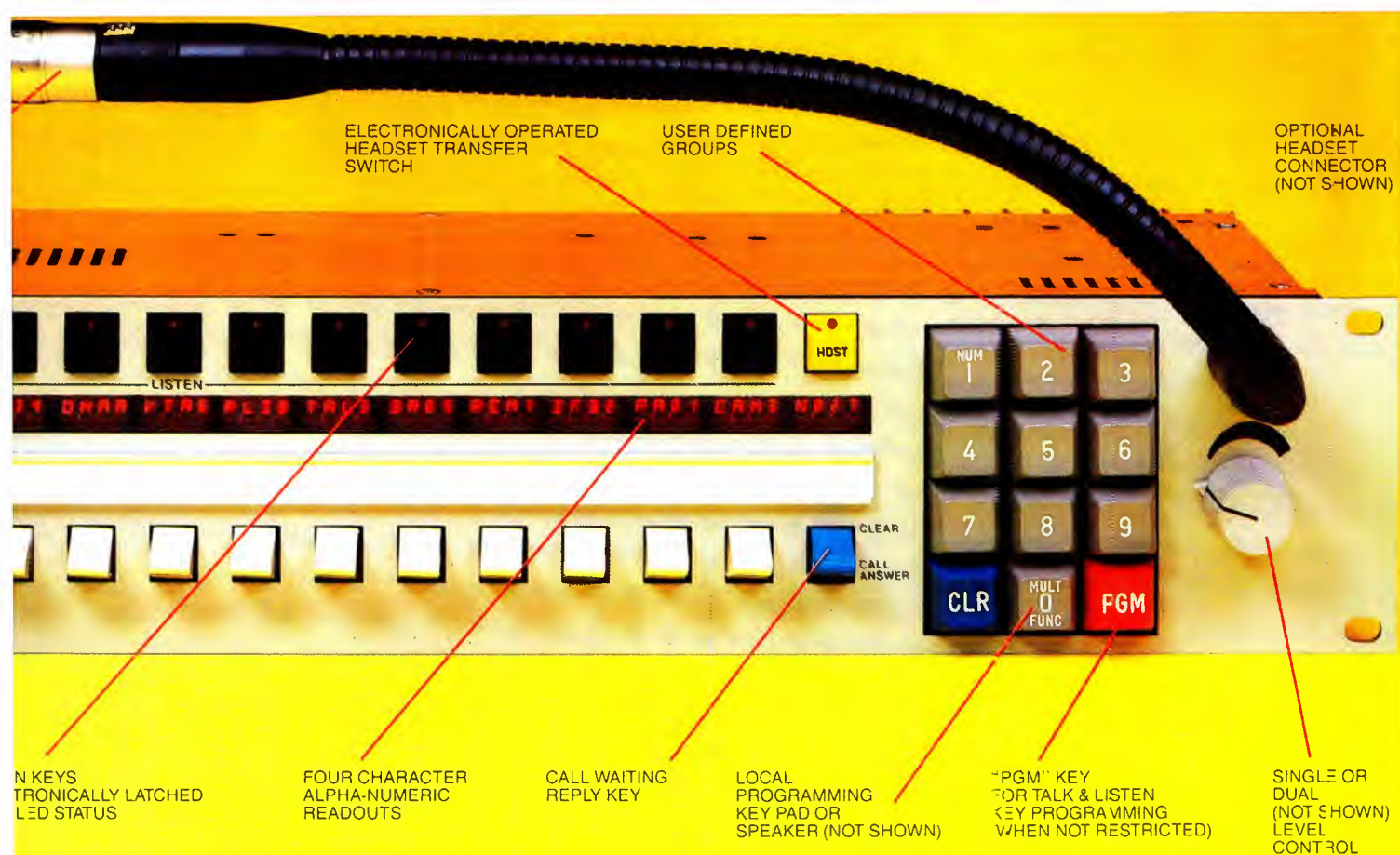
When the receiving station's call-answer key is depressed, normal two-way conversations can proceed. Key components of the interface are a programmable microprocessor card, an auto-answer hybrid and power supply.

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.





N KEYS
TRONICALLY LATCHED
LED STATUS

FOUR CHARACTER
ALPHA-NUMERIC
READOUTS

CALL WAITING
REPLY KEY

LOCAL
PROGRAMMING
KEY PAD OR
SPEAKER (NOT SHOWN)

"PGM" KEY
FOR TALK & LISTEN
KEY PROGRAMMING
WHEN NOT RESTRICTED)

SINGLE OR
DUAL
(NOT SHOWN)
LEVEL
CONTROL

PL-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 put-to-single output mixer for one of the puts 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 for 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.

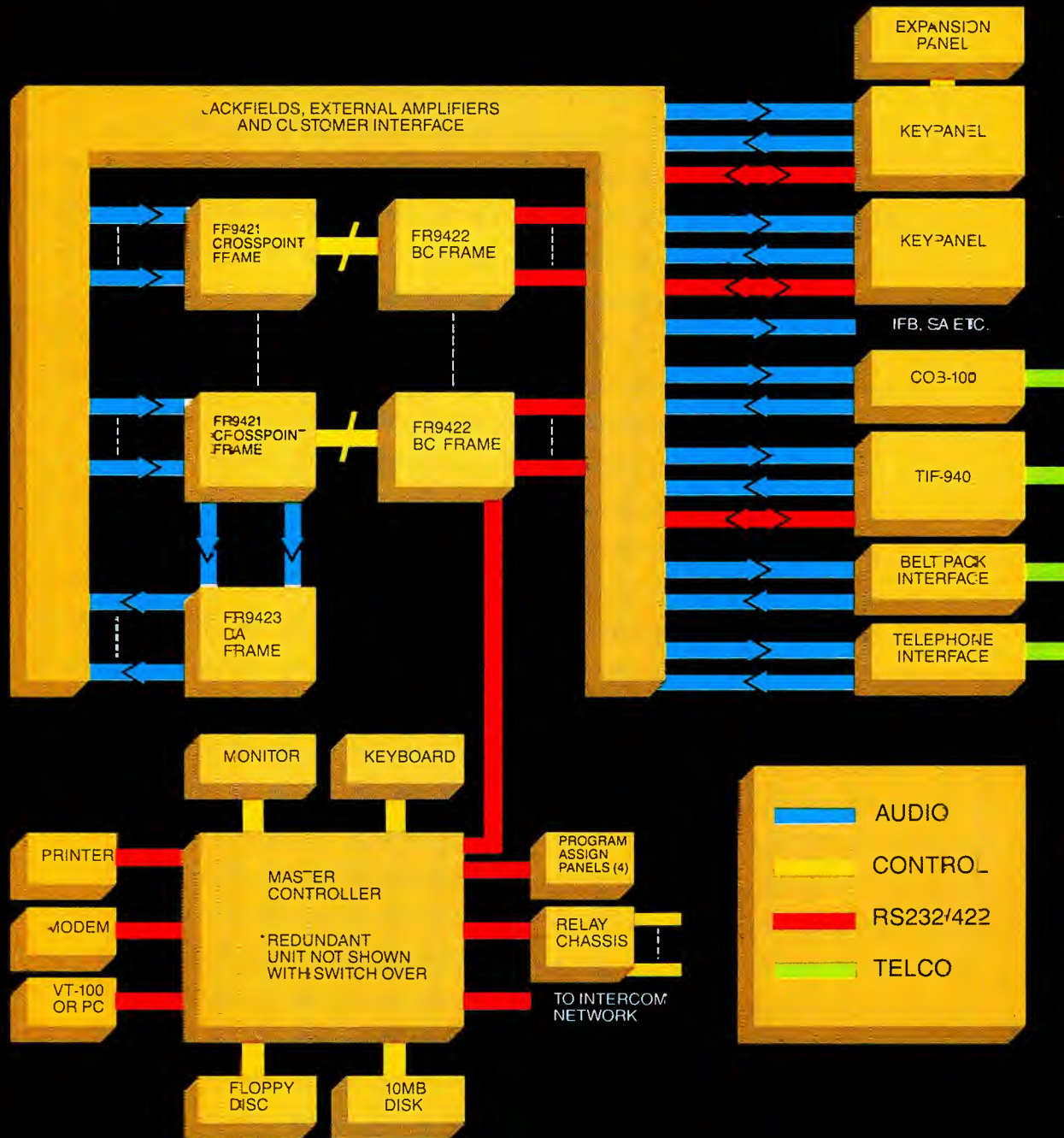
XCP-XXX CUSTOMER CONNECT INTERFACES

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 desirable. This can be for stage managers, floor buses, camera buses and external existing beltpack installations.

SYSTEM BLOCK DIAGRAM



SPECIFICATIONS AND ORDERING INFORMATION

The CS940C+ 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 CS940C+ Engta 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, belt packs, headsets, microphones, speakers and auxiliary equipment. For additional information, engineering assistance or application data, contact McCurdy Radio Industries.

McCurdy

McCurdy Radio Industries

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Telex: 06-965533 Telefax: (416) 751-6455

1051 E. Main Street, Buffalo, New York
14206 Tel: (212) 772-0719



"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 WTIK
New Orleans, LA

BROADCAST
engineering

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 (8 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		<-90dB 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 60Ω		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	<-90dB 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, -85dBu
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	Bal 5k/10kΩ	AB 150/600Ω	TB/AB 600Ω	600/35Ω
Output connection	Bal 60Ω	600/3k/10kΩ?	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



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.



Focusing on new technology.
77 Selleck St. Stamford, CT 06902
(203) 348-2121

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Circle (121) on Reply Card

www.americanradiohistory.com

Manufacturer	Ramko Research
Model/Series	DC38-10S‡
Distortion	0.5% 8dBm
S/N ratio	63dB
Crosstalk	-70dB 1kHz 8dBm
Reader Service Number	375

Ramsa/Panasonic Pro A/V	
Model/Series	WR-T820B‡
Distortion	0.08% 18dB 20-20k
S/N ratio	-130dB typical
Crosstalk	60dB 1kHz
Reader Service Number	376

Solid State Logic Ltd	
Model/Series	SL 4000 E series Master
Distortion	0.03% 1kHz 4dBm
S/N ratio	84dB
Crosstalk	-64dB 10kHz 4dBm
Reader Service Number	378

Manufacturer	Sonosax
Model/Series	SX-T
Modular construction	No
# of mixing positions	14
# of mixing buses	10
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	3-band
Filtering	Low-pass
Panpots	Yes
Groups subgroups	Subs on request
Sends returns	...
Solo bus	AFL or PFL
Compression limiting	Yes
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Fixed frequency
Metering types	PPM, LED
Input connections	TB/AB 5k Ω
Output connection	TB/AB 25 Ω
Output levels	26dBm max
AF response	± 0.1 dB
Distortion	0.02% 1kHz 6dBm
S/N ratio	-129dBm EIN/-115dBm
Crosstalk	-80dBm 1kHz 6dBm
Reader Service Number	380

Sony Pro Audio	
Model/Series	MXP-3000 series
Modular construction	Yes
# of mixing positions	18-52
# of mixing buses	3
Patch points	.....
Stereo output	Yes
Fader types	Slider
Equalizer	Shelving/parametric
Filtering	High, low-pass
Panpots	Yes
Groups subgroups	8
Sends returns	6 pre/8 post
Solo bus	PFL/in-place
Compression limiting	No
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Variable
Metering types	VU, PPM
Input connections	TB/AB 1.5k/7k Ω
Output connection	TB/AB 120 Ω
Output levels	22dBm 2k Ω
AF response	-0.3dB 4dBm
Distortion	0.1% 1kHz 4dBm
S/N ratio	80dB
Crosstalk	-70dB 20kHz
Reader Service Number	381

Soundcraft	Soundtracs/AKG
Model/Series	TS-12
Modular construction	Yes
# of mixing positions	24, 36
# of mixing buses	Mix, channel
Patch points	Yes
Stereo output	Yes
Fader types	Sliders
Equalizer	4-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	12/8
Sends returns	6/6
Solo bus	PFL, in-place
Compression limiting	.....
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Yes
Metering types	VU
Input connections	AB 2k Ω (m)/10k Ω (l)
Output connection	5k Ω /600 Ω
Output levels	21dBu, 26dBu max
AF response	-1dB 20-20k 10dBu
Distortion	0.005% 1kHz
S/N ratio	-128.5dBm EIN
Crosstalk	-80dB between groups
Reader Service Number	383

Manufacturer	Soundtracs/AKG
Model/Series	MR series‡
Modular construction	Yes
# of mixing positions	24+8
# of mixing buses	8 + 2
Patch points	.....
Stereo output	Yes
Fader types	Sliders
Equalizer	4-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	8
Sends returns	6 pre/post
Solo bus	Yes
Compression limiting	.....
Talkback circuits	Yes
Speaker muting	.....
Lineup oscillator	30Hz, 1kHz
Metering types	10-seg bar graph
Input connections	AB 2k/10k Ω
Output connection	Unbal 50 Ω
Output levels	22dBm max
AF response	.....
Distortion	<0.015%
S/N ratio	-127dBm/>78dB
Crosstalk	<-70dB
Reader Service Number	385

Sluder	
Model/Series	Model 963‡
Modular construction	Yes
# of mixing positions	60-in/4sub/4-master
# of mixing buses	4-8sub/4master/4aux
Patch points	To +6dB
Stereo output	Yes
Fader types	Slider
Equalizer	3-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	4 or 8
Sends returns	4 pre/post switched
Solo bus	Post-fader
Compression limiting	Per channel/system
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	5-frequency
Metering types	VU or bar graph
Input connections	TB >5k Ω
Output connection	TB <50 Ω
Output levels	24dBm
AF response	-0.1, 0dB 30-15k
Distortion	0.03% 4dBm 30-15k
S/N ratio	-123dBm EIN mic
Crosstalk	-80dB 4dBm 15kHz
Reader Service Number	386

TASCAM	
Model/Series	M-500 series‡‡
Modular construction	Yes
# of mixing positions	12-20
# of mixing buses	8main/4aux/2master
Patch points	Access patches
Stereo output	Yes
Fader types	Slider
Equalizer	3-band
Filtering	No
Panpots	Yes
Groups subgroups	8 main, 4 aux
Sends returns	Yes
Solo bus	In-place, PFL
Compression limiting	Sidechain opt
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	3-tone
Metering types	VU meters
Input connections	Bal 2k/100k Ω
Output connection	Bal 100 Ω
Output levels	18dBV maximum
AF response	± 1 dB 20-20k
Distortion	0.025% 1kHz
S/N ratio	68dB unwtid mic-pgm
Crosstalk	<-70dB 1kHz
Reader Service Number	388

Manufacturer	Ward-Beck Systems
Model/Series	ST3642/ST series‡
Modular construction	Yes
# of mixing positions	36
# of mixing buses	23
Multitrack outputs	24 as option
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	3-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	2-st, 2-m/4-st
Sends returns	6 pre/6 post
Solo bus	AFL, PFL
Compression limiting	Yes
Machine starts stops	Per request
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Variable
Metering types	VU, PPM
Automation preparation	No
Input connections	TB 1.5k/20k Ω
Output connection	Bal <100 Ω
Output levels	8dBm nom, 30dBm max
AF response	< ± 1 dB 20-20k

Wheatstone	
Model/Series	SP-5 (SP-6)‡
Modular construction	Yes
# of mixing positions	32+8 or 4
# of mixing buses	8 groups or 4 stereo
Multitrack outputs	8
Patch points	Yes
Stereo output	Yes
Fader types	Wheatstone M-104 slider
Equalizer	3-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	8 groups
Sends returns	4 pro, post
Solo bus	PFL
Compression limiting	No
Machine starts stops	Yes
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Variable
Metering types	VU movement
Automation preparation	No
Input connections	AB 150 Ω /20k Ω
Output connection	AB 600 Ω
Output levels	22dBm max
AF response	± 0.5 dB 20-20k

Yamaha International	
Model/Series	RMM2408‡‡
Modular construction	Yes
# of mixing positions	24 max
# of mixing buses	8
Multitrack outputs	8
Patch points	Yes
Stereo output	Yes
Fader types	Slider
Equalizer	3-band
Filtering	High-pass
Panpots	Yes
Groups subgroups	8 groups
Sends returns	2-send switchable
Solo bus	AFL
Compression limiting	No
Machine starts stops	No
Talkback circuits	Yes
Speaker muting	No
Lineup oscillator	Variable
Metering types	VU
Automation preparation	No
Input connections	TB 600 Ω
Output connection	Unbal 600 Ω
Output levels	4dBm for 0VU
AF response	-3dB ref 4dBm

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.

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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.

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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.

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Manufacturer **Ward-Beck Systems**
Model/Series **ST3642/ST series‡**

Distortion <0.2% 24dBm
 S/N ratio -125dB EIN
 Crosstalk <-75dB 30-15k
 Reader Service Number 390

Wheatstone
SP-5 (SP-6)‡ **3224 series†**

<0.005% 18dBm mic
 -129dB EIN/>90dB
 <-90dB 1kHz
 391

0.05% 20dBm
 -129dB EIN/90dB
 <-90dB 1kHz
 392

Yamaha International
RMM2408†‡ **PM3000**

0.1%
 -128dB EIN
 -70dB 1kHz 4dBm
 393

<0.1% 14dBm
 -128dB EIN
 -60dB 1kHz
 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**
Model **EMT 980**

System configuration Single
 Player trays One
 Programmable Yes
 Output connection Bal 50Ω source
 Output level +6dB (+12dB max)
 Audio response ±0.5dB 20-20k
 Distortion 0.004%
 Dynamic range
 Crosstalk <-60dB
 SN ratio 96dB linear rms
 Access time <1s fader start delay
 Reader Service Number 656

Nakamichi
CDP-2A

Single player
 1
 24-programs
 600Ω
 2.5V 600Ω
 ±0.5dB 5-20k
 0.0025% 1kHz
 >96dB
 >95dB separation
 >100dB A-wtd

 657

Ramsa/Panasonic
SL-4300 (SL-4700)

Single (6-CD magazine)
 1
 20 (36) selection
 Bal 600Ω (1KΩ)
 2Vrms
 ±0.5dB 20-20k
 0.003% 1kHz 0dB
 94dB

 >96dB
 <6s
 658

Sony/Pro Audio
CDP-3000CDS-3000 **CDP-5000**

Multilayer
 2 per controller
 Yes
 Balanced
 +4dBm nom
 -1, +0.8dB 20-20k
 0.01%
 94dB
 >90dB 1kHz

 2s
 659

Single player

 Yes
 Bal 600Ω <50Ω source
 +4dBm
 -1, +0.5dB 20-20k
 0.01%
 >94dB
 90dB 1kHz

 2s
 660

Studer
A730

Single player
 3-event & CD memory
 +6dBm nom
 ±0.1dB 20-20k
 0.006%
 >90dB
 >90dB
 >90dB unwt'd
 <3s
 661

Manufacturer **Studer**
Model **A727**

System configuration Single player
 Player trays
 Programmable Multiple event
 Output connection Xfmr bal <50Ω source
 Output level +15dBm max
 Audio response ±0.1dB, 20-20k
 Distortion <0.006%
 Dynamic range 96dB
 Crosstalk >90dB separation 1kHz
 SN ratio >100dB
 Access time 3sec
 Reader Service Number 662

Philips LHH-2000

Multilayer
 3 max
 To 3 events
 Xfmr balunbal <40Ω
 +6dBm
 ±0.5dB 20-20k
 <0.01%
 >90dB
 >80dB separation
 >90dB
 <2sec
 663

Studer/ReVox
B226

Single player

 To 19 events
 Unbal <500Ω
 0-2V
 ±0.1dB 20-20k
 <0.005%
 96dB
 >90dB
 >100dB
 <3s random
 664

TASCAM
CD-501

Single player
 1
 Yes, remote control
 XLR bal 600Ω load
 0dBm nom
 ±0.3dB, 5-20k
 0.0025% 1kHz
 >96dB
 >95dB separation
 >96dB
 665

Technics/Panasonic
SL-P990770 (-1300)

Single, 3" & 5" disc
 1
 32 (20) selection
 600Ω bal
 2.5Vrms (or 8dBm)
 ±0.2dB 2-20k
 <0.0025% (0.0002%)
 100dB
 >110dB separation
 113dB (112dB)

 666

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Circle (123) on Reply Card

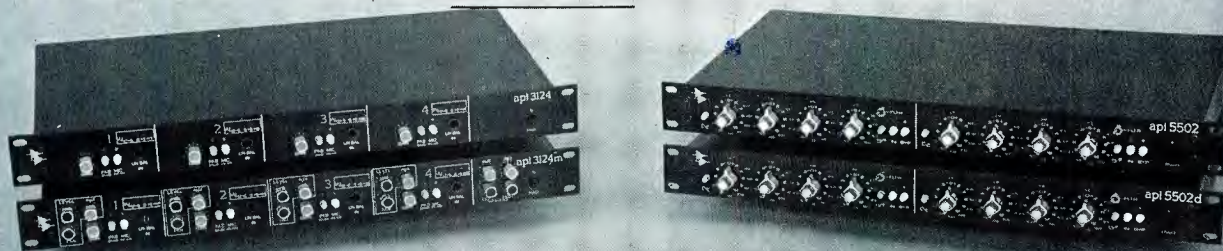
Audio Cassette Decks

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 1 $\frac{1}{2}$ ips. 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	Maj30 Jingle Machine	250 (250AV) X-15	MR-1 (MR-2)	B215
Deck control logic	μ P control	TTL	Mechanical	μ P control
Timer	Min/sec	Yes	No	Yes
Cue track	4 tones available	No	No	No
Capstan motor, drive	dc-servo, direct	dc-servo, belt	dc-servo, direct	dc-servo, direct
Reel motor	2 dc-servo	dc-servo	dc-servo	dc-servo
Play speeds	1.875, 7.5 ips	3.75 (& 1.875)ips	1.875ips $\pm$ 6%	1.875ips
No. of heads	Single 4-track	2	3 (2)	3
Meter types	L/R VU meters	VU & peak LEDs	Bar graph	Bar graph
Input connection	10k Ω unbal, 600 Ω bal	Unbal	Unbal	Bal or (unbal)
Input level	-10dBm for 0VU	-60dBv 10k Ω	-50dBv 10k Ω	+4dBm (-10dBv 50k Ω)
Output connection	Bal or unbal, 600 Ω	Unbal	Unbal	Bal or (unbal)
Output level	4dBm nom., +18dBm max	-10dBv, 10k Ω	-20dBv 20k Ω	+4dBm
AF response	-3.0dB, 35-14k	-3, +2dB, 20-18k	$\pm$ 3dB, 20-12.5k ref to -10dBm	$\pm$ 3dB, 20-20k
S/N ratio	50dB	71dB wtd w/Dolby C	50dB unwt'd	72dB A-wtd, Dolby C
Crosstalk Pgm-Pgm	>35dB separation	-50dB, 1kHz, 0VU	-40dB 1kHz, 0VU	-40dB, 1kHz, 0VU
Distortion	1.5%, 315Hz, 1 7/8ips	1.5%, 315Hz	1.5%, 1kHz, 0VU	<1.5%, 315Hz, 0VU
Wow, flutter	.....	<0.02%	$\pm$ 0.1%	0.1%, DIN 45507
Equalization	Types I, II	3180 μ s + 70 μ s	3180 μ s + 70 μ s	3180 μ s + 12 μ s/70 μ s
Reader Service Number	1360	1361	1362	1364

Manufacturer	Studer	TASCAM	Yamaha International
Model/series	A721	122mkII (112R/112) ¹ 238 Syncaset	234 Syncaset MT44-D (MTIX ²)
Deck control logic	μ P control	TTL (w/reverse)	TTL
Timer	Yes	Index & (tape timer)	Tape counter
Cue track	No	In FF, RWD modes	No
Capstan motor, drive	dc-servo, direct	FG-servo, direct	dc servo, belt
Reel motor	dc-servo	dc reel & ancillary	dc-servo
Play speeds	1.875ips	1.875ips $\pm$ 12% ($\pm$ 15%)	3.75ips $\pm$ 12%
No. of heads	3	1-E, 1-R, 1-P, Acculign	2 4-track
Meter types	Peak program	L/R VU, peak LED (ladder)	VU, peak LEDs
Input connection	Xfmr bal	XLR 40k Ω bal, RCA 30k Ω	Unbal line, instr/mic
Input level	+4dBu, 10k Ω	+4dBu, -10dBv	100k Ω mic, 22k Ω line

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212-704-6682

Circle (124) on Reply Card

Manufacturer	Studer
Model/series	A721
Output connection	Xfmr bal, <50 Ω source
Output level	+4dBu into 600 Ω
AF response	-3. $\pm$ 2dB 20- $\geq$ 18k 0dB = 200nWb/m
S/N ratio	72dB Dolby C, Type IV
Crosstalk Pgm-Pgm	<-40dB 1kHz
Distortion	<1.5% Types I, II, IV
Wow, flutter	0.1% wtd C-46 to C-90
Equalization	Types I, II, IV
Reader Service Number	1365

¹Model 112R uses operates bidirectionally and includes 2 erase heads.
²MITX is integral with a 4-channel portable mixer system.

TASCAM	
122mkII (112R/112) ¹	238 Syncaset
Xfmr 100 Ω bal, RCA 100 Ω +4dBm, -10dBv $\pm$ 3dB, 25-17k, -20VU 160nWb/m=0VU, std tape 80dB w/Dolby C > 1kHz <-45dB, 1kHz, 0VU 1%, 400Hz, 0VU 0.04% NAB, $\pm$ 0.08% DIN 3180 μ s + 70 μ s, 120 μ s 1366	Unbal, RCA -10dBv nominal $\pm$ 3dB, 30-16k ... >93dB IHF-A w/dbx -50dB w/o dbx 0.8%, 400Hz 0VU w/ 0.04% 3180 μ s + 70 μ s 1367

Yamaha International
MT44-D (MTIX) ²
Unbal 2.5k(1k) Ω -10dB (-10dBu) $\pm$ 3dB 20-12.5k 20dB, 20nWb/m 67dB Dolby C (85 dbx) >50(55)dB separation <1% 0.06% (<0.05%) 3180 μ s + 120 μ s/70 μ s 1369

Audio Cartridge Decks

Recorders using 1/4" 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
Model/series	•Model 578†
Deck control logic	Transistor
Remote control bus	No
Replay inhibit	Yes
Record timer	Yes
Sec. Tert tones	Yes
Phase correction	n.a.
Capstan motor	ac-synchronous
Play speeds	7.5
Sec. tert output	TTL
Meter types	VU rec/play/erase
Monaural model	.....
Play only model	Model 557
Multideck model	Model 2214
Input connection	Balanced
Input level	-5/+20dB, 5k Ω
Output connection	Balanced
Output level	+12dBm nom, 110 Ω source $\pm$ 1.5dB, 40-12.5k
AF response	1dB under saturation 54dB
S/N ratio	.....
Crosstalk L-R	.....
Crosstalk Pgm-Cue	.....

Audi-Cord
Series A, S, TDS
CMOS devices
Yes
Yes
Yes
Yes
None
as-synchronous
7.5
Solid-state
VU movement
S21, A21
S11/-16, A11/-16
TDS-1, TDS-6 twins
Xfmr bal
-22/-12dBm
Xfmr bal
-8dBm
$\pm$ 2dB, 50-15k
1kHz, 160nWb/m
>47dB stereo
<-50dB
<-50dB

Broadcast Electronics		
PT90RPS‡ (PhaseTrak90)	Series 2100C✓	Series 3000A✓
.....	TTL & CMOS devices	TTL
Simple remote	None	None
Yes	No	No
Option	No	No
Sec. Tert. AFSK	Sec only	No
Non-encoded type	No	No
dc-servo	ac-synchronous	ac-synchronous
7.5 (3.7, 15 options)	3.75, 7.5	3.75, 7.5
Solid-state	Relay closure	Relay closure
LED VU	Taut-band A	Taut-band A
PT90P	2100RP	3200ARP, 3400ARP
PT90PS	2100P	3100/3200/3400AP/APS
.....	None	.....
Active bal	Active bal	Xfmr bal bridging
+8dBm	-10dBm	-20/+20dBm, 50k Ω load
Active bal	Active bal	Xfmr
+24dBm, as 75 Ω source	0dBm	-54/+10dBm, 600 Ω /150 Ω
$\pm$ 2dB, 40-16k	$\pm$ 2dB, 50-15k	$\pm$ 2dB, 50-15k
250nWb/m	10dB, 160nWb/m	10dB, 160nWb/m
-80dB w/Dynafex NRS	>52dB	>52dB unwtd
-50dB	-50dB, 1kHz	-50dB, 1kHz
-50dB	-50dB, 1kHz	-50dB, 1kHz

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Manufacturer		Audi-Cord		Broadcast Electronics	
Model/series		Series A, S, TDS		Series 2100C✓	Series 3000A✓
Distortion	<1.5% 1kHz	1% 1kHz, 160nWb/m	<1.5% tape dependent	2%	<2%, tape dependent
Vow, 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		Fidelipac		ITC/EM	
Model/series		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-syn	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	Solic-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 on y 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
A.F. response	±2dB, 20-16k	±2dB, 50-16k	±2dB, 50-16k	±2dB, 50-16k	±2dB, 50-16k
	405nWb/m	250nWb/m, 1kHz	10dB, 250nWb/m	10dB, 250nWb/m	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
Vow, 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		Pacific Recorders & Engineering	
Model/series		99B series	OMEGA series	Tomcat†✓	Micromax††✓
Deck control logic	μP	μP	μP	μP control	CMC S devices
Remote control bus	Simple remote	Simple remote	Simple remote	Yes	Yes
Record timer	Ext timer trigger	No	No		
Sec. Tert tones	Yes	Sec only	Sec only	Yes	Yes
Phase corrector	Yes, ELSA system	No	No	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)	7.5 (3.75 opt)	7.5, 15, also record	7.5 ps
Sec. tert output	Solid-state, relay	Solid-state	Solid-state	Solid-state	Solid-state



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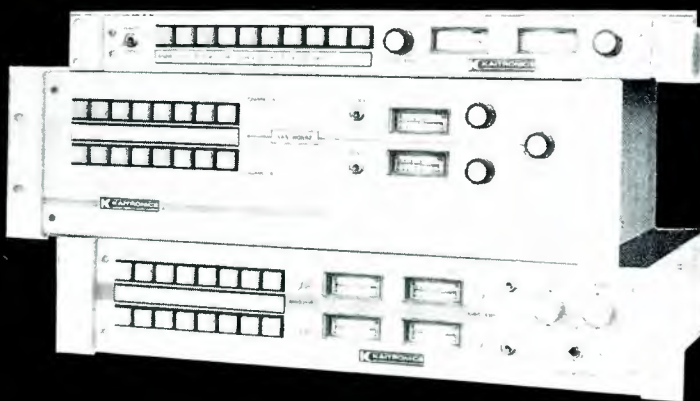
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Manufacturer	International Tapetronics/3M	Olari	Pacific Recorders & Engineering
Model/series	99B series	OMEGA series	CTM-10SR†
Meter types	Taut-band A/peak LED	Taut-band A	VU, peak LEDs
Monaural model	RPME	OMEGA mono player	CTM-10MR
Play only model	PM mono/PS stereo	OMEGA player M or S	CTM-10
Multideck model	None	None	None
Input connection	TB 20kΩ or 150/600Ω	Line, mic, bal/unbal	Active bal 10kΩ
Input level	-20, +28dB 20kΩ	0dB line, -70dBv mic	+28dBv max
Output connection	TB 180Ω source	Xfmr bal	Active bal 5Ω
Output level	-18, +25dBm 600Ω	+18dBm, 180Ω source	+26dBv into 200Ω
AF response	±1dB, 31.5-16k 250nWb/m	±2dB, 50-16k 10dB, 250nWb/m, OVU	±2dB 20-16k
S/N ratio	≥56dB bias/no signal	≥56dB bias, no signal	53dB
Crosstalk L-R	-50dB 1kHz	<-50dB, 1kHz, OVU	<48dB 1kHz
Crosstalk Pgm-Cue	-50dB 1kHz	<-50dB	<48dB 1kHz
Distortion	≤0.8%, 1kHz, 250nWb/m	≤1.5%, 1kHz, OVU	<0.8% 1kHz
Wow, flutter	<0.12% DIN wtd	0.15% DIN wtd	<0.15% 7.5ips
Reader Service Number	1380	1381	1382

†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"
Deck 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 OVU	-70dB
Distortion	<0.6% max stereo/2-tr	<0.6%, 510nWb/m	<1%	<1% 1kHz OVU	<1% 1kHz OVU
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		Nagra-Kudelski			Olari
Model/series	Lyrec A/S 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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Circle (127) on Reply Card

Manufacturer	Lyrec A/S
Model/series	TR-55 (TR-533)
Reel motor	dc servo (ac-servo)
Tape speeds	7.5/15(15/30 $\pm$ 33%), var
No. of heads	3
Meter types	VU movements
Equalization	NAB, CCIR (& AES)
Input connection	Xfmr bal(floating) 8k Ω
Input level	-6, +24dBm max
Output connection	Xfmr bal(floating) <40 Ω
Output level	+24dBm max
AF response	$\pm$ 1dB/60-18k(2dB/30-20k)
S/N ratio	>2dB unwt'd
Crosstalk Cue-Pgm	...
Crosstalk Pgm-Pgm	-40dB 1kHz (< -46dB)
Distortion	0.4% 1kHz 0VU
Wow, flutter	0.04% 15ips pk wtd
Reader Service Number	1394

Nagra-Kudelski	
IV-STC	T-Audio Time Code
dc	Servo
3.75, 7.5, 15 ips	3.75-30ips, var
4	4
VU movements	LED indicators
NAB, CCIR, NAGRA	NAB, DIN, IEC
Bal, unbal	Bal, floating 10k Ω
Mic, line levels	390mV-4.4V
Resistive bal	Bal floating 30 Ω
1V to 5k Ω	775mV-4.4V
2dB 30-30k	$\pm$ 1.5dB 30-15k 7.5ips
>72dB	72dB
...	...
<-60dB 1kHz	<-88dB
<1% 810nWb/m 400Hz	0.3% NAB 7.5ips
0.028% NAB, 15ips	<0.025% 7.5ips
1395	1396

Olari	
MTR-10-2	MTR-100A
dc-servo	dc-servo
3 57-30ips, var	7.5, 15, 30
3 or 4	ERP
VU, peak LEDs	24 VU w/peak LED
NAB, IEC, AES-30ips	NAB, IEC, AES-30ips
Active bal, xmtr opt	AB > 10k Ω
+4dBm	Switchable level
Active bal, xmtr opt	AB < 5 Ω source
+28dBm max	Switchable level
$\pm$ 2dB, 20Hz-25kHz	$\pm$ 2dB, 30-22k 15ips
73dB unwt'd 30ips	70dB
-60dB	...
-60dB 1kHz 0VU	<-55dB 1kHz
0.25% 1kHz 0VU	0.5%, 1kHz
0.04%	< $\pm$ 0.04%, 30ips
1397	1398

Manufacturer	
Model/series	MX-55
No. of tracks	1, 2, 2TC, 4
Tape width	1/4"
Deck control logic	μ P
Edit interface type	...
Recording timer	Yes
Cue track	Search 0 Cue 3-cue
Phase correction	...
Reel motor	Induction torque
Tape speeds	3.75/7.5, 7.5/15
No. of heads	ERP-P
Meter types	VU w peak LED
Equalization	IEC NAB
Input connection	AB > 10k Ω
Input level	-30dB max
Output connection	AB < 200 Ω source
Output level	-26dB max bal
AF response	$\pm$ 2dB 30-22k 15ips
S/N ratio	>70dB 15ips
Crosstalk Cue-Pgm	<-55dB 1kHz
Crosstalk Pgm-Pgm	...
Distortion	<0.3% 1kHz
Wow, flutter	< $\pm$ 0.06% 15ips
Reader Service Number	1399

Olari	
MX5050B-II (MX-50)	B77 Mk II
2	2 or 4
1/4"	1/4"
TTL	...
None	External option
Yes	Yes
No (Search 0 $\rightarrow$ 1 cue)	No
No	...
ac-synchronous	Triac control
3.75/7.5/15/var	3-speed $\rightarrow$ variable
4 (ERP)	3
VU w peak LEDs	VU movements
NAB IEC	NAB, IEC
AB > 10k Ω	Unbal 2.2k 110k 220k Ω
10k Ω	0.15mV-40mV
AB 600 Ω load	Unbal > 20k Ω load
$\pm$ 27dB max	1.55V 20k Ω minimum
$\pm$ 2dB 20-20k 15ips	-3, -2dB, 30-20k 7.5
72dB unwt'd ($\geq$ 54dB)	>66dB NAB, 7.5ips
<-55dB	...
-55dB 1kHz, 0VU	<-45dB stereo 1kHz
0.5% 1kHz (>0.3%)	<0.2% 7.5ips
0.04% 15ips (0.06%)	<0.08% 7.5ips
1400	1401

ReVox	
C270 (C274, C278)	PR99 Mk II
2 (4, 8)	2
1/4" (or 1/2")	1/4"
μ P	TTL, μ P
Remote control, RS-232	Remote control
Yes	Yes
Zero, address locators	No
...	...
ac servo	Triac control
3-speed $\pm$ 0.2% $\rightarrow$ var	3 7.5-15ips
3	3
VU w/peak LEDs (LED bar)	VU movements
NAB or CCIR	NAB, CCIR
Bal > 1.2k/5k Ω	Bal > 1.2k/5k Ω , Unb 100k Ω
-10, -10dBu, 22dBu max	-10, -10dBu
Bal, <80 Ω , XLR	Bal, <50 Ω
-22dBu out, 600 Ω load	-22dBu out, 600 Ω load
$\pm$ 2dB, 30-18k 7.5ips	-3, -2dB, 30-20k 7.5
>64dB NAB, 7.5ips	>66dB NAB, 7.5ips
...	...
<-50dB stereo 1kHz	<-45dB stereo 1kHz
<1.2% 7.5ips	<0.3% 7.5ips
<0.07% 7.5ips	<0.08% 7.5ips
1402	1403



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Circle (128) on Reply Card

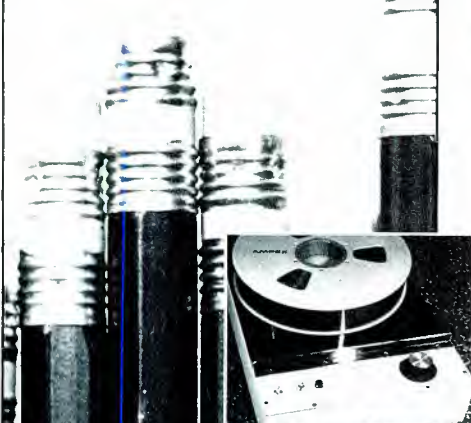
Circle (129) on Reply Card

Manufacturer	Sony Pro Audio	Stellavox	Studer
Model/series	APR-2003 portable	APR-5000 series	A820 series (A812)
No. of tracks	3	Full, half, halfC	2 to 24 (2)
Tape width	1/4"	1/4"	1/4" to 2" (1/4")
Deck control logic	No	16-bit μ processor	μ P, TTL, CMOS
Edit interface type	No	Serial, parallel	RS-232, RS-422
Recording timer	Tape counter	on APR-5003	Yes
Cue track	Yes	SMPT center track	SMPT center track ²
Phase correction	No	No	Yes
Reel motor	dc	dc-servo	dc servo
Tape speeds	3-75, 7 5ips	7.5, 15, 30ips $\pm$ 50%	3.75-30ips, variable
No. of heads	3	4	5 possible
Meter types	VU movement	Tautband A	Tautband A
Equalization	.....	NAB, DIN, IEC	NAB, IEC, DIN
Input connection	Bal, 10k Ω	Balanced	Balanced
Input level	-70dBs, +4dBs	-72dBm mic	+6dBm
Output connection	Unbal 600 Ω	Balanced	Balanced
Output level	1V to 10k Ω load	+6dBm typical	+15dBm max
AF response	$\pm$ 30B, 30-18k, 7.5ips	-1, +1dB, 20-20k	-2, +1dB 30-20k
S/N ratio	.....	68dB	70dB
Crosstalk Cue-Pgm	<-90dB audio-TC	-90dB	-90dB
Crosstalk Pgm-Pgm	.....	-55dB 1kHz 0VU	-55dB
Distortion		0.6% 1kHz 0VU	0.5% 1kHz 0VU
Wow, flutter	$\pm$ 0.08% 7.5ips	0.02%	0.02%
Reader Service Number	1404	1405	1407

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Manufacturer	Studer	TASCAM
Model/series	A807	ATR-60 series
No. of tracks	2 (or 4)	2T, 2N/2D, 2HS/4HS, 8
Tape width	1/4" (or 1/2")	1/4" or 1/2"
Deck control logic	μ P control	μ P control
Edit interface type	Serial, parallel	AQ-65 autolocator
Recording timer	LED display	Yes
Cue track	Address & autolocator	Timecode on 2T, RTZ/STC
Phase correction	Yes	No
Reel motor	ac servo	dc servo, eddy current
Tape speeds	3.75, 7.5, 15 +7/-7 HT	7.5-15 or 15-30
No. of heads	3 (optional -track)	3 (NAB, DIN)
Meter types	VU movement	VU w/peak LEDs
Equalization	NAB, CCIR switched	IEC/CCIR, NAB
Input connection	Xlfr bal >10k Ω	Bal 10k Ω
Input level	-30dB min, +24dBu max	+4/28dBm
Output connection	Xlfr bal <50 Ω	Bal <20 Ω
Output level	+24dBu max to 600 Ω	+28dBm max

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Circle (131) on Reply Card

Manufacturer		TASCAM		TTC/Scully Tape	
Model/series	Model 48	ATR-80 series	280B series ¹	250 series [†]	
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 OVU	<-55dB 1kHz OVU	<-60dB 250Wb/m 1kHz	.....	
Distortion	0.8%, OVU, 1kHz	<0.5%, 1kHz	<3%	<0.7%, 250Wb/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	

¹For playback only use 285B series
[†]For playback only use 255 series

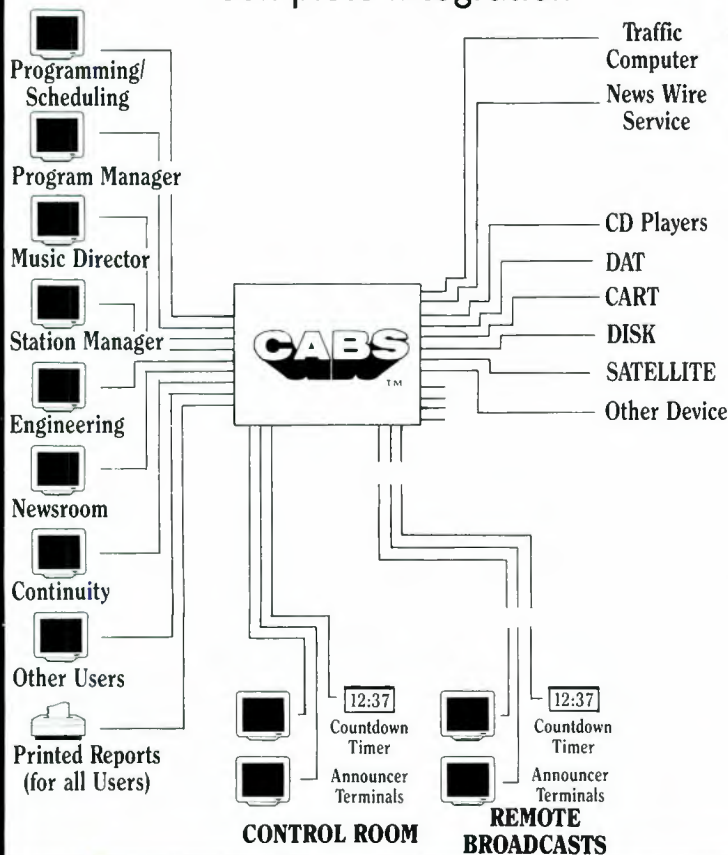
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Manufacturer	Aphex Systems		ATI/Audio Technologies		Audio Developments
Model/Series	#300 Compellor (-303 [†])	• 612 expander/gate	• 700 Dominator✓	Emph'a'Sizer‡	AD066-1 Port-a-Flex‡
Design function					
AGC	12dB leveling	No	No	No	....
Compression	1:1.1 to 20:1	No	Zero overshoot	Yes	2:1 to 20:1
Limiting peak	12dB ceiling	No	Opt 703/704	Yes	Yes
Limiting pre emp	No	No	....	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 unwd	87dB w/hum unity gain	80dB unwd 20dBm	80dB	>70dB
Reader Service Number	1280	1281	1282	1283	1284

[†]Model #303 includes Aphex aural exciter spectral enhancement.

Manufacturer	Brooke Siren Systems		CRL Systems	
Model/Series	FM-601 limiter	DPR 402	• AM-4 (AM-4S✓)	• BAP-2000 FM/TV‡
Design function				
AGC	Yes	No	AGC-400 (SGC-800)	2-band, pgm dep
Compression	Yes	Yes	SEC-400 (SEC-800)	....
Limiting peak	Yes	Yes	Yes	Yes
Limiting assym	No	No	Yes	....
Limiting pre emp	Flat, 25/75ms	De-ess/adj side chain	per NRSC	to 20dB
Expansion	Yes	Yes	Dynafex NR	Dynafex NR
Gate threshold	Yes	No	-10...30dB adj	TV sync filter
Programmable	User	User, factory set	Yes	Adjustable
Meter type	3 meters	LED bargraph	LED ladder	LED
Meter functions	2 VU, 1 gain	In, out, GR	GR, peaks	GR, relative output
Time constants	Variable	Variable	Adjustable	Adjustable
Input connection	Xfmr bal 600Ω	AB bridging	AB, unbal	AB, bridging 10kΩ
Input level	+20dBm	+20dBv	4dBm	-20, +20dBm
Output connection	Xfmr bal 600Ω	Unbalanced	AB, unbal	AB <100Ω
Output level	+20dBm max	+20dBv max	4dBm	-20, +20dBm
AF response	±0.5dB, 30Hz-20kHz	±1dB, 25Hz-20kHz	±1dB 50Hz-15kHz	±1dB 50Hz-15kHz ops
Distortion	0.75%	0.15%, 1kHz	<0.5%	<0.25% operation
S/N ratio	>60dB	86dB	65dB unwd	>75dB ops 5kHz
Reader Service Number	1285	1286	1288	1289

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Manufacturer	CRL Systems	D&R Electronics	Dorrough Electronics	EMT-Franz/Gotham
Model/Series	• FM-4/-3/-2/-1	TVS-3010 ¹ ✓ (-3001)	Compressor/limiter	•DAP-610 FM/TV/AM†
Design function				EMT 227 DX-limiter‡
AGC	SGC-800 -4/-3/-2	30B range	No	No
Compression	SEC-800 -4/-3	CBS Loudness control	Yes	Yes
Limiting peak	SMP-850 -4/-3/-1	Yes	Yes	Yes
Limiting assym	w/SGC-800	On -3001	No	For AM
Limiting pre emp	w/SMP-850	Variable on -3010	No	No
Expansion	Dynafex NR SGC-800	Stereo enhancement 3010	No	Yes
Gate threshold		....	No	No
Programmable	Adjustable	No	User	Adj pgm equalization
Meter type	LED ladder	LED ladder	LEDs	4 LED level displays
Meter functions	Left, right	Gain reduction	GR	GR, out, level, peak
Time constants	Adjustable	Program dependent	0.3/3/7ms a. var r	Per EPROM program
Input connection	AB, unbal	Balanced	Unbalanced	AB bridging
Input level	4dBm	....	-20, +20dBu	+20dBm
Output connection	AB, unbal	Balanced	Unbalanced	AB
Output level	4dBm	....	-20, +20dBu	+20dBm
AF response	± 10B 50Hz-15kHz	± 0.75dB 50Hz-15kHz	± 0.5dB, 20Hz-20kHz	n.a.
Distortion	<0.5%	....	<0.046%	0.3% below clipping
S/N ratio	>65dB	>70dB S+N/N	81dB	72dB at comp threshold
Reader Service Number	1290	1291	1292	1293
†TV sync filter.				1294

Manufacturer	EMT-Franz/Gotham Audio	Eventide	Furman Sound
Model/Series	EMT 266X transient	EMT 257/260/261‡	Omniressor‡
Design function			LC-6
Compression	No	261	Yes
Limiting peak	Yes	257, 260, 261	Yes
Limiting pre emp	Adaptive pre-emphasis	257, 260, 261	No
Expansion	No	261	Noise gate
Gate threshold	No	....	Yes
Programmable	No	User adjustable	User
Meter type	LEDs	Analog meter	Meter
Meter functions	Peak	Instantaneous gain	In, out, gain
Time constants	Program dependent	Program dependent	Variable
Input connection	Bal > 5kΩ	Bal > 10kΩ floating	AB, xfmr opt
Input level	-20.0; 0, +15	-8, +6dB	+20dBm max
Output connection	Bal <40Ω	Bal <40Ω floating	Unbal, xfmr opt
Output level	-20.0; 0, +15	+21dBm max	+18dBm max
AF response	± 0.3dB, 30Hz-15kHz	± 0.5dB, 40Hz-15kHz	-0.5dB 20Hz-15kHz
Distortion	<0.2%	s0.5%, 1kHz, automode	0.5% 1kHz
S/N ratio	92dB	r75dB	90dB
Reader Service Number	1295	1296	1297
			1298
			1299

Manufacturer	Harris Broadcast	Inovonics	ITAME SA
Model/Series	• Ulti-Mate 91‡	260 TV/FM (±255 FM)†	• 222††✓
Design function			Mod. 90A‡
AGC	110dB dynamic range	Yes	No
Compression	Yes	Yes	No
Limiting peak	Yes	Yes	Yes
Limiting assym	....	No	for AM
Limiting pre emp	....	Yes	Yes
Gate threshold	....	Yes	NRSC filter
Programmable	Adjustable	No	No
Meter type	LED	Digital/RS-232 opt	No
Meter functions	GR/limiting/overload	LEDs	LEDs
Time constants	Adjustable	GR	GR
Input connection	AB, 20kΩ	Program dependent	n.a.
Input level	-10, +15dB switched	AB bridging	AB bridging
Output connection	60Ω source AB	+10dBm max	+15dBm max
Output level	0, +20dBv	AB 600Ω	AB 600Ω
AF response	-0.25dB 20Hz-20kHz	+15dBm max	+15dBm max
Distortion	0.05% 1kHz 40dB GR	± 0.5dB, 10Hz-15kHz	± 1dB, 10Hz-9.7kHz
S/N ratio	....	<0.25%	1% w/limiting
Reader Service Number	1300	75dB	>75dB
		1301	1302
			1303
			1304

Manufacturer	Marti	Orban Associates
Model/Series	CLA-40A‡	Co-Operator (#424A)
Design function		
AGC	Yes	Yes
Compression	Yes	Loudness controller
Limiting peak	Yes	Yes
Limiting assym	Yes	Yes
Limiting pre emp	Yes	No
Expansion	No	Yes
Gate threshold	No	No (De-essing)
Programmable	Switch select	Yes
Meter type	Meter	User, program dep
Meter functions	Output, GR	5 meters
Time constants	0.8/2/5s release	GR, VU, voltage
Input connection	Balanced 600Ω	Program dependent
Input level	+20dBm max	AB bridging
Output connection	Balanced 600Ω	-30, +10dBm
Output level	+20dBm max	AB 370Ω
AF response	± 0.5dB, 50Hz-15kHz	> +20dBm
Distortion	<1% any compr lvl	± 0.25dB
		± 0.75dB 50Hz-15kHz
		<0.05%, 1kHz

Manufacturer Marli
Model/Series CLA-40A‡

S/N ratio 66dB @ +10dBm
Reader Service Number 1305

†Studio chassis and stereo generator are available

‡ACC-022 filter option.

§Day-night, transmitter 1-2 switch; 9100B contains NRSC pre-emp and 10kHz low-pass filtering per NTSC AM program.

Co-Operator (#424A) • 8182A Optimod-TV¹ • 8100A Optimod-FM² • 9100A Optimod-AM^{3,4}
 >85dB 75dB >75dB 75dB
 1306 1307 1308 1309

Manufacturer ProTech Audio
Model/Series 663CL (663CL1)‡

Design function
 AGC No
 Compression 20dB, 2:1 ratio
 Limiting peak No
 Limiting pre emp No
 Expansion No
 Programmable User
 Meter type Meter
 Meter functions Compression, output
 Time constants 0.05-0.5ms a/0.05-5s r
 Input connection Xfmr bal 600Ω(unbal)
 Input level +27dBm max
 Output connection Xfmr bal 600Ω(unbal)
 Output level +27dBm (+20dBm) max
 AF response ±0.5dB (0.25dB) 20-20k
 Distortion 0.4% 6dB compression
 S/N ratio >78dB
Reader Service Number 1310

CL-150B Fast RMS‡ 525 dual •528 voice‡ processor 544 quad gate
 No No No No
 Yes 1:1-20:1 Yes Yes
 Peak & RMS Peak & RMS Yes Yes
 De-ess De-ess No No
 No 1-4 Downward Downward
 No Threshold/comp Threshold/comp
 LED bargraph LED bargraph LED bargraph
 GR, de-ess, output GR, Exp, Output GR, de-ess, output
 Fixed & adjustable Pgm dependent Fixed Fixed, adjustable
 AB bridging Bal, >40kΩ AB bridging Bal >45Ω
 +18dBm max +18dBm max +18dBm max +18dBm max
 AB or UB AB xlmr opt AB xlmr opt Unbal 100Ω
 +24dBm max bal +18dBm max +24dBm max +19dBm max
 -1.0dB 20-20k -1.0dB 20-20k 19Hz-22kHz 20Hz-20kHz
 0.03-0.09% 0.025% 10dB GR 0.025% 10dB GR
 -127dBm EIN <-86dBm 20kHz bw
 1311 1312 1313 1314

Manufacturer Symetrix
Model/Series 501‡

Design function
 AGC No
 Compression Yes
 Limiting peak Peak, RMS 1:∞
 Limiting pre emp No
 Expansion
 Programmable Threshold/comp
 Meter type LED bargraph
 Meter functions GR, output
 Time constants Fixed, adjustable
 Input connection Bal or unbal
 Input level +18dBm max
 Output connection Bal or unbal
 Output level +26dBm max bal
 AF response -1.0dB 20-20k

1176LN (1178)‡ **UREI** 7110‡ **Commander‡** **Valley International** 440‡
 No No Yes Yes
 No 1.5-∞:1 Yes Yes
 Yes Yes No Yes
 No No No Yes
 No No Yes Yes
 Yser Compression ratio User, auto
 VU meter VU LED bargraph 3 LED bargraphs
 Output, GR Output, GR GR GR comp/lim, in, out
 20-800's, 0.05-1.1s Program dependent Variable Adjustable
 AB bridging AB bridging 20kΩ AB bridging +24dBm max
 +20dBm max +22dBu +24dBm +24dBm max
 Xfmr bal 600Ω Xfmr bal 150Ω AB 50Ω AB 40Ω
 +24dBm +22dBm into 600Ω +24dBm into 600Ω +24dBm max
 ±1dB, 20Hz-20kHz ±0.5dB, 20Hz-20kHz n.a. n.a.

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Manufacturer	Symetrix	UREI	Valley International
Model/Series	501‡	1176LN (1178)‡	7110‡
Distortion	<0.25%	+L0.5% 50-15k/1 1s	<0.25%
S/N ratio	-95dBu 20dB GR	81dB	<-83dB 20Hz-20kHz
Reader Service Number	1315	1316	1317

Manufacturer	Valley International	Wheatstone	Yamaha International
Model/Series	400 mic processor‡	DDP Processor‡	Dynamite
Design function	No	No	No
AGC	No	Multi-band	Yes
Compression	Yes	Yes	Yes
Limiting peak	No	Yes	Yes
Limiting pre emp	3-band EQ	Yes	No
Expansion	Yes	Multi-band	Yes
Gate threshold	Noise gate w/o comp	Yes	Noise gate mode
Programmable	User	Yes	User
Meter type	2 LED bargraphs	LED	LED bargraph
Meter functions	In. out. VU, GR	In. Out. GR, Comp	GR
Time constants	Fixed	Adjustable	Variable
Input connection	AB bridging	AB, bridging	AB
Input level	+26dBm max	+24dBm max	+24dBm max
Output connection	AB <50Ω	AB <50Ω	Unbal
Output level	+26dBm	+24dBm max	+21dBm 600Ω
AF response	.....	.....	.....
Distortion	<0.05%	<0.01%	<0.04% 1kHz quiescent
S/N ratio	-128dBm EIN	>93dB unwt'd	<-83dB 20Hz-20kHz
Reader Service Number	1320	1321	1322

Manufacturer	Valley International	Wheatstone	Yamaha International
Model/Series	400 mic processor‡	DDP Processor‡	Dynamite
Design function	No	No	No
AGC	No	Multi-band	Yes
Compression	Yes	Yes	Yes
Limiting peak	No	Yes	Yes
Limiting pre emp	3-band EQ	Yes	No
Expansion	Yes	Multi-band	Yes
Gate threshold	Noise gate w/o comp	Yes	Noise gate mode
Programmable	User	Yes	User
Meter type	2 LED bargraphs	LED	LED bargraph
Meter functions	In. out. VU, GR	In. Out. GR, Comp	GR
Time constants	Fixed	Adjustable	Variable
Input connection	AB bridging	AB, bridging	AB
Input level	+26dBm max	+24dBm max	+24dBm max
Output connection	AB <50Ω	AB <50Ω	Unbal
Output level	+26dBm	+24dBm max	+21dBm 600Ω
AF response	.....	.....	.....
Distortion	<0.05%	<0.01%	<0.04% 1kHz quiescent
S/N ratio	-128dBm EIN	>93dB unwt'd	<-83dB 20Hz-20kHz
Reader Service Number	1320	1321	1322

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
Design features	Delay	Effects processor
Talkshow delay	No	No
Plate/reverb	No	Yes
Reverb/echo	No	Yes
Pitch change	No	No

Manufacturer	AKG Acoustics	AMS/Advanced Music Systems
Model/Series	TDU-8000 + R800	MSP-126
Design features	Delay	Effects processor
Talkshow delay	No	No
Plate/reverb	No	Yes
Reverb/echo	No	Yes
Pitch change	No	No

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Manufacturer	AKG Acoustics			AMS/Advanced Music Systems		
Model/Series	TDU-8000 + R800	MSP-126	ADR68K†	DMX15-80S (SB dual)	TIMEFLEX¹	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

¹Performs 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 unwtld	>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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Circle (198) on Reply Card

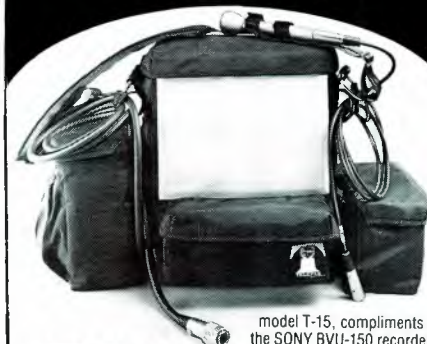
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Circle (138) on Reply Card

Manufacturer	Audio/Digital	BEL Electronics	EMT-Franz (Gotham Audio)		Eventide
Model/Series	TC-5	BD 320	EMT 445	EMT 251, 252/252S	BD 931 (BD 932)
Reverb/echo	Effective	Yes	No	0.4s-4.5s	No
Phasing/flanging	No	Yes	No	No	No
Programmable	User	Manual only	99 presets	User-alterable	No
Delay type	Digital	Digital	16-bit 48kHz	16-bit, 32.6kHz	Digital
Delay range	500ms, exp to > 1s	8s std, expandable	Dual 1ms-10.9s	0-440ms 4-taps	3.2, 6.4 s
Stereo implementation	No	Possible	w/2, 4, 6 outputs	Yes	(BD 932 only)
AF bandwidth	20kHz	15kHz for 8s	30Hz-20kHz	15kHz	16kHz
Input connection	AB, unbal	Bal bridging	AB	Bal floating 3kΩ	Bal bridging
Output connection	AB, unbal	Unbal	AB	Bal floating <60Ω	AB
Dynamic range	90dB a-wtd		88dB	75dB	90dB
Remote control			Yes	252S rmt ctl	No
Interfaces	None		Serial remote	No	No
Reader Service Number	1252	1253	1254	1255	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

¹Effects processor includes -200%, 100% time modification with -3,+1-octave pitch change on 2 channels.

²Provides 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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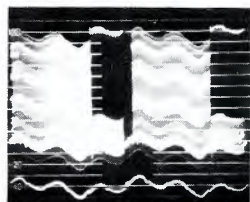
ELIMINATES HUM AND INTERFERENCE:

IN STUDIO

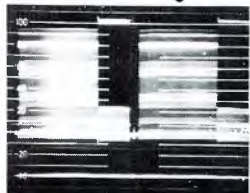
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- On long runs in Buildings
- Between Studio and Transmitter
- On Incoming Telco circuits
- On Outgoing Telco circuits

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Circle (140) on Reply Card

Circle (141) on Reply Card

Manufacturer JBL/UREI		Klark Teknik		Lexicon		
Model/Series	7922	DN 716	DN 780	#200† (PCM60)	2400† (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 Mfr.	MIDI, RS-232
Reader Service Number	1264	1265	1266	1267	1268	1269

†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 $\pm 10\%$ 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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- 200-3 Chroma equalizing video DA, up to ± 3 dB.
- 200-4 Delayed video DA, up to 750 nS.
- 200-5* VCA video DA, remote control system DA.
- 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.
- 273* Component video DA one gain control for 3 CH.
- 280* DC 12V powered audio DA, 8 outputs.
- 470* DC 12 V powered - V DA, A DA, 5x1 V xp A xp in one 1 RU package.

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Circle (143) on Reply Card

Manufacturer	JBL/UREI
Model/Series	7922
Talkshow delay	No
Plate/room	No
Reverb/echo	No
A/V synchronization	Yes
Pitch change	No
Phasing/flanging	No
Programmable	No
Delay type	Digital
Delay range	160ms, expandable
Stereo implementation	No
AF bandwidth	20kHz
Input connection	Balanced
Output connection	Balanced
Dynamic range	100dB
Remote control	Yes
Interfaces	TEK 110-S video synchronizer
Reader Service Number	1276

Manufacturer	Klark Teknik
Model	DN 716
No	Yes
Yes	No
Early reflection	No
No	Yes
....	No
Yes	No
Factory, user	Yes
Digital/LSI	Digital, analog
99.9ms + 9.9s	2.66s adjustable
Dual channel	Yes
20Hz-12kHz	20Hz-20kHz
Bal 10kΩ + 4dBm	Bal > 10kΩ + 4dBu
Bal 600Ω + 4dBm	Bal 600Ω + 4dBm
> 90dB typical	≥ 90dB
RC7 controller	Yes
MIDI bus	RS-232, serial I/O
1277	1278

Manufacturer	Lexicon
Model	#200† (PCM60)
No	Yes
Yes	Early reflection
No	No
4 programs	2 programs
128 programs	Digital
Digital	....
....	Yes
20Hz-12kHz	Unbal 10kΩ
Unbal 10kΩ	Unbal 600Ω
Unbal 600Ω	> 90dB typical
> 90dB typical	MIDI
MIDI	MIDI bus
1279	

Audio Telephone Bandwidth Extenders

This equipment uses frequency offset or digital techniques to expand the effective audio spectrum bandwidth of standard telephone lines for use in remote broadcasting.

Manufacturer	Comrex Corporation
Model	LX-T/LX-R
System type	Single line
Frequency offset	250Hz
AF response	± 2dB 50-3k dial line
Translation error	± 0.02Hz
Transmitter	LX-T w/coupler
Source inputs	-20, +8dBm ext adj 600Ω
Output connection	Xfmr, telco coupler
Output level	-9dBm
Packaging	Desk top (opt rack)
Powering	120Vac (220Vac opt)
Receiver	LX-R w/coupler
Input connection	Xfmr bal
Input level	-40, +8dBm 600Ω bal
AF output connection	Balanced

Manufacturer	Comrex Corporation
Model	PLXmicro/TH-X
1-line, full duplex	250Hz
± 2dB 50-3k dial line	± 0.02Hz
PLXμ/monitor-decoder	Mic bal/tape unbal
Mic bal/tape unbal	Xfmr, telco coupler
Xfmr, telco coupler	-9dBm
Portable	9Vdc, opt AC adapter
TH-X encoder/decoder†	TH-X encoder/decoder†
Telco coupler	-40, +8dBm
-40, +8dBm	Balanced

Manufacturer	Comrex Corporation
Model	PTLX/RTLX²
Dual line	L-1 250Hz; L-2 2kHz
± 2dB 50-5k dial line	± 0.02Hz
PTLX	+4/+8dBm ext switchable
Xfmr, telco coupler	-9, +8dBm
Portable	120/240Vac
RTLX	Unbalanced
Unbalanced	-40, +8dBm ext adj.
Unbalanced	Unbalanced

Manufacturer	Gentner Electronics
Model	EFT-3000 digital
3-line³	Algorithmic
50-7.5k	....
EFT-3000 SEND	Mic/line TB 1kΩ/>50kΩ
600Ω bal Telco	per Telco spec
110/220Vac	EFT-3000 RECEIVE
600Ω bal Telco	per Telco spec
AB 600Ω	Active bal

Manufacturer	Gentner Electronics
Model	EFT-1000A (EFT-100)
Two or (one) line	250Hz
± 0.5dB 50-3.5k	0.0006Hz
EFT-1000A (-100)	Mic, line
Active bal	-13dBm
Portable, rack	110-220Vac, 9Vdc
EFT-1000A (EFT-100)	Balanced
-25dBm	Active bal



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Circle (145) on Reply Card

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, desktop unit
Reader Service Number	601	602	603	604	605

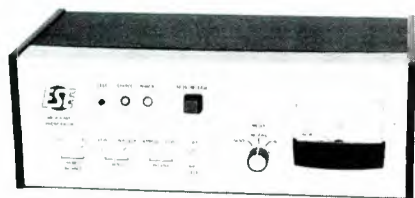
¹Wideband hybrid with manual or auto answer.
²Integral Telco interface; multiband companding audio control.
³1- and 2-line operation are possible with this unit.

Wireless Microphone Systems

Low power FM mic/transmitter, receiver systems serve for in-studio, on-set use. Range is limited to approximately 1,100 feet, dependent upon the surroundings. If marked with a dagger (†), the mic unit includes an auxiliary line input. For transmitter units requiring 9Vdc power, the MN1604 alkaline type battery or an equivalent is suitable. FM carrier stability is rated typically $\leq 0.005\%$. In Audio Response, Hz is understood.

Manufacturer	AKG Acoustics	Beyer Dynamic		Cetec Vega	
Model Series	System 185	System TS185	System 185	77Dy nex 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

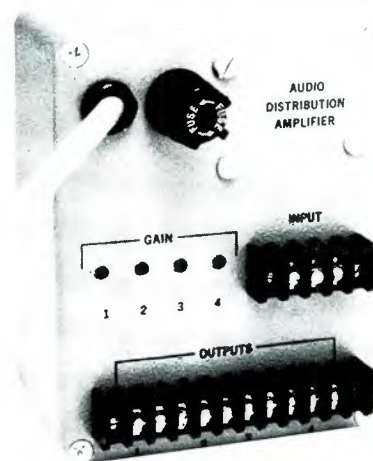
AUDIO PRODUCTS



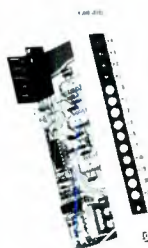
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Manufacturer	AKG Acoustics	Beyer Dynamic	Cetec Vega
Model Series	System 185	System TS185	System 185
Distortion, system	<0.2%	<2%	<0.5%
Modulation control	Switchable limiter	Limiting	Limiting/compression
Companding function	Low Noise compander	Yes	Dynex II
Transmitter model	T185.10W (T185.10N)	TS185US	Model 77 Dynex II
Transmitter packaging	Hand-held	Pocket transmitter	Bodypack
RF output level	≈25mW (35mW)	50mW (3mW radiated)	50mW
Carrier deviation	±60Hz (±12kHz)	±12kHz nom, ±13kHz peak	±15kHz
Microphone type	Dynamic, condenser	Electret, dynamic	Electret, dynamic
Power requirement	9Vdc	9Vdc	9Vdc
Operating weight	13.6 oz w/mic, bat	220gm	360gm
Receiver model	SR185.10 [SR185.11]	NE 185 US	R-33 ProPlus
Sensitivity	1μV for >35dB (55dB)	1μV >85dB SNR companded	<2.5μV, 50dB S/N
Spurious rejection	>110dB	>110dB	>75dB
Output connection	Bal 600Ω, unbal	Bal, XLR	Bal, 600Ω, 150Ω
Audio output level	+6dBm or variable	-20dBm, +6dBm	Line, mic selectable
Power requirement	110-220Vac, 15-27Vdc ext	110Vac, 15-27Vdc ext	9Vdc, 10-20Vdc ext
Metering	AF, RF, battery levels	RF/transmit level, +Vdc	RF, AF, battery
Panel indicators	LED ladder displays	LED ladder, points	LED display
Antenna types	50Ω SO-239 for whips	TTA 85MA whip	Various
Diversity receiving	[SR185.11]	Available	No
Multichannel system	No	1 or 3-channel	No
Reader Service Number	1193	1194	1195

*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)†
RF frequency	150-216MHz	150-216MHz	170-216MHz
Audio response	±1.5dB, 100-13k	±1.5dB 90-15k	±3dB (-2dB) 40-15k
S/N ratio	103dB typical	>100dB	75dB (95dB) unwt'd
Distortion, system	<0.4%	0.15% THD/IMD typical	<1% (0.5%)
Modulation control	Limiting, compression	Limiting, compression	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
Transmitter packaging	Bodypack (handheld)	Handheld	Pocket pack
RF output level	50mW (40mW)	50mW	50mW
Carrier deviation	±15kHz	±15kHz	±30kHz, ±15kHz in US
Microphone type	Electret	Dynamic, electret, ribbon	Dynamic, electret
Power requirement	9Vdc	9Vdc	9Vdc
Operating weight	6oz (10oz)	9-13.5oz per model	4 oz

Model Series	E COM Highband	E COM Highband
RF frequency	150-216MHz	150-216MHz
Audio response	±2dB 200-16k	±2dB 200-16k
S/N ratio	103dB typical	103dB typical
Distortion, system	<0.4%	<0.4%
Modulation control	Limiting, compression	Limiting, compression
Companding function	Dynex II	Dynex II
Transmitter model	T-37 (T-36/-39)	T-37 (T-36/-39)
Transmitter packaging	Bodypack (handheld)	Bodypack (handheld)
RF output level	50mW (40mW)	50mW (40mW)
Carrier deviation	±15kHz	±15kHz
Microphone type	Electret	Electret
Power requirement	9Vdc	9Vdc
Operating weight	6oz (10oz)	6oz (10oz)

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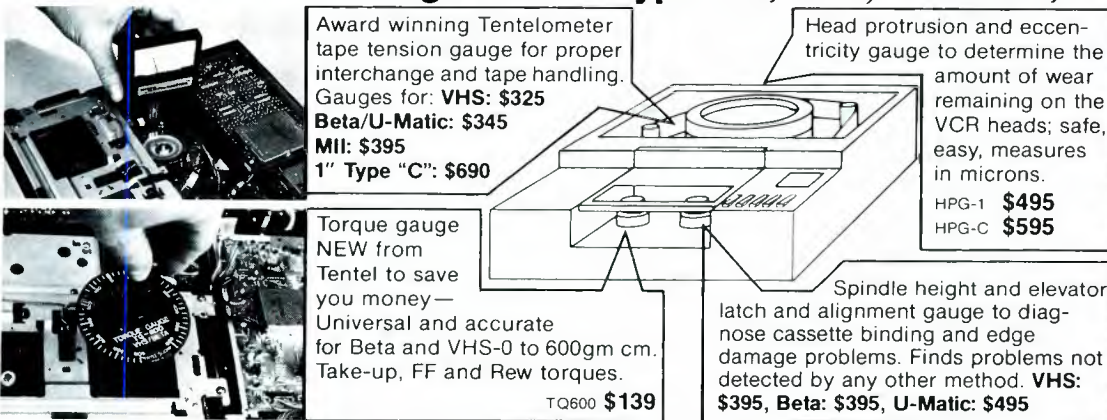
Circle (147) on Reply Card

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-4¼/2/42W	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 selectable	100mV (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" 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		Electrosonics	
Model Series	# 42/420 (25/25RA)	# 82/820 (58/580)	# 87/870 (85/850)	Freedomike M170/R170†
RF frequency	150-216MHz	150-216MHz	150-216MHz	150-216MHz
Audio response	±1dB 100-12k	±3dB 50-15k	±3dB 50-15k	±1dB 50-18k
S/N ratio	>60dB A-wtd	115dB dynamic range	115dB dynamic range	106dB A-wtd
Distortion, system	1%	0.3%	0.3%	<1% (0.7% typical)
Modulation control	Compression			Compression
Companding function	No	Yes	Yes	Yes
Transmitter model	TX425/TV (WM250/TV)	TX822/TV (TX580/TV)	TX872/TV (TX852/TV)	M170
Transmitter packaging	Pocket (hand-held)	Pocket (hand-held)	Hand-held	Beltpack
RF output level	50mW	50mW	50mW	50mW
Carrier deviation	±15kHz	±15kHz	±15kHz	±15kHz
Microphone type	Electret or (dynamic)	Electret or (dynamic)	Electret [or dynamic]	Any type
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc alkaline
Operating weight	4.5 oz (16 oz)	4.5 oz (15 oz)	15 oz	4 oz
Receiver model	WM125 (WM300A)	RS722/752	RX722 (RX752)	R170 (CR170)
Sensitivity	1µV 20[30]dB quieting	1µV 30dB quieting	1µV 30dB quieting	1µV 20dB SINAD
Spurious rejection	>60dB	>60dB	>60dB (>65dB)	>100dB
Output connection	Act [xlmr] bal	Xfmr bal	Xfmr bal	XLR & headphone
Audio output level	0dBm nominal	+18dBm & mic level	+18dBm (10dBm) & mic	100mV, 700mV, 1V
Power requirement	10-30Vdc, 115Vac	12-30Vdc, 110Vac	12-30Vdc, 110Vac	110Vac, 12Vdc, 9Vdc
Metering	RF, AF, +V on WM125A	RF, AF, battery	RF, AF, battery	RF, AF, battery
Panel indicators	+V, carrier	+Vdc, carrier	+Vdc, carrier	LEDs & VU meter
Antenna types	Whip furnished	Whip furnished	Whip furnished	PL259 connector
Diversity receiving	Option	Option	Option	No
Multichannel system	1 per receiver	1 per receiver	1 per receiver	No
Reader Service Number	1203	1204	1205	1206

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Manufacturer	Electrosonics
Model Series	VHF Pro M185/CR185
RF frequency	150-216MHz
Audio response	±1dB 50-18k
S/N ratio	102dB A-wtd
Distortion, system	<1% (0.7% typical)
Modulation control	Compression
Companding function	2:1 comp/exp
Transmitter model	M185
Transmitter packaging	Bodypack
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Any type
Power requirement	9Vdc alkaline
Operating weight	5.3oz
Receiver model	CR185
Sensitivity	0.6µV 20dB quieting
Spurious rejection	>100dB
Output connection	XLR & headphone
Audio output level	Line
Power requirement	110Vac 12Vdc (9Vdc)
Metering	RF, AF, battery
Panel indicators	LEDs
Antenna types	BNC connection
Diversity receiving	No
Multichannel system	No
Reader Service Number	1208

¹Without CNS Complementary Noise Suppression. Related units TX501/502 transmitters and MR510 receiver do offer CNS

	Micron Audio
Model Series	TX-500†/MDR-530
RF frequency	150-216MHz
Audio response	±2dB 50-15k
S/N ratio	>115dB strong signal
Distortion, system	<0.3%
Modulation control	Yes
Companding function	CNS noise reduction
Transmitter model	TX501 (TX503)
Transmitter packaging	Pocket (handheld)
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Various (AKG elements)
Power requirement	9Vdc (2 batteries)
Operating weight	8.5oz (10.5oz)
Receiver model	MDR-530 (MDR-540)
Sensitivity	1.5µV for 75dB S/N
Spurious rejection	>80dB adj chan rej
Output connection	XLR mic, line
Audio output level	-53dBV, 0dBm
Power requirement	110-240Vac, 12-18Vdc
Metering	Vdc, RF, AF
Panel indicators	Led ladder
Antenna types	Whip, 3-element Yagi
Diversity receiving	Yes
Multichannel system	No (MDR-540)
Reader Service Number	1209

Related units TX501/502 transmitters and MR510 receiver do offer CNS

	Nady Systems
Model Series	101 VHF (201 VHF)
RF frequency	170-216MHz
Audio response	±3dB, 25-20k
S/N ratio	.....
Distortion, system	<0.3%
Modulation control	None
Companding function	Yes
Transmitter model	101/201HT, GT, LT
Transmitter packaging	Handheld, Instr, Body
RF output level	50mV
Carrier deviation	±15kHz
Microphone type	Attached electret
Power requirement	9Vdc
Operating weight	8.5oz, 2.5oz, 2.5oz
Receiver model	101 VHF (201 VHF)
Sensitivity	1.5µV, 20dB quieting
Spurious rejection	-80dB
Output connection	Bal, unbal/XLR, phone
Audio output level	Switchable mic/line
Power requirement	12Vdc 150ma
Metering	Power, A-RF (B-RF)
Panel indicators	LEDs
Antenna types	Whip (2 for 201 VHF)
Diversity receiving	201 VHF only
Multichannel system	Single channel
Reader Service Number	1212

Manufacturer	Nady Systems
Model Series	1200 VHF systems
RF frequency	151-216MHz
Audio response	±3dB, 25-20k
S/N ratio	<0.3%
Distortion, system	None
Modulation control	Yes
Companding function	Yes
Transmitter model	Various
Transmitter packaging	Pocket, handheld, instr
RF output level	50mV
Carrier deviation	±15kHz
Microphone type	Electret
Power requirement	9Vdc

	RF Technology
Model Series	RM-102 (RM-100)
RF frequency	947-952MHz ¹
Audio response	±1dB 50-10k
S/N ratio	60dB unwttd
Distortion, system	1% w/AGC
Modulation control	Soft limiting
Companding function	No
Standard Unit	SK2012-6 (SK2012-90)
Transmitter packaging	Pocket pack
RF output level	50mW
Carrier deviation	±50kHz
Microphone type	Electret, lavalier
Power requirement	3-1.5V alk. Mn cells

Sennheiser Electronics
SK2012/EM1036²

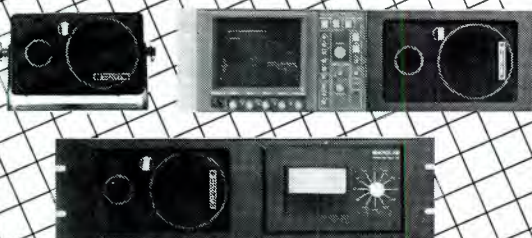
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- Optional RS-232 Interface
- Optional relay follow switch outputs
- Plug-in screw-clamp terminals

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Circle (152) on Reply Card

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	Software	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

¹Available for Canadian use in 902-928MHz spectra.
²Also 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 [J58]	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	¾-λ whips (¼-λ)	¾-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

¹Systems available in 470-960MHz spectra.
²WL83 mini lav, WL84 supercardioid lav, WM98 mini cardioid are applicable.

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Manufacturer Swintek Enterprises Model Series Mark 2L-RFSD/50A†

RF frequency	150-470MHz
Audio response	±1dB 20-12k
S/N ratio	96dB
Distortion, system	1%
Modulation control	Compression
Companding function	Yes
Transmitter model	Mark 50A-dbs
Transmitter packaging	Body, pocket pack
RF output level	50mW
Carrier deviation	±10kHz
Microphone type	SM87, ECM-50
Power requirement	9Vdc
Operating weight	6 oz
Receiver model	Mark 2L-RFSD
Sensitivity	0.2µV, 20dB quieting
Spurious rejection	<-80dB
Output connection	Balanced
Audio output level	-40.0dBm
Power requirement	12Vdc, 115Vac
Metering	RF, AF, battery
Panel indicators	Carrier presence
Antenna types	Whip furnished
Diversity receiving	Yes
Multichannel system	2 per receiver
Reader Service Number	1223

HT-400/FMR-4

165-216MHz
50-15k
102dB w/companding
<0.5%
Compression
Yes
HT-400 series
Handheld
45mW
±12kHz
Dynamic, condenser
9Vdc or 8.4Vdc Nicad
14.8-16.4oz
FMR-4
<0.5µV for 12dB SINAD
<-70dB
Bal XLR 8/600/10kΩ
Mic, line selectable
110-220Vac
RF, AF, Freq
LED ladder/7-segment
¼-λ, ¾-λ whips
Pos-i-Phase
To 4 channels
1224

Telex Communications

WHM/FMR50

150-186MHz
±1dB 50-15k
98dB A-wtd
<0.5%
Compressor
Yes
WHM410/WHM500
Handheld
15mW max
±12kHz
Dynamic/condenser
9Vdc
16oz/14oz
FMR-50
<0.5µV for 12dB SINAD
<-75dB
XLR bal 200Ω
Mic level
110-220Vac, 13.6Vdc ext
RF presence, AF
LED ladder, pcint
Single whip
No
No
1225

WT-400/ENG-4

165-216MHz
±1dB 100-15k
104dB companded
<1%
Compression
Yes
WT-400
Pocket/body pack
50mW max, 45mW typical
±12kHz
Dynamic, electret
9Vdc
5.5oz
ENG-4
0.5µV for 12dB SINAD
<-70dB
XLR bal 600Ω
Mic, line selectable
4 AA alk/nicad, 12-24Vdc
RF, AF, battery
Meter
Whip
No
4-channel
1226

WT-50/FMR-2

150-186MHz
±2dB 50-15k
>90dB ultimate
<0.3%
Compression
Yes
WT-50 (WT-50G instrument)
Pocket/body pack
50mW
±12kHz
Various
8.4V Nicad or 9Vdc
5.4oz
FMR-2 (FMR-2G)
<0.5µV, 12dB SINAD
<-70dB
XLR bal 8/600/10kΩ
Mic, line selectable
110Vac, 13.6Vdc ext
AF, RF
2 LED ladder displays
Whip
Pos-i-Phase
No
1227

Shotgun Microphones

Manufacturer

Model No. C 568EB

Frequency response	20-20k
Polar pattern	Hypercardioid
Output impedance	600Ω
Output level	11mV/Pa
Maximum SPL	128dB 0.5% THD
Output Noise	18dB-A per DIN
S/N ratio	.....
Power required	B18 18Vdc supply
Filters	Bass cut
Weight	6.2oz
Accessories	Stand adapter, wind screen, options.
Reader Service Number	1228

†Based on C450B studio mic preamp with CK8X; CK8/CK9 operate with C451 preamp.
‡Where 0dB = 1mW/10dynes/cm².

AKG Acoustics

D-900E

60-12k
Hypercardioid
200Ω
-49.5dBm
50Pa (128dB SPL)
-125dBm
.....
Dynamic
Bass rolloff
18oz
Stand adapter, case, other options.
1229

CK8/CK8X/CK9 capsules

30-20k (30-18k)
Hypercardioid
120Ω†
10mV/Pa-15mV/Pa
137dB for 0.5% THD
15dB-A DIN equiv
79dB
B18 18Vdc
Bass cut
4.2oz + preamp
Preamp, stand adapter capsule cord, opts
1230

Audio-Technica

AT4071 (AT4073)

30-20k
Lobar (narrow dir)
250Ω bal, no xlmr
62mV/Pa (56mV/Pa)
127dB (129dB)
12dB (14dB) typical
.....
12-48Vdc phantom
Hi-pass/Lo-cut
5.8oz (4.2oz)
Clamp, carrying case
1231

Beyer Dynamic

MC736 (MC737 long)

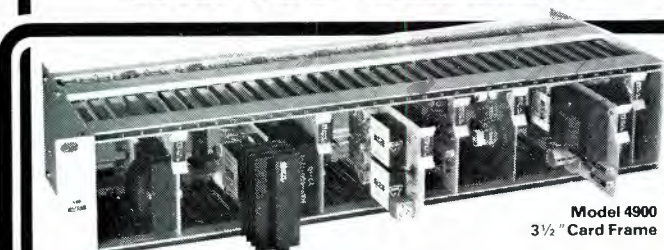
40-20k
Cardioid/lobe
150Ω
25mV/Pa
122dB (128dB preattn)
4.5Vp
74dB
12-48Vdc
.....
195g (250g)
Case, windscreens
Handles, clamp, supply
1232

Electro-Voice

Model DL42

50-12k
Hypercard, line
150Ω
-50dB(1)
.....
-125dBm hum pickup
.....
Dynamic, not required
13 oz
Coil cord, handle
Windscreens, case
1233

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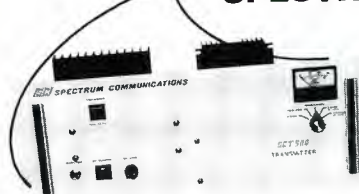


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Circle (154) on Reply Card

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- 27 Hz Decoder Available



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Circle (155) on Reply Card

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 600Ω 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
Pcwr 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	Windscreen, case	MTX 190i matrix amp	Windscreen, mounting.	Windscreen, mounting,	Windscreen, shock-mount,
	Shock mount, attenuator	Mounting devices	.....	Power supply	power unit.	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 $\pm 0.00025\%$. 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	15 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

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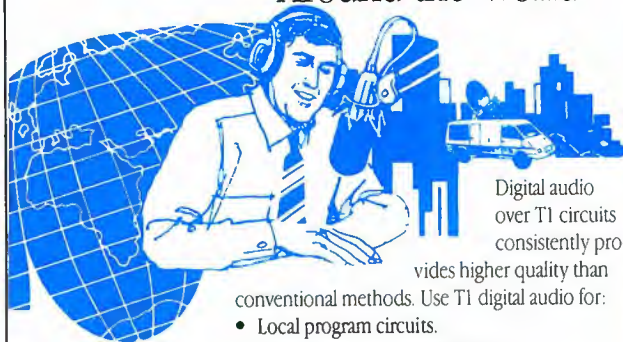
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Circle (157) on Reply Card

Manufacturer	Marti Electronics	Moseley Associates	TFT
Model/Serial	RPT-15/CR-10	RPT-2/AR-10	RPL-4000
Power requirements	120Vac, 13Vdc	120Vac, 13Vdc	13.6Vdc, 120Vac
Metering functions	AF, RF, dc, decode	AF, RF, dc, decode	AF, RF, V, LO
Auto relay decoder	27Hz	27Hz	Yes
Reader Service Number	1486	1487	1489

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.

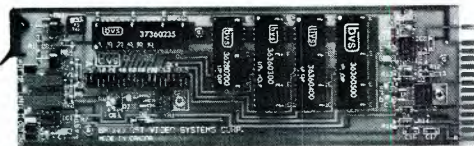
Manufacturer	Amber Electro Design	ASACA/ShibaSoku	Audio Precision
Model Number	3501 (3501a)†	•5500 (5400)†✓	•5300††✓
Frequency range	10-100k, 4-range	10-100k	8.5->500k
Input level	30mV-100V, 100kΩ (300Va)	30mV-100V, 100kΩ	-100, +40dBV
Input connection	Bal/float opt (std)	Active bal	Bal, unbal
Fundamental reject	>100dB 1kHz	>100dB @ 1kHz	Yes
Auto level set	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes
Minimum THD figure	0.0008% or -102dB	0.001%	-100dB/0.001% THD + N
THD accuracy	±1dB 20-20k	±1dB	±2dB 10-100k
IMD measurement	SMPTE/DIN/CCIF	SMPTE/DIN/CCIF	SMPTE, DIN, CCIF
IMD accuracy	±1dB SMPTE/DIN	±1dB	....
Minimum IMD	0.001%	0.001%	<0.003% 3k-10k
ac Volts accuracy	-128, +42dBm, ±0.5dB	-100, +40dBm, ±1% fs	-100, +40dBV ±0.1dB
Audio noise range	-120dBm	-120dBm	to <2.5μV
Signal generator range	10-100k @ +28dBm	10-100k +30dBm 600Ω	Use 5100 10-100k
Generator stability	±1%	±0.5%	....
Generator output	Xfmr, bal/unbal	Xfmr, bal, unbal	Bal, unbal
Frequency counter	Option 358	5-digit	with 5200
Meters/displays	True RMS movement	LED/7-seg display	7-seg displays
Digital design	No	Yes	Yes
Automated measurements	....	GPIB, RS-232	IEEE-488 interface
Reader Service Number	668	669	670

†Software/hardware package for use with IBM PC.

Manufacturer	Boonton Electronics	Hewlett Packard	Panasonic Factory Automation
Model Number	•1120 analyzer†	1130 analyzer	8903B/8903E†
Frequency range	10-140k	10-140k	20-100k
Input level	3mV-300V, 100kΩ	3mV-300V, 100kΩ	425V peak, 100kΩ
Input connection	Diff. bal or unbal	Diff. bal or unbal	Balanced, BNC
Fundamental reject	Resid THD + noise-10dB	Resid THD + noise-10dB	>100dB
Auto level set	Yes	Yes w/autoranging	Yes

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Circle (197) on Reply Card

Boonton Electronics	
Manufacturer	Model Number
•1120 analyzer†	•1130 analyzer
Auto null set	Yes
Minimum THD figure	0.003%
THD accuracy	±1dB, 20-20k
IMD measurement	No IMD
IMD accuracy	.....
Minimum IMD	.....
ac Volts accuracy	3mV-300V ac/dc
Audio noise range	120dB S/N & SINAD
Signal generator range	10-140k
Generator stability	10ppm ± 1 count
Generator output	Bal or unbal
Frequency counter	5-200k
Meters/displays	LED 7-seg displays
Digital design	Yes
Automated measurements	IEEE-488
Reader Service Number	673

Polomac Instruments	
Manufacturer	Model Number
•AA-51 Analyzer†✓	
Frequency range	20-20k
Input level	2mV-15.5V, 300kΩ
Input connection	Balanced
Fundamental reject	>80dB overall
Auto level set	Autorangeing
Auto null set	Yes
Minimum THD figure	0.1% fs
THD accuracy	±5% fs
IMD measurement	SMPTE
IMD accuracy	±5% fs
Minimum IMD	0.1%
ac Volts accuracy	1mV-100Vrms
Audio noise range	(Signal+noise)/noise
Signal generator range	20-20k
Generator stability	±1%
Generator output	Xfmrless bal, unbal
Frequency counter	No
Meters/displays	VU movement
Digital design	No
Automated measurements	No
Reader Service Number	678

†System designed for use in testing telco & broadcasting program lines.

Schmid Telecomm. Zurich	
Manufacturer	Model Number
•SIAT†	
Frequency range	40-15k/400Hz THD
Input level	-70, +21dBm 600Ω

RE Instruments	
Manufacturer	Model Number
•RE201 dual channel✓	
Frequency range	20-25k
Input level	2mV-15.5V, 300kΩ
Input connection	Balanced
Fundamental reject	105dB, 20Hz-12.5kHz
Auto level set	Yes
Auto null set	Yes
Minimum THD figure	0.001%
THD accuracy	±2.5dB, THD-70dB
IMD measurement	SMPTE, DIN 45403
IMD accuracy	±2.5dB, IMD-50dB
Minimum IMD	<-67dB
ac Volts accuracy	-51.8, +25.7dBu ± 3%
Audio noise range	<-93dB 40Hz-25kHz
Signal generator range	1-25k, 0.8m-8.87V
Generator stability	±20ppm
Generator output	Active, floating bal
Frequency counter	4-25k by 0.1Hz
Meters/displays	CRT alphanumerics
Digital design	Programmable 100 setups
Automated measurements	GPIB, IEEE-488
Reader Service Number	679

Hewlett Packard	
Manufacturer	Model Number
8903B/8903E†	
Auto null set	Yes
Minimum THD figure	<-90dB, 0.003%
THD accuracy	±1dB, 20-20k
IMD measurement	No
IMD accuracy	.....
Minimum IMD	.....
ac Volts accuracy	0.3mV-300V ± 2%
Audio noise range	-85dB (17μV) 80kHz BW
Signal generator range	20-100k for 8903B
Generator stability	0.3% of setting
Generator output	0.6mV-6V open circuit
Frequency counter	±0.004% + 1 digit
Meters/displays	Digital readout
Digital design	Yes
Automated measurements	HP-IB
Reader Service Number	675

Panasonic Factory Automation	
Manufacturer	Model Number
VP-7721P	VP-7722P†
Auto null set	Yes
Minimum THD figure	0.003% fs (10 ranges
THD accuracy	cover to 100%)
IMD measurement	< ± 2%
IMD accuracy	SMPTE
Minimum IMD	±1dB
ac Volts accuracy	0.01%
Audio noise range	0.316mV-100V ± 2%
Signal generator range	0-100dB SNR
Generator stability	10-110k
Generator output	± 3% overall
Frequency counter	BNC floating
Meters/displays	Yes
Digital design	7-segment LED displays
Automated measurements	Yes
Reader Service Number	GPIB
	677

Rohde & Schwarz	
Manufacturer	Model Number
UPA analyzer†✓	
Frequency range	10-100k(300kHz harm)
Input level	12mV to 400Hz, 1.2mV
Input connection	Bal (600Ω), unbal (10kΩ)
Fundamental reject	.....
Auto level set	Yes
Auto null set	Yes
Minimum THD figure	-90dB to 0dB range
THD accuracy	± 1dB to 100kHz
IMD measurement	No
IMD accuracy	.....
Minimum IMD	.....
ac Volts accuracy	0-120dB SNR
Audio noise range	UPA-B6 opt (10-100k)
Signal generator range	± 0.01%
Generator stability	Bal, unbal
Generator output	8-250k
Frequency counter	LCD displays
Meters/displays	Yes
Digital design	IEEE-488/IEC 625-1
Automated measurements	680

Schmid Telecomm. Zurich	
Manufacturer	Model Number
•SUN-2 System†	
Frequency range	10-100k
Input level	-84, +32dBm, 1MΩ
Input connection	Xfmr bal or unbal
Fundamental reject	>65dB
Auto level set	Auto ranging
Auto null set	No
Minimum THD figure	0.06%
THD accuracy	± 0.1dB
IMD measurement	DIN
IMD accuracy	.....
Minimum IMD	.....
ac Volts accuracy	Yes
Audio noise range	Yes
Signal generator range	SUN-2/S 10-100k
Generator stability	.....
Generator output	Telephone jacks
Frequency counter	No
Meters/displays	LED displays
Digital design	μP control
Automated measurements	No
Reader Service Number	681

Sound Technology	
Manufacturer	Model Number
•1710A	•1510A (1530A BTSC)†
Frequency range	20-40k
Input level	0.1mV-40V (245μ-42V)

Technical Projects	
Manufacturer	Model Number
•MJS401D/MD404B†✓	
Frequency range	10-300k
Input level	100V, 100kΩ

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Manufacturer	Schmid Telecomm. Zurich	Sound Technology	Technical Projects
Model Number	SIAT ¹	+1710A	+1510A (1530A BTSC)†
Input connection	.....	Active bal	Active bal
Fundamental reject	.....	> 100dB 1kHz	100dB, 1kHz
Auto level set	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes
Minimum THD figure	.....	0.002%	0.01%
THD accuracy	.....	± 10%	± 5% of full scale
IMD measurement	SMPTE	SMPTE, DIN	SMPTE 4:1
IMD accuracy	.....	± 4%	 (± 5%)
Minimum IMD	.....	0.0025%	 (0.01%)
ac Volts accuracy-70, +21dBm	± 0.2dBm ± 2%	Yes	± 0.15dBm, ± 0.05% fs
Audio noise range	W/stereo crosstalk	-103dBm	-79dBm
Signal generator range	40-15k programmable	10-110k + 26dBm	20-40k, 30dBm (opt)
Generator stability	.....	± 2%	 (Xtal cti)
Generator output	.....	Active bal	Act bal, floating
Frequency counter	.....	No	No
Meters/displays	LED displays, printer	RMS, AVG, PEAK scales	Bargraph, CRT
Digital design	Yes	No	μP-based
Automated measurements	Remote via RS-232	.....	GPB-488
Reader Service Number	683	684	685
			686
			687

¹Short Interval Audio Test system performs battery of tests on program lines between program segments.

Manufacturer	Tektronix	Wandel & Goltermann
Model Number	AA501	+NFA-1†✓
Frequency range	10-100k	15-200k (receiver)
Input level	60mV-200V, 100kΩ	140nV-30V, 600Ω, 100kΩ
Input connection	Balanced	Bal, unbal, BNC/XLR/CF
Fundamental reject	10dB ¹	90dB at 1kHz
Auto level set	Yes	Auto range -135dB, +30dB
Auto null set	Yes	Auto tune to harmonics
Minimum THD figure	0.0025%	0.003% typical
THD accuracy	± 10%	± 0.003% absolute
IMD measurement	Opt: SMPTE/DIN/CCIF	By any procedure
IMD accuracy	± 10%	± 0.01%
Minimum IMD	0.0018%	0.01%
ac Volts accuracy	-108, +48dBm ± 2% fs	-135dB, +30dB
Audio noise range	-108dBm	-100dBm A-wtd < -90 CCIF
Signal generator range	10-100k, 28dBm	10-50k, full level
Generator stability	± 0.01%	± 30ppm worst case
Generator output	Balanced	Bal, unbal, BNC/XLR/CF
Frequency counter	No	Yes w/SNR-10dB
Meters/displays	LED displays	CRT graph/numeric
Digital design	Yes	Yes
Automated measurements	No	GPB/IEEE, IEC
Reader Service Number	688	690

¹Value is below specified residual THD & noise or actual THD, whichever is greater.

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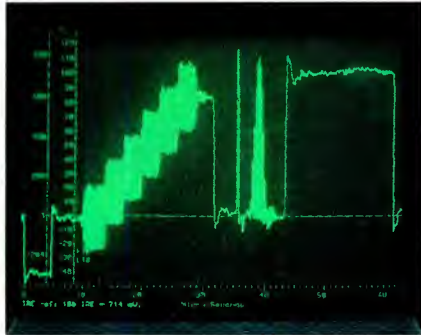
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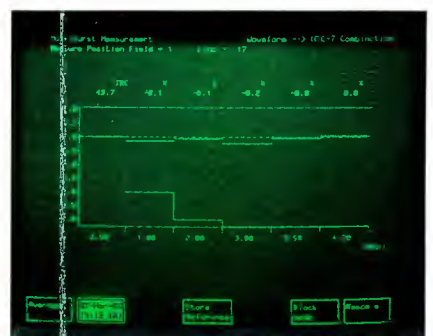
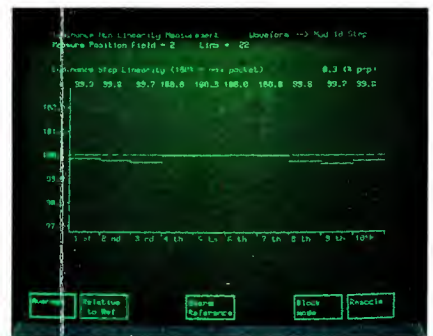
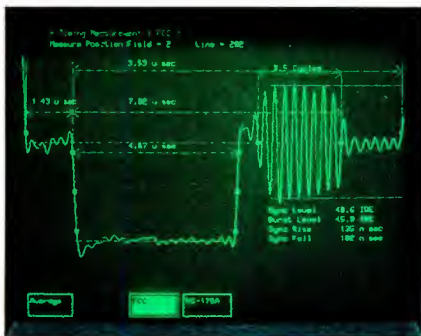
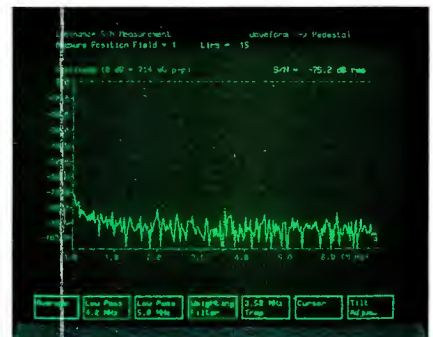
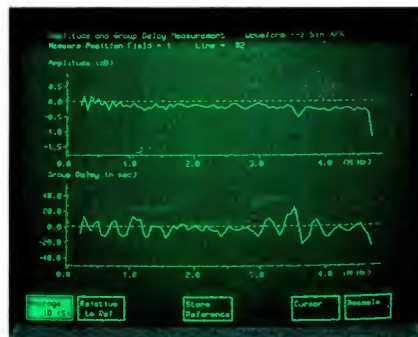
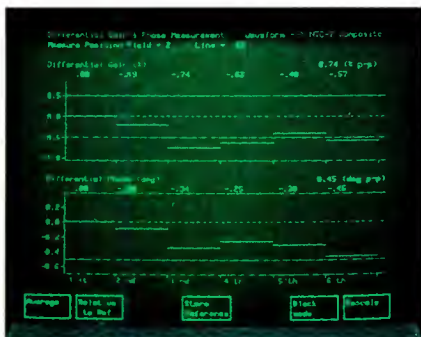
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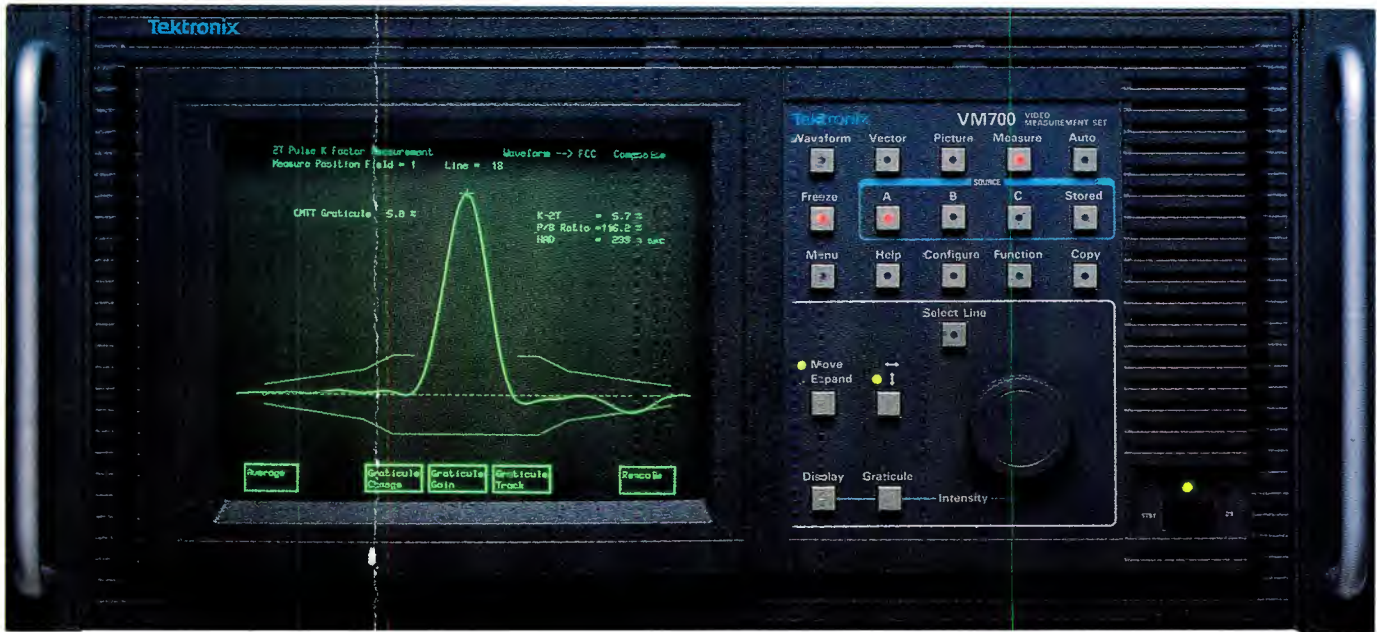
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RF/Test and measurement specs

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)†	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	1½" 50Ω	1½"	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 unwt'd	<-60dB unwt'd
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	28.6kW, 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

120kW 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	3½" EIA female	1½"	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-7.5kHz	<3%, 90% mod
AM noise figure	<-60dB unwt'd	<-60dB unwt'd	<-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"	20m ²	42m ²	35m ²
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††	T-10-A1†	725 (715C)†	710C ³
Service band	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave
RF output rating	110kW	12kW	25kW (15kW)	10kW
RF output connector	6½"	1½"	.....	1½"
Carrier stability	± 5Hz	± 5Hz	± 5Hz	± 5Hz
Carrier shift	3% 100% mod, 400Hz	3%, 100% mod 400Hz	3%, 100% mod, 400Hz	3%
Modulation max	125%	125%	125%	125%
AF input connection	Xfmr bal	Xfmr bal	.....	Xfmr bal
AF response	± 1.5dB, 50Hz-10kHz	± 1.5dB, 50Hz-10kHz	± 1dB, 50Hz-7.5kHz	± 1dB, 50Hz-10kHz
THD distortion	3% 95% mod	2.5% 95% mod	<2.5%	<2% 95% mod
AM noise figure	-55dB unwt'd	-55dB unwt'd	-60dB unwt'd	-60dB unwt'd
Final amp device	4CV100000E	3CX10000A3	4CX20000B/8990 tetrode	4CX15000
Modulator final device	4CV50000E	4CX3000A	4CX20000B/8990 tetrode	4CX5000A
Stereo exciter preferred	Motorola	Motorola	Any exciter	Any exciter
Floor space required	237"Wx55"D	76.5"Wx34"D	140"Wx30D	70"Wx31"D
Input ac power required	460Vac 3φ	240Vac 3φ	380-450Vac 3φ (220Vac)	208-240Vac 3φ
Power factor	0.89	0.89	0.9	0.9

Manufacturer	CSI Electronics		Elcom Bauer		Harris Broadcast
Model Series	T-100-A1†‡	T-10-A1†	725 (715C)‡§	710C³	SX-A series⁴
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

¹Other 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.

²Model 715C includes two 4CX5000A modulators driving a 4CX15000A final.

³Other similar models in the series include 701B, 1kW; 705C, 5kW.

⁴The 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 (200kW¹)	10kW	50kW rated	10kW (5kW, 2kW)
RF output connector	300Ω bal	230Ω unbal	1½"	3½" EIA	1½" (LC female)
Carrier stability	± 1x10⁻⁹Hz 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

¹VPD-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 (B6126²)	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	3½" (6½") 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 unwt'd	<-55dB	<-55dB	-60dB unwt'd
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%	<2% 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

¹Combinations of 50kW units with bridged-T circuits form 100kW, 150kW and 200kW. Values are given for 50kW equipment.

²The 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	1½" (¾")	50Ω unbalanced	3½" 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 unwt'd	>60dB	-60dB unwt'd	-60dB unwt'd	-60dB unwt'd 50kW
Final amp device	2 4CX1500A tetrode	Tube type	8 (4) 1.25kW s-s modules	12 (6) 250W modules	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-3000D¹	AM-10000D¹†
Service band	Broadcast	Broadcast, shortwave	Broadcast, shortwave
RF output rating	20W	3kW	10kW
RF output connector	UHF SO-239	¾"	1½"

Audio Transformers

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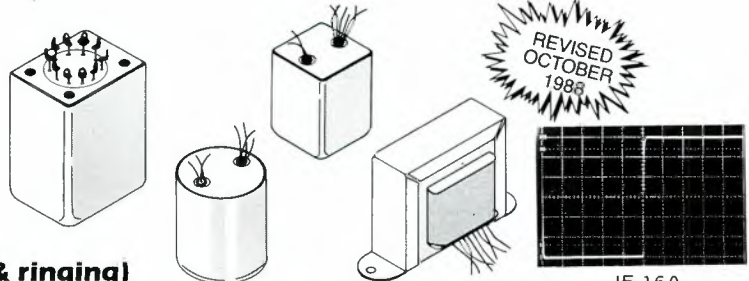
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Low distortion

Wide bandwidth

Minimum transient distortion (overshoot & ringing)



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
JE-16-A	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	52.36	36.12
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	87.04	57.55	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

MICROPHONE 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

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 1/16" Diam.	1 1/16"	1 1/16"
2 = 1 3/16" x 1 3/16"	1 3/16"	1 3/16"
3 = 1 1/8" Diam.	1 1/8"	1 1/8"
4 = 1 1/2" x 1 3/4"	2 1/2" w/ solder terminals	
5 = 1 5/8" Diam.	1 3/4"	1 3/4"
6 = 1 1/4" Diam.	1 1/4"	1 1/4"

NICKEL CORE OUTPUT TRANSFORMERS⁷

Model	Construction	Nominal Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20 Hz Max Output Level ⁸ 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		
				(dBu)										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	Quadfililar	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	Quadfililar	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	Quadfililar	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" x 2 5/16"	1 1/16"	2 1/16"	2 1/16"
8 = 1 5/16" x 1 5/16"	1 5/16"	2 3/8"	2 3/8"
9 = 1 1/8" x 1 1/16"	1 3/8"	2"	2"
10 = 1 1/16" x 1 1/16"	1 3/16"	1 3/4"	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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Circle (167) on Reply Card

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 unwt'd	< -60dB unwt'd
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	0.1kW	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

¹Other 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	1 ³ / ₃₂ female	1 ¹ / ₂ "	3 ¹ / ₂ "	1 ¹ / ₂ " (1 ¹ / ₂ "*)	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 unwt'd (< -50)	< -50dB unwt'd	-45dB (-55)	-40dB	< -60dB
FM noise figure mono	< -64dB unwt'd	< -62dB unwt'd	-72dB 75μs deemf	-75dB 75μs deemf	< -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

¹Additional 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.

²Additional models in this series and their final output device include: FM-1A, 3CX1500A7; FM1.5A, 3CX1500A7/8877.

Manufacturer	Cemlys	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	1 ¹ / ₂ " (1 ¹ / ₂ ", 3 ¹ / ₂ "*)	3 ¹ / ₂ ", 6"	1 ¹ / ₂ " EIA	1 ¹ / ₂ " EIA male	3 ¹ / ₂ ", 6"
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 unwt'd	-72dB (-75dB)	.....	-75dB	-75dB unwt'd (-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

¹Additional 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	MK-15 (MK-30) ²
RF output rating	60kW	10kW (25kW/10kW)	1kW w/Fluorinert cooling	15kW 30kW
RF output connection	6 ¹ / ₂ " EIA male	3 ¹ / ₂ "	1 ¹ / ₂ "	1 ¹ / ₂ " 3 ¹ / ₂ "
Operating VSWR	< 2:1	.....	.....	.....
Modulation capability	± 150kHz	± 150kHz	± 200kHz	± 200kHz
Final amp device	4CX40,000G	3CX10000A7 (15000A7)	Solid-state modules	3CX10000A7 (-20000A7)
AF input connection	Active bal	Bal 600Ω, unbal 10kΩ	Bal, unbal, 10kΩ	Balanced
AF response	0.5dB, 20Hz-15kHz	± 0.1dB 30Hz-100kHz	± 0.1dB 30Hz-100kHz	0.2dB, 30-100k

WATTS UP?



3.5KW

5KW

10KW

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What's more, for upgrades to power levels beyond 10KW, each of these FMQ series

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Circle (168) on Reply Card

www.americanradiohistory.com

Manufacturer	Continental Electronics	Elcom-Bauer		Energy-Onix
Model Series	817A	610A (625A†/610C)†	61000	MK-15 (MK-30)²
THD distortion	0.2%, 20Hz-15kHz	<0.25%	0.08%, 0.1% IMD	0.2%
Pre emphasis	25/50/75µs	75µs	75µs	75µs
AM noise figure	-55dB	<-50dB	<-60dB	-60dB
FM noise figure mono	-72dB unwt'd	<-65dB	<-72dB	-70dB, 75µs deemph
Wideband composite input	Yes	Yes	Yes	.....
Floor space required	72Hx128Wx40D"	70"Wx30"D	23"Wx30"D	58x32.5x73.6"
Input ac power	200-250Vac 3φ 60Hz	208-240Vac 3φ	110-220Vac 1φ	440 or (220)Vac 3φ
Typical power factor	>0.95	0.9	0.9	.....
Power consumption	99kVA	21kW (38kW)	2.7kVA	24kW 48kW
System efficiency	64%	80% final amp	.....	.....
Monitoring output	10-40Vrms, 50Ω	2V 50Ω	Yes	.....
Fault logic architecture	µP based	Relay	CMOS/TTL	µP
µP diagnostics	No	No	No	No
Reader Service Number	734	735	736	737

¹Additional models of the series include 601A, rated 1kW; 602A, rated 2kW; 603 uses 4CX3500A.

²Model 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
RF output rating	40kW (1kW, 50kW¹)	10kW³	30kW (10k/5k/3k/1kW)
RF output connection	3/4" (1/4", 6/8")	3/4" EIA	3/4" (1/4")
Operating VSWR	1.7:1 max	VSWR protected	.....
Modulation capability	±100kHz	±200kHz	>±75kHz
Final amp device	4CX15000A(2)	4CX7500A tetrode	4CX5000A
AF input connection	Balanced	Bal resistive 600Ω	Bal 600Ω, 1kΩ unbal
AF response	±0.5dB, 30Hz-15kHz	±0.5dB, 30Hz-15kHz	±0.5dB, 40Hz-15kHz
THD distortion	0.15% THD/IMD	0.08%	0.5%
Pre emphasis	25, 50, 75µs	25, 50, 75µs	50µs & options
AM noise figure	-50dB	<-50dB	<-65dB
FM noise figure mono	-80dB	-80dB	>70dB
Wideband composite input	2kΩ resistive	Yes	w/2 subcarriers
Floor space required	33"Wx30"D	33"Wx34"D	173cm x 98cm
Input ac power	240Vac 3φ²	240Vac 3φ	220-380Vac 3φ
Typical power factor	0.95	.....	.....
Power consumption	60kW (2.1kW, 80kW)	15.7kW	43kW
Monitoring output	Yes	Yes	.....
Fault logic architecture	µP	µP	µP
µP diagnostics	.....	ColorStat/StatusPlus	Yes
Reader Service Number	739	740	741

¹Additional models include 100W, 300W; 1kW system uses 4CX1000A tetrode; 50kW system includes 8990 tetrode.

²1kW system operates on 240V, single phase supply.

³Series includes 3.5kW, 5kW, 20/25kW, 30/35kW systems.

⁴Other products range from 1kW to 10kW.

⁵Other 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
RF output rating	10kW (20kW)¹	50W-30kW²	10kW (20kW, 30kW)	3.5kW, 5kW
RF output connection	3/4" EIA	Power dependent	1/4" (3/4" 3/4")	1/4"
Operating VSWR	1.4:1	.....	.....	.....
Modulation capability	±75kHz	±150kHz	>150kHz	>150kHz
Final amp device	8986 (9011) tetrode	Triode, grounded grid	YU148 (3CX15000A7)	3CX3000A7 triode GG
AF input connection	Xfmr bal	600Ω bal	Bal 600Ω	Bal 600Ω
AF response	<±0.5dB 40Hz-15kHz	±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%
Pre emphasis	0/50µs switchable	50, 75, 150	75µs	75µs
AM noise figure	-50dB	>55dB	-55dB	-55dB
FM noise figure mono	-70dB de-emph unwt'd	>65dB	-75dB	-75dB
Wideband composite input	Yes	Yes	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
Typical power factor	>0.9	.....	.....	.....
Power consumption	<16.7kW (<33kW)	Power dependent	<17kW, 35kW, 50kW	£6.4kW, <9.5kW
System efficiency	60% (61%)	.....	.....	.....
Monitoring output	5Vrms 50Ω	Yes	Yes	Yes
Fault logic architecture	CMOS/TTL & relay	Relay	CMOS/TTL	CMOS/TTL
µP diagnostics	No	No	No	No
Reader Service Number	744	745	746	747

¹Other models include 1kW and 2kW systems.

²Systems available with combiners to double power output with parallel configurations.

Manufacturer	Rohde & Schwarz	TEM-Milano²	Thomson-LGT	TTC/Wilkinson Div
Model Series	NU-series (NR-series)	NU-series	AR20E (AR10F)	EMF series(1)
RF output rating	1kW to 5kW¹	5kW, 10kW	2kW (10kW)	100W-5kW
RF output connection	BNC to 1/4" EIA	Dezifix D	1/4" 1/4"	EIA type
Operating VSWR	<1.5:1	<1.5:1	<2.0:1	.....
Modulation capability	±75kHz	>±75kHz	±75kHz ±100kHz peak	>±150kHz max
Final amp device	Solid-state (tetrode)	Siemens RS 2024 CL	Triode (tetrode)	Solid-state
AF input connection	4kΩ bal L/R	600Ω bal, 2kΩ unbal	Bal, unbal 600Ω	Balanced
AF response	<±0.3dB, 40-75k	<±0.3dB, 40-75k	±0.1dB 30-40k	±0.2dB 40Hz-15kHz
THD distortion	<0.4% ±75kHz dev	<0.4% ±75kHz dev	<0.4%, <0.3% IMD	<0.5%
Pre emphasis	50, 75	50, 75	50, 75µs	50 (75 opt)
AM noise figure	>60dB unwt'd	>60dB unwt'd	>70dB	<-52dB
FM noise figure mono	>68dB @ ±40kHz dev	>68dB @ ±40kHz dev	>70dB mono	<-60dB
Wideband composite input	4kΩ bal(2)	600Ω bal, 2kΩ unbal	.....	Yes
Floor space required	70Wx98Hx29D	70Wx98Hx29D	.....	23Wx30D
Input ac power	120-1φ 220/380-3φ	380Vac 3φ	240Vac-1φ, 380Vac-3φ	120/240Vac
Typical power factor	>0.85 to >0.95	>0.95	>0.9	0.3kW-10.5kW
Power consumption	2kW to 8.6kW	10.5kVA, 21kVA	<3.8kVA (<21.3kVA	Yes
Monitoring output	Yes	Yes	Yes	

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Circle (169) on Reply Card

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

¹Solid-state systems are constructed from 500W modules.
²Available in US through Comad Communications.
³Series includes options for FM mono, stereo, multiplex, RDS and SCA operations.
⁴Additional 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	¾"	Type N	1½"	3¼"
Operating VSWR	.....	.....	.....	2.0:1
Modulation capability	75kHz dev	± 150kHz	± 150kHz	150kHz
Final amp device	5CX1500B	Solid-state	Solid-state	3CX15000A7(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

¹Other models in the series include FM-1000J 1kW and FM-1500J 1.5kW.
²The series includes LDM-1238, 0.5kW; LDM-1237, 0.3kW; LDM-1248, 0.1kW; LDM-1244, 4kW; LDM-1243, 3kW; LDM-1242, 2kW.
³The 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	-40dB, -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

¹Series includes models ranging from 1kW to 50kW.
²Visual driver is 8988 tetrode. TVD-series uses two TV- systems in parallel.
³TVD-series consumption is slightly greater than double that of the TV-series.
⁴Aural 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	20kW (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	-60dB, -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	Model/series	LDL Communications/Larcan	Marconi Communications
	.Itelco		
	T100 (T300) series¹	TTC 30L (TTC 50LH)	B7540 series⁴
Input ac power	110/208Vac	208-242Vac 3 ϕ	380-415Vac 3 ϕ
Power consumption	.....	63kVA (120kVA)	<38kW (to 129kW)
Power factor	>0.9	0.95	>0.9
Reader Service Number	943	944	946
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✓
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%	2%			....
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
¹Systems available using internal or external diplexing.						

Manufacturer	Model/series	Townsend Broadcast
	.Thomson-LGT	
	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	≥ 0.3 dB	3%
Modulation capability	100%	1%
Response vs brightness	<0.7dB	± 0.75 dB
ICPM uncorrected	$\geq 3^\circ$	.....
Diff phase, gain	$\pm 3^\circ, 0.95$	$\pm 2^\circ, 2\%$
LF linearity	5% lum non-linearity	1dB
S/N ratio	≥ 64 dB wtd	50dB
K factor 2T, 12.5T	$\pm 1.5\%$ 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	± 100 kHz	± 75 kHz
AF response	± 0.5 dB, 30Hz-15kHz	± 0.5 dB, 30Hz-15kHz
Harmonic distortion	<1%	0.5%
AM, FM noise	≥ 46 dB hum	-55dB, -58dB
Aural PA device	Solid-state	Solid-state
Cooling system	Forced air	Forced air
Input ac power	220-380Vac 3 ϕ 2kW	230Vac 3 ϕ
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 $\frac{1}{20}$ and $\frac{1}{100}$ of visual.		

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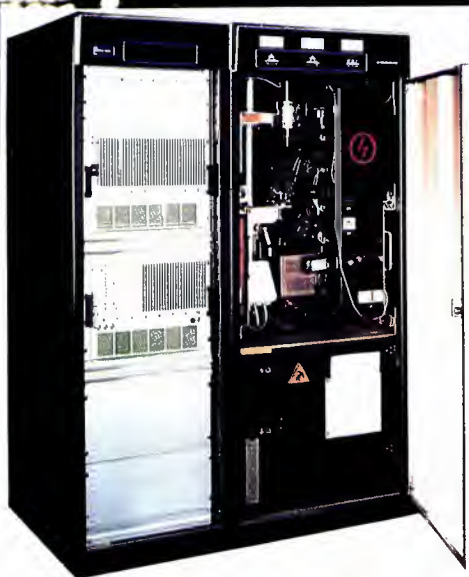
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UHF TV Transmitters

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	Model Series	Acrodyne	Comark/Thomson
	TRU 10 KVC	TRU 30 KV	FL series
Visual peak power	10kW	30kW	5kW, 10kW, 30kW
Carrier level regulation	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$
Modulation capability	3%	3%	3%
Response vs brightness	± 0.75 dB	± 0.75 dB	± 0.75 dB
ICPM uncorrected	$\pm 2^\circ$	$\pm 2^\circ$	$\pm 2^\circ$
Diff phase gain	$\pm 2^\circ, 5\%$	$\pm 2^\circ, 5\%$	$\pm 2^\circ, 5\%$
LF linearity	5%	5%	5%
S/N ratio (AM)	.....	.....	52dB
K factor 2T, 12.5T	2%, 5%	2%, 5%	2%, 5%
Harmonics below visual	-60dB	-60dB	<-60dB
Visual PA device	Tetrode	Tetrode	Klystron
Aural power output	1kW	1kW	6kW or 12kW
Carrier deviation			± 25 kHz, ± 50 kHz
AF response	± 1 dB, 10Hz-15kHz	± 1 dB, 10Hz-15kHz	± 0.5 dB, 30Hz-15kHz
Harmonic distortion	.....	.....	0.5% max, ± 50 kHz
AM, FM noise	-52dB, -60dB	-50dB, -60dB	<-50dB, <-60dB
			CCT-U-60SK SK-series
			CTT-U-60SE S-series
Visual peak power	10kW	30kW	60kW ¹
Carrier level regulation	$\pm 3\%$	$\pm 3\%$	3%
Modulation capability	3%	3%	97%
Response vs brightness	± 0.75 dB	± 0.75 dB	± 0.75 dB
ICPM uncorrected	$\pm 2^\circ$	$\pm 2^\circ$	.....
Diff phase gain	$\pm 2^\circ, 5\%$	$\pm 2^\circ, 5\%$	$\pm 3^\circ, 0.5$ dB
LF linearity	5%	5%	1dB or better
S/N ratio (AM)	.....	.....	52dB
K factor 2T, 12.5T	2%, 5%	2%, 5%	2%, 5%
Harmonics below visual	-60dB	-60dB	<-60dB
Visual PA device	Tetrode	Tetrode	Klystron
Aural power output	1kW	1kW	6kW
Carrier deviation			± 25 kHz, ± 50 kHz
AF response	± 1 dB, 10Hz-15kHz	± 1 dB, 10Hz-15kHz	± 0.5 dB, 30Hz-15kHz
Harmonic distortion	.....	.....	0.5%, ± 50 kHz dev
AM, FM noise	-52dB, -60dB	-50dB, -60dB	-50dB, -60dB

TELEVISION TRANSMITTERS



**THE PERFECT PICTURE
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THOMSON-LGT

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TELEX 696833 F

Circle (170) on Reply Card

Acrodyne			Comark/Thomson		
Manufacturer					
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	Klystron	Klystron
Cooling system	Vapor-phase	Vapor-phase	Air cooled to 10kW	Water	Water, air
Input ac power	230Vac 3 ϕ	230Vac, 3 ϕ	230Vac 3 ϕ	480Vac 3 ϕ	460-500Vac 3 ϕ
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.					

¹The series extends to 120kW and 240kW using hybrid combiners.

²Additional models are rated at 10kW and 30kW; 120kW and 240kW use hybrid combiners.

Comark/Thomson		EMCEE		Harris Broadcast	
Manufacturer	Model Series	TTU-5000DP (-100DP)‡	TU-1000EP/U*	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	Klystron³
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	Klystron³
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

¹Models rated 1kW, 2kW and 5kW also available.

²Models TTU100E, 100W, and TTU10E, 10W are of total solid-state design.

³Transmitters designed around integral cavity klystron, VPK-5550 series.

Manufacturer	Information Transmission		Midwest Communications/Technologix		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

¹Fully redundant system.

²With pulser power supply, add 15-20% to system efficiency.

³Reduced redundancy.

⁴Designed around Amperex YK-1265 (YK-1233) or EEV K3672 (K3271) external cavity klystrons.

⁵Power consumption indicated without/with pulser power supply in operation.

PESA		Rohde & Schwarz			Thomson-LGT	
Manufacturer	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)	$V_{out}/V_{in}/V_{ref}/OE^1$	
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 unwd	-46dB, -56dB unwd	-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	

Manufacturer	PESA
Model Series	TR-series
Power consumption	....
Power factor	>0.9
Reader Service Number	923
¹ Aural = $\frac{1}{100}$ Visual for dual channel sound system.	

Rohde & Schwarz		
NT325A1 (NT354A1)†	NT414A1 (425A1)†‡	NT424A1 (NT444)†‡
11kVA (20kVA)	28kVA (60kVA)	79kVA (120kVA)
> 0.9	> 0.9	> 0.9
924	925	926

Thomson-LGT
EUHF 2000S-6000S†
80kW-135kW
>0.95
927

Manufacturer	Thomson-LGT
Model Series	EUHF 2000S/-DS†‡
Visual peak power	2kW
Carrier level regulation	..
Modulation capability	100%
Response vs brightness	0.7dB, 0.5dB
ICPM uncorrected	± 1°
Diff phase gain	± 3°, 5%
LF linearity	± 1%
S/R ratio (AM)	>60dB
K factor 2T, 12.5T	1.5%
Harmonics below visual	-60dB
Visual PA device	TH-393 combined V/A
Aural power output	0.2kW (100W + 20W)(1)
Carrier deviation	± 100kHz
AF response	± 0.5dB, 30Hz-15kHz
Harmonic distortion	<0.5%
AM, FM noise	≤ -50dB, -60dB
Aural PA device	Common amplification
Cooling system	Forced air
Input ac power	220-380Vac 3φ
Power consumption	24kW (19kW)
Power factor	>0.95
Visual PA efficiency	....
Reader Service Number	928
¹ Solid-state systems to 2kW; tube PAs 1kW to 20kW; klystrons 20kW, 30kW.	
² Models for 120kW, 240kW also available.	

Townsend
TA 60TA
60kW
2%
1%
± 0.1dB
± 2°
± 3°, 5%
10%
55dB
2%, 5%
-60dB
Klystron
6kW
± 100kHz
± 0.5dB
-54dB THD/IMD
-50dB, -58dB
Klystron
Water
480Vac, 3φ
130kW
0.9
930

TTC/Television Technology	
UHF 60S Silverline	UHF 10MA(D)
60kW ²	10kW
< 4%	< 4%
....	
....	
....	
≤ ± 4°, ≤0.5dB	≤ ± 2°, ≤0.25dB
1.5dB	< 1.5dB
50dB	55dB
....	2%
-65dB	< -65dB
Klystron	Klystrode (klystron opt)
6kW	1kW
± 25kHz	± 25kHz
+ 1dB, 30Hz-15kHz	± 1dB, 30Hz-15kHz
1%	1%
-55dB, -55dB	-55dB, -55dB
Klystron	Diplexed
Vapor-phase	Forced air
480Vac 3φ	230Vac 1φ, 480Vac 3φ
....	4.8kVA
0.9	0.9
....	66% overall
931	932

Manufacturer	TTC/Television Technology
Model Series	Silverline UHF-30SK
Visual peak power	30kW
Carrier level regulation	<4% black-to-white
Modulation capability	....
Response vs brightness	....
ICPM uncorrected	....
Diff phase gain	≤ ± 4°, ≤ 0.25dB
LF linearity	<1.5dB
S/N ratio (AM)	55dB
K factor 2T, 12.5T	2%
Harmonics below visual	<-65dB
Visual PA device	Klystron
Aural power output	6kW
Carrier deviation	± 25kHz
AF response	± 1dB 30Hz-15kHz
Harmonic distortion	1%
AM, FM noise	≤ -55dB/ ≤ -55dB
Aural PA device	Diplexed
Cooling system	Forced air
Input ac power	230Vac 1φ, 480Vac 3φ
Power consumption	....
Power factor	0.9
Visual PA efficiency	....
Reader Service Number	933
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.	

TTC/Television Technology
XL1000U (XL100U) ¹
1kW (100W)
....
95%
0.5dB
± 2°
± 2°, 0.25dB
1dB
55dB
2%
-80dB
TH-347 tetrode
100W (10W)
± 40kHz
± 0.5dB, 30Hz-15kHz
0.5%
-55dB, -55dB
Diplexed
Forced air
230Vac 1-3φ (110Vac)
4.8kVA (500VA)
0.9
....
934

Varian TVT	
LDM-1790/1791 ²	LDM-1780 (1781)
30kW/60kW-70kW	5kW (10kW)
± 2%	2%
95%	95%
± 0.5dB	± 0.5dB
± 4°	± 4°
± 3°, 0.5dB	± 3°, 0.5dB
0.9dB	0.9dB
60dB	60dB
2%, 2%	2%, 2%
-70dB	-70dB
Klystron PT5093/5090	TH-382 (TH-392)
10% of visual	10% of visual
± 100kHz	± 100kHz
± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz
0.5% 100% mod 1kHz	0.5%
-50dB, -60dB	-50dB, -60dB
Diplexed(PT5093/5090)	Diplexed (TH 327)
Vapor-phase	Forced air
460/226, 480/272Vac	380/220Vac
130kW/112-147kW	21kVA (23kVA)
0.9	0.9
26%/78-68%	37% (75%)
936	937

Aural STL Systems

Manufacturer	ITAME
Model/Series	Mod. UHF-450A ¹
System type	Composite
Audio response	± 0.1dB, 30-60k
Distortion	<1% 40-70k
S/N ratio	70dB 100% mod
Stereo separation	....
Hot standby system	Option
Transmitter No.	UHF-900A
RF power output	10W
RF output connector	Type N
Frequency stability	<5 parts/million
AM noise rating	<-70dB spurious/harmonic
Audio level	+12dBm 600Ω; 3.5V 22kΩ
Metering	RF for/rev dcV
	Main ch mod
Rack space needed	3.5"
Receiver No.	UHF-450A
Signal conversion	Dual
Sensitivity	30μV, 65dB S/N
Bandwidth	3dB IF BW 280kHz
Metering	RF/baseband/Vdc
	Pgm
Rack space needed	3.5"
Reader Service Number	1476
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.	

ITAME
Mod. UHF-900A ²
Composite
± 0.1dB, 30-60k
<1% 40-70k
70dB 100% mod
....
No
UHF-900A
9W (20W opt)
Type N
<5 parts/million
<-70dB spurious/harmonic
+12dBm 600Ω; 3.5V 22kΩ
RF for/rev dcV
Main ch mod
3.5"
UHF-900A
Dual
30μV, 65dB S/N
3dB IF BW 280kHz
RF/baseband/Vdc
Pgm
3.5"
1477

Marti	Micro Controls/MCI
STL-30	PTS-10C ³ (PTS-10DC)
Dual	Composite
± 0.3dB, 20-15k	± 0.4dB 30-55k
0.5% 20-15k	<0.4%, 0.25% IMD
70dB 100% mod	>65dB
.....	≥ 40dB
No	Yes
STL-30	PTS-10C
30W	7-10W
UG-58	SQ-239 UHF
± 0.00025%	± 500Hz
<-60dB spurious	.....
....	
RF/main ch mod/dcV	SWR/VSWR, RF, DC
Mux mod	.....
3.5"	
R-10	PRS-10
Dual	Dual superhet
4μV, 50dB S/N	2μV 20dB SNR
>200kHz for FM stereo	380kHz 3dB IF
RF/LQ/subcarrier/dcV	RF/AF/DC
AF levels	.....
3.5"	.....
1479	1480

Micro Controls/MCI
PTS-10C ³ (PTS-100C) ⁴
Composite
± 0.4dB 30-55k
<0.4%, 0.25% IMD
>65dB
≥ 40dB
Yes
PTS-10C
7-10W
SO-239 UHF
± 500Hz
....
SWR/VSWR, RF, DC
....
PRS-10
Dual superhet
2μV 20dB SNR
380kHz 3dB IF
RF/AF/DC
....
3.5"
1480

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	Option	Option
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

¹Values given for composite system.

²System also available for 300-470MHz.

³Selectable IF of 100kHz or 500kHz; value here based on 3dB IF BW.

⁴Specifications given for data model.

⁵Values 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	Programmable (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 unwt'd	75dB unwt'd	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 -10, +5% carrier level)	None	Carrier, modulation	Carrier, mod (No)	Carrier failure
Reader service number	1461	1462	1463	1464	1465

¹Equipment useable for modulation measurement of AM, FM and PM systems as well as other parameters, including THD.

²For 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 unwt'd
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

¹Equipment is also capable of modulation measurements for FM and PM transmissions.

²Option 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	QEI	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

Manufacturer	Belar Electronics
Model	FMM-2
AGC circuitry	No
Modulation range	± 133%
AF response of meter	± 0.1dB 50-75k
Peak modulation adjustment	to 199%
Peak flasher accuracy	± 2% all levels
Residual AM monitor	Integral
Audio output nominal	+ 10dBm
Audio connection	Active balanced
Audio response	± 0.01dB 50-15k
Audio distortion	0.01% THD & IMD
S/N ratio, mono	90dB unwt'd
Composite output level	1.5Vrms
Metering display type	Analog mvmt, LEDs
Oscilloscope test output	Yes
Modulation alarm	LED at 90% carrier
Stereo monitor	Use FMS-2
SCA monitor	Use SCM-1 or SCM-2
Reader Service Number	1468

QEI	
MODEL 691	
No	
± 133%	
± 0.2dB 30-75k	
199%	
± 2% 5kHz	
Integral	
+ 10dBm	
Xfmr bal	
± 1dB 30-15k	
0.05%	
75dB wtd	
2Vrms	
Analog movement	
Yes	
Yes	
Integral	
Single, dual opt	
1469	

Rohde & Schwarz	
FKD/FKDL	
....	
77.5kHz (2.5kHz LED)	
± 0.5dB 50-65k	
None	
5%-	
....	
6dBm	
Bal 600Ω L-R	
0.05dB 40-65k	
< 0.5% 30-15k	
> 68dB wtd	
6dBm ± 40kHz dev	
Dual 32-LED bar graph	
No	
Yes	
Integral	
Integral	
1470	

TFT	
Model 884 stereo	
40dB range	
-100, + 133%	
± 0.2dB 30Hz-100kHz	
50-199%	
± 2% 5kHz 100% mod	
< 70dB from 100% mod	
0dBm	
600Ω bal, barrier strip	
± 0.5dB 30-120k	
0.2% max 10kHz comp	
70dB 400Hz de-emp comp	
5Vrms 100% mod 10kHz	
Analog meter	
Yes	
....	
Integral	
TFT-730A, 845	
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
Model	TVM-1
Frequency range	Single UHF, VHF channel
Off-air input level	100μV w/RFA-3 pre-amp
AGC circuitry	Yes
Modulation range	± 133% ± 25kHz dev
Meter frequency response	± 0.5dB 50-75k
Nominal audio output	10dBm xfmr bal
Audio response, mono	± 0.5dB 50-15k
Audio distortion, mono	0.1%
S/N ratio, mono	70dB
Composite output	1V at 2kΩ
Metering display types	Analog meter
ATS compatible	Yes
Oscilloscope test output	Yes
Carrier alarms	None
Modulation alarms	None
Stereo monitor	....
SCA monitor	Use SCM-1 or SCM-2
Reader Service Number	1472

Belar Electronics	
TVM-100	
-L VHS, -H UHF	
100mV-5Vrms	
....	
133%, 100% ± 73kHz dev	
± 0.1dB 30-50k	
+ 10dBm bal, 5V unbal	
± 0.01dB 30-50k	
0.01% THD, IMD	
80dB min	
1.5V BTSC/SAP/PRO/SCA	
Meter & LEDs	
Yes	
Yes	
90% power	
None	
TVM-210/220 package	
SCM-1 or SCM-2	

Tektronix	
751 BTSC	
Any US TV channel	
From 1450-1 demod	
In demod	
100% or max 73kHz	
± 0.7kHz total	
+ 8dBm, 600Ω	
± 0.1dB 50Hz-15kHz(1)	
< 0.1% Main ch. only	
> 70dB ¹	
No	
EL bargraph, digital	
....	
Loss, unlocked pilot	
Stereo phase reversal	
Integral	
SAP, PRO integral	
1474	

TFT	
MODEL 850	
Any TV channel	
20μV 50Ω	
No-	
100% ± 25kHz	
± 0.2dB 50-120k	
6dBm active bal	
± 0.2dB 50-15k	
0.1% 1kHz	
78dB de-emphasized	
3Vrms 75Ω	
Meter & LEDs	
Yes	
Yes	
Reduced power	
Relay closure	
Integral	
TFT855, TFT851	
1475	

TFT
701

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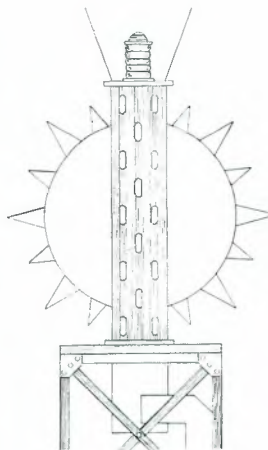
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Vectorscopes

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

¹Represented by Broadcast Video Systems.

²Unit inserts waveform and/or vector displays into the image on a video picture monitor.

³Expanded display of 512-linesx34μs; WFM timebase includes H, 2H, 5H, V and 25V positions.

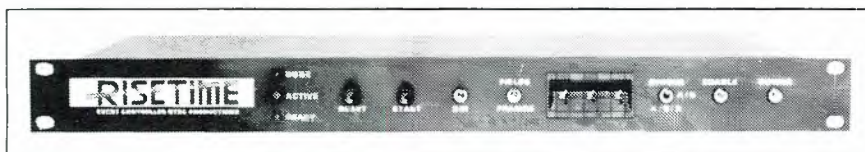
Manufacturer	Magni Systems			Philips T&M	Snell & Wilcox
Model/Series	VS 560 (VS 561)†	VS 530 (VS 531)	PM 5667 (PM 5668)	PM 5661 combo	MSD-140, X-Y140
Display size	8x10cm	8x10cm	8x10cm rect	8x10cm	8x10cm rect
Graticule	Internal	Internal	Internal	Internal	Ext opt
Waveform monitor mode	Vectors, audio phase	Vectors, audio phase	SC/H φ PM5668	Yes	Possible
Function control from	Manual, remote¹	Manual, remote²	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

¹From WFM560, by RS-232.

²From WFM530, by RS-232.

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Manufacturer	System Video ¹
Model/Series	Model 1225
Display size	10x10cm
Graticule	Internal
Waveform monitor mode	X-Y mode
Function control from	Manual
Standards	NTSC, PAL/M
Integral calibrator	Yes
Composite video inputs	A, B
Subcarrier input	Yes
Composite sync input	Yes
Display references	A, B, ext
Diff phase, gain mode	2°, 2%
VITS line selector	Lines 15-21
Luminance measurements	No
Reader Service Number	1436

¹Represented by AF Associates.

Tektronix	
R520A series	1720†
5"	5 1/4"
Int, ext	Internal
Component waveforms	Stereo audio phase
Manual	μP control
NTSC, PAL/M	NTSC, PAL
Yes	Yes
A, B	A, B
Yes	From ext ref
Yes	Yes
A, B, ext	Int, ext
<1°, <1%	≤2°, ≤2%
Lines 15-21	From 1730 WFM
Y/I/Q/R/G/B	No
1437	1438

Thomson Video	
TTV 8300†	
8x10cm	
External	
Waveform	
Manual	
None	
SECAM	
Yes	
No	
Yes	
Yes	
...	
...	
...	
1439	

Videotek	
VSM-60	
8x10cm	
Internal etched	
None	
Manual	
NTSC, PAL/M	
Yes	
A, B, alternate	
Yes	
No	
A, B, ext	
≤1°, ≤1%	
No	
None	
1440	

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, iG
	iG, linearity	iG, 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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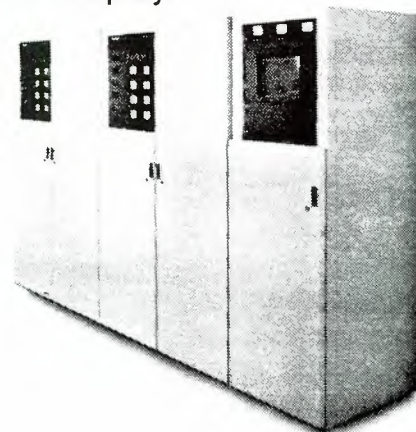
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Manufacturer	Hitachi Denshi
Model/Series	•V-099 (-098) portable
Display size	3.5" rect
Graticule	...
Available for	NTSC (PAL)
Internal calibrator	Yes
Vertical Response	Flat, IRE, chroma ∂G, transients
Timebases	2H, 2V, 1μs/div 2V mag
Magnification factors	x20
RGB/YRGB displays	No
DC restore	Blanking
VITS line select	No
Programmable	No
Remote controllable	No
Composite inputs	A, B
Component inputs	No
Line strobe pulse	No
Vectorscope function	No
AF stereo phase mode	No
Waveform comparison	No
Reader Service Number	1446

Manufacturer	Leader Instruments
Model/Series	LBO-5860B (5865B)
Display size	8x10cm
Graticule	Internal
Available for	NTSC, PAL/SECAM opt
Internal calibrator	Yes
Vertical Response	Flat, L-P, chroma ∂G, transients
Timebases	2H, 1μs, 2V 2V mag
Magnification factors	x20
RGB/YRGB displays	Option
DC restore	Back porch
VITS line select	7-21 (525)
Programmable	No
Remote controllable	No
Composite inputs	A, B
Component inputs	No
Line strobe pulse	Yes
Vectorscope function	No
AF stereo phase mode	No
Waveform comparison	No
Reader Service Number	1447

Manufacturer	Magni Systems
Model/Series	1527†
Display size	8x10cm on 1525 display
Graticule	Int, ext
Available for	NTSC
Internal calibrator	Yes
Vertical Response	Flat, L-P, chroma 1520 ∂G, ∂φ
Timebases	2-H, 2-V
Magnification factors	x5
RGB/YRGB displays	No
DC restore	Back porch
VITS line select	No
Programmable	No
Remote controllable	No
Composite inputs	A, B
Component inputs	No
Line strobe pulse	No
Vectorscope function	Yes
AF stereo phase mode	(Tone source)
Waveform comparison	No
Reader Service Number	1448

Manufacturer	Magni Systems
Model/Series	WFM-530 (WFM-531)
Display size	8x10cm
Graticule	Internal
Available for	NTSC (PAL)
Internal calibrator	Yes
Vertical Response	Flat, chroma, L-P
Timebases	H, 2H, 2V, V Mag
Magnification factors	x5
RGB/YRGB displays	Yes
DC restore	Back porch
VITS line select	Any line
Programmable	16 memories
Remote controllable	RS-232
Composite inputs	3 channels
Component inputs	....
Line strobe pulse	Yes
Vectorscope function	Limited components use
AF stereo phase mode	No
Waveform comparison	Yes
Reader Service Number	1449

Manufacturer	Magni Systems
Model/Series	WFM-560 (WFM-561)
Display size	8x10cm
Graticule	Internal
Available for	NTSC/CAV (PAL/CAV)
Internal calibrator	Yes
Vertical Response	Flat, chroma, L-P
Timebases	....
Magnification factors	Yes
RGB/YRGB displays	Back porch
DC restore	Any line
VITS line select	16 memories
Programmable	RS-232
Remote controllable	2 inputs, 3 channels
Composite inputs	2 sets
Component inputs	Yes
Line strobe pulse	Full components
Vectorscope function	No
AF stereo phase mode	No
Waveform comparison	Yes
Reader Service Number	1450

Manufacturer	Philips T&MI
Model/Series	PM5665 (5662 combo)††
Display size	8x10cm
Graticule	Internal
Available for	NTSC, PAL/-M/-G/-N
Internal calibrator	Yes
Vertical Response	Flat, chroma, ∂G chroma (∂φ)
Timebases	H, 2H, V, 2H Mag
Magnification factors	x10 (x10H/x20V)
RGB/YRGB displays	Yes
DC restore	Back porch
VITS line select	1-263/1-262, 1-625
Programmable	No
Remote controllable	Yes
Composite inputs	A, B
Component inputs	No
Line strobe pulse	(Yes)
Vectorscope function	No (with SC/H φ)

Manufacturer	Rohde & Schwarz
Model/Series	ODF digital TV scope††
Display size	10x13cm
Graticule	Electronic
Available for	PAL
Internal calibrator	Yes
Vertical Response	Flat, LP, ∂-staircase
Timebases	0.1-100ms/div, 1/2/5 steps, 54 field/s
Magnification factors	....
RGB/YRGB displays	....
DC restore	to black
VITS line select	1-625, F1-4, rep 2/4/8
Programmable	Yes
Remote controllable	RS-488, IEC-625
Composite inputs	Yes
Component inputs	....
Line strobe pulse	10 waveform memory
Vectorscope function	No

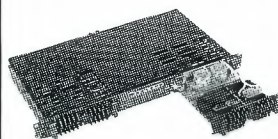
Manufacturer	Tektronix
Model/Series	1480 series††
Display size	8x10cm
Graticule	Int, ext
Available for	NTSC, PAL/-M, SECAM
Internal calibrator	Yes
Vertical Response	Flat, chroma, LP IRE, ∂G
Timebases	H, 2H, 2H mag V, 2V, 2V mag x5, x10, x20, x25, x50
Magnification factors	Yes
RGB/YRGB displays	Back porch or sync
DC restore	Single & 15-line
VITS line select	No
Programmable	Yes
Remote controllable	A, B, aux
Composite inputs	No
Component inputs	Yes
Line strobe pulse	Yes
Vectorscope function	No

Manufacturer	Tektronix
Model/Series	•1730 series (1730 HD)
Display size	8x10cm
Graticule	Internal
Available for	NTSC, PAL (multistd)
Internal calibrator	Yes
Vertical Response	Flat, LP, chroma (30MHz/dual-mode fltr)
Timebases	H, 2H, 2V (10ns/div) 2H/2V mag (1/2/3-line) x25 (& x10, x20)
Magnification factors	Yes (Parade, overlay)
RGB/YRGB displays	Back porch
DC restore	Any one (& 14-line)
VITS line select	Yes
Programmable	Yes
Remote controllable	A, B
Composite inputs	(3 each A & B)
Component inputs	Yes
Line strobe pulse	No
Vectorscope function	 ∂φ in R-Y mode

Manufacturer	Tektronix
Model/Series	•1740 series combo
Display size	8x10cm
Graticule	Internal
Available for	NTSC (PAL/-M)
Internal calibrator	Yes
Vertical Response	Flat, IRE, (luma) Chroma
Timebases	H, 2H, 2H mag V, 2V, 2V mag x10, x20
Magnification factors	Yes
RGB/YRGB displays	Back porch or sync
DC restore	Internal jumper set
VITS line select	All functions
Programmable	Yes
Remote controllable	A, B
Composite inputs	No
Component inputs	
Line strobe pulse	
Vectorscope function	

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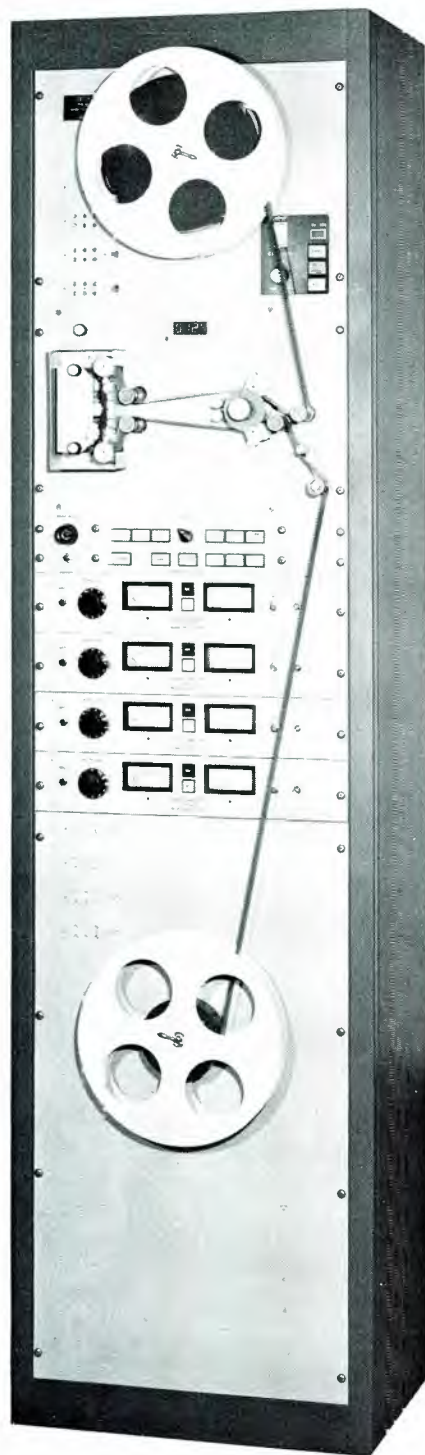
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Manufacturer	Philips T&M	Rohde & Schwarz	Tektronix	
Model/Series	PM5665 (5662 combo)††	ODF digital TV scope††	1480 series††	•1730 series (1730 HD) •1740 series combo
AF stereo phase mode	No	No	No	No
Waveform comparison	No	Yes	Overlay, parace	Yes Parade
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
Graticule	Internal	Electronic, accur 1%
Available for	NTSC (PAL)	525/60 625/50 RGB(1)
Internal calibrator	Yes	Yes
Vertical Response	Flat, IRE (luma) chroma	"Lightning, Bowtie" displays
Timebases	H, 2H, 2H mag V/2V, 2V mag	1H, 2H, 2V and 2V mag
Magnification factors	x2, x10, x20, x50	x20
RGB/YRGB displays	Yes	Parade, overlay
DC restore	Back porch or sync	Back porch
VITS line select	8-23 (6-21, 319-334)	Any line
Programmable	All functions	No
Remote controllable	Yes	Yes
Composite inputs	A, B	No
Component inputs	No	RGB or YCrCb ¹
Line strobe pulse	Yes	Any 2, any 15
Vectorscope function	SC/H ϕ measurements	Yes
AF stereo phase mode	No	No
Waveform comparison	Overly vector/waveform	Overlay, parade
Reader Service Number	1456	1457

¹Transcoders for YIQ, YCrCb available.

TV Demodulators

TV receiving equipment for signal monitoring and examination. inputs are typically 50 Ω or 75 Ω . Video signal outputs are 75 Ω .

Manufacturer	Barco Industries	Philips T&M	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
CCIR standards	I, III, IV, V	I, III, IV, V	I/III/IV/V	I/III/IV/V
Channel selection	Fixed, PLL-tuned	Thumb-wheel PLL	Tunable, crystal	Fixed, tuneable
RF input impedance	50 Ω , 75 Ω	50 Ω	50 Ω , 75 Ω	50 Ω
Direct input level		1Vrms $\pm$ 6dB w/AGC	20mV-1.5V	0.1mV-30mV, 1mV-100mV
Off-air input level	-30mV, +30mV	100mV $\pm$ 6dB w/AGC	250 μ V-300mV	250 μ V-5mV
IF input level	10-40dBmV	70mV $\pm$ 3dB 50 Ω	5mV-100mV	5mV-100mV
Input level indicator	LED display	Vision & IF meters	Meter	Panel meter

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Circle (184) on Reply Card

GRIP HEADS

PAGE 11

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"THE REEL THING"

Circle (203) on Reply Card

Manufacturer **Barco Industries**
Model **VSD 1000BG**

Intercarrier input	No
Split carrier mode	No
Zero-carrier reference	Internal
Envelope detection	Yes
Synchronous detection	Yes
Quadrature detection	No
Aural signal reject	Yes
SAW filter design	.....
No. of video outputs	2-75Ω
Aural deviation port	.....
Audio line out	+6dBm
Speaker output	8Ω
Video clamp on	Back porch
ATS compatible	.....
Carrier fail alarm	Yes
Modulation fail alarm	No
Stereo aural type	German system
Reader Service Number	1491

¹Models for CCIR -B/G, -D/K and -I standards.

²EMFK crystal control, EMFT continuous tuning, EMTD crystal/AFC.

Philips T&M
PM5560M¹

Yes
Yes
Internal
Yes
Yes
No
Yes
Nyquist filter
2-75Ω
+6dBm ± 25kHz
+6dBm/1.55V
None
0 IRE, active or VBI
Yes
No
No
.....
1492

Rohde & Schwarz
EKF2D (EKF2K)

.....
Yes
Int/ext trigger
Yes
Yes
.....
Yes
.....
2-75Ω
0-50kHz
+6dBm ± 30kHz
Yes
Sync, blanking
.....
No
No
.....
1493

EMFT series²

.....
Yes
Line 15/ext trigger
Yes
Yes
Yes
Yes
Yes
2-75Ω
.....
+6dBm ± 30kHz
No
Sync, blanking
Yes
.....
Dual carrier Std B/G
1494

Textronics
1450-1

50Ω
Yes
Int, ext
Yes
Yes
Yes
Yes
2-75Ω
50mV/kHz 600Ω
.....
Yes
.....
.....
.....
US/NTSC system
1495

Manufacturer **Telemet**

Model **3713-A1 (-A2)**

Service band	VHF (UHF)
CCIR standards	I/III (IV/V)
Channel selection	Fixed channel
RF input impedance	50Ω, 75Ω
Direct input level	50mV-10V
Off-air input level	5mV-1V (5mV-50mV)
IF input level	.....
Input level indicator	LEDs
Intercarrier input	No
Split carrier mode	Quasi-parallel
Zero-carrier reference	Int & ext
Envelope detection	Yes
Synchronous detection	Yes
Quadrature detection	Yes
Aural signal reject	Yes
SAW filter design	No
No. of video outputs	5-75Ω
Aural deviation port	Shown w/LEDs
Audio line out	+8dBm
Speaker output	8Ω, headphone
Video clamp on	.....
ATS compatible	.....
Carrier fail alarm	Yes

4500-B1 (-B2)(-F1)

VHF (UHF)
[Any channel]
Fixed channel, xtal
75Ω F (S0-239)
300μV-30mV
.....
None
.....
Internal
No
.....
Yes
No
2-75Ω
Yes
+3dBm 600Ω
Yes
.....
No
No

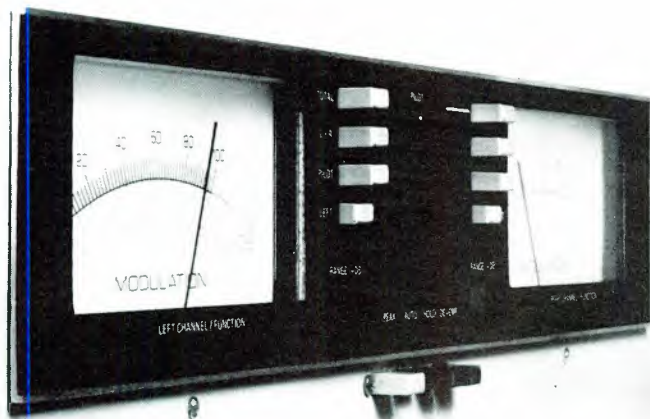
4501-B

VHF, UHF
I, III, IV, V
Fixed down-converter
50-500mV
50-500mV
5-50mV
No
Detector out, LED
Yes
Yes
Internal
Yes
w/4504B1 accessory
w/4504B1 accessory
Yes
.....
2 BNC 75Ω
BNC
Winchester M7 7-pin
Yes
.....
No
Loss of video out

Videotek

DM-140S

VHF, UHF, CATV
I, III, IV, V
Varactor, synthesized
75Ω F-connector
.....
-15dBmV min
None
None
No
No
No
Yes
No
No
No
Yes
2-75Ω
No
Bal/unbal, mono/stereo
Yes
L & R
No
No



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Circle (177) on Reply Card

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	Model Series	Magni Systems	Marconi Instruments	PESA Electronica	Philips T&M	Rohde & Schwarz
Controlling computer	MS PC-DOS	2924 universal analyzer	Proprietary	SWAT	PM5578	UVF video analyzer
Video signal generator	Multistandard	2926, 2913, other	Proprietary	Uses program video	Proprietary	Proprietary
System control mode	IBM-PC/compatible(1)	via GPIB, serial	External	.....	External	Bar, dot only
Programmable	Yes (4 signal sets)	Yes	Yes	.....	Yes	Yes
Standards	NTSC/PAL/CAV/HDTV	NTSC, PAL, SECAM	NTSC, PAL	NTSC, PAL	NTSC/PAL	PAL
External data storage	Yes	Possible	Printout or PC	Possible	Possible	.....
Auto logging mode	No	Yes	RS-232 link	Yes	Yes	Yes
Waveform plotting	Yes	.....	.....	.....	On CRT only	Yes
Parameter limits	No...	3 sets, upper/lower	Yes	Yes	RS-232	IEC-625/IEEE-488
Out of tolerance alarm	No...	Visual on CRT	Yes	Per programming	Set via jumpers	EEPROM, user defined
Carrier failure alarm	No...	.....	.....	Per programming	Yes	Blinking LED
Modulation loss alarm	No...	NTC-7/FCC/CCIR/CBC	.....	CCIR/RS-170A	VITS low LED	No
Measurements per	Any reference	Individual lines	CCIR/RS-170A	Total signal	CCIR/NTC-7	CCIR-569-1
Tests made on line	Any line	1326	Individual lines	1327	Lines 17/18, 2-field	Individual lines
Reader Service Number	1325				1328	1329

¹2021 is designed with front-panel controls for standalone operation.

Manufacturer	Model Series	Tektronix	Thomson Video
Controlling computer	1980 ANSWER	VM700 measurement set	TTV8400 Thom-CAT
Video signal generator	Proprietary	Motorola 68020	Apple
System control mode	External (TEK1910)	No (Picture mode)	TTV8410 Prodigie
Programmable	Manual	Manual, programmable	Yes
Standards	No	Yes	Yes
External data storage	NTSC	NTSC, PAL	NTSC, PAL
Auto logging mode	Yes	Also internal	Floppy disk
Waveform plotting	Yes	Via RS-232C	Yes
Parameter limits	User defined	Raster scan display	Yes
Out of tolerance alarm	Printer	User programmable	Yes
Carrier failure alarm	No	On-screen message	User defined
Modulation loss alarm	No	No	Printer, CRT
Measurements per	RS170A/NTC-7/CCIR-569	RS-170A/NTC-7/RS-250B	None
Tests made on line	Any VBI line	Any line	CCIR-569
Reader Service Number	1330	1331	1332

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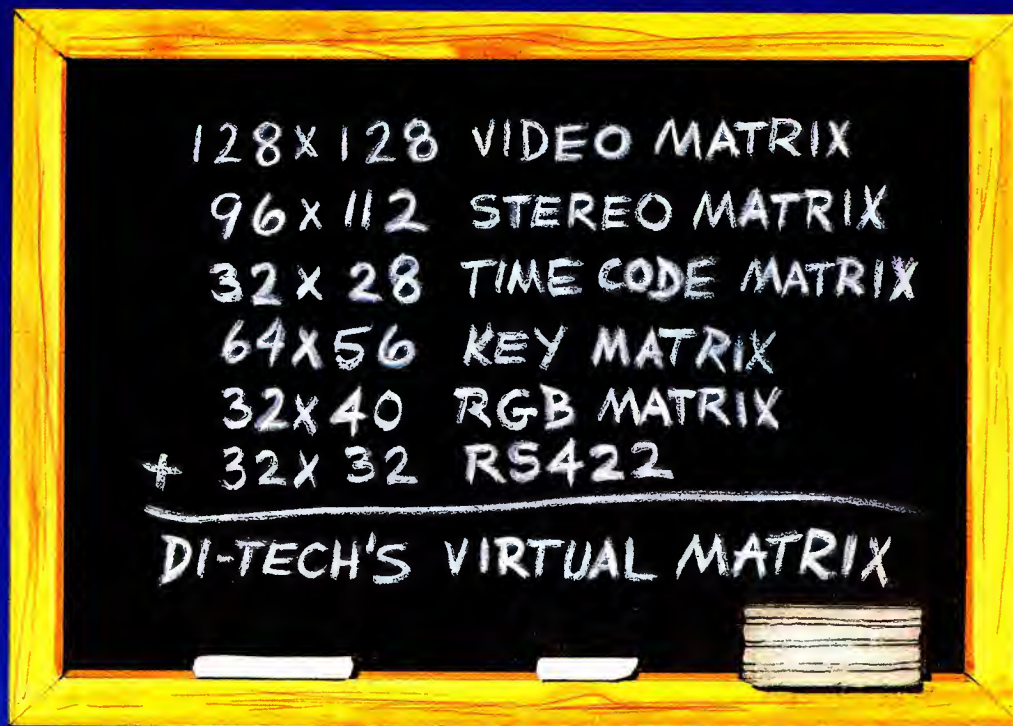
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ADC Telecommunications, Inc.	65	195	612/893-3010	Klark-Teknik	151	93	
Adrienne Electronics Corp.	225	161	800/782-2321	Lake The Systems Company	86	47	617/244-6881
Adrienne Electronics Corp.	245	179	800/782-2321	Landy Associates, Inc.	98		609/424-4660
Advanced Video Associates	224	197	415/792-8684	Leitch Video of America, Inc.	45	25	804/424-7290
ADX Systems USA	221	153	800/444-4ADX	Lerro Corp.	53	29	215/223-8200
AKG Acoustics, Inc.	197	121	203/348-2121	Lowell-Light Mfg., Inc.	98	57	212/947-0950
Alexander Mfg. Co.	104	188,189	800/247-1821	MCG Electronics, Inc.	237	180	516/586-5125
Alpha Audio	208	134	804-358-3852	Magna-Tech Electronics Co., Inc.	247	183	212/586-7240
Alpha Tower Design, Inc.	110		214/783-2578	Magni Systems, Inc.	235	169	503/626-8400
Alpha Wire Corp.	85	45	800/52ALPHA	Markertek Video Supply	243	173	800/522-2025
Amek Systems and Controls Ltd.	43	109		Matthews Studio Equipment	248	203	818/843-6715
Ampex Corp. (AVSD)	112	81	415/367-2911	McCurdy Radio Industries	187-194	120	416/751-6262
Ampex Corp. (MTD)	60	35	415/367-2911	Micro Audio	206	128	800/445-1248
Aphex Systems Ltd.	169	105	818/765-2212	Microtime, Inc.	133	86	800/243-1570
Arrakis Systems, Inc.	21	13	303/224-2248	Midwest Communications Corp.	1	3	800/543-1584
Arrakis Systems, Inc.	93	13	303/224-2248	Midwest Corp.	41	23	800/543-1584
Artel Communications Corp.	213	198	508/562-2100	Mikrolab	220	151	213/306-0120
Audio Accessories, Inc.	92	54	603/446-3335	Modular Audio Products	222	154	800/333-7647
Audio Precision	179	110	800/231-7350	Mohawk Wire & Cable	105	65	800/422-9961
Audio Products, Inc.	201	124	703/455-8188	Multidyne Electronics Inc.	220	152	800/535-3050
Audio Technologies Inc.	212	205	215/443-0330	Nakamichi USA Corp.	183	182	213/538-8150
Audio-Video Engineering	214	140	516/546-4239	Nautel	102	62	902/823-2233
Audiolab Electronics	207	130	916/485-0500	Nortronics Co., Inc.	211	135	800/328-5640
Auditronics, Inc.	23	14	901/362-1350	Nova Systems, Inc.	89	49	203/693-0238
Auditronics, Inc.	86	46	901/362-1350	Nova Systems, Inc.	144	90	203/693-0238
Auditronics, Inc.	216	144	901/362-1350	NTSC Productions	244	174	818/505-9430
BAL Components Ltd.	205	127		Nurad	29	17	301/462-1700
Barco Industries Inc.	141	89	408/370-3721	O'Connor Engineering	105	66	714/979-3993
BASC Assoc. Inc.	243	171	602/654-2838	Omega International	71	39	714/553-0564
BCS Video	245	201	818/845-1999	Omicron Video	215	142	818/700-0742
Belar Electronics Laboratory Inc.	249	176	215/687-5550	Opamp Labs Inc.	224	159	213/934-3566
Belden Wire and Cable	137	88	800/BEL-DEN4	Orban Associates Inc.	7	6	800/227-4498
BERC	115	74	818/841-3000	Osborne, Alan	79	42	805/495-8420
Beyer Dynamic Inc.	81	43	516/935-8000	Otari Corp.	170	106	415/592-8311
Bi-Tronics, Inc.	98		800/522-7377	Periphex Inc.	208	133	800/634-8132
BJM Electronics Ltd.	213	148	718/442-0223	Pesa Electronica S.A.	25	108	800/872-7372
Boland Communications	206	129	714/951-7557	Pi Rod Inc.	104	64	219/936-4221
Boonton Electronics Corp.	121	76	201/584-1077	Polyline Corp.	90	52	312/297-0955
Broadcast Services Co.	105		919/934-6869	Pro Video Sales Co.	99	58	800/225-4424
Broadcast Technology of Colorado	92	196	303/641-5503	QEI	233	168	800/334-9154
Broadcast Video Systems Ltd.	224	158	416/764-1584	Quanta Corp.	161	100	801/974-0992
Bryston Vermont	246	181	802/223-6159	Radio Systems	87	84	215/356-4700
BTS Broadcast Television Systems	123	77	801/972-8000	Ram Broadcast Systems Inc.	101	61	516/832-8080
Camera Mart, Inc.	97	55	212/757-6977	Ramsa/Panasonic	9	7	714/895-7277
Canon USA Inc., Broadcast Lens	31	18	516/488-6700	Rane Corporation	125	78	206/355-6000
Canon USA Inc., Broadcast Lens	32-33	19	516/488-6700	Richardson Electronics	149	92	800/323-1770
Carter Cartop Mfg.	244	175	503/622-4477	ROH	87	83	800/262-4671
Centro Corp.	15	10	619/560-1578	ROH	215	143	800/262-4671
Cetec Vega	202	125	818/442-0782	Rohde & Schwarz, Inc.	77	41	301/459-8800
Chemtronics, Inc.	249	177	516/582-3322	Ross Video Ltd.	117	185	613/652-4886
Christie Electric Corp.	207	131	213/320-0808	RTS Systems, Inc.	52	33	818/843-7022
Cipher Digital, Inc.	103	63	301/695-0200	S.C.A. Data Systems Inc.	163	202	213/452-2506
Clear-Com Intercom Systems	185	112	415/861-6666	S.W.R. Inc.	246	132	603/529-2500
Comark	35	20	215/822-0777	Sennheiser Electronic Corp.	173	107	203/434-9190
Computer Friends, Inc.	225	163	800/547-3303	Sescom, Inc.	225	162	800/634-3457
Comrex Corp.	56	31	617/443-8811	Shively Labs	88	50	207/647-3327
Conex Electro Systems	220	150	206/734-4323	Sony Mag. Tape Div.	73	40	201/930-7669
Control Concepts Corp.	100	60	607/724-2484	Sound Technology	10	8	408/378-6540
Daily Electronics Corp.	99	186	213/774-1255	Spectrum Communications	222	155	215/631-1710
Daily Electronics Corp.	104	187	213/774-1255	Standard Tape Laboratory, Inc.	224	160	415/786-3546
Datatek, Inc.	49	27	201/654-8100	Stanton Magnetics	154	95	516/349-0235
Delta Electronics	51	28	703/354-3350	Studer Revox America Inc.	1FC	1	615/254-5651
Di-Tech Inc.	IBC	2	516/667-6300	Surcom Associates Inc.	218	147	619/722-6162
DKW Systems Inc.	209	132	403/426-1551	Techni-Tool, Inc.	223	156	215/825-4990
Dolby Labs Inc.	63	36	415/558-0200	Tektronix Inc.	227		800/452-1877
Dynatech Communications	109	70	800/622-8877	Tektronix Inc.	228	166	800/452-1877
EEV, Inc.	145	91	914/592-6050	Telemetrics Inc.	160	99	201/427-0347
Emcor Products	181	111	507/289-3371	Telepak	213	138	619/268-1100
ESE	83	44	914/592-6050	Television Technology Corp.	129	82	303/665-8000
ESE	217	48	914/592-6050	Tentel	219	149	800/538-6894
Faroudja Laboratories Inc.	135	87	408/245-1492	Thomson Video Equipment	57	32	203/324-1320
Fostex Corp. of America	199	122	213/921-1112	Thomson-CSF/LGT	239	170	203/324-1320
Fujinon Inc.	47	26	201/633-5600	Total Spectrum Manufacturing, Inc.	19	12	914/268-0100
GE Broadcast Systems Integration	50	200	215/583-6800	Townsend Broadcast Systems, Inc.	245	178	413/568-9581
Gentner Electronics Corp.	91	53	801/268-1117	Townsend Test & Measuring Group	153	94	704/547-8378
Gentner Electronics Corp.	90	51	801/268-1117	Ultimate Corp.	27	16	818/345-5525
Grass Valley Group, Inc.	5		916/273-8421	United Media	162	102	714/630-8020
Gray Engineering Laboratories	218	146	912/883-2121	Utah Scientific Inc.	54-55	30	800/543-8782
Hall Electronics	104		804/973-8697	Varian	39	22	415/592-1221
Harris Video Systems	13	9	800/4HARRIS	Video Display Corp.	155	96	800/241-5005
Hipotonics, Inc.	96	56	518/789-6464	Videomeida	168	104	408/745-1700
Hitachi Denshi America Ltd.	3	4	800/645-7510	Videoquip Research Ltd.	108	69	416/293-1042
HM Electronics	69	38	619/535-6060	Videotek, Inc.	157	97	602/997-7523
Hnat Hinds Inc.	200	123	203/935-9066	Vinten Equipment Inc.	59	34	516/273-9750
Hotronic, Inc.	226	164	408/292-1176	Ward-Beck Systems Ltd.	BC		416/438-6550
IGM Communications	110	71	800/628-2828	Western Internat'l. Communications Ltd.	106	67	604/526-3214
Ikegami Electronics Inc.	66-67		201/368-9171	Wohler Technologies, Inc.	110	72	415/285-5462
Inovonics, Inc.	248	184	408/458-0552	Yamaha International Corp.	127	79	
Intraplex, Inc.	223	157	617/486-4072				
Jampro Antennas Inc.	99	59	916/383-1177				
Jensen Transformers Inc.	231	167	213/876-0059				

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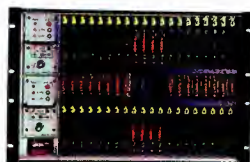


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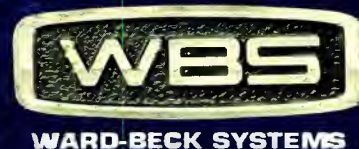
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