



# 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
- Seamless and gapless punch-in and punch-out
- Integral scrape-flutter filter in head assembly
- Constant tape tension on both spooling motors
- One-hand cueing under full servo control
- Fully modular audio electronics allowing quick interchange of individual circuit elements
- Front access to all audio electronics, even when rack-mounted
- Plug-in record and reproduce equalizers for optimal performance and easy speed pair conversion
- 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

## STUDER REVOX

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# SOURCE

## The DPS-270 Time Base Corrector... The Last Word in Time Base Correction.



### Well Actually, Here's the Last Word... \$2,995.

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.

So for those of you as concerned about value as you are about quality, remember... one last word... \$2,995. As always backed by Midwest.

For more technical and sales information contact your nearest Midwest office.



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Exclusive U.S. Distributor.

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4 Letter from the Editors

6 Service/Parts Centers

## BUYERS' GUIDE

## 11 Product directory

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.

## SPEC BOOK

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| 113 | Color TV Cameras                | 216 | Telephone Bandwidth Extenders        |
| 118 | Camera Lenses                   |     |                                      |
| 120 | Color Video Monitors            | 217 | Wireless Microphones                 |
| 126 | Digital Effects Systems         | 222 | Shotgun Microphones                  |
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| 134 | Graphics Systems                | 224 | Distortion Analyzers                 |
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| 144 | Video Production Switchers      | 229 | TRANSMITTING, TEST & MEASURING SPECS |
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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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**BROADCAST ENGINEERING** (ISSN 0007-1794) is published monthly (except in the fall, when two issues are published) and mailed free to qualified persons within the United States and Canada in occupations described here by Intertec Publishing Corporation, 9221 Quivira Road, Overland Park, KS 66215. Second-class postage paid at Shawnee Mission, KS, and additional mailing offices. POSTMASTER: Send address changes to **Broadcast Engineering**, P.O. Box 12960, Overland Park, KS 66212.

**SUBSCRIPTIONS:** Non-qualified persons may subscribe at the following rates: United States and Canada; one year, \$25.00. Qualified and non-qualified persons in all other countries; one year, \$30.00 (surface mail); \$108.00 (air mail). Back issue rates, \$5.00, except for the Buyers' Guide/Spec Book, which is \$20.00. Rates include postage. Adjustments necessitated by subscription termination at single copy rate. Allow 6-8 weeks for new subscriptions or for change of address.

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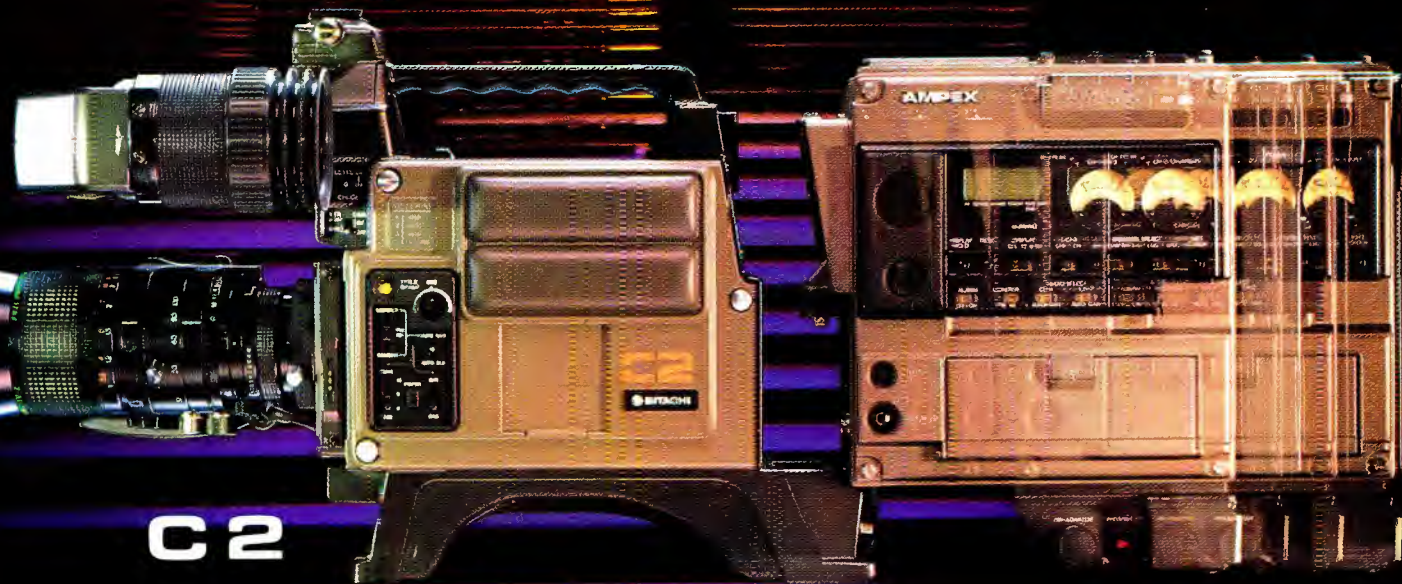
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The Hitachi FP-C1 3-chip auto set-up camera is a rugged workhorse when you need a stand-alone model with high resolution and high sensitivity that's easy to operate.

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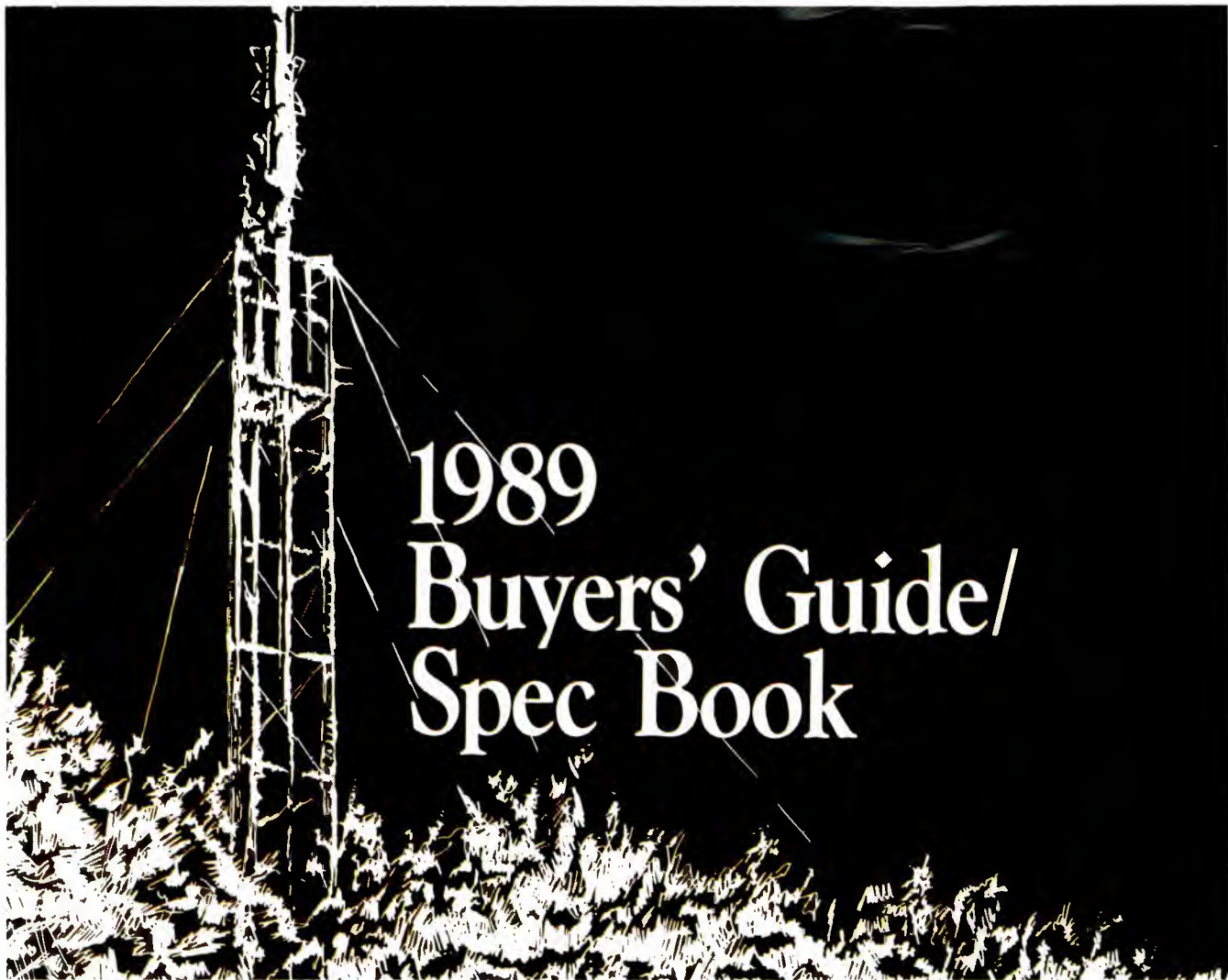
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# 1989 Buyers' Guide/ Spec Book

**W**ith 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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213-876-0059

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**8100A/XT2 Six-Band Limiter** Accessory to OPTIMOD-FM: Adds more competitive loudness, punch, and brightness.

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**464A Co-Operator** (for stereo) or **422A Compressor/Limiter** (for mono): Transparent studio level control to protect your STL microwave or telephone/post line.

## Television

### **OPTIMOD-TV 8182A On-Air Audio**

**Processor:** For both stereo and mono television. Controls levels from any source artfully and automatically without audible processing artifacts.

### **OPTIMOD TV Stereo Generator 8185A:**

BTSC stereo generator (for NTSC countries) meeting the highest specifications. Also available — mating SAP and Pro Channel generators.

### **275A Automatic Stereo Synthesizer:**

Automatic recognition of mono and stereo, dramatic stereo synthesis, automatic polarity detection and correction, and single-ended noise reduction.

## The Production Studio

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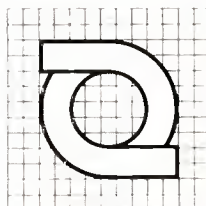
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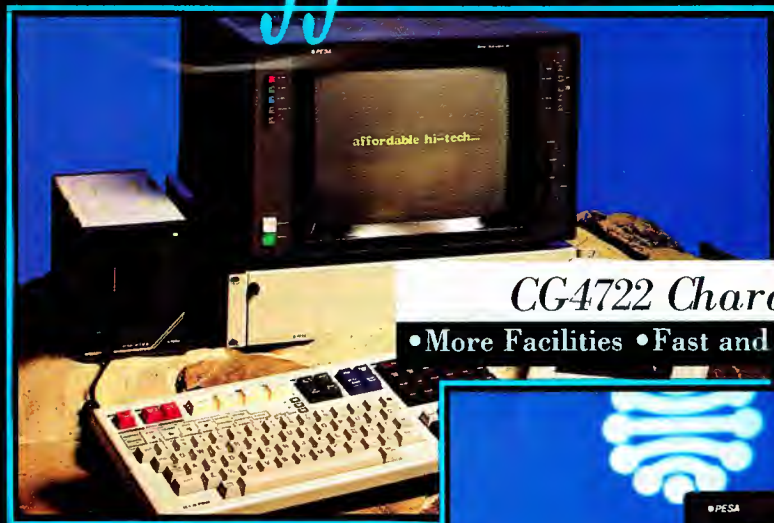
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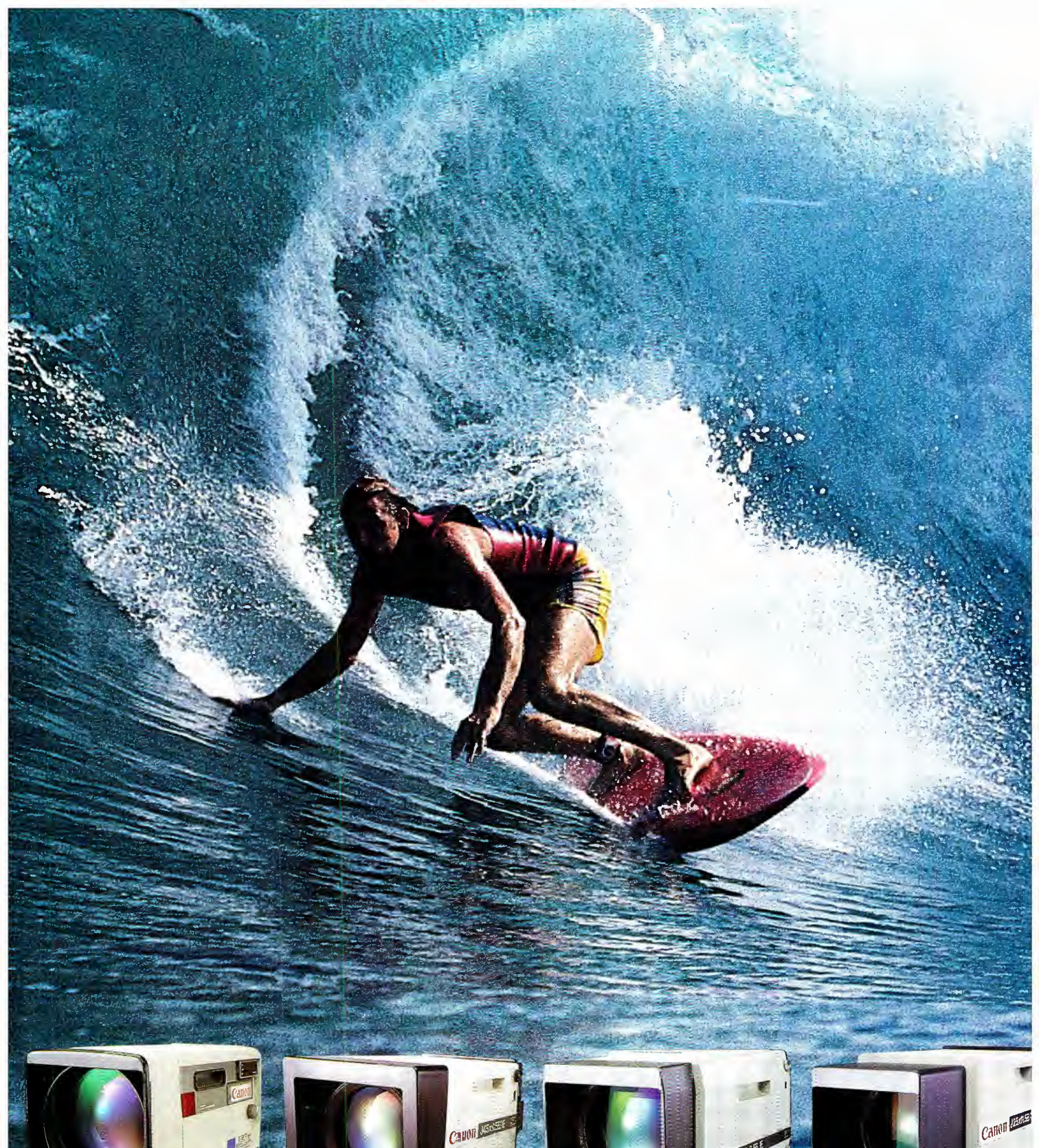
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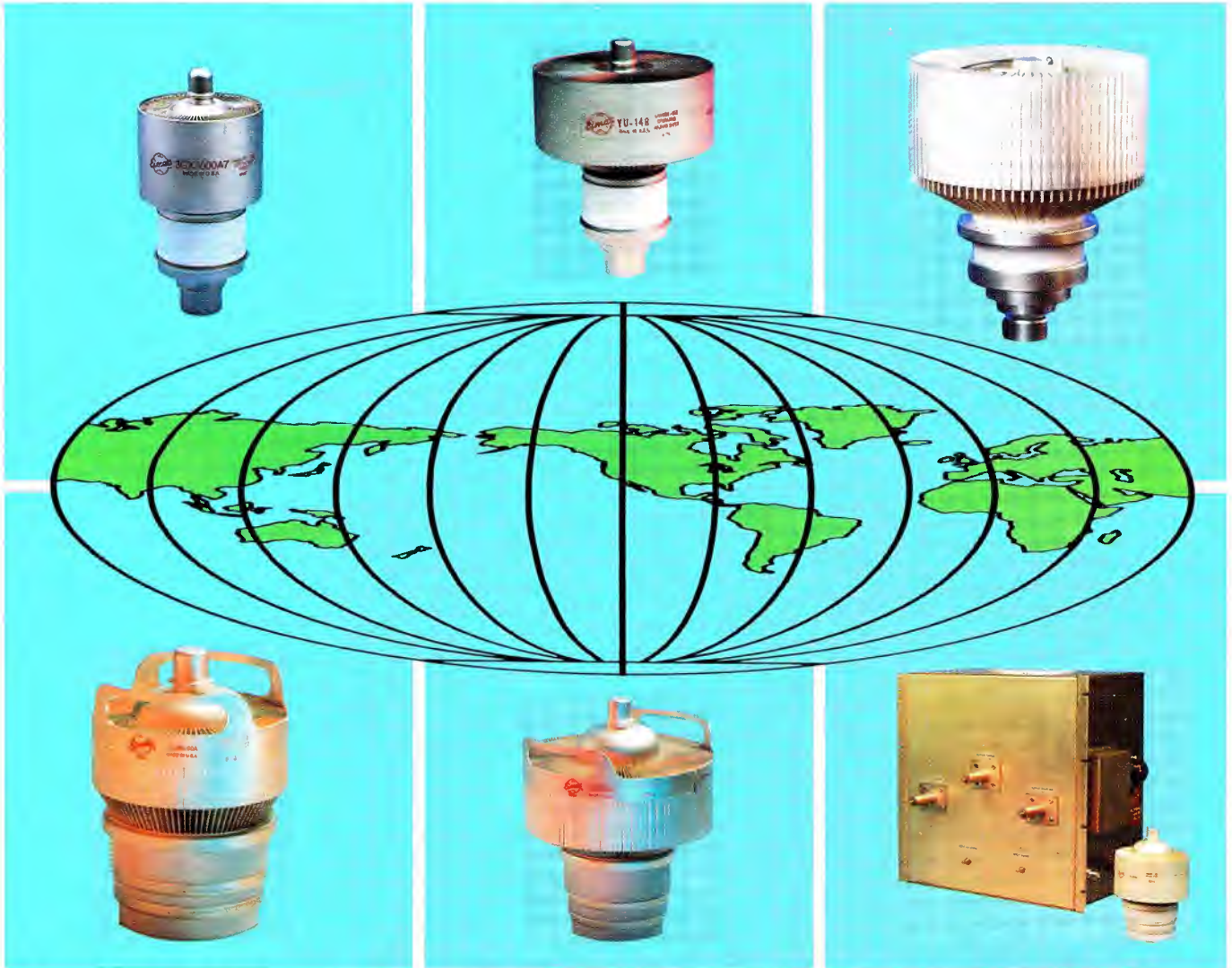
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 Holaday Industries, Inc. ....  
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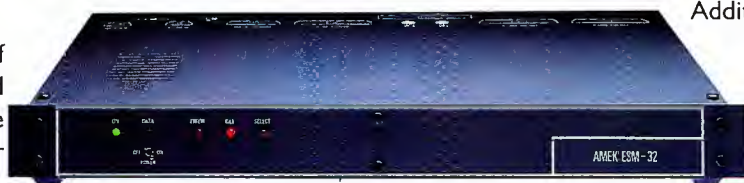
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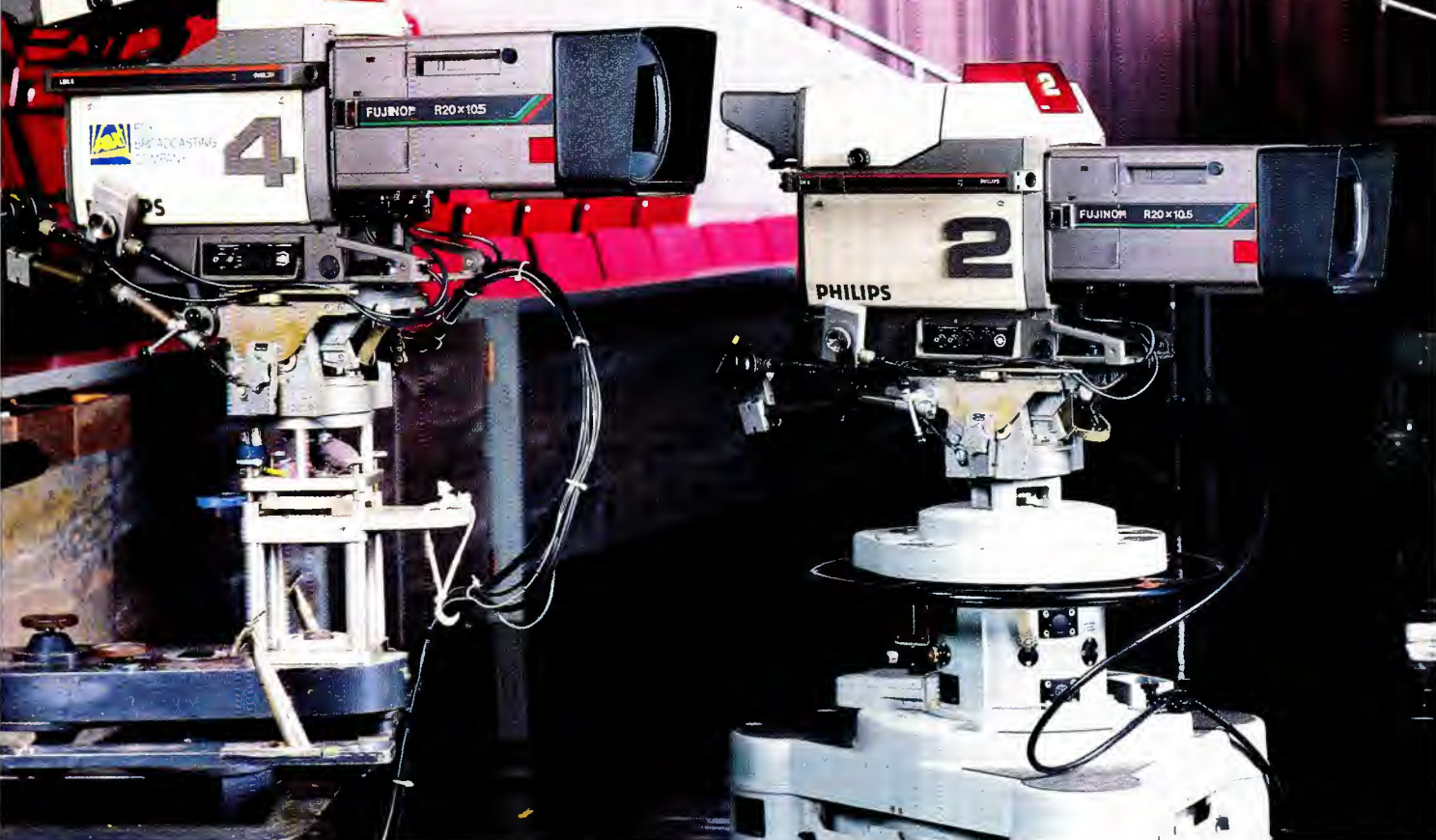
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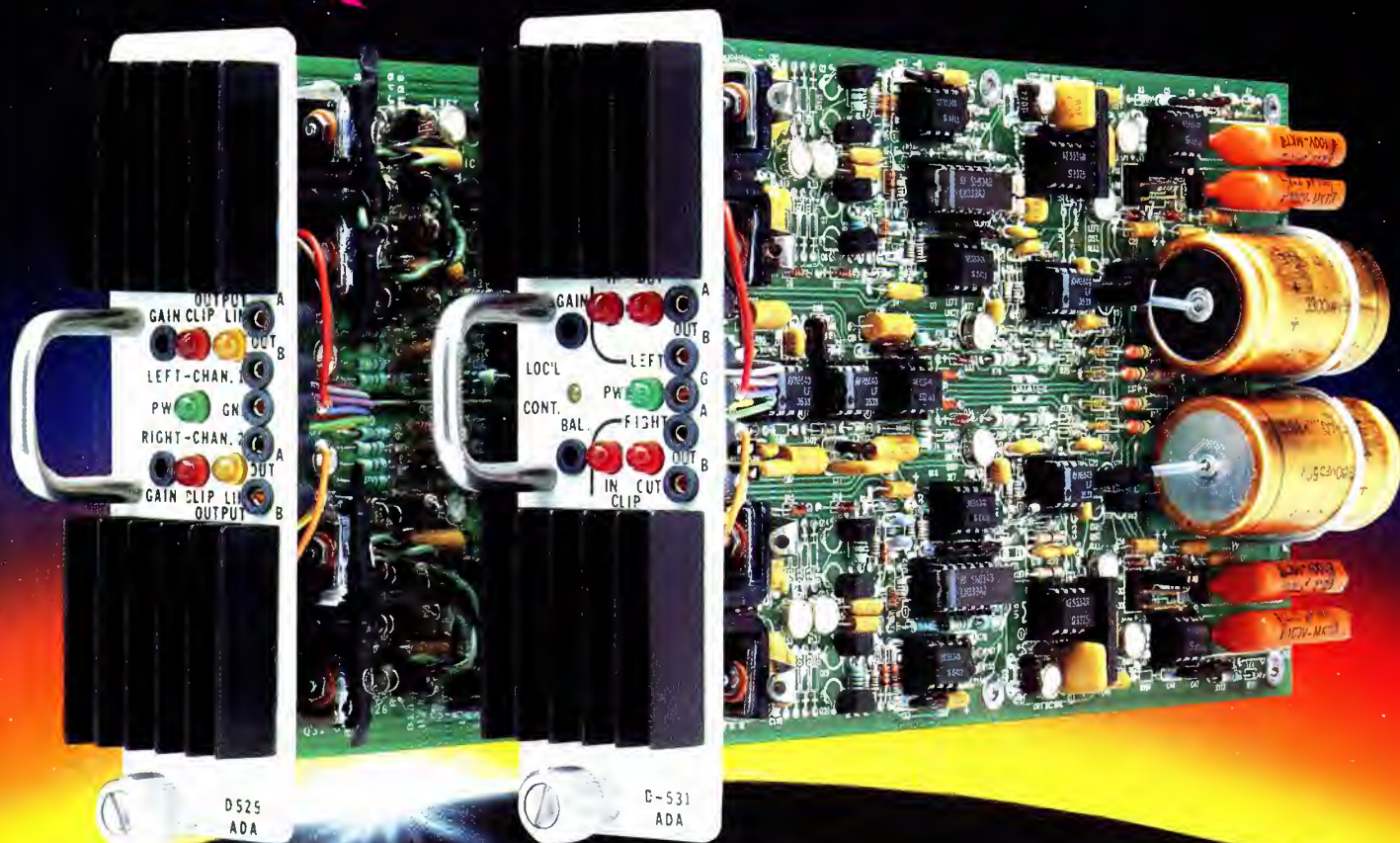
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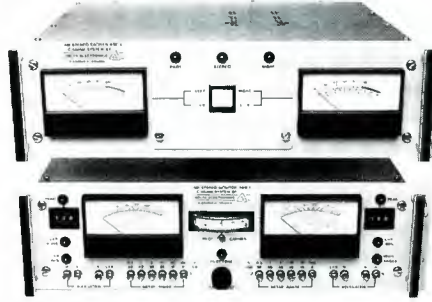


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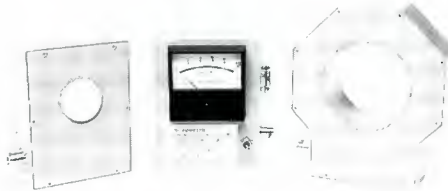
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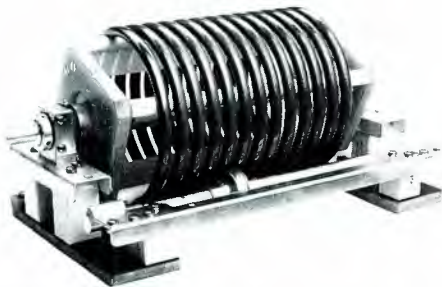
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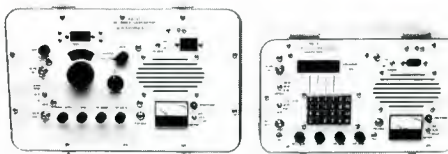
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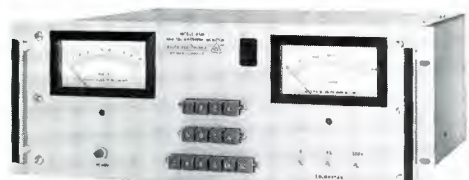
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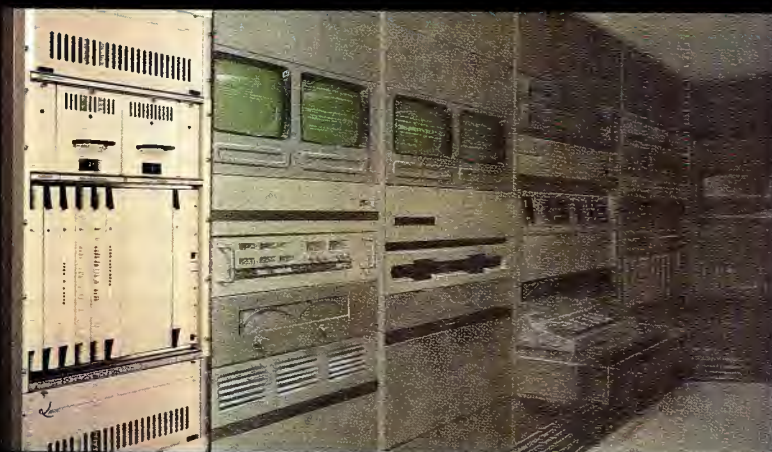
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# Portable Partnership

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

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

Yet despite its size, it's packed with features: the Comrex frequency extender is built in, along with interface for cellular telephone or standard dial line. There are

microphone and tape inputs and automatic send level control.

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

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

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Comrex UK, Ltd., 171-175 Uxbridge Road,  
London W139AA 01-579-2743



After the 5650, anything else is just a mixer.

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

**FREEDOM.**

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

**THE SECRET?**

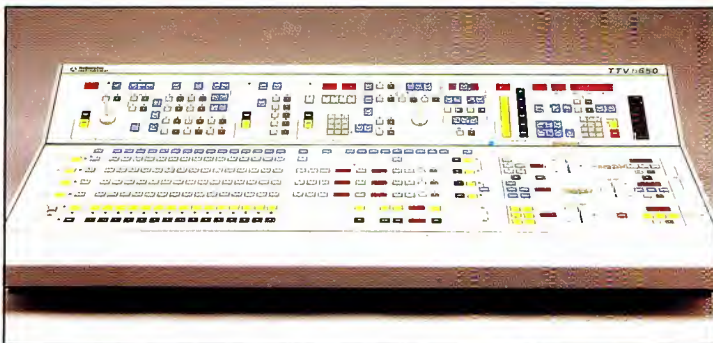
Multi-format input/outputs in both analog and

digital standards. And above all, open system to provide full integration in diverse and evolving environments.

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

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

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



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THE FUTURE OF DIGITAL DESIGN.

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USA - THOMSON-CSF BROADCAST INC - 30 Commerce Road STAMFORD CONNECTICUT 06902 - Phone (203) 324.13.20 - Fax (203) 327.61.75

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Titus Technological Labs  
Tower Design & Fabrication, Inc.  
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Vir James Consulting Engineers  
Vistek Electronics Ltd.  
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Westlake Audio Professional Products  
Mfg. Group  
Wireworks Corp.

**EQUIPMENT LEASING/RENTALS**

Adelphon, Inc.  
American Laser Systems, Inc.  
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Bexel Corp.  
Biamp Systems  
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SA  
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Harris Corp. Broadcast Div.  
Johnson Electronics Inc.  
LDL Communications, Inc.  
Leasametric, Inc. Instrument Rental  
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Motorola Communications &  
Electronics Inc.  
Musco Mobile Lighting, Ltd.  
RAG Electronics, Inc.  
Roscor Corp.  
Solid Electronics Labs  
Tekno Inc.  
Tyler Camera Systems  
U.S. Instrument Rentals  
Video Design Pro  
W. Vinten Ltd. Broadcast Systems Div.  
**Ward-Beck Systems Ltd.** ..... BC

**EQUIPMENT SALES, USED/RECONDITIONED**

American Laser Systems, Inc.  
Audio Service Corp.  
R. Barth KG  
BFE AG  
Broadcast Electronics, Inc.  
**The Camera Mart, Inc.** .....97  
Component Video, Inc.  
Crow Broadcast Systems Ltd.  
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Maze Broadcast, Inc.  
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Newman-Kees Measurements  
Engineering & Installations  
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Pro Video & Film Equipment  
RAG Electronics, Inc.  
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U.S. Instrument Rentals  
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**FILM CLEANING/INSPECTION/PROCESSING**

Allied Film & Video/IL  
Image Transform, Inc.  
**FILM-TO-TAPE TRANSFERS**  
Allied Film & Video/DC  
Allied Film & Video/IL  
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Johnson-Nyquist Productions Inc.  
RADMAR, Inc.

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Broadcast Signal Lab  
J. Boyd Ingram & Associates  
Johnson Measurement Service  
Phil McQuatters Frequency  
Measurement Service  
Newman-Kees Measurements  
Engineering & Installations  
Old Dominion Broadcast Eng. Service  
Standard Frequency Measuring  
Service  
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**HEAD REFURBISHING/RELAPPING**

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

**LENS REPAIR**

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**MAINTENANCE, AM/FM RADIO**

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Evans Associates Consulting Telecom,  
Engineers  
Harris Corp. Broadcast Div.  
Horizon Towerz, Inc.  
J. Boyd Ingram & Associates  
D. L. Markley & Associates, Inc.  
Consulting Engineers  
Micro Communications, Inc.  
Newman-Kees Measurements  
Engineering & Installations  
Old Dominion Broadcast Eng. Service  
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S.G. Communications Inc.  
Steiger, Hurray & Associates Inc.  
Broadcast Tech. Consultants  
Teletech, Inc.  
Tenco Tower Co.

**MAINTENANCE, MICROWAVE/EARTH STATION**

**Broadcast Technology of**  
**Colorado** .....92  
Comwave Div. of Communication  
Microwave Corp.  
Conus Communications Satellite  
Services Div.  
Dalsat Inc.  
Harris Corp. Broadcast Div.  
Horizon Towerz, Inc.  
Newman-Kees Measurements  
Engineering & Installations  
Radiotechniques Engineering Corp.  
Roscor Corp.  
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Crow Broadcast Systems Ltd.

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

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(Music, Sound Effects,  
Syndication Radio Formats,  
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Comsat Video Enterprises  
Concept Productions  
Leonardo Software  
Kenneth R. Meades  
Music Director Programming Service  
The Musicworks, Inc.  
Network Production Music, Inc.  
Soper Sound Music Library Soper  
Sound Media Music  
Tape-Athon Corp. Cavox Stereo  
Productions  
Valentino, Inc.

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Freeland Products, Inc.  
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Jem-Fab Corp.  
Lunar Video Ltd.  
Media Optical Services  
Merlin Engineering Works  
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VTR Associates, Inc.  
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**RELOADING, CARTRIDGE/CASSETTE**

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

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Capitol Satellite Communications  
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Comsat Video Enterprises  
Conus Communications Satellite  
Services Div.  
Cycle-Sat  
GE American Communications

Liberty Broadcasting Network  
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Nexus Engineering Corp.  
Scientific-Atlanta  
Wold Communications

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Comsat Video Enterprises  
Conus Communications Satellite  
Services Div.  
GE American Communications  
National Public Radio Satellite  
Services  
Northstar Satellite Systems Inc.  
Wold Communications

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

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Liberty Broadcasting Network  
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Music Director Programming Service  
The Musicworks, Inc.  
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Zonal Ltd.

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ESD, Inc.  
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R/SCAN Corp.  
Systemation Corp.  
WSI Corp.

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Audio Service Corp.  
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**Abekas Video Systems, Inc.**  
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Redwood City, CA 94063  
415-369-5111

**Abroyd Communications Ltd.**  
614 Colby Drive  
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519-746-1743

**Accurate Sound Corp.**  
3515 Edison Way  
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415-365-2843

**Accu-Weather, Inc.**  
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State College, PA 16801  
814-237-0309

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England TW13 6DH  
01-894-5622

**Acoustic Sciences Corp.**  
P.O. Box 1189  
Eugene, OR 97440  
503-343-9127

**Acoustic Systems**  
P.O. Box 3610  
Austin, TX 78764  
800-531-5412

**Acrian Inc.**  
490 Race St.  
San Jose, CA 95126  
408-294-4200

**Acrodyne Industries Inc.**  
516 Township Line Road  
Blue Bell, PA 19422  
215-542-7000

**Acron Ltd.**  
Unit 3, Lovelace Road  
Bracknell, Berks, England RG12 4YT  
0344-55625

**Adams-Russell Electronics Co.**  
**ARVIS Div.**  
300 Second Ave.  
Waltham, MA 02154  
617-890-5850

**Adams-Smith**  
34 Tower St.  
Hudson, MA 01749  
508-562-3801

**ADC Telecommunications, Inc.**  
4900 West 78th St.  
Minneapolis, MN 55435  
612-835-6800

**Adelphon, Inc.**  
P.O. Box 7256  
Fort Worth, TX 76111  
817-335-8666

**ADM Technology, Inc.**  
1626 E. Big Beaver Road  
Troy, MI 48084  
313-524-2100

**Adrienne Electronics Corp.**  
11994 Marjon Drive  
Nevada City, CA 95959  
916-265-8288

**Advance Products Co.**  
P.O. Box 2178  
Wichita, KS 67201  
316-263-4231

**Advanced Designs Corp.**  
P.O. Box 1907  
Bloomington, IN 47402  
812-333-1922

**Advanced Micro-Dynamics, Inc.**  
7 Lomar Drive  
Pepperill, MA 01463  
617-433-8877

**Advanced Video Associates**  
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Redwood City, CA 94063  
415-792-8684

*Michelle Greene*

**ADX Systems, Inc.**  
274 Madison Ave., Suite 1406  
New York, NY 10016  
800-444-4ADX

**AEA, Inc.**  
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Pasadena, CA 91104  
818-798-9127

**AEG Bayly Inc.**  
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416-683-8200

**AEG Olympia AG**  
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D-1000 Berlin, West Germany  
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**A.F. Associates, Inc.**  
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Northvale, NJ 07647  
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*Richard Lunniss*

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33 9031 10 68

**Agfa-Gevaert Inc.**  
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201-440-2500

**Aiphone Intercom Systems**  
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Bellevue, WA 98005  
206-455-0510

**Akai Professional**  
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Fort Worth, TX 76102-3410  
817-336-5114

**AKG Acoustics, Inc.**  
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Stamford, CT 06902  
203-348-2121

**Alamar Electronics USA, Inc.**  
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Campbell, CA 95008  
408-866-9373

**P. Albrecht Elektronik**  
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D-8540 Schwabach, West Germany  
09122-2821

**Alden Electronics, Inc.**  
40 Washington St.  
Westborough, MA 01581  
508-366-8851

**Alexander Batteries**  
P.O. Box 1508  
Mason City, IA 50401  
515-423-8955

**Alias Research Inc.**  
110 Richmond St., E.  
Toronto, Ont., Canada M5C 1P1  
416-362-9181

**Allen & Heath**  
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Orange, CT 06477  
203-795-3594

**Allen Avionics, Inc.**  
224 E. Second St.  
Mineola, NY 11501  
516-248-8080

**John P. Allen**  
**Airspace Consultant**  
P.O. Box 1008  
Fernandina Beach, FL 32034  
904-261-6523

**Allied Film & Video/DC**  
717 Second St. N.E.  
Washington, DC 20002-4307  
202-546-2228

**Allied Film & Video/IL**  
1322 W. Belmont Ave.  
Chicago, IL 60657  
312-348-0373

**Allied Tower Co., Inc.**  
12450 Old Galveston Road  
Webster, TX 77598  
713-486-7691

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

**Alpha Tower Design, Inc.**  
901 Waterfall Way, Suite 203  
Richardson, TX 75080  
214-783-2578

**Alpha Wire Corp.**  
711 Lidgerwood Ave.  
Elizabeth, NJ 07630  
201-925-8000

**Alta Group, Inc.**  
535 Race St.  
San Jose, CA 95126  
408-297-2582

**Altronic Research Inc.**  
P.O. Box 249  
Yellville, AR 72687  
501-449-4093

**Aluma Tower Co. Inc.**  
P.O. Box 2806-BE  
Vero Beach, FL 32961-2806  
407-567-3423

**Amber Electro Design Inc.**  
3391 Griffith St.  
St. Laurent, Que., Canada H4T 1W5  
514-735-4105

**Amco Engineering Co.**  
3801 N. Rose St.  
Schiller Park, IL 60176  
312-671-6670

**Amek/TAC US Operations**  
10815 Burbank Blvd.  
North Hollywood, CA 91601  
818-508-9788

**Amek Systems & Controls**  
Islington Mill, James Street  
Salford, England M3 5HW  
061-834-6747

**American Laser Systems, Inc.**  
751 S. Kellogg Ave.  
Goleta, CA 93117  
805-967-0423

**Amherst Electronic Instruments, Inc.**  
P.O. Box 201  
Haydenville, MA 01039  
413-268-7204

**Amos of Exeter Ltd.**  
Weircliffe Court  
Exwick, Exeter, England  
0392-72132

**Amperex Electronic Corp.**  
**Klystron Div.**  
230 Duffy Ave.  
Hicksville, NY 11802  
516-931-6200

**Amperex Electronic Corp.**  
Providence Pike  
Slatersville, RI 02876  
401-762-3800

**Amplex Corp.**  
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401 Broadway, MS-22-02  
Redwood City, CA 94063  
415-367-3888

*Richard A. Antonia, 415-367-3809*

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CA, San Fernando, (818) 365-8627  
GA, Tucker, (404) 491-7112  
IL, Arlington Heights, (312) 593-6000  
MD, Bethesda, (301) 530-8800  
NJ, Allendale, (201) 825-9600  
TX, Carrollton, (214) 960-1162  
Australia, New South Wales, 02-887-3333  
Canada, Ontario, (416) 821-8840  
England, Berkshire, 0734-875200  
France, Paris, 1-4270-5500  
Germany, Frankfurt, 69-60580  
Hong Kong, Kowloon, 3-678051  
Japan, Tokyo, 03-767-4521  
Spain, Madrid, 1-241-0919

**Amplex Corp.**  
**Marketing, Sales & Service**  
401 Broadway, MS 3-11  
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415-367-4161

*Patrick Burns, 415-367-2959*

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IL, Arlington Heights, (312) 593-6000  
MD, Bethesda, (301) 530-8800  
NJ, Allendale, (201) 825-9600  
NY, New York, (212) 947-8633  
TX, Carrollton, (214) 960-1162  
WA, Kent, (206) 251-8682

**AMR (Audio Media Research)**  
P.O. Box 1230  
Meridian, MS 39301  
601-483-5372

**AMS/Calrec**  
**(AMS Industries Inc.)**  
P.O. Box 31864  
Seattle, WA 98103  
206-633-1956

**AMS/Calrec (AMS Industries Inc.)**  
AMS Industries Park, Billington Road  
Burnley, Lancs, England BB11 5ES  
0282-57011

**Amtel Systems Inc.**  
33 Main St.  
Nashua, NH 03060  
603-880-9011

**AMX Corp.**  
12056 Forestgate Drive  
Dallas, TX 75243  
214-644-3048

**Andrew Corp.**  
10500 West 153rd St.  
Orland Park, IL 60462  
312-349-3300

**Angenieux Corp. of America**  
7700 N. Kendall Drive, Suite 503  
Miami, FL 33156  
305-595-1144

**Eric Neil Angevine, P.E.**  
910 Lakeridge Drive  
Stillwater, OK 74075  
405-372-3949

**R.B. Annis Co., Inc.**  
1101 N. Delaware St.  
Indianapolis, IN 46202  
317-637-9282

**Anritsu America, Inc.**  
15 Thornton Road  
Oakland, NJ 07436  
201-337-1111

**Antenna Technology Corp.**  
1140 E. Greenway St.  
Mesa, AZ 85203  
602-264-7275

**Antennas For Communications, Inc.**  
334 Cypress Road  
Ocala, FL 32672-3198  
904-687-4121

**Anton/Bauer, Inc.**  
1 Controls Drive  
Shelton, CT 06484  
203-929-1100

**Anvil Cases**  
Unit of Zero Halliburton  
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Rosemead, CA 91770  
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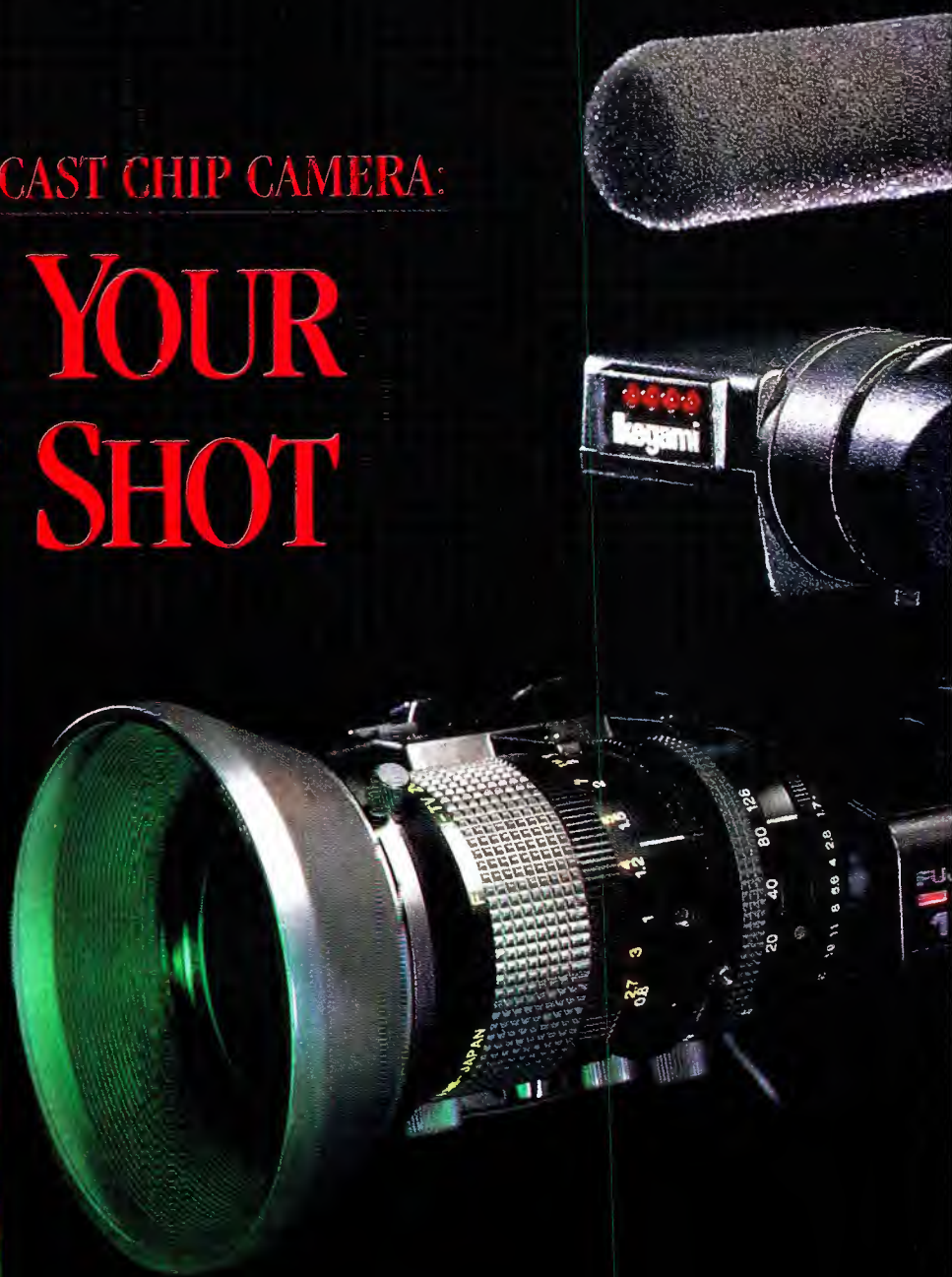
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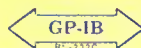
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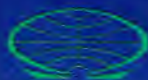
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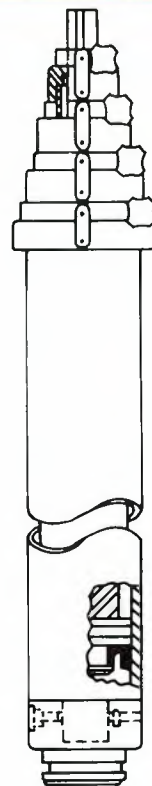
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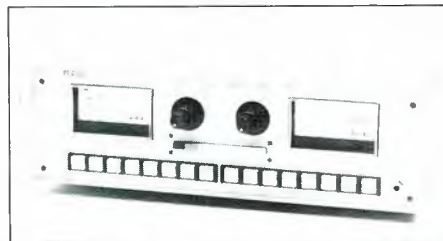
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1163 King Road  
Burlington, Ont., Canada L7R 3X5  
416-681-2450

**Telecommunication Products Corp.**  
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Chamberburg, PA 17201  
717-267-3939

**Telectro Systems Corp.**  
96-18 43rd Ave.  
Corona, NY 11368  
718-651-8900

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

**Teledyne Energy Systems**  
110 W. Timonium Road  
Timonium, MD 21093  
301-252-8220

**Telemet Div.**  
**A Geotel, Co.**  
25 Davids Drive  
Hauppauge, NY 11788  
516-436-7260

**Telemetrics Inc.**  
7 Valley St.  
Hawthorne, NJ 07506  
201-423-0347  
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**Telepak**  
4783 Ruffner St.  
San Diego, CA 92111  
619-268-8559

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

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

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

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

*Dirk Freeman*

**REGIONAL SALES CONTACTS:**  
*TN, Nashville, (615) 824-5845*

**Telex Communications, Inc.**  
9600 Aldrich Ave. S.  
Minneapolis, MN 55420  
612-887-5578

**Telfax Communications**  
P.O. Box 31  
Webster City, IA 50595  
515-832-1263

**Telnox Telecommunication Products Ltd.**  
55 Montpelier Blvd.  
St. Laurent, Que., Canada H4N 2G3  
514-744-1785

**Teltron Inc.**  
2 Riga Lane  
Birdsboro, PA 19508  
800-835-8766

**Tenco Tower Co.**  
9723 Folsom Blvd., Suite A  
Sacramento, CA 95827-1326  
916-638-8833

**Tennaplex Systems Ltd.**  
21 Concourse Gate  
Nepean, Ont., Canada K2E 7S4  
613-226-5870

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

**Tepco Corp.**  
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Rapid City, SD 57709  
605-343-7200

**Texar Inc.**  
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Monroeville, PA 15146-1502  
412-856-4276

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Dallas, TX 75209  
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**TFT Inc.**  
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Santa Clara, CA 95052-8088  
408-727-7272

**Theatre Service & Supply Corp.**  
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Baltimore, MD 21211  
301-467-1225

**Thermodyne International**  
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Long Beach, CA 90810  
213-603-1976

**Thomson Consumer Electronics Inc.**  
**Distributor & Special Products**  
2000 Clements Bridge Road  
Deptford, NJ 08096-2088  
609-853-2356

**Thomson-CSF**  
**Electron Tube Div.**  
550 Mount Pleasant Ave.  
Dover, NJ 07801  
201-328-1400

**Thomson-CSF**  
**Div. Tubes Electroniques**  
38, rue Vauthier, Box 305  
F-92102 Boulogne-Billancourt,  
Cedex, France  
33-1-46048175

**Thomson-LGT**  
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78700 Conflans Ste.  
Honorine, France  
331 34 90 30 26

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**REGIONAL SALES CONTACTS:**  
*MA, Southwick, (413) 569-5939*

**Thomson Video Equipment**  
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France  
34 207072

*A. Fresco*

**REGIONAL SALES CONTACTS:**  
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*Belgium, Bruxelles, 322-648.64.85*  
*England, Datchet, 44 753.681.122*  
*Greece, Athens, 301 672.11.73*  
*Italy, Rome, 396 638.01.43*  
*Spain, Madrid, 341 411.34.93*  
*Sweden, Stockholm, 468 756.73.55*  
*West Germany, Lahr, 49 78.25.10.11*

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5451 Ukiah Circle  
Las Vegas, NV 89118  
702-367-3656

3M Audio Visual Div.  
225-3NE 3M Center  
St. Paul, MN 55144-1000  
800-328-1371

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Torpey Controls & Eng. Ltd.  
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Scarborough, Ont., Canada M1P 3E6  
416-298-7788

Toshiba America  
2441 Michelle Drive  
Tustin, CA 92680

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

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

Tower Design & Fabrication, Inc.  
Route 1, Box 33AA  
Sturgeon, MO 65284  
314-687-3932

Townsend Broadcast Systems Inc.  
79 Mainline Drive  
Westfield, MA 01085  
413-568-9581

Barry R. Huntsinger

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CA, Poway, (619) 748-4834  
IN, Noblesville, (317) 577-8371  
TX, Austin, (512) 836-6011

Townsend Broadcast Studio Systems  
8222 Jamestown Drive  
Austin, TX 78758  
512-836-2016

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

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

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

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

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

Trim Inc.  
400 W. Lake St.  
Libertyville, IL 60048  
312-362-3700

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

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

The Truck-Mobile Audio  
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### Manufacturers' Addresses

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619-457-1000

**Trylon Mfg. Co. Ltd.**

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519-669-5421

**TSM-Total Spectrum Mfg.**

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West Nyack, NY 10994  
914-358-8820

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**TTE, Inc.**

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Los Angeles, CA 90064  
213-478-8224

**Tungstone Batteries Inc.**

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**Tyler Camera Systems**

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Van Nuys, CA 91401  
818-989-4420

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North Hollywood, CA 91605  
818-764-1120

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Fort Collins, CO 80524  
303-493-4488

**ULTIMATE Corp.**

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Reseda, CA 91335  
818-345-5525

*Mary F. Zaller*

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CA, Redwood City, (415) 365-3944  
GA, Atlanta, (404) 875-3753  
IL, Chicago, (312) 299-4206  
IN, Indianapolis, (317) 872-2327  
IA, Des Moines, (515) 282-4800  
KY, Edgewood, (603) 331-8990  
KY, Lexington, (606) 277-4994  
MA, Lynnfield, (617) 245-6618  
MN, Minneapolis, (612) 831-2248  
NM, Albuquerque, (915) 833-2206  
NY, New York, (212) 265-2195  
NC, Charlotte, (704) 399-6336  
OH, Cleveland, (216) 447-9745  
PA, Pittsburgh, (412) 364-6780

**Unex**

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Westford, MA 01886  
508-692-9505

**Union Connector Co., Inc.**

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**Digital Hybrid**



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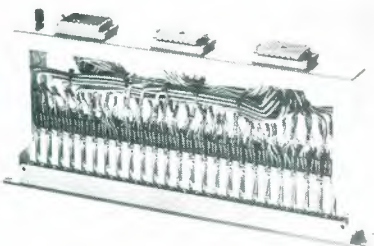
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Sydney, N.S.W., Australia 2011  
02-3315789

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MD, Linthicum, (301) 850-5010  
MA, Burlington, (617) 272-8532

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0223-245115

### VDO-PAK Products

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### Vega, a Mark IV Co.

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KS, Mission, (913) 262-1720  
MD, Rockville, (301) 251-0330  
MI, Detroit, (313) 937-3000  
NJ, Edison, (201) 225-0085  
NY, Yorktown Heights, (914) 245-6452  
OH, Cleveland, (216) 238-1777  
PA, Springfield, (215) 544-5884  
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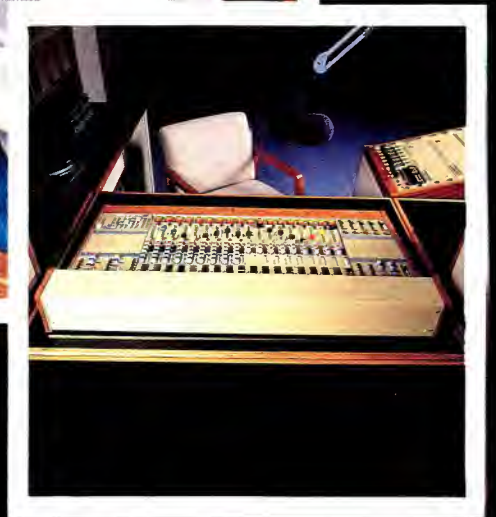
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49 05105 81144

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### Videomedia, Inc.

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Stan Sult

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CA, Woodland Hills, (818) 999-1393  
HI, Honolulu, (808) 955-8841  
MD, Gaithersburg, (301) 948-5266  
MI, Ann Arbor, (313) 761-4506  
MN, Minneapolis, (612) 941-0556  
NY, New York, (212) 265-1760  
PA, Pittsburgh, (412) 364-6780  
UT, Salt Lake City, (801) 521-5606  
VA, Norfolk, (804) 853-2600  
WA, Bellevue, (206) 451-1999  
England, London, 753-681-596

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### Videoquip Research Ltd.

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### Videotek, Inc.

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Peter Choi

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Suffolk, England IP33 3TB  
0284-2121

### Vir James

Consulting Engineers  
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303-937-1900

### Visionics Corp.

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408-745-1551

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335 E. Price St.  
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215-844-2626

### Vizcom

304 San Miguel Ave.  
San Luis Obispo, CA 93401  
805-995-1072

### VMI-Visual Methods Inc.

35 Charles St.  
Westwood, NJ 07675  
201-666-3950

### Voodoo Technology

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

### VTR Associates, Inc.

3023 Holiday Drive S.W.  
Huntsville, AL 35805  
205-533-0571

## W

### Wallach & Associates Inc.

P.O. Box 18167  
Cleveland, OH 44118  
216-575-0765

### Wandel & Goltermann GmbH & Co.

Postfach 1262  
D-7412 Eningen, West Germany  
07121 86-1570

### Ward-Beck Systems Ltd.

841 Progress Ave.  
Scarborough, Ontario, Canada M1H  
2X4  
416-438-6550

Arthur A. Schubert, Jr.

#### REGIONAL SALES CONTACTS:

MA, Danvers, (617) 777-7228  
TX, Dallas, (214) 247-5999

### Watco Inc.

P.O. Box 4507  
Fort Walton Beach, FL 32549  
904-863-2247

### WaveFrame Corp.

4725 Walnut St.  
Boulder, CO 80301  
303-447-1572

### Wavefront Technologies

530 E. Montecito St.  
Santa Barbara, CA 93103  
805-962-8117

### Wegener Communications Inc.

11350 Technology Circle  
Duluth, GA 30136  
404-623-0096

### Weller WTCPS/Cooper Tools

P.O. Box 728  
Apex, NC 27502  
919-781-7200

### Western Electronic Products Co.

915-G Calle Amanecer  
San Clemente, CA 92672  
714-492-4677

### Western Int'l. Communications Ltd.

Aristocart Div.  
17-825 McBride Blvd.  
New Westminster, BC, Canada V3L  
5B5  
604-526-3214

### Westlake Audio

Professional Products Mfg. Group  
2696 Lavery Court, Unit 18  
Newbury Park, CA 91320  
805-499-3686

### Wheatstone Corp.

6720 VIP Parkway  
Syracuse, NY 13211  
315-455-7740

### Wheelit, Inc.

P.O. Box 7350  
Toledo, OH 43615  
800-523-7508

### Brian R. White Co., Inc.

313 Station Road  
Ukiah, CA 95482  
707-462-9795

### White Instruments

P.O. Box 698  
Austin, TX 78767  
512-892-0752

### Whitmor Waveguides

27737 Ave. Hopkins  
Valencia, CA 91355  
805-257-2400

### Wide Band Engineering Co., Inc.

P.O. Box 21652  
Phoenix, AZ 85036  
602-254-1570

### Winsted Corp.

10901 Hampshire Ave. S.  
Minneapolis, MN 55438  
612-944-8556

### Wireworks Corp.

380 Hillside Ave.  
Hillside, NJ 07205  
201-686-7400

### Wohler Technologies, Inc.

1349 Kansas St.  
San Francisco, CA 94107  
415-285-5462

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#### REGIONAL SALES CONTACTS:

CA, San Diego, (619) 268-1100  
CA, San Francisco, (415) 332-7070  
CA, San Francisco, (415) 222-0307  
CA, Albany, (912) 883-2110  
HI, Honolulu, (808) 373-2701

IL, Chicago, (312) 358-3330  
IN, Richmond, (317) 962-8596  
KY, Edgewood, (606) 331-8990  
MA, Boston, (617) 244-6881  
MI, Detroit, (313) 471-0027  
NY, New York, (212) 586-3690  
NC, Winston-Salem, (919) 748-0916  
TX, San Antonio, (512) 496-9581  
Canada, Calgary, Alta, (403) 250-1719  
Canada, Toronto, Ont., (416) 655-3824

### Wold Communications

3415 S. Sepulveda Blvd.  
Los Angeles, CA 90034  
213-313-7950

### World Video Inc.

P.O. Box 117  
Boyetown, PA 19512  
215-754-6700

### WSI Corp.

41 North Road  
Bedford, MA 01730  
617-275-5300

## Y

### Yamaha Music Corp., USA

Pro Audio Div.  
P.O. Box 6600  
Buena Park, CA 90622  
714-522-9011

Bob Shomaker

## Z

### Ziehl Electronic Service

8611 Dale Road  
Gaspport, NY 14067  
716-772-7800

### Zonal Ltd.

Holmethorpe Ave.  
Redhill, Surrey, England RH1 2NX  
0737-767171

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# Dealers/Distributors

## 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
- See advertisement on page 115
- 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.
- Birns & Sawyer, Inc.**, 1026 N. Highland Ave., Hollywood, CA 90038 (213-466-8211) Worldwide, Film Equip.; 16mm & 35mm; Service & Repair; Used Equip.
- Broadcast Cartridge Service**, 15131 Triton Lane, Suite 108, Huntington Beach, CA 92649 (714-898-7224) 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 Collins 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.

**Skyline, Inc.**, 1041 N. Orange Drive, Hollywood, CA 90038 (213-856-0033) CA, Audio Equip.:

## Dealer/distributors

Sound Production Packages; Transfers; Radio  
**Sprague Magnetics, Inc.**, 15720 Stagg St., Van Nuys, CA 91406 (818-994-6602) Worldwide, Replacement Tape Heads; Recorder Care Products; Head Refurbishment Services  
**SSL Industries Inc.**, P.O. Box 3410, Camarillo, CA 93011 (805-482-9884) AZ, CA, CO, NV, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design, Installation & Sales  
**System Associates**, 10375 Jefferson Blvd., Culver City, CA 90232

(213-836-1111) North America, Brokers of Used Broadcast TV Equip.; Video Equip.; Test & Measurement Equip.; Film Equip.; Vans & Accessories  
**Televideo San Diego**, 4783 Ruffner St., San Diego, CA 92111 (619-268-1100) USA, Audio, Video & RF Products; Interactive Systems; Teleconferencing  
**Tenco Tower Co.**, 9723 Folsom Blvd., Suite A, Sacramento, CA 95827-1326 (916-638-8833) AK, AZ, CA, HI, NV, OR, WA, Transmitters, Antennas & Transmission Systems; Service & Repair  
**TVA/Television Associates**, 2410

Charleston Road, Mountain View, CA 94043 (415-967-6040) Northern-CA, Broadcast Professional & Industrial Products; Video Equip. System Design; Video Production & Duplication Facilities  
**U.S. Instrument Rentals**, 2988 Campus Drive, San Mateo, CA 94403 (800-824-2873) USA & Canada, Equip. Leasing, Rental & Sales  
**Videomedia, Inc.**, 211 Weddell Drive, Sunnyvale, CA 94089 408-745-1700 AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY, Editing Systems; Color Cameras; Monitors;

Time Base Correctors; Video Tape Recorders, Projectors & Tape; Time Code, Sync & Character Generators; Lighting; System Design, Fabrication & Training; Still Video Systems; Other TV Products  
**Videotape Products, Inc.**, 320 N. Madison Ave., Los Angeles, CA 90004 (213-664-1144; 800-422-2444) Worldwide, All Formats of video & audio tape. Pro Industrial Video Equip.; Test & Measurement Equip.; Sales & Service  
**Western Broadcast Systems Inc.**, 3350 Scott Blvd., Building 5, Santa Clara, CA 95054 (408-727-9898) AK, CA, HI, NV, OR, WA, Audio & Video Equip.; Test & Measurement Equip.; Tape; Film Equip.; Service & Repair; System Design  
**Whitehouse Audio Visual**, 11511 W. Pico Blvd., Los Angeles, CA 90064 (213-479-8313) AZ, CA, CO, KY, MI, NV, OR, WA, WY, Video Equip.; Test & Measurement Equip.; Film Equip.; Service & Repair; Used Equip.

## COLORADO

**Didier Broadcast Associates**, 9775 W. Cornell Place, Lakewood, CO 80227 (303-987-0256) CO, ID, KS, MT, NE, NM, UT, WY, Audio & Video Equip.; Test & Measurement Equip.; Transmitters, Antennas & Transmission Equip.  
**Film/Video Equipment Service Co.**, 800 S. Jason, Denver, CO 80223 (303-778-8616) AK, AZ, CA, CO, DC, FL, KS, LA, MN, MS, MO, MT, NE, NV, NM, ND, SD, TN, TX, UT, WY, Audio & Video & Film Equip.; Service & Accessories  
**Penstock Rocky Mountain**, 9940 E. Costilla Ave., Suite L, Englewood, CO 80112 (303-792-0777) CO, RF & Microwave Active & Passive Components; Cable Assemblies & Connectors  
**2001 Enterprises, Inc.**, 180 Cook St., Suite 209, Denver, CO 80206 (303-333-4477) AZ, CO, ID, MT, NM, EL Paso-TX, UT, WY, Audio & Video Equip.; Tape

## CONNECTICUT

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

## FLORIDA

**Barbizon Delta Corp.**, 1125 North 53rd Court, West Palm Beach, FL 33407 (407-844-5973) FL, GA, SC, PR, Specialized lighting equip. for stage, studio, television, still & video lighting with complete range of expendable supplies

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**Beattie & Associates, Inc.**, 3317 Barrow Hill Trail, Tallahassee, FL 32312 (904-893-1382) AL, FL, GA, Audio & Video Equip.; Transmitters, Antennas & Transmission Systems; Sales, Service & Installation. Turnkey LPTV Systems; All Solid State FM Transmitters up to 5 KW.

**Beatsik 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 Beau-mont Center Drive, Suite 330, Tampa, FL 33634 (813-887-3141) FL, Audio, Video, Test &

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### GEORGIA

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

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

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

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

**MPCS Video Industries Atlanta**, 2258 Northwest Parkway, Suite E, Marietta, GA 30067 (404-

955-5550) 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

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

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

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

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

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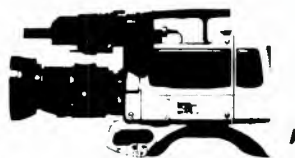
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Omega Pacific, 222 Kaelepulu Drive, Kailua, HI 96734 (808-263-4212) HI, Video Equip.; Transmitters, Antennas & Transmission Systems

## IDAHO

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

## ILLINOIS

Allied Broadcast Equipment, 5215 Old Orchard Road, Suite 970, Skokie, IL 60077 (312-470-0303) IL, IA, MI, MN, MO, NE, ND, SD, WI, Audio Equip.; Test & Measurement Equip.; Transmitters & Antennas; Tape; Service & Repair; System Design

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

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

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

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

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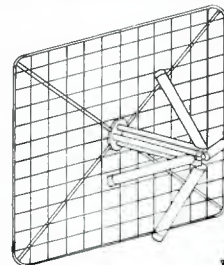


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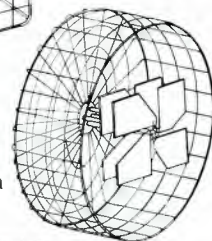
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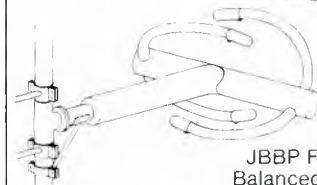
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## Dealer/distributors

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

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**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.

## KENTUCKY

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

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

See Advertisements on page 1 and page 41

## MARYLAND

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

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

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

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

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

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

**Theatre Service & Supply Corp.**, 1792 Union Ave., Baltimore, MD 21211 (301-467-1225) USA, Lighting Equip. for Studio & Location; Studio Curtains & Track Systems; Projection Screens; Dimming Equip. & Electrical Distribution; Motorized & Manual Rigging Equip.

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

## MASSACHUSETTS

**BAF Communications Corp.**, 17 Everberg Road, Woburn, MA 01801 (617-932-3232; 800-633-8223) USA, Audio, Video & RF Equip.; Earth Stations; Microwave Equip.

**Barbizon Light**, 3 Draper St., Woburn, MA 01801 (617-935-3920) CT, DC, FL, GA, ME, MD, MA, NH,

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**Contact East**, 335 Willow St. S., North Andover, MA 01845 (508-682-2000) USA, Precision hand tools, test instruments, tool kits, soldering supplies

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

**Lake Systems Corp.**, 287 Grove St., Newton, MA 02166 (617-244-6881) Worldwide, Turnkey design & construction of broadcast radio & TV stations. Production &

Post Production Facilities; Teleconferencing Systems; Local Area Networks, Conference & Boardrooms  
See advertisement on page 86

**Landy Associates, Inc.**, 330 Bear Hill Road, Waltham, MA 02154 (617-890-6325) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, Audio & Video Equip.; Test & Measurement Equip.; Film Equip.; Tape; Vacuum Tubes; Service & Repair; System Design & Installation; Transmitters, Antennas & Transmission Systems, VTR's  
See advertisement on page 98

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

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

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

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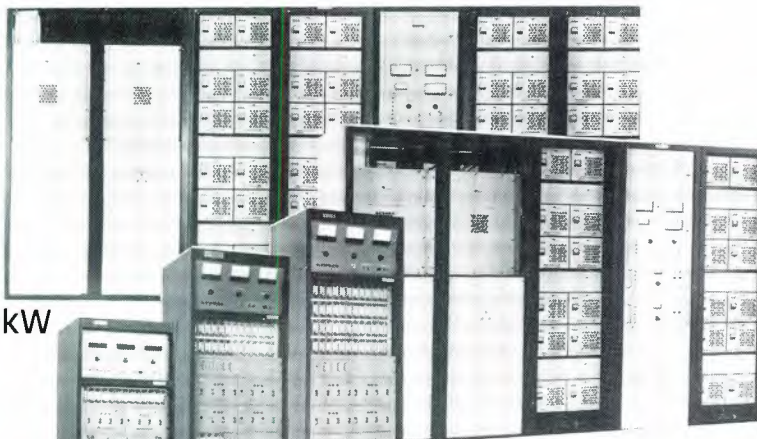


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**Emmons Associates, Inc.**, 1121 Riverwood Drive, Burnsville, MN 55337 (612-890-8920) IA, MN, ND, SD, WI, Audio & Video Equip.; Test & Measurement Equip.; STL Transmission Systems; Service & Repair

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

**Vaughn Communications, Video Midwest/AVC Systems**, 7951 Computer Ave. S., Minneapolis, MN 55435 (612-831-2248) IL, IA, MN, SD; Rental & Duplication Nationwide, Audio & Video Equip.; Test & Measurement Equip.; Video & Audio Tape; Vacuum Tubes; Service & Repair; System Design; Used & Rental Equip.; Duplications

## MISSISSIPPI

**Broadcast Equipment Sales & Engineering Inc.**, P.O. Box 20331, Jackson, MS 39289-1331 (601-857-8573; 85-RADIO) AL, AR, FL, LA, MS, TN, Audio Equip.; Transmitters, Antennas & Transmission Systems; Tape; Service & Repair; System Design

## MISSOURI

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

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

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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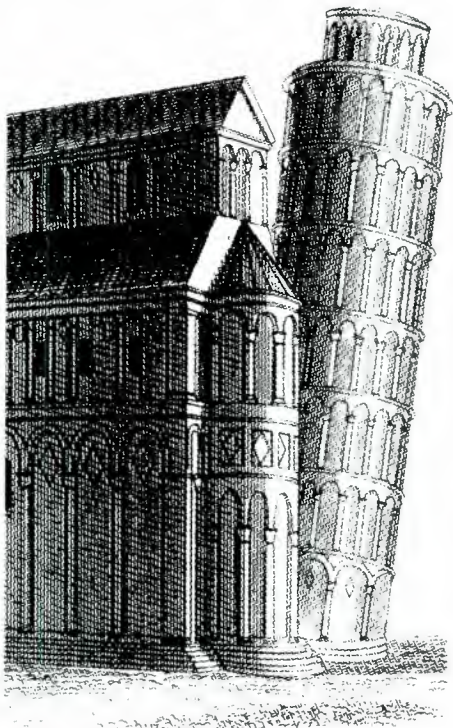
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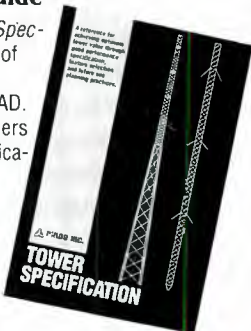


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**Audiotechniques Inc.**, 1619 Broad-

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.

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**Avtech Electronics Inc.**, 22-60 46th

St., Astoria, NY 11105 (718-956-1200; 800-221-1300) Worldwide, Audio & Video Equip.; Tape; Vacuum Tubes

**Barbizon Electric Co., Inc.**, 426 West

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

**Beaveronics, Inc.**, 8 Haven Ave., Port

Washington, NY 11050 (516-883-4414) USA, Video Equip.

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

ahoe, NY 10707 (914-793-3221; Outside NY: 800-522-7377) USA and Canada, Cable and Assemblies; Audio & Video Connectors For Japanese Equip.

See advertisement on page 98

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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

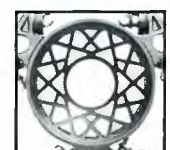
**Martin Audio/Video Corp.**, 423 West 55th St., New York, NY 10019 (212-541-5900) CT, DE, DC,




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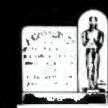


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**Miller Associates Ltd., L. Matthew,** 48 West 21st St., 11th Floor, New York, NY 10010 (212-741-8011; 800-221-9328) USA, PR, Audio & Video Equip.; Test & Measurement Equip.; Tape; Service & Repair; System Design; Rental; Used Equip.

**MPCS Video Industries, Inc.,** MPCS Video Center Building, 514 West 57th St., New York, NY 10019 (212-586-3690) USA, Full service distributor of industrial &

broadcast video equip. Rental; Production, post-production & duplication. System Design & Installation. Specializers in network, call letter, cable stations, corporations, educational, legal & medical institutions

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

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

Vacuum Tubes; RF Amplifiers & Transistors; Vacuum Capacitors; SCR'S

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

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

**Temtron Electronics Ltd.,** 15 Main

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

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

## NORTH CAROLINA

**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

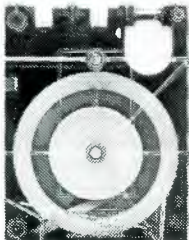
## OHIO

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

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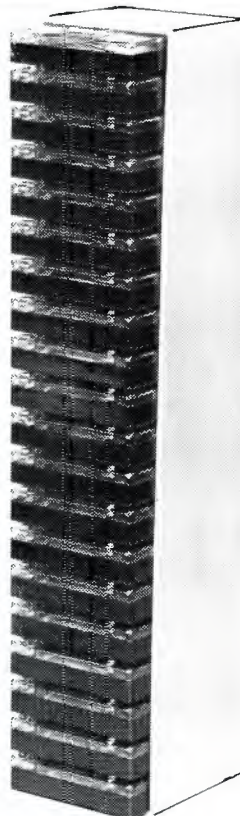
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**Frontier Communications Corp.**, P.O.  
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(503-246-8080) AK, AZ, CA, CO,  
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WA, WY, Audio Equip.; Transmit-  
ters, Antennas & Transmission  
Systems; Service & Repair; Sys-  
tems Design

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

## PENNSYLVANIA

**Alpha Video & Electronics Co.**, 200  
Keystone Drive, Carnegie, PA  
15106 (412-429-2000) MD,  
NY, OH, PA, WV, Audio & Video  
Equip.; Test & Measurement  
Equip.; Transmitters; Tape; Vans &  
Accessories; Service & Repair;  
System Design

**Audio Associates**, 814 W. Broad St.,  
Bethlehem, PA 18018 (215-  
865-6013) USA, Audio Equip.;  
Test & Measuring Equip.; Trans-  
mitters, Antennas & Transmission  
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**Comwave, Div. of Communication  
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474-6751) USA, Antennas; Di-  
plexers & Other RF Products

**Jerry Conn Associates, Inc.**, P.O. Box  
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223-8200) DE, MD, NJ, PA, Au-  
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  
Ave., Hatboro, PA 19040  
(215-443-0700) AL, CT, DE,  
DC, FL, GA, IL, IN, IA, KS, KY, LA,  
ME, MD, MA, MI, MN, MS, MO, NE,  
NH, NJ, NY, NC, ND, OH, OK, PA,  
PR, RI, SC, SD, TN, TX, VT, VA,  
WV, WI, Audio & Video Tape; Re-  
processed Tape all formats; Cus-  
tom Loaded 1/2" Video Cassettes  
& Audio; Reloaded 3/4" Cassettes  
**Milanese Associates Inc.**, 2344 Pe-  
rot St., Philadelphia, PA 19130  
(215-763-2138) CT, DE, DC, IL,  
IN, IA, KY, ME, MD, MA, MI, MN,  
MO, NH, NJ, NY, OH, VA, WV, WI,

Video Equip.

**Northeast Broadcast Lab, Inc.**,  
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tenna equip.; Audio, Test &  
Measurement Equip.; Transmitters,  
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**Peirce-Phelps, Inc.**, 2000 North  
59th St., Philadelphia, PA 19131  
(215-879-7171) USA, GU, PR,  
VI, Audio & Video Equip.; Tape;  
Vans & Accessories; Service & Re-

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

**Radio Systems Inc.**, 5113 W. Chester Pike, Edgemont, PA 19028

(215-356-4700) USA, Audio Equip.; Tape; Transmitters, Antennas & Transmission Systems; System Design; Service & Repair; Turnkey Installation; Studio Furniture; SCA Receivers; Digital Audio Tape Recorder/Players

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

**Steinberg Electronics Inc.**, 2520-22 N. Broad St., Philadelphia, PA

19132 (215-223-9400; 800-523-0894; PA Only-800-245-3105) Worldwide, Audio & Video Equip.; Tape; Vacuum Tubes  
**Tape World**, 220 Spring St., Butler, PA 16001 (800-245-6000; 412-283-8621) OH, PA, WV, Tape and Audio Cassettes

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

**Val-Tronics, Inc.**, 89 E. Vaughn St., Kingston, PA 18704 (717-287-5580) USA, Cart Machines; Consoles; Transmitters; Audio Carts; Tape Recorders & Turnta-

bles; Microphones; Optimods; Antennas; Transmission Lines; Cabinets; Phono Cartridges; Replacement Heads; Amplifiers; Dummy Loads

## SOUTH CAROLINA

**Distribution Services, Inc.**, 2122 Platt Springs Road, Suite B, West Columbia, SC 29169 (803-796-8840) AL, FL, GA, LA, NC, SC, TN, VA, OEM Parts for Sony & Hitachi

## 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.

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

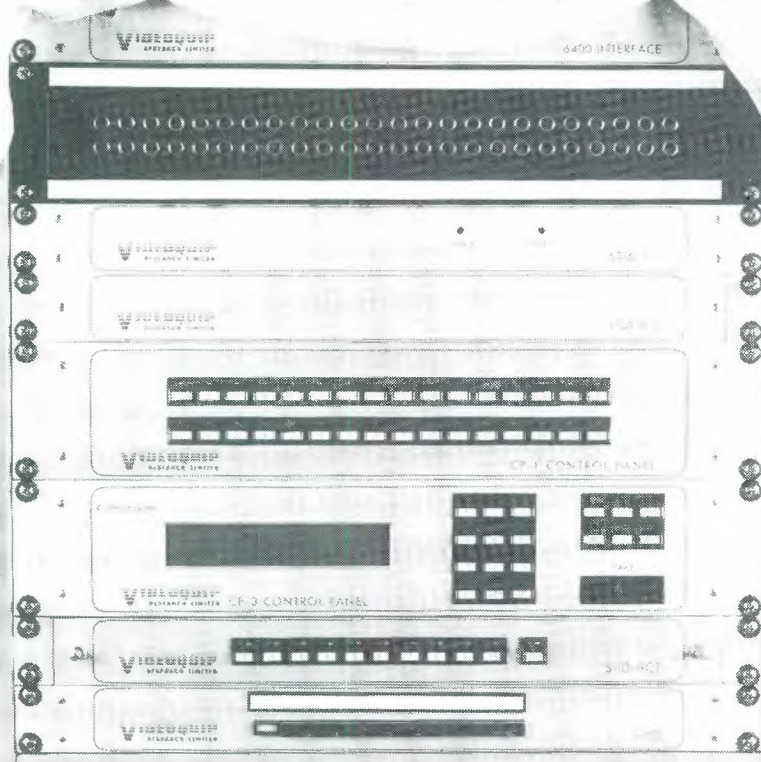
**G.P. Enterprises, Inc.**, P.O. Box 912, Arlington, TX 76004-0912 (817-572-0132; 478-0050) AL, AZ, AR, CO, FL, GA, IA, KS, LA, MN, MS, MO, MT, NE, NM, NC, ND, OK, SC, SD, TN, TX, WI, WY, A/V, Test & Measurement, Film & Used Equip.; Monitors; Audio Lip Sync & Time Compression-/Expansion; 3D Graphics/Animation;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

**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.

## WISCONSIN

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

## UTAH

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

## VIRGINIA

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

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

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

**Broadcast Services Co.**, P.O. Box 309, Front Royal, VA 22630 (703-635-1413; 919-934-6869) DC, MD, NC, PA, SC, VA, WV, Full line of Broadcast Audio & Radio RF Equip.; Cellular Phones & Systems

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

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

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Circle (70) on Reply Card





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# Video equipment specs

## Color Television Cameras

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

Manufacturer	Amplex AVSD				BTS Broadcast TV Systems
	Model Series	CVC3A (30)	CVC 5 w/CVR-505	CVC-7†	
Application	ENG, EFP	ENG, EFP	ENG, EFP	ENG, EFP	ENG, EFP
Pickup devices	MF SAT (DG PbO)	CCD 510x492 pix NTSC	3-IT CCD	3-FIT CCD	LOC PbO
Optical format	3/4"	3/8" 500x582 pix P/S	3/8" spatial offset	3/8"	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", 1/8"	1/16", 1/8"	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 Betacom 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)
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	3/8"	3/8"	1", 1 1/4" (3/4")	3/8"
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, field, OB	Studio, OB	ENG	ENG, EFP	ENG, EFP
Pickup devices	LOC DG PbO	3 mixed-field tubes	3 mixed-field tubes	3-CCD 574Hx499V-pixel	MS SAT (DG-LOC PbO)	MS DG SAT or PbO
Optical format	1" f/1.5 (3/4" HS PbO)	3/8"	3/8"	3/8" w/bias	3/8" w/bias	3/8" w/bias
Sensitivity 89.9%R	630 (800) lux f/2.8	1000 lux	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	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	600 TVL	800 (660) TVL	700 SAT (650 PbO)
Registration Z1, Z2, Z3	μP corrected	0.04%	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	56dB NTSC, 53dB PAL	60dB N, 57dB P (57dB N)	59dB N, 56dB P
ND filters	3-position optic	3 ND + Effects	1/8" ND	1/8" ND	Internal 1/8" ND	6.3, 25, 100% int
Color correction	3 optic, electronic	4 position	3 filters	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)	NTSC, PAL (NTSC, PAL-B)
Output signal forms	Encoded, RGB	RGB, RGB/sync	Composite, RGB	Composite	Composite, RGB, YIQ, YUV	Composite, RGB, YIQ, YUV
CCU required or option	CCU suggested	Required	ROU available	ROU available	CCU-97(D)/CCU-110(D) opt	Multiple
μP control	Yes	Yes, lens correction	Yes	Yes	Yes	Multiple
Setup memories	Multifunction	Color balance	B/W balance	B/W balance	Color balance	Color balance, lens

Manufacturer	BTS Broadcast TV Systems			Hitachi Denshi	
	Model Series	KCM-125 (KCM-318)	KCH-1000 <sup>1</sup>	FP-C1 (FP-C2)	Z31A (Z31SX)
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

<sup>1</sup>Software selection allows programming for operation of the camera within the parameters of all proposed HDTV systems to date.

Manufacturer	Hitachi Denshi			Ikegami Electronics	
	Model Series	SK-970D (SK-971D)	SK-110D	HL-55†	HL-79E (HL-791)
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	Yes	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	HR SAT IV H4299	Studio	ENG	Studio, OB, ENG, EFP
Pickup devices	CCD 485Vx670H pixels	HR SAT IV H4299	HR SAT IV H4299	PB0 or SAT	CCD (649x491 pixel)	DG PbO
Optical format	1/2"	3/4"	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	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	10fc 6dB
Resolution or % mod	580 TVL	>750 TVL	700 center Saticon	480 TVL	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%, fixed	0.05%, 0.1%, 0.2%
S/N ratio	58dB	58dB N, 56dB P	57dB N	≥53dB	≥53dB	59dB 4.2MHz (60dB)
ND filters	1/8 ND	12.5%	NDB (12.5%)	12.5%	12.5%	4 (3) internal
Color correction	4-position optic	3 position optic	3 position optic	3-position filter	3-position filter	4 (3) pos optic
Color standards	NTSC	NTSC, PAL	NTSC	NTSC	NTSC	NTSC
Output signal forms	Composite, S-VHS, other	Composite, RGB at CCU	RGB, composite	Composite	Composite	Composite, RGB
CCU required or option	Digital RCU available	CCU-735	Yes	No	No	Yes (Opt)
μP control	Yes	Single	Single	....	....	Multiple
Setup memories	Color	B/W bal, centering	Color balance	Color balance	Color balance	Color bal, lens
Auto centering	Fixed	Yes	Yes	Fixed by CCD	Fixed by CCD	Yes
Auto registration	Fixed	No	Yes	Fixed by CCD	Fixed by CCD	Yes
Auto cable compensation	....	No, switchable	Yes	....	....	Yes
Computer setup system	No	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	Coax	Triax, multi, fbr op
Portable unit	Yes	Yes	No	Yes	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	57.2 lbs -1" (15.4 lbs)
Docking VCR	Available	No	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	HDTV	ENG, EFP, studio	ENG, EFP, studio	ENG, EFP, studio
Pickup devices	PbO ACT, LOC, DG	MS HR PbO	MS HR PbO	HR EM SAT	HR EM SAT	SM PbO
Optical format	30mm std (25mm opt)	1 1/4"	1 1/4"	3/4"	3/4"	3/4"
Sensitivity 89.9%R	1200 lux f/4	2000 lux f/5.6	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	1125 TVL HDTV	600 TVL	750 TVL	650 TVL
Registration Z1, Z2, Z3	0.05% overall	0.03% center, 0.045%	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	47dB Y-channel 27MH bw	54dB	58dB	57dB
ND filters	6-position	3-position	3-position	3-position	25%	25%
Color correction	6-pos electronic	4-position optic	4-position optic	3-position optic	3 position optic	3 position optic
Color standards	NTSC	2:1 interlace, 16:9	2:1 interlace, 16:9	NTSC	NTSC	NTSC
Output signal forms	RGB, composite	Y/Cw/Cn, RGB	Y/Cw/Cn, RGB	Composite	Composite	Composite
CCU required or option	Yes	Yes	Yes	RS-110U opt	FS-500U opt	RS-500U, RS-T900U opts
μP control	Multiple	Multiple, distributed	Multiple, distributed	Yes	....	No
Setup memories	Lens, correction files	Lens, level correction	Lens, level correction	Color balance	Color balance	Color balance
Auto centering	Yes	Yes	Yes	Yes	Yes	Yes
Auto registration	Yes	Yes	Yes	Auto-shift	Auto-shift	Auto-shift
Auto cable compensation	Yes	Yes	Yes	No	No	No
Computer setup system	From CCU	Yes	Yes	No	No	No

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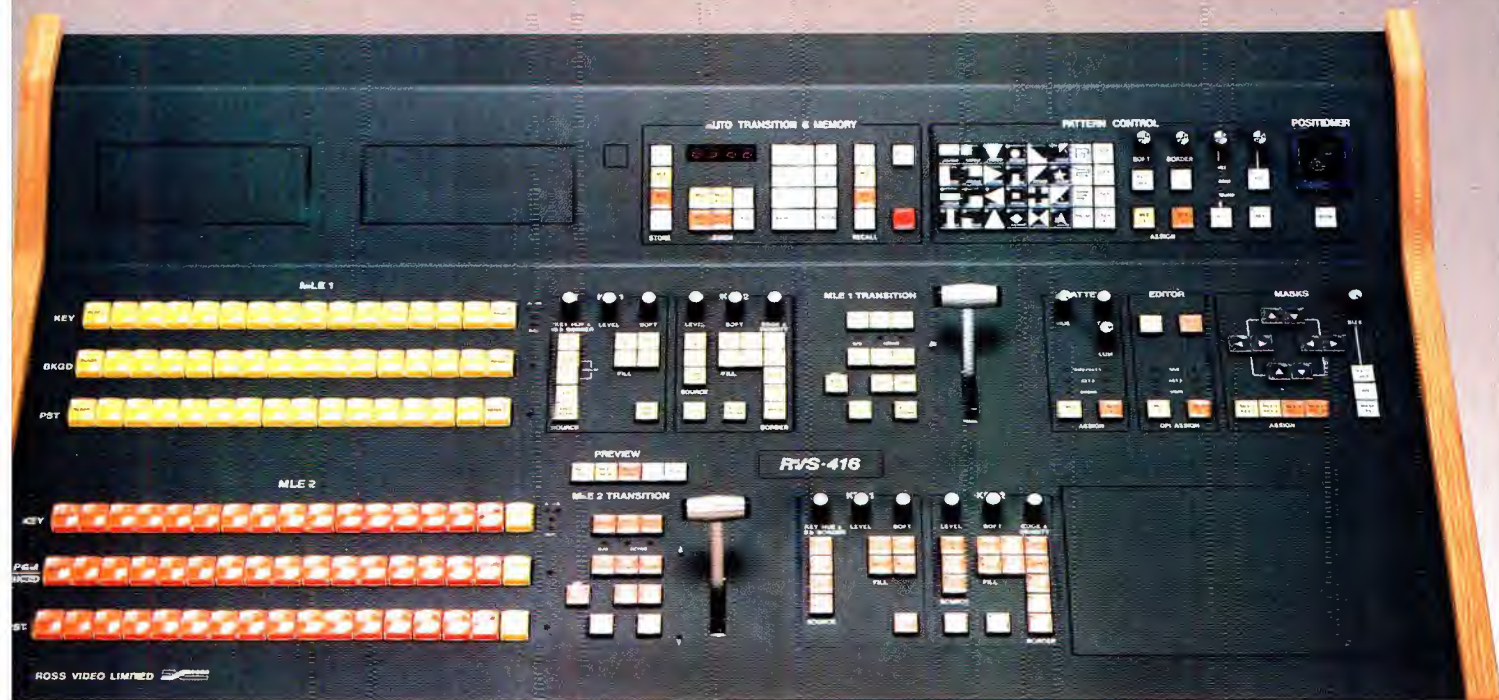
Manufacturer	Ikegami Electronics			JVC Company	
<b>Model Series</b>	<b>HK-322</b>	<b>EC-1125 HiVision</b>	<b>BY-110U</b>	<b>KY-210BU</b>	<b>KY-320U</b>
Diagnostic display	At CCU, printer	Yes	No	In viewfinder	In viewfinder
Cable types	TV24(81), triax	28-core	14-core, triax	Multicore, coax, triax	Multicore, 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
<b>Reader Service Number</b>	<b>526</b>	<b>527</b>	<b>528</b>	<b>529</b>	<b>530</b>

Manufacturer	JVC Company		NEC America		Panasonic Broadcast
<b>Model Series</b>	<b>KY-75 (KY-80)</b>	<b>KY-950BU (900BU)</b>	<b>SP-3A(SP-30)†</b>	<b>EP-3†</b>	<b>AK-400 CCD†</b>
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	3/4" f/1.4	3/4"	3/4" 2-G, 1-R/B	3/4" 2-G, 1-R/B	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
μP control	Of setup	Single	.....	.....	Single
Setup memories	Yes	Yes	Color balance	Color balance	B/W bal
Auto centering	Yes	Yes	Fixed	Fixed	Fixed
Auto registration	Yes	No	Fixed	Fixed	Fixed
Auto cable compensation	.....	No	Option	w/RCU-3EP	.....
Computer setup system	Yes	No	None	.....	No
Diagnostic display	In Viewfinder	In Viewfinder	.....	Viewfinder	In viewfinder
Cable types	Various	Multicore, triax	Triax, multi (26,41)	Triax, 41-core	Multicore, coax, triax
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight	10 lbs	10 lbs	7.3 lbs w/VF	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
<b>Reader Service Number</b>	<b>531</b>	<b>532</b>	<b>533</b>	<b>534</b>	<b>535</b>

Manufacturer	Panasonic Industrial			Sharp Electronics	
<b>Model Series</b>	<b>AG-450 (AG-400P)†</b>	<b>WV-D5000†</b>	<b>WV-300CLE (-200CLE)†</b>	<b>XC-B20P (XC-B10)</b>	<b>XC-A1</b>
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	3/4"	3/4"	3/4"	3/4"	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 (43cB)	46dB	60dB (59dB)	57dB	57dB
ND filters	Internal	Internal	Internal	+12%	+12% internal
Color correction	Electronic	Optic (4-pos)	4-position	3 position optic	3 position optic
Color standards	NTSC	NTSC	NTSC	NTSC	NTSC
Output signal forms	S-VHS Y/C	Composite	Y/C S-VHS, composite	Encoded, RGB, Y/R-Y/B-Y	Composite, RGB
CCU required or option	None	WV-CR12 option	WV-RC36 option	XC-B10RP, XC-B10TRX	XC-A1RP, XC-A1TCP
μP control	.....	Single	Single	Yes	Yes
Setup memories	Color balance	Color balance	Color balance	Color balance	Color balance, clock
Auto centering	Fixed	Fixed	Fixed	Yes	Yes
Auto registration	Fixed, auto focus	Fixed	Fixed	Auto knee, contrast	No
Auto cable compensation	No	No	.....	No	No
Computer setup system	No	No	No	No	No
Diagnostic display	Viewfinder	In VF	Viewfinder	Viewfinder	Viewfinder
Cable types	.....	Multicore, BNC, VCR	Multicore, VTR	300m triax opt	Multicore, VCR
Portable unit	Yes	Yes	Yes	Yes	Yes
Camera head weight	5.8 lbs (6.6 lbs)	7.6 lbs	11.9 lbs	9.2 lbs	9.8 lbs
Docking VCR	Integral S-VHS	No	M-II w/WV-VT10 adapter	Betacam/M-II adapters	No
<b>Reader Service Number</b>	<b>536</b>	<b>537</b>	<b>538</b>	<b>539</b>	<b>540</b>

†Includes digital image mixing effects capability.

Manufacturer	Sony Broadcast				
<b>Model Series</b>	<b>BVP-3A (BVP-30)</b>	<b>BVP-5/5P<sup>1</sup> (BVP-7†)</b>	<b>BVP-150, -150P</b>	<b>BVP-330A</b>	<b>BVP-350 (BVP-360)</b>
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	3/4"	3/4"	3/4"	3/4"	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 (11c)
Resolution or % mod	650 TVL	550 TVL <sup>2</sup> (700 <sup>3</sup> )	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	Internal optic	Internal	2 position internal
Color correction	Optic, electronic	4 optic	Optic	Optic, electronic	4 pos optic (& elect)
Color standards	NTSC, PAL/M, SECAM	NTSC	NTSC, PAL	NTSC, PAL	NTSC (& PAL)
Output signal forms	Composite, YCrCb	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Encoded, Y/R-Y/B-Y	Composite (& RGB/YCrCb)
CCU required or option	CCU-300 option	Options	CCU-M3 suggested	CCU-300 suggested	CCU-360 triax opt(360H)
μP control	Single	Yes	Yes	Yes	Single
Setup memories	Color, black, center	Balance, filters	Color, black, center	Color, black, center	Color balance (& lens)
Auto centering	Yes	Fixed	Yes	Yes	Yes
Auto registration	No	Fixed	Nos	No	Yes
Auto cable compensation	No	No	No	No	Yes
Computer setup system	No	No	No	No	w/CCU-360 (in head/CCU)
Diagnostic display	No	.....(Viewfinder)	In viewfinder	No	Viewfinder (& CCU)
Cable types	Multicore, coax, triax	Coax (multicore)	Multicore	Multicore, coax, triax	Triax, multi (& coax)
Portable unit	Yes	Yes	Yes	Yes	Yes (No)
Camera head weight	10.1 lbs	19.5 lbs operational	9.2 lbs	11.9 lbs	<13.5 lbs (50 lbs w/VF)



## 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 <sup>1</sup> (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

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

Manufacturer	Sony Broadcast			Thomson Video Equipment	
Model Series	BVP-3000 SuperMotion	HDC-100	TTV 1530 (1532)	TTV 1525C (1525PC <sup>3</sup> )	TTV 1640
Application	EFP, slow motion	HDTV, 1125/60 only	Studio, OB	Studio, EFP	ENG, EFP
Pickup devices	MS PbO or MS SAT	Mix-field SAT	LOC DG PbO	3 LOC DG PbO	3-IL CCD
Optical format	2/3"	1"	2/3"	1"	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 optic	Int optic	Internal	Internal w/effects	Internal
Color correction	Int optic	Int optic	Optic	Electronic	Electronic
Color standards	NTSC & 90fr/s	HDTV	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Output signal forms	....	RGB, Y/Cw/Cn	Composite, RGB	Composite, RGB	RGB, adapters
CCU required or option	Required <sup>1</sup>	Required <sup>2</sup>	TTV-1530/1532	Yes	w/CA-83 adapter opt
μP control	Yes	Distributed	182-point setup	Yes	Ops. status
Setup memories	....	Color, black, gamma	Color, centering	Lens, color, register	2 b/w bal per color set
Auto centering	Yes	Yes	Yes	Yes	Fixed
Auto registration	Yes	Yes	Yes	Yes	Fixed
Auto cable compensation	Yes	Yes	Yes	Yes	....
Computer setup system	In CCU	in CCU	External unit opt	Multiple	Opt
Diagnostic display	....	No	Yes	Viewfinder	Status, VF
Cable types	Multicore, fiber optic	Multicore, fiber optic	Multicore, triax	Multicore, coax, triax	Triax w/CA83 adapter
Portable unit	Yes	No	No	(1525 PC only)	Yes
Camera head weight	12 lbs	22 lbs	62 lbs	87 lb	7.7 lbs
Docking VCR	No	No	No	No	Betacam adapter
Reader Service Number	546	547	548	549	550

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

Manufacturer	Thomson Video	Toshiba
Model Series	TTV 1624	SC 821†
Application	ENG, EFP	ENG
Pickup devices	LOC PbO	3-FIT CCD
Optical format	2/3"	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	1/8, 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
μP control	Distributed	Single
Setup memories	Color, centering	Color
Auto centering	Yes	Yes
Auto registration	Option	Fixed
Auto cable compensation	No	....
Computer setup system	From CCU, ext unit	Auto setup
Diagnostic display	Viewfinder	Viewfinder
Cable types	Multicore, coax, triax	Various w/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

PC programs and technical info applicable to Radio & TV

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John Hoffman  
Forum Administrator  
73705.1036

## TV Camera Zoom Lenses

The following sections include zoom lens systems suitable for broadcast and professional television cameras of 1/2", 2/3", 1" and 1 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 μP design. The applicability of any lens system specifically for CCD cameras should be discussed with the manufacturers before units are purchased for CCD-design applications.

### TV Camera Zoom Lenses, 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/1.9-f/3	f/1.4-3
MOD distance	23.6"/0.6m	31"/0.8	0" on front glass	31.5"/0.8m
MOD image area HxV	80x60mm	61x46mm (52x39mm)	55x41.5mm @ 8.2"/2.5m	53x40mm
Horiz angle wide-tele	54°-1.3°	58°-4.5° (52-4)	49.75°-1.33°	53°-4°, 27°-2.2°
Back focus distance	....	Adjustable	Manual, electronic	35.5mm
Clear apertures f-r	....	....	....	70.5mm, 30.5mm
Integral extenders	1.6, 2.5	2, WA	2.1 std, 1.45 opt	2
Macro focus feature	....	Yes	....	Yes
Maintenance access	Remove cover	Screwdriver adjust	Remove cover	Screwdriver adjusts
Assembly weight	....	4.2 lbs (3.3 lbs)	43 lbs	3.95 lbs/1.8 kg
Reader Service Number	553	554	555	556

## TV Camera Zoom Lenses, 2/3"

Manufacturer	Angenieux				Canon
Model	14x6 (14x7)	15x9 (15x9.5)	20x8.5††	40x9.5††	J13x9BIE-II (IRS-IIA)
Application	ENG/EFP w/CCD	ENG/EFP	Studio/OB	EFP/sports	ENG
Zoom range (basic)	6-84mm (7-98mm)	9-135mm (9.5-143mm)	8.5-170mm	9.5-380mm	9-117mm
Aperture wide-tele	f/1.4-1.6	f/1.5-1.9 (f/1.8-2.6)	f/1.3	f/1.3-2.1	f/1.6-1.9 (3.2-3.8)
MOD distance	31"/0.8m	31"/0.8m (24"/0.6m)	0" front of glass	0" (at front glass)	29.1"/0.8m
MOD image area HxV	61x46mm (52x39)	43x36mm (1.42x1.02")	121.9x91.7mm (28x21)	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)	....	....	....
Integral extenders	2, WAC41	2, 0.76, WA²	1.2, 1.4, 1.6³	2.1 std, 1.45 opt	2x available
Macro focus feature	To front of glass	....	No	....	Yes
Maintenance access	Screwdriver adjust	Screwdriver adjust	Remove cover	Remove cover	Cover removal
Assembly weight	4.2 lbs (3.1 lbs)	4.7 lbs (5.5 lbs)	39 lbs	43 lbs	3.2 lbs (2.84 lbs)
Reader Service Number	557	558	559	560	561

†Tele attachment & retrozoom available.

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

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†	A15x8ESM†
Application	EFP	EFP	ENG, EFP	Studio (EFP)	Studio
Zoom range (basic)	8.5-145mm	8-144mm (7-140mm)	12.5-275mm	9.5-420mm	8-120mm
Aperture wide-tele	f/1.2-1.4 (f/1.7-2.3)	f/1.5-1.9 (1.4-1.6)	f/2, f/2.8	f/1.2-2.1¹	f/1.5-1.7
MOD distance	0.75m (0.9m)	0.7m (0.75)	1.8m	2.5m (2.2m)	0.7m
MOD image area HxV	59x44mm (49x37mm)	51x38mm (58x44mm)	54x41mm	50x37mm (42x32)	61x46mm
Horiz angle wide-tele	54°44'x3°29'(x3°17')	57°37'x3°30' (64°18'x3°36')	38°47'x1°50'	49°42'x1°12'	57°37'-4°12'
Back focus distance	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Clear apertures f-r	....	....	....	....	....
Integral extenders	1.5, 2 (2)	2	2	2	2
Macro focus feature	....(Yes)	....(Yes)	Yes	....	....
Maintenance access	Remove cover (screw adj)	Remove cover	Screw adjust	Remove cover	Remove cover
Assembly weight	44 lbs (3.4 lbs)	28.6 lbs (33 lbs)	8 lbs	55 lbs (32 lbs)	28.6 lbs
Reader Service Number	567	568	569	570	571

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

Manufacturer	Schneider Optics	Schwem Technology	Tamron Industries		
Model	TV66	TV80	Gyrozoom 60/300 (FP-1)	466H (H14x9B1)	Model 47HD
Application	EFP	Studio, OB	ENG/EFP/OB¹	ENG	CCTV
Zoom range (basic)	8.8-130mm	8.5-150	60-300mm	9-126	8-16mm
Aperture wide-tele	f/1.4-3.4	f/1.4-4	f/6.2 (range to f/32)	1.6-1.9	1.6
MOD distance	17.7"/0.45m	27.5"/0.7m	10"/3.048m	39.37"/1m	39.37"/1m
MOD image area HxV	43x32mm	53x40mm	....	....	....
Horiz angle wide-tele	56°-4°, 28°-2°	55.5°-3.4°, 27.7°-1.7°	8.38-1.62°	52°6'-4°	57.62°-30.75°
Back focus distance	43.6mm	42.4mm	Adjustable	38.98mm	10.85mm
Clear apertures f-r	134mm, 35.8mm	133mm, 33mm	....	76.5mm, 24.8mm	26mm, 9.4mm
Integral extenders	2	....	....	No	....
Macro focus feature	....	....	....	Yes	No
Maintenance access	Remove covers	Remove covers	....	Screwdriver adjusts	Screwdriver adjusts
Assembly weight	41.8 lbs, 19 kg	33 lbs, 15 kg	7.25 lbs	3.33	0.21 lbs
Reader Service Number	577	578	579	580	581

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/EFP	ENG/EFP	ENG/EFP	EFP/sports	EFP/sports	OB, studio
Zoom range (basic)	7-98mm	8-112mm	9-126mm	14-560mm	9.5-380mm	11-200mm
Aperture wide-tele	f/1.6-2	f/1.6-2	f/1.6-2	f/1.9-3	f/1.3-2.1	f/1.6-2
MOD distance	31"/0.8m	31"/0.8m	31"/0.8m	0" (on front glass)	0" (on front glass)	23.6"/0.6m
MOD image area HxV	72x54mm	61x46mm	52x39mm	55x41.5mm @ 8.2'	55x41.5mm @ 8.2'	49x37mm
Horiz angle wide-tele	64°-5°	58°-4.5°	52°-4°	49.75°-1.33°	49.75°-1.33°	60.4°-3.7°
Back focus distance	Adjustable	Adjustable	Adjustable	Manual, electronic	Manual, electronic	62.79mm
Clear apertures f-r	.....	.....	.....	.....	.....	185.2mm, 42.4mm
Integral extenders	2, WA	2	2, WA <sup>1</sup>	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

<sup>1</sup>Also retrozoom and tele attachments.

Manufacturer	Canon	Fujinon			Schneider Optics
Model	PV40x13.5BIE	R17x12.5ESM†	R20x10.5ESM†	R44x13.5ESM†	TV64†
Application	OB, studio	BCTV, studio	BCTV, studio	BCTV	Studio, OB
Zoom range (basic)	13.5-540mm	12.5-215mm	10.5-210mm	13.5-600mm	13-190mm
Aperture wide-tele	f/1.7-2.8	f/1.7-2.8	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, 1 1/4"

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

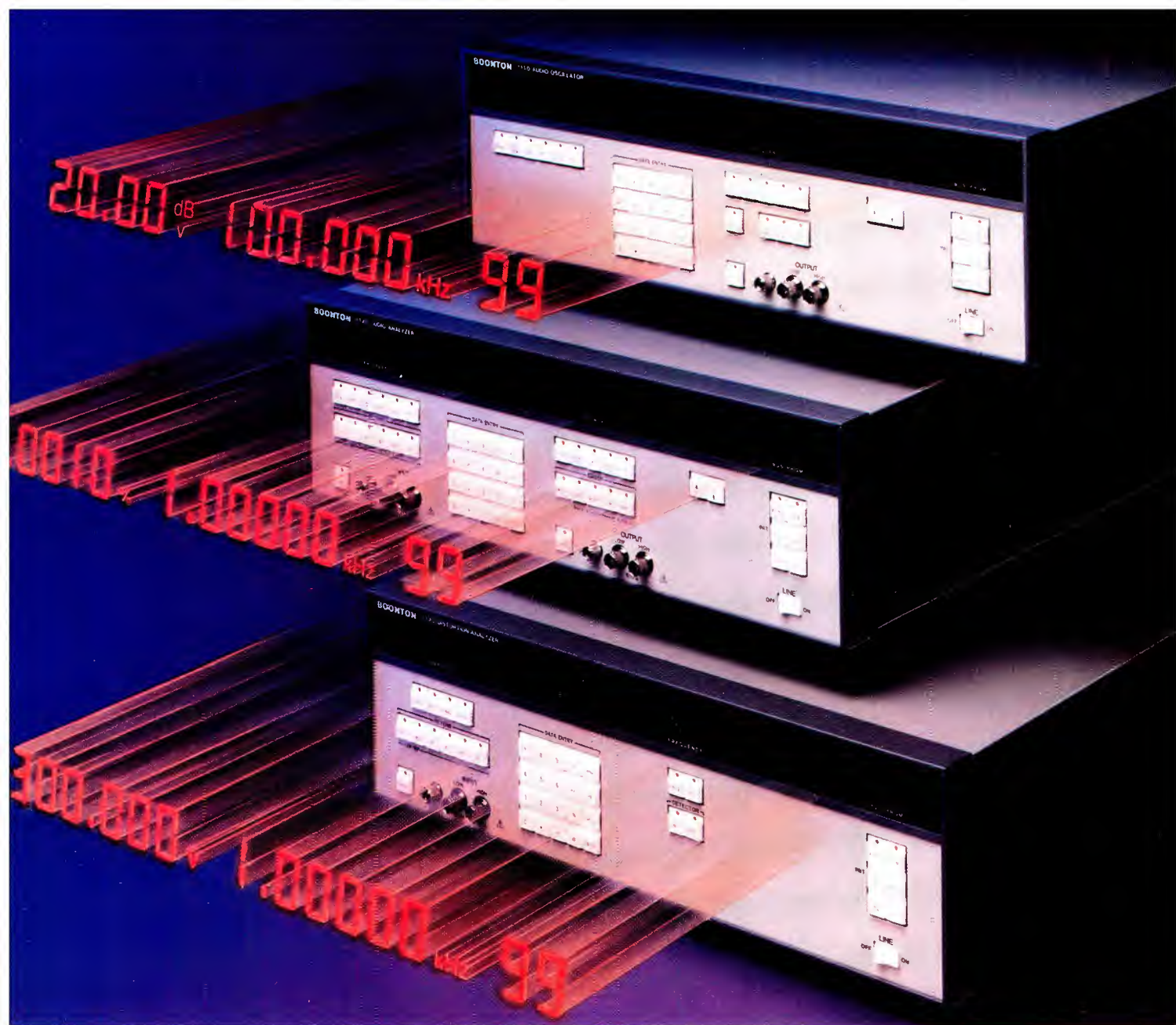
Manufacturer	Fujinon	Schneider Optics
Model Series	P44x18ESM†	TV65†
Application	EFP, OB	Studio, OB
Zoom range (basic)	18-800mm	16.5-240mm
Aperture wide-tele	f/2.4-4	f/2.2-6.4
MOD distance	2.5m	15.7"/0.4m
MOD image area HxV	50x37mm	45.3x34mm
Horiz angle wide-tele	50.75°x1.21°	54°-4.2°, 29°-2.1°
Back focus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

## Color Video Monitors

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

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





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Circle (76) on Reply Card

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Manufacturer	ASACA/ShibaSoku			Barco Industries	
Model/Series	CM23A (CM43A) [CM44A]	•CM22A6 (CM65A)	CMM11 series	CMM7 series	CVS series <sup>1†</sup>
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

<sup>1</sup>Color analyzer available as optional equipment.

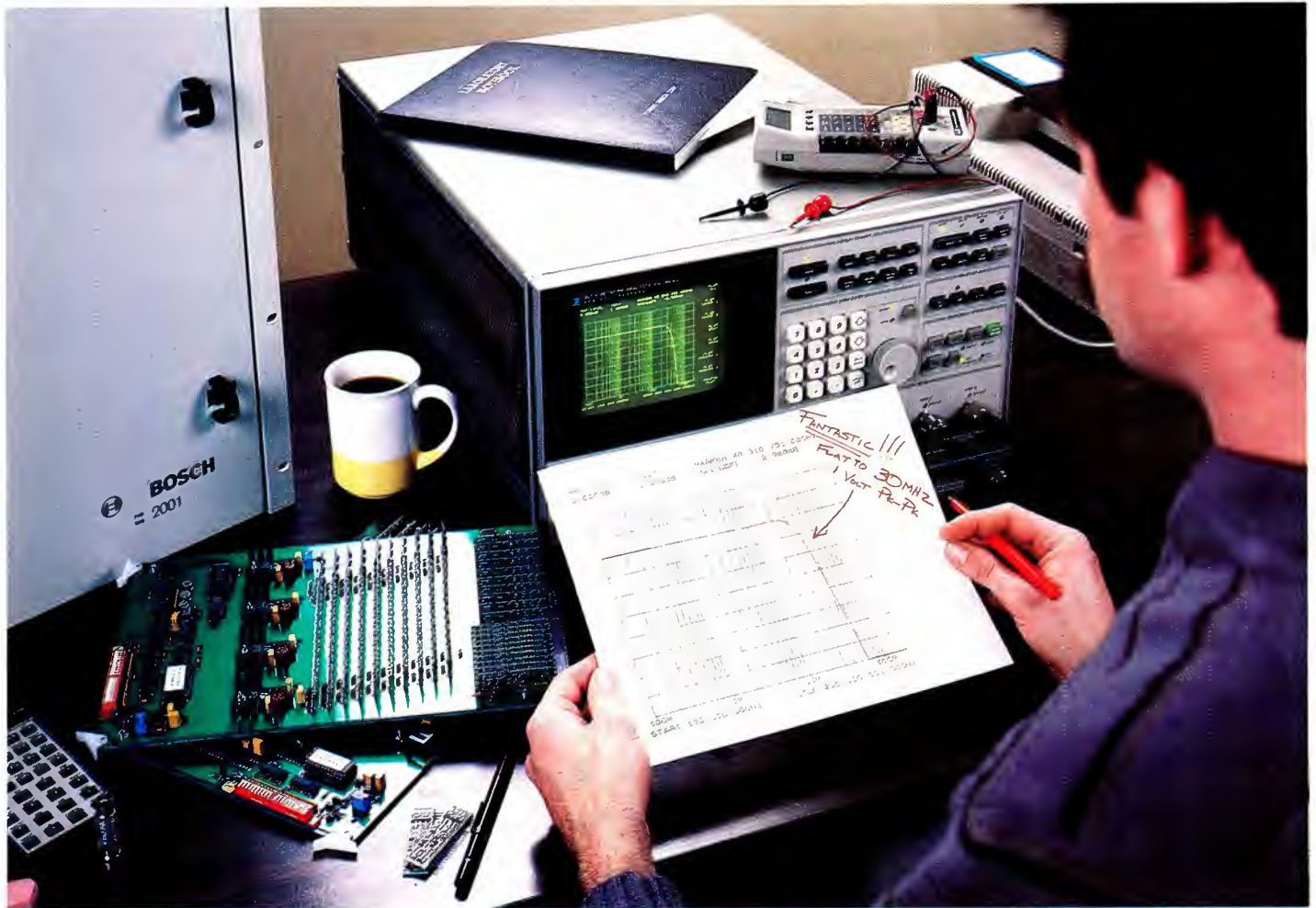
Manufacturer	Barco Industries		Brabury <sup>1</sup>	BTS Broadcast TV Systems
Model/Series	CTVM 4 series	CM22 (CM33, CM51) <sup>✓</sup>	•HDTV series‡	MCM37B (MCM series)
Application	Master control	Master, utility	...	Utility
CRT diagonal (Inches)	14 (20, 26)	9 (14, 19)	20, 26, 30, 40	14 (9, 20)
Preferred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

<sup>1</sup>Available in US through Grunder & Associates. Units provide split screen presentation of inputs 1 & 2.

Manufacturer	BTS Broadcast TV Systems Conrac		Croma Research	Digivision	Electrohome
Model/Series	MC37BA (51, 22)	6545 w/6550 Micromatch‡	CM137 (CM142, 151)	BCV37 (BCV51)	•ECM 1900 series‡
Application	Master control	Master control	Master control	Utility	Graphics (CGA/EGA/PGA)
CRT diagonal (Inches)	14 (20, 9)	13 (19)	14 (16, 20)	14 (20)	19
Preferred CRT type	Delta or inline dot	Inline dot	Inline, self-converged	Delta-dot	High resolution
Dot/Strip 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	± 1MHz	± 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
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/strip pitch	0.4mm	0.47mm or 0.43mm	0.49mm horiz slot	0.31mm (0.43) [0.28]	0.31mm (0.43)
Beam feedback design	...	...	No	No	Yes
Resolution at center	9MHz equivalent	Equiv 8MHz	>240 lines center	700 TVL [600 TVL]	800 TVL
Luminance bandwidth	-3dB to ≥10MHz	± 1dB 8MHz RGB mode	-3, +1dB to 4MHz	-3, +1dB to 8MHz	-3, +1dB, 60Hz-10MHz
Chrominance bandwidth	± 1.1MHz	± 1.1MHz PAL/PAL-D	-3, +1dB, 3.58 ± 0.5MHz	± 0.5dB 0.3(0.6)MHz	± 0.5dB, I-0.6, Q-0.3
Aperture correction	...	...	Yes	-15, +6dB	-15, +6dB
Chrominance decoder	Notch filter	Notch filter	Notch	Comb, notch filters	Comb filter
Demodulation axes	U, V	U-V	R-Y, B-Y	I/Q [R-Y, B-Y]	I/Q
X-Y display output	...	No	No	R-Y, B-Y (No)	Yes
NTSC matrix test	No	No	No	No	Yes
Blue gun only test	No	No	Yes	Yes [No]	Yes
Underscan	No	Yes	...	90%	90%
Available standards	PAL-D std (PAL opt)	PAL, PAL-D, RGB	NTSC	NTSC, RGB	NTSC
Multistandard unit	No	No	No	No	No
Composite inputs	A, B, C PAL encoded	A, B, C	A, B	A, B, C [A, B]	Yes
Component inputs	RGB	YCbCr, RGB	No	RGB, YCbCr [RGB]	RGB, other
VCR input output	No	No	No	No	No
Reader Service Number	626	627	628	629	630

# 2001 is here, now!



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

## Wide band switchers for any size system.

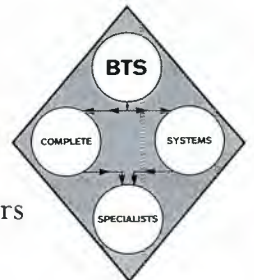
The new Bosch TVS/TAS-2001 Video/Audio Routing Switcher demonstrates a video bandwidth of more than 30 MHz — measured with a **full-amplitude** (1 V P-P) sine wave or video signal.

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Circle (77) on Reply Card

www.americanradiohistory.com

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/CrCb 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‡✓²	BT-M1310Y (BT-D1910Y)
Application	Utility (Master)	Master, graphics	Studio	Utility, computer	Utility
CRT diagonal (Inches)	19 (14)	16 (20)	14, 9, 20, 22 (26)	35	13, (19)
Preferred CRT type	In-line slot (dot)	IL gun, Dot matrix	IL gun, Dot matrix	Multi-step focus/stripe	In-line, dot
Dot/stripe pitch	0.68mm (0.47)	0.31mm (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	...	...	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	PM 5625 G/L/M
Application	Utility	Utility (& data)	S-VHS monitor	Utility, master	GP/utility
CRT diagonal (Inches)	10 (7, 13, 19)	10, 13 (14)	13, 20, 25	9, 14, 10	14
Preferred CRT type	In-line	In-line (dot)	...	PIL, stripe	In-line
Dot/stripe pitch	...	... (0.49mm)	Medium res	0.31mm & 0.43	0.65mm
Beam feedback design	No	No	No	No	No
Resolution at center	300 TVL	300, 280 (370 or 580-dot)	420, 450	<450, <600	0.65mm equivalent
Luminance bandwidth	To 4.2MHz	To 4.2MHz	To 3.9MHz	± 0.5dB 50Hz-5MHz	-3dB 5MHz
Chrominance bandwidth	To 1.5MHz	To 1.2MHz	To 1.5MHz	...	To color subcarrier
Aperture correction	No	On 1301, 1400	No	No	No
Chrominance decoder	Notch, comb filter	Comb, notch	...	Comb, notch filters	Notch filter
Demodulation axes	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y	I/Q	R-Y, B-Y
X-Y display output	No	No	No	No	A-B Split-screen
NTSC matrix test	No	No	No	No	No
Blue gun only test	Yes	No	No	No	No
Underscan	Yes	No	...	Yes	Yes
Available standards	NTSC	NTSC, (RGB, RGB/TTL)	NTSC, S-VHS	NTSC, PAL	P, S, N
Multistandard unit	No	No	...	...	PAL/SECAM opt
Composite inputs	Line 1/VCR (Line 2)	Yes	A, B VCR	NTSC or PAL	A, B
Component inputs	No	(RGB)	Y/C from VCR	RGB,	RGB
VCR input output	Yes	8-pin	8-pin	No	No
Reader Service Number	641	642	643	644	645

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	BVM1910/2010P†
Application	Utility	Master, graphics	Utility	Master control	Master control
CRT diagonal (Inches)	9	13	8	12	19
Preferred CRT type	In-line stripe	In-line dot	Trinitron	Trinitron	Trinitron
Dot/stripe pitch	0.47mm	0.31mm	0.25mm	0.25mm	0.30mm
Beam feedback design	Yes	Yes	No	No	Yes
Resolution at center	310 TVL	600 TVL	400 TVL	600 TVL	900 TVL
Luminance bandwidth	To 5MHz	7MHz	-3dB at 4MHz	8	10

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Circle 73 on Reply Card

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 filter	(Comb, notch)	...	Comb filter
Demodulation axes	UV or R-Y/B-Y	R-Y, B-Y	R-Y, B-Y	U-V	U-V
X-Y display output	Yes	No	No	No	No
NTSC matrix test	Yes	No	No	No	No
Blue gun only test	Yes	Yes	Yes	No	Option
Underscan	To 20%	90%	90%	Yes	Option
Available standards	N, P, S	NTSC only	NTSC	PAL, NTSC	N3.58/4.43, P, S
Multistandard unit	Switch selected	No	No	No	Option
Composite inputs	Yes	Yes	A, B, C	A, B	A, B
Component inputs	RGB	No	No	RGB	RGB
VCR input output	No	8-conductor	No	No	No
Reader Service Number	651	652	653	654	655

## Digital Video Effects Systems

Manufacturer	Abekas Video Systems		Alta Group		Ampex AVSD
Model Series	A52	A53-D	Centaurus	Pyxis <sup>5</sup>	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 <sup>4</sup>	Yes	No
TBC functions	No	No	Dual TBC, frame sync	Dual TBC, frame sync	No
Remote control port	Switcher, editor <sup>1</sup>	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 <sup>3</sup>	...	...	Page turn, cylinder <sup>6</sup>
Image freeze	Fld/frm/storyboard <sup>2</sup>	Fld, frm, strobe	Fld, frm, update	Frm, fld each TBC	Fld, frm, trail, update
Picture splits	Yes	...	H, V, 4-way	Yes	...
Mirror effects	...	...	...	No	...
Push-on/push-off	Yes	Yes	Yes	No	Yes
Posterization	8 levels Y & C	8 levels, Y & C	Yes	Yes	Inf level w/false colors
Mosaic tiling	Variable	...	...	No	Infinte tile sizes
Programmable sequences	Yes	Yes	No	Yes	Yes
Reader Service Number	758	759	760	761	762

<sup>1</sup>Also 4 GPI in, 1GPI out and diagnostic test patterns.

<sup>2</sup>Multiple frames of 4, 9, 16 per screen.

<sup>3</sup>Warp option & diagnostic test patterns.

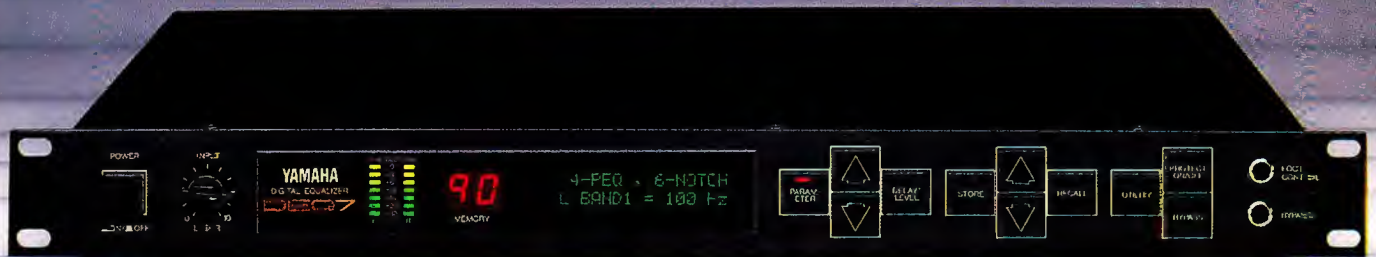
<sup>4</sup>Integral still-store with removable disk, S-VHS output.

<sup>5</sup>Includes audio control and mixing.

<sup>6</sup>Also rotating cube, 3D, geometrics.

Manufacturer	CEL (Grunder Associates)		Convergence	DSC/Digital Services	
Model Series	EFX-2 <sup>1</sup>	MS-101 <sup>1</sup>	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 <sup>1</sup>	MS-101 <sup>1</sup>	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
<b>Reader Service Number</b>	<b>763</b>	<b>764</b>	<b>765</b>	<b>766</b>	<b>767</b>

<sup>1</sup>Systems provide component or composite input; component output is optional.

Manufacturer	DSC/Digital Services	For-A	Fougerolle Video	GML Grove	
Model Series	SX-2000D <sup>1</sup>	MF-2000 Multiflex (-DC)	MPV 4000 (PAL/SECAM)	X-Calibre (X-Calibre II)	Proteus
No. of output channels	Pgm, Pwv	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 <sup>2</sup>	Multiple VCRs <sup>2</sup>
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	Variable aspect ratio	No
Image freeze	Fld, frm, strobe	w/multifreeze	Field, frame	Fld, frm, strobe	Fld, frm, update, 2-pic
Picture splits	Yes	Yes, w/keys	H & V	Yes, quad repeats	H, V 4-quadrants
Mirror effects	H, V, diagonal	....	H & V	H, V, w/re-enter	H, V
Push-on/push-off	Yes	Yes	Trajectory paths	Yes	Yes
Posterization	2 levels w/false color	Yes	Yes	Yes, colorize	10 level w/false color
Mosaic tiling	10 levels	Yes	Yes	Yes	7 tile sizes
Programmable sequences	Yes	Multiple	Yes	Yes (w/Keyframe traj.)	Yes
<b>Reader Service Number</b>	<b>768</b>	<b>769</b>	<b>770</b>	<b>771</b>	<b>772</b>

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

<sup>2</sup>Variable tracking is supported by integral TBC facilities.

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

<sup>1</sup>Composite, component inputs and outputs; Signature analysis diagnostics.

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





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FM Transmitter

300J  
FM Transmitter

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Manufacturer	Pinnacle	Quantel	QuesTech	Thomson Video
<b>Model Series</b>	<b>System 2010</b>	<b>DVM8000 Mirage</b>	<b>DPE5800 Encore</b>	<b>TTV 5305</b>
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	Y, Z	X, Y, Z	X, Y, Z	X, Y, Z
Perspective effects	Page turn/3D/geo/V/cube	Page turn/3D/H-V <sup>1</sup>	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
<b>Reader Service Number</b>	<b>778</b>	<b>779</b>	<b>780</b>	<b>781</b>

<sup>1</sup>Also geometrics, cylinder, cube.

## Editing Controllers

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

Manufacturer	Adams-Smith	AEG AG	Albrecht Elektronik	Alpha Audio
<b>Model Series</b>	<b>2600 A-V (CC✓)†</b>	<b>Mosaic-A</b>	<b>ESP-M series</b>	<b>The Boss 8400✓</b>
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	....	....	No
Microprocessor	Multiple 8-/16-bit	Distributed 1P	Multiple 8-bit	Multiple 8-bit
Internal storage	> 1,000 (100)	....	Multiple event	999-event
Ext storage type	Disk (None)	....	Paper tape	Floppy disk
Edit decision list	Yes (no)	Yes	Yes	Yes, ADL
Edit data display	LED displays	Luminescent panel	LED displays	CRT, printout
Printer interface	RS-232C	Yes	TTY	RS-232 Centronics
Animation mode	No	....	....	No
Time code reader	Yes (No)	Intelligent interfaces	Interface option	External
Time code generator	Yes (Yes)	....	In interface	External
Time code types	SMPTE, EBU	SMPTE longitudinal	EBU, LTC/VITC	SMPTE, EBU
Color framing use	NTSC, PAL (None)	Yes	PAL	No color framing
Device interfaces	Switcher, title, Effects & (mixer)	Distr intelligence	Switcher, mixer, Effects	No color framing to 48-track control
Control bus	RS-232/422, ESBUS	Serial data 4-wire	Coaxial serial	....
<b>Reader Service Number</b>	<b>838</b>	<b>839</b>	<b>840</b>	<b>842</b>

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

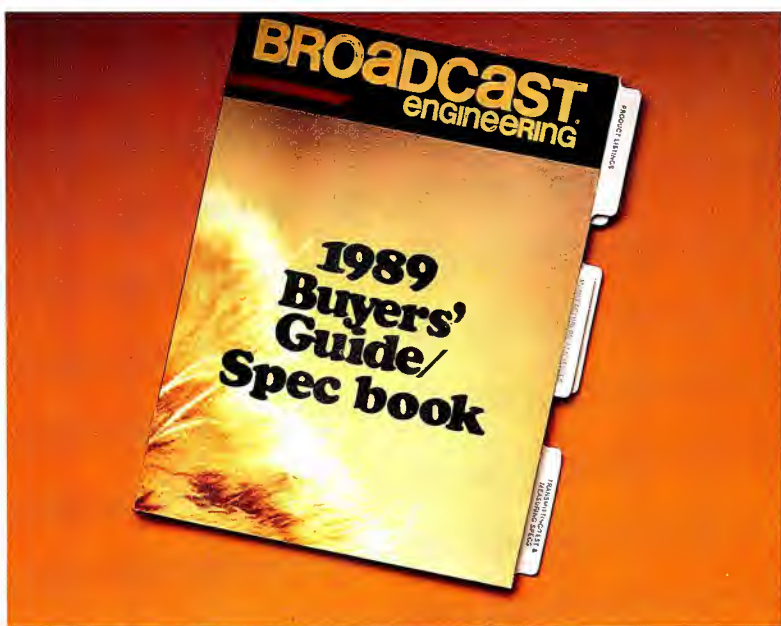
<sup>2</sup>System allows multiple non-interacting work stations.

<sup>3</sup>Deck selection from a pool of 32 units for multiple, non-interacting work stations.

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

<sup>1</sup>Integral 7-source audio mixer and video switcher for composite or component signals.

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



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1989 BG/SB *Broadcast Engineering* 131

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

<sup>1</sup>Integral 5-in video, 6-in audio switching.

Manufacturer		Comprehensive Video		Editron		ECCO/Convergence	
Model Series	EditMaster <sup>1</sup> ‡	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) ....(No)	2R/4P (1R/6P)	1R, 1-2P	9, no function		
Videodisc interface	....	....(No)	Yes	No	No		
Microprocessor	MS-DOS, 256kB	Distributed 8-bit	Distributed 8-bit	Centralized 8-bit	Distributed 16-bit		
Internal storage	900-event	999 (99)	999	Single	750		
Ext storage type	Floppy disk	FD/PT	8" disk-based	F.disk, p.tape, PC	F.disk, p.tape, PC		
Edit decision list	Yes	Yes	Yes	Yes	Yes		
Edit data display	PC system CRT	CRT, LCD (LED)	RGB, B-W, EL screen	CRT	CRT		
Printer interface	via PC	RS-232	Possible	RS-232	RS-232		
Animation mode	Automation function	No	No	Yes	No		
Time code reader	Yes	Yes	In interfaces	Yes	Yes		
Time code generator	....	Yes	....	No	Option		
Time code types	LTC, ctl trk	LTC	LTC	LTC, ctl-trk	LTC, ctl-trk		
Color framing use	Yes	NTSC, PAL	NTSC, PAL	NTSC	NTSC		
Device interfaces	Various	16-channel GPI	To 250 possible	....	Switcher		
Control bus	RS-232 data	RS-422, ESbus,	RS-422, ESbus,	RS-422/232, GPI	RS-422/232, GPI		
Reader Service Number	858	859	860	861	862		

Manufacturer		ECCO/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, ctl-trk	LTC, ctl-trk	LTC, ctl-trk	SMPTE	LTC, VITC			
Color framing use	Yes	Yes (No)	NTSC	NTSC	NTSC, PAL			
Device interfaces	Switcher, mixer	Switcher, mixer (....)	Switcher, GPI, mixer	Parallel switcher	CV-100, AMX-170, GPI Dubner titler			
Control bus	RS-422, GPI	RS-422, GPI	RS-422/232, GPI	RS-422	RS-422			
Reader Service Number	863	864	865	866	867			

<sup>1</sup>The -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 <sup>1</sup>				
Suggested for	On, off-line	On, off-line	On, off-line	On, off-line	On-line, off-line				
VTRs ATRs record/play	22 ports total	7 + 2 aux source	1R, 1P, 2P opt (1)	1 record, 2 play	1R, 1P				
Videodisc interface	Option	Option	No	No	Possible				
Microprocessor	DEC LSI 11/73 CPU	LSI-11/73 CPU	Centralized 8-bit	Centralized 8-bit	Proprietary				
Internal storage	9,999 event, 4MByte	9,999 events/500kByte	Single event	20 event	Frame, scene numbers				
Ext storage type	3.5/8" floppy, H.disk	3.5", 8" floppy option	No	F-disk, P-tape	....				
Edit decision list	BINS multi-EDL	Yes	No	Yes	....				
Edit data display	CRT, color, mono	CRT color or mono	LED display	CRT	LEDs, super on CRT				
Printer interface	RS-232	RS-232	No	RS-232C	....				
Animation mode	Yes, film modes	Yes	No	Yes	Yes				
Time code reader	Yes	Yes	No	Yes	w/VTR				
Time code generator	No	No	No	....	....				
Time code types	LTC, VITC, mixed	LTC, VITC, mixed	Control track	SMPTE, EBU, ctl-trk	LTC, VITC				
Color framing use	NTSC, PAL	NTSC, PAL	525/60, 625/50	NTSC, PAL	NTSC, PAL				
Device interfaces	Switcher, effects, Stills, title, mixer	Video/audio switchers, GPI, titler	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				

# THE Tx4 — A SUPER TBC BUT NOT ONLY FOR SUPER VHS



The Microtime Tx4 Component TBC will maximize your performance not only with Super VHS but also with other VTR formats. A complete range of digital effects will be at your fingertips when you add the optional TBC Effects Control. The full frame memory lets you operate with or without advanced sync to the VTR and frame and field freeze are standard. Features include:

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- Super VHS, composite and component outputs
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Two types of remote control are available. The TBC Remote provides presets, freeze, and sync generator controls. The TBC Effects Control adds effects that include:

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- Mosaics
- Quarter size image with joystick positioning
- Variable strobe rate
- Horizontal and vertical and corner wipes
- Horizontal and vertical and corner pulls
- 4 Transition speeds
- Composite keyer with background input

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contact Microtime.

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Circle (86) on Reply Card

www.americanradiohistory.com

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

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

<sup>1</sup>BKE option is component or composite video switcher with effects; edit accuracy is  $\pm 1$  frame in Ctl-Trk mode, machine dependent; capabilities include control of machines with variable tracking (DT).

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

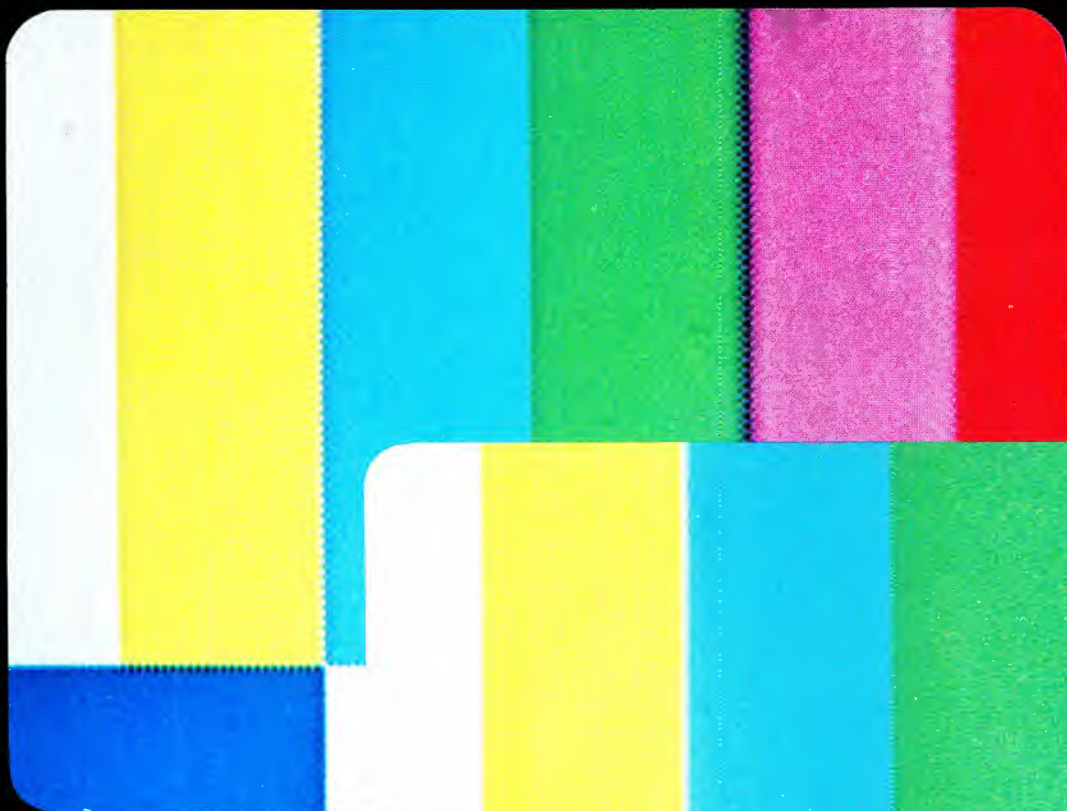
<sup>1</sup>COMM-ETTE A/B roll, Mini-COMM 2-6 roll, Commander II, 2-8 roll.

<sup>2</sup>MT30 AB roll; MT60 2-6 roll; MT90 2-9 roll.

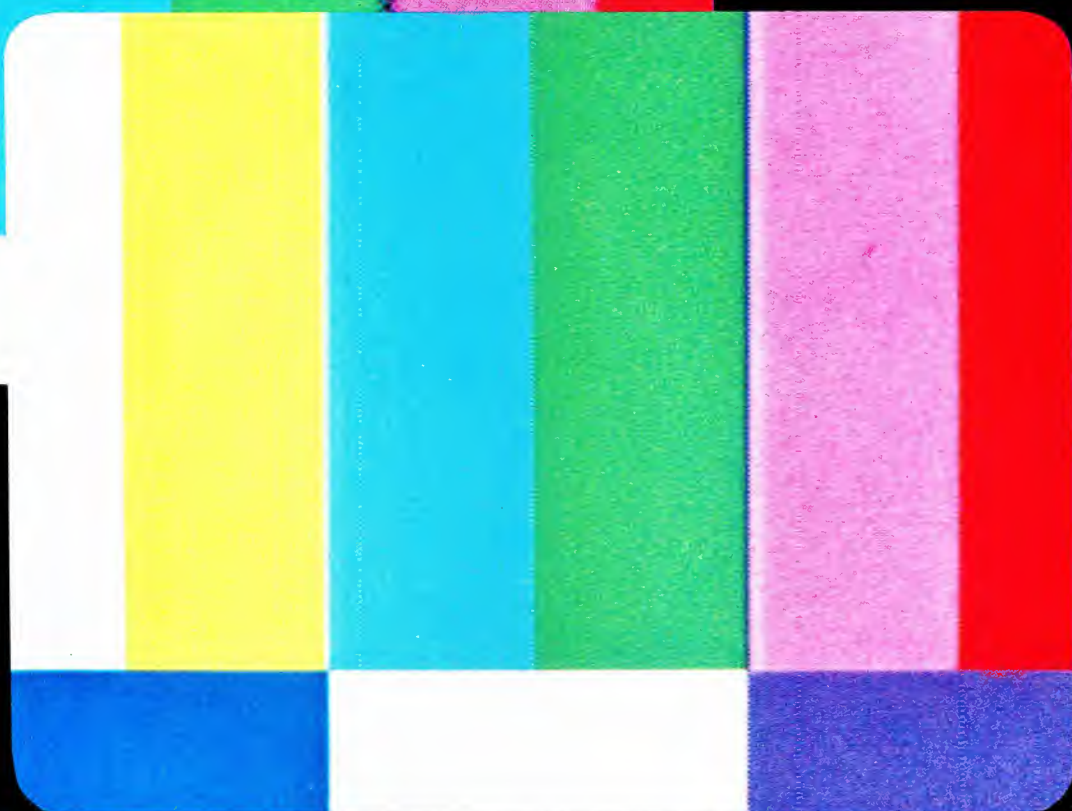
## Graphic Production Titlers

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

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



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Manufacturer	Abebas Video Systems	Ampex	Aston Electronics	BTS Broadcast TV Systems
Model/Series	A72	ALEX	Aston 4	Viditext II <sup>1</sup>
On-line type faces	15 master faces	Multiple	Multiple	8
Type styles	Instant resizing	1500 face library	Instant resizing	A/B/C/D
Non-Arabic faces	....	Yes	Yes	Yes
Type face storage	Disk	RAM, disk	Disk	Disk, RAM
Face-font compose	Yes	w/true perspective	Option	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	Assignable center
Roll/crawl control	Yes	w/full animation	VECTOR effects	Variable
Keyer/colorizer	Yes	Yes & components	External keyer	Integral
Color palette	16.7 million	16.7 million	16.7 million	4,096
Colors per screen	16.7 million	16.7 million	16.7 million	64/screen
Internal memory	....	....	....	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	Disk	Floppy/Winchester
Access time page	....	....	<1s	<0.9s
Effective planes	Multiple channel	Multiple	4 plane	32 planes
Remote control	RS-232/-422	RS-232/422, Ethernet.	RS-232/-422	RS-232/422
Image sources	RGB, CCIR 601	Any video	Camera, LogoMaster draw	RGB, composite
Multi-user system	Possible	1 or 2-channel	....	2 keyboard on-line
Automation interface	RS-232/-422/GPI	GPI	RS-232/422	No
<b>Reader Service Number</b>	<b>330</b>	<b>331</b>	<b>332</b>	<b>333</b>

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

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

<sup>1</sup>Scribe series includes Scribe Jr., Super Scribe and High Definition Scribe.

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

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



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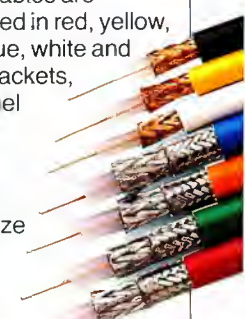
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Circle (88) on Reply Card



**BELDEN**

Manufacturer	Dubner Computer Systems		For-A Corporation		
Model/Series	Texta	CBG-2	20-K	VTW-220 (VT-210H <sup>1</sup> )	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

Manufacturer	ICM Video	Knox Video		Laird Telemedia	
Model/Series	CG-7000P	K40 Microfont (K20)	K-200 Chromafont II	1500 <sup>2</sup> (1450)	CG-7000ES (-Y/C <sup>3</sup> )
Subtitles	Any line	Possible	Possible	Lower thirds (....)	Yes
Tabs	.....	.....	Yes	16 position	Yes
Underlining	.....	Yes	Yes	Yes	.....
Italicize function	.....	Yes (No)	Yes	14 slants	7 slants
Page format	38 char/16 line	.....	32C/17L, 32TVL font	80char/27 rows	60c/24l 12TVL
Resolution	48x64 dot character	.....	.....	35ns	35ns
Anti-aliasing	Hardware	.....	None	Yes	.....
On-line type faces	8	20/32-line (1 size)	8, 2 sizes	16 (6) resident	4 (6)resident
Type styles	A/B/D	Helvetica <sup>1</sup>	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

<sup>1</sup>K40 contains foreign language set; K20 includes Eurobold uppercase only.

<sup>2</sup>Model 1500 PProM includes 6 type styles with no floppy disk drives in system.

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

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

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
<b>Reader Service Number</b>	<b>903</b>	<b>904</b>	<b>905</b>	<b>906</b>	<b>907</b>

## 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	Ampex AVSD	Aurora Systems	Aurora Systems (Harris)	AVS (AF Assoc.)
Model Series	Alias/1	AVA-3	System/225 (250)	System/220	Art Master <sup>1</sup>
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, Betacam, DigVid	Any video source,	RGB, modem, tablet	RGB, tablet, modem	Any including U-matic,
Output drivers	Eikonix hi-res camera	Digital I/O option	Ethernet	Ethernet	VHS, RGB, YUV
Encoder/Decoder/Sync-gen	NTSC, Betacam, DigVid	Int/Int/Int	RGB F.buffer, NTSC	RGB F.buffer, modem	PAL, RGB, CCIR-601
VTR controller	Film recorder	Internal	Film recorder	Film recorders	YUV, Key-matte
Image manipulations	Int/not req/int	Perspective/distort/flip	Ext/ext/ext	Ext/ext/ext/	PAL, options
Artist's tools	Lyon-Lamp VAS-5	Comp/exp/rot	Internal	Internal	Yes
Texture mapping	Standard	Geom/grid/zooms	Skew/perspective/stretch	Perspective/stretch/copy	Brushes, cut/paste
Shading	All standard	Cut-paste	Rot/reflect/move/cpy/scale	Rot/reflect/move/cpy/scale	matte, screen print
Animation features	Opt 3D modeling	....	Geom/curve trace/writon	Geo/curve trace/write on	Yes
3D render features	Animated/bump/natural	....	Fill/brdr/magnify	Fill/brdr/magnify	Yes
CRTs used for	Lambert, Phong, Blinn	....	....	....	Yes
Multiple user	Objbs, light, camera	....	Reflectance	Reflectance	Tint, merge
Remote/Data input by	Wireframe prvw/PIXAR	....	Options	Options	Yes
<b>Reader Service Number</b>	Canvas	Wireframe prevw/fulclr	Options	Wireframe prvw/3D model	Yes
	Canvas	Canvas	Canvas, system	Menu, canvas, system	Menu on art screen
	....	....	....	....	No
	IGES/RS-232/Ethernet	RS-232/422	RS-232, Ethernet, WX	RS-232, Ethernet, WX	....
	<b>1059</b>	<b>1060</b>	<b>1061</b>	<b>1062</b>	<b>1063</b>

<sup>1</sup>Of a 16.7 million color palette, 400,000 may be used in one screen.

Manufacturer	Barco Ind/Wavefront	BTS Broadcast TV Systems		CGL/Computer Graphic Lab	
Model Series	Producert†	Vidifont Graphics <sup>1</sup>	•FGS-4500 <sup>2</sup>	Images II+	Instamation <sup>3</sup> ✓
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
Encoder/Decoder/Sync-gen	Film recorder	....	Film recorder, DigVid	Film recorder	....
VTR controller	Ext/ext/ext	Int/Int/ext	Ext/ext/ext	Ext/ext/ext	Ext/Int-ext/Ext
Image manipulations	LyonLamb VAS/miniVAS	....	Ext, BTS	Internal	Internal
Artist's tools	All standard types	Standard types, stencils	All standard types	Std 2D manipulations	Scale/rotate/mirror
Texture mapping	TIPS, Media Logic, NPS paint	Crop, geom./mosaic/montage	Geom/retouch	Perspective/transforms	Copy/move
Shading	Yes	All standard types	....	Geom/grids/std tools/ mosaic/posterization	Color correction, crop
Animation features	Yes	....	Texture/bump	....	Enhance
3D render features	Gouraud, Phong	....	Gouraud, Phong, others	....	No
CRTs used for	Dynamic Imaging module	Color cycle, 2D	Objbs/light/camera	2D motion, color cycle	50 ind 2D objects
Multiple user	Model software module	No	Wireframeprvw/fulclr rndr	....	None
Remote/Data input by	RGB/NTSC, Text	Canvas, edit	Canvas, status	Menu, canvas	Menu, canvas
<b>Reader Service Number</b>	Yes	Yes	....	Yes	No
	Modem, RS-232, Ethernet	RS-232/422	Ethernet	Ethernet	Ethernet from Images II+
	<b>1064</b>	<b>1066</b>	<b>1065</b>	<b>1068</b>	<b>1067</b>

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

<sup>2</sup>PIXELERATOR rendering engine option greatly improves 3D rendering speed.

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

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

<sup>2</sup>Optional 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 Tablet	Any video source	RGB/NTSC, tablet Component scan-in Video F.buffer Film recorder	VCR, video	RGB source, tablet
Output drivers	Encoder	Composite & DVTR	Int/int/int	NTSC	RGB Fbuffer, film recorder, Bernoulli
Encoder/Decoder/Sync-gen	....	....	Ext/ext/ext	Ext/ext/ext	Ext./ext/ext
VTR controller	....	Yes	Lyon Lamb MiniVAS	....	Internal
Image manipulations	Standard effects	Real time effects	Standard, flips, digvid Multi-freeze	Per software package	Perspective
Artist's tools	Standard tools	Geometrics, others	Grid, all std tools TIPS paint software	Per software package	Cut-paste, move Transparency
Texture mapping	....	Yes	....	....	Texture, reflectance
Shading	....	Yes	Ray-tracing	Per software package	Gouraud, Phong, metallic
3D render features	....	Yes	...(Yes)	Per software package	Obj, light, 3D metal
CRTs used for	Canvas	....	Menu-canvas	Menu, NTSC	Menu, RGB
Multiple user	No	....	....	No	Yes
Remote/Data input by	RS-232	....	RS-232, Ethernet LAN	....	Modem, LAN, renderer
Reader Service Number	1074	1075	1076	1077	1078

<sup>†</sup>Two color palettes are involved; of 16.7 million, 256 colors can be used per screen; of a secondary set of 4,096, 16 can be used per screen.

Manufacturer	Pinnacle Systems	Quanta	Quantel
Model Series	Model 2020/2030	Model 3000E	Quantapaint-32
Base computer	Proprietary	Proprietary	T1 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 Component video scan-in	RGB/NTSC source, tablet Component video opt	RGB/NTSC, CCIR-601 4:2:2 Tablet, other
Output drivers	Frame buffer for video	Frame buffer for video	RGB f.buffer, encoder Network
Encoder/Decoder/Sync-gen	Int/int/int	Int/int/int	Int/int/int
VTR controller	Yes	w/serial protocol	RS-422
Image manipulations	Standard, flips, digvid Multifreeze, PRIZM	3000E-10 option PRIZM option	Mosaic, duplicate, move Posterize, emboss
Artist's tools	Geom, grids, std tools mosaics, posterization	Geom, grids, std tools, Mosaics, posterization	Geom/paint, mix, fixative magnify, graph
Texture mapping	Yes	Yes	....
Shading	....	Gouraud, Phong, flat	Phong, gamma correction
Animation features	With upgrade 2040	3000E-40 option	TOPAS-32 processor
3D render features	With upgrade 2033	Yes	TOPAS-32 processor
CRTs used for	Menu, canvas	Menu-canvas	System, canvas
Multiple user	....	....	Yes
Remote/Data input by	....	....	RS-232/422
Reader Service Number	1079	1080	1081

Manufacturer	Rank Cintel	Shima Seiki	Symbolics Graphics	Transformations
Model Series	Art-File	SDS series systems <sup>1</sup>	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



# INTELLIGENCE RUNS IN THE FAMILY

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(1) Price at time of publication.

Contact:

**East-Coast:**

Barco-Industries Inc.  
472 Amherst Street, Suite 16  
Nashua, NH 03063 USA  
Tel.: 1/603/880 1430  
Fax: 1/603/880 8918

**West-Coast:**

Barco-Industries Inc.  
170 Knowles Drive Suite 212  
Los Gatos, CA 95030 USA  
Tel.: 1/408/370 3721  
Fax: 1/408/866 9103

**Europe:**

Barco-Industries n.v.  
Th. Sevenslaan 106  
8500 Kortrijk Belgium  
Tel.: 32/56/23 32 11  
Fax: 32/56/20 04 18

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INDUSTRIES

Manufacturer	.Rank Cintel	Shima Seiki	Symbolics Graphics	Transformations
Model Series	Art-File	SDS series systems <sup>1</sup>	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	RGB, 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	....
<b>Reader Service Number</b>	<b>1084</b>	<b>1085</b>	<b>1086</b>	<b>1087</b>

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

## Video Processing Systems

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

Manufacturer	.Accom	A.C.E./Midwest Communications		AVS (AF Associates)	
		ACC 200 translator	600, 660 series	ADAC	AVS-6500
Model Series	DIE 125				
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 <sup>1</sup>	RS-232, other	Manual only
<b>Reader Service Number</b>	<b>975</b>	<b>976</b>	<b>977</b>	<b>978</b>	<b>979</b>

<sup>1</sup>Data from RAM can be downloaded for storage in PC with setting recall from menu prompts.

Manufacturer	.BTS Broadcast TV Systems	CEL/Grunder	Electrocraft Consultants		Faroudja Laboratories	
			CPS-84 (PAL)		Flesh tone corrector	VHP detail processor
Model Series	XCC 6016 corrector	P156-2				
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	Y/C to YUV, RGB, PAL	Yes	Yes	
Format conversions	Yes	No	To 3.5MHz luma	....	No	
Video response	± 0.5dB to 5MHz Y	-3dB 2.5MHz NTSC/3.5 PAL	....	± 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.	
<b>Reader Service Number</b>	<b>980</b>	<b>981</b>	<b>982</b>	<b>983</b>	<b>984</b>	

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



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

<sup>1</sup>4-field, EBU-3246, parallel inputs & outputs.  
<sup>2</sup>PAL-M, PAL-N optional.

## Video Master Control & Production Switchers

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

Manufacturer	A.C.E. (Midwest Communications)	Ampex AVSD
Model Series	T24-2 (T24-PO)	Model T8 AVC-33S (AVC series) AVC Vista <sup>1</sup> (Vista 18) AVC Century 330
Control application	Production (master ctl)	Video production
# of inputs	23V (& 23A)	32V, 16A opt
Integral matte source	Yes	Yes
Key sources	4 external	32 int, 6 ext opt
Chroma keyers	Enc/RGB (option)	10 enc, 6 RGB opt
Downstream keyer	4 source opt (std)	All sources
Switching buses	10, 4 aux (2, 2 aux)	8, 16 aux opt
Mix Effects amps	3 (1)	3
Pattern generator	100 (9) patterns	164 patterns
Wipe effects	Rotary & (soft-edge)	Rotary, soft, user pgmd

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	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

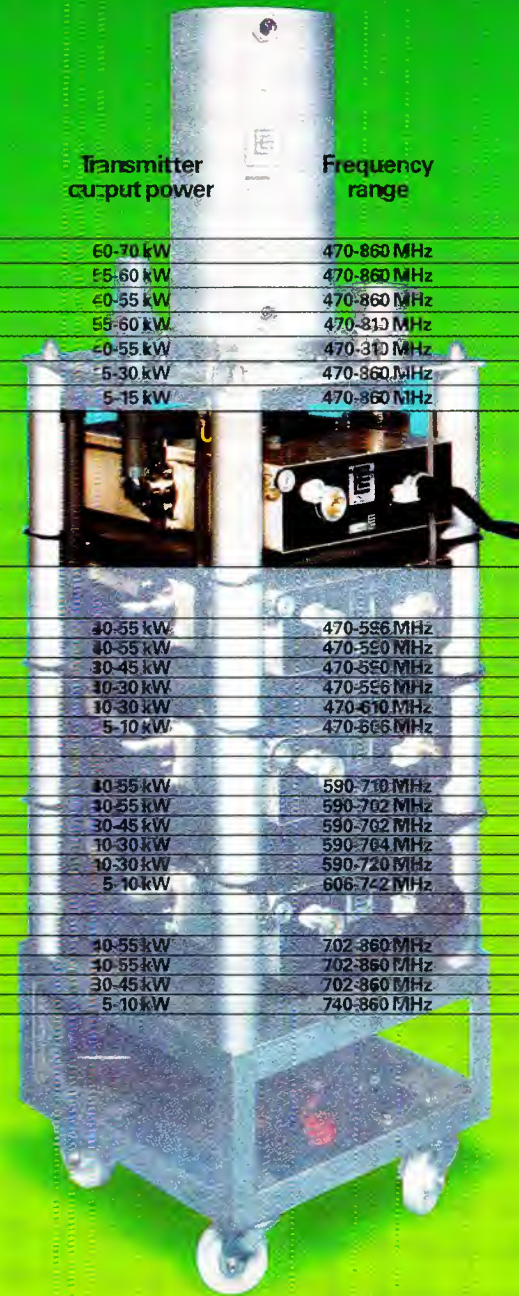
K3276HBCD	40-55 kW	470-556 MHz	38% to 43%
K3382BCD	40-55 kW	470-550 MHz	38% to 42%
K3217HBCD	30-45 kW	470-550 MHz	40% to 42%
K3230BCD	40-30 kW	470-556 MHz	40% to 42%
K376L	10-30 kW	470-610 MHz	34% to 40%
K370/W series	5-10 kW	470-666 MHz	29% to 35%

### Mid Band

K3277HBCD	40-55 kW	590-710 MHz	38% to 43%
K3383BCD	40-55 kW	590-702 MHz	38% to 42%
K3218HBCD	30-45 kW	590-702 MHz	40% to 42%
K3231BCD	10-30 kW	590-704 MHz	40% to 42%
K377L	10-30 kW	590-720 MHz	38% to 45%
K371/W series	5-10 kW	606-742 MHz	32% to 35%

### High Band

K3278HBCD	40-55 kW	702-860 MHz	38% to 43%
K3384BCD	40-55 kW	702-860 MHz	38% to 42%
K3219HBCD	30-45 kW	702-860 MHz	40% to 42%
K372/W series	5-10 kW	740-860 MHz	32% to 35%



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Manufacturer	A.C.E. (Midwest Communications)		Ampex AVSD		
Model Series	T24-2 (T24-PD)	Model T8	AVC-33S (AVC series)	AVC Vista <sup>1</sup> (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
<b>Reader Service Number</b>	<b>1088</b>	<b>1089</b>	<b>1090</b>	<b>1091</b>	<b>1092</b>

<sup>1</sup>An electroluminescent panel on the Vista systems provides status display; extended memory options are available.

Manufacturer	Beaveronics		BTS Broadcast Television Systems		CAL/Cox Associates
Model Series	Model 712	Model BI-154 (-156)	MCS-2000	R102ME (RME series)	Title Assembler
Control application	Video production	Video production	Master control	Production	Graphics production
# of inputs	12 video	12 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
<b>Reader Service Number</b>	<b>1093</b>	<b>1094</b>	<b>1095</b>	<b>1096</b>	<b>1097</b>

Manufacturer	Crosspoint Latch				Echolab
Model Series	6112(AK) (6124A)	6150BK	6129AHK (6139)	8200/8200C <sup>2</sup>	DV-5 w/AFS
Control application	Production	Master control	Production	Production	Production
# of inputs	8 (12)	16V, 16A	8 (8, 16, 24)	5	10V
Integral matte source	Yes	Yes	Yes	Yes	Yes
Key sources	Multiple int, 2 ext	4 ext	Int, 2 ext per M/E	Int, Ext, multilevel	3 + RGB ext & int.
Chroma keyers	Options	No	RGB std, 2nd opt (dual)	Yes	Encoded or RGB opt
Downstream keyer	Yes	No	Dual, 4-input	Yes	2 sources
Switching buses	4 primary	2	3 primary (6 primary)	2	4 prime, 3 aux
Mix Effects amps	Independent dual	1	2 (3)	Multilevel w/digital	1+
Pattern generator	12 per ME	Patterns optional	32 patterns (12 or 32/ME)	12-pattern	> 40 patterns
Wipe effects	Soft-edge	No	Inc push, pulls	Soft-edge	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 <sup>1</sup>	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
<b>Reader Service Number</b>	<b>1098</b>	<b>1099</b>	<b>1100</b>	<b>1101</b>	<b>1102</b>

<sup>1</sup>Automation functions determined by model 7203 or 7239 Auto-Drive controls.

<sup>2</sup>Switcher system includes dual TBCs for VCR operation; 8200C system is prepared for S-VHS VCRs.

Manufacturer	Echolab	Electrocraft	For-A Corporation		Grass Valley Group
Model Series	SE-3 (SE-6)	VM-8548	CVM-500, -600, -1000	PVM-500 (PVM-600)	DPP-1 Kadenza <sup>1</sup>
Control application	Production	Production	Component production	Production (& editing)	Production
# of inputs	10V	8	6, 12, 16/24 RGB, YCrCb	6 (12)	32 maximum <sup>1</sup>
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	VM-8548	
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	.....
<b>Reader Service Number</b>	<b>1103</b>	<b>1104</b>	<b>1105</b>	<b>1106</b>	<b>1107</b>

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

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

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

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

Manufacturer	<b>Kaitronics</b>	<b>3M Company</b>	<b>Numark Electronics</b>	<b>Omicron Video</b>	<b>Polar Video Ltd</b>
Model Series	<b>CMS-12</b>	<b>Model 324</b>	<b>VAM-2000</b>	<b>Model 507 series</b>	<b>PVM-1 portable</b>
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	<b>Ross Video</b>				<b>Shintron</b>
Model Series	<b>RVS 416</b>	<b>RVS-508 (514) [517]<sup>1</sup></b>	<b>RVS 210A (RVS 216A)</b>	<b>RVS-524</b>	<b>Empress 2000 (EC2000)</b>
Control application	Production	Production	Production	Production	Production (component)
# of inputs	16V	16,20,24 ([12,20])	10 (16) NTSC, PAL	12 or 20 NTSC, PAL/-M	10 + key + spare
Integral matte source	6 generators	Yes	Yes	Yes	Yes
Key sources	Int, ext	Int, ext	Int, ext	Any int, ext, titler	Int, ext
Chroma keys	RGB & encoded opts	RGB, encoded available	RGB (& encoded)	Opt encoded, RGB	RGB
Downstream keyer	3 sources	Yes ([...])	3-source	Yes	Option
Switching buses	6 primary	8(4)[7] prime, to 10 aux	3 primary	4 primary	4 primary
Mix Effects amps	2 4-bus multilevel	Single ([dual])	1 multilevel	1 MLE	1
Pattern generator	2 w/rotary, matrix, spin	62 per ME	12 patterns	27 patterns	16 pattern
Wipe effects	Hard, soft-edge	Rotary, soft-wipe	Hard, soft	9 rotary, hard, soft edge	Soft-edge
Spotlight effects	w/Linear key	Yes	No	....	No
Border effects	Opt/analog key border	Yes	Opt, analog key border	Yes	Yes
Shadow effects	Yes	Yes	No	Yes	No
Automation interface	RS-422 optional	Encore memory system	RS-422 option	Scene store memory	RS-422 & Empress
Programmable functions	X-fade, fade-black	Auto transitions	x-fade, fade-black	Yes	Yes
Memory backup battery	Yes	Yes	Yes	In scene store memory	No
Diagnostic software	....	....	Yes	....	No
Digital effects port	....	Option	Yes	....	No
Path length or deviation	1.5µs differential	±1/5° @ NTSC, PAL/-M	≤1.5° @ NTSC, PAL	±1.5° differential	50ns
Crosstalk at subcarrier	<-53dB NTSC, PAL	>53dB 3.58/4.43MHz	≤-53dB to 4.43MHz	53dB 3.58/4.43MHz	<-50dB
Audio preview, follow	....	....	Opt mixer	....	A270 AFV switcher
Audio level control	....	....	No	....	via RS-422
Audio mixer interface	....	....	For 12-input mixer	....	A270 AFV switcher
Edit control interface	Expanded GPI	RS-422	Yes	Option	RS-422, SMPTE
Reader Service Number	1123	1124	1125	1126	1127

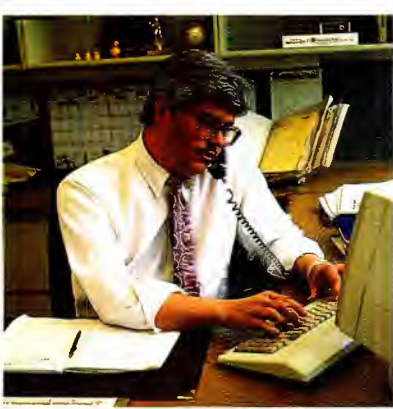
<sup>1</sup>Series also includes models 504 and 505.

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

## Routing/Distribution Switchers

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

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



Larry Broome  
Product Manager/Broadcast

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Circle (92) on Reply Card

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

Manufacturer	Datatek	Di-Tech	Dynair Electronics		
Model/Series	D-2400	5800 (5850) series	5861-V/5862-A	Dynasty series <sup>1</sup>	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 max	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

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

Manufacturer	Dynamic Technology/DTL		For-A	Grass Valley Group	
Model/Series	Routemaster	3900 series	VRS-2000/ARS-2000	Horizon HX-series <sup>4</sup>	Horizon systems
Crosspoint matrix	16x1	16x8 A & V	8x8	16x16 to 64x64	16x16
Typical system size	16x4, 16x8, 32x4	16-256x8-256V <sup>2</sup>	32x32 <sup>3</sup>	128x128	128x128
Audio response	±0.25dB 20H-20kHz	±0.25dB 20H-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 <sup>1</sup>	±0.1dB 5.5MHz <sup>1</sup>	±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

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

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

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

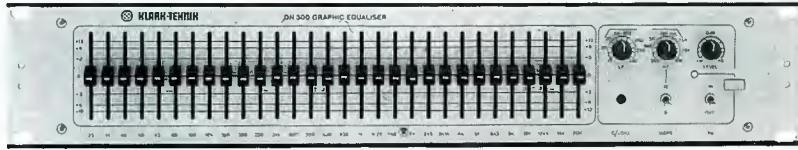
<sup>1</sup>The system allows up to 3 levels of audio-follow control.  
<sup>2</sup>Levels include 1-audio, 3-video.  
<sup>3</sup>Various configurations of audio, video and A/V multilevel control available; values given based on 0dB system gain.

**30 band 1/2 octave graphic equaliser** - Frequency response  $\pm 0.5\text{dB}$  (20Hz - 20kHz), Distortion (+4dBm) $<0.01\%$  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 1/2 octave graphic equaliser.

# DN300

## GRAPHIC EQUALISER

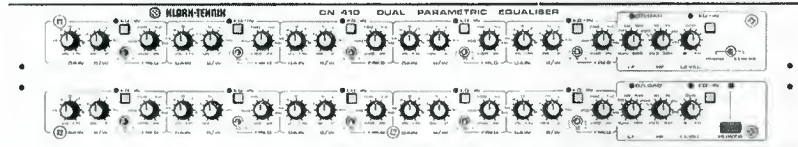


**Dual channel 5 band parametric equaliser** - Frequency response  $\pm 0.5\text{dB}$  (20Hz - 20kHz), Distortion (+4dBm) $<0.01\%$  at 1kHz, Equivalent input noise  $<-90\text{dBm}$ , 100% Frequency overlap for each filter + variable bandwidth, Bypass, XLR inputs and outputs.

Also available DN405 Single Channel 5 band parametric equaliser.

# DN410

## PARAMETRIC EQUALISER



**Real time audio spectrum analyser** - 30 band 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 unwt'd
Video crosstalk worst	> 60dB at 4.43MHz
Control format	RS-422, RS-232
Applicable to CAV	Possible
Reader Service Number	1173

<sup>1</sup>Systems of 32x32 and 128x32 configuration also available.

3M Company		
AX series	Series H	Model 40X
20x10	16x2 V/A	10x1 (40x1)
40x10 m/20x10 s	64x64 V w/3A <sup>1</sup>	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 at 4.43MHz	60dB at 3.58MHz
RS-232	RS-422	RS-232
No	....	No
1174	1176	1177

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	NEC America
Model/Series	TKA-500B/AKA-500B
8x16	512x512 A/V 6-level
± 0.2dB 20-20k	< 0.01% 8dBu
< 0.1% 8dBu	-85dBu
> 95dB wideband	-85dB 20-20k worst
< -80dB worst case	-0.5, +0.2dB 10MHz
[Unit for audio	± 0.2°, ± 0.2%
[only, input and	± 5ns
[output modules	64dB unwt'd 10MHz
[required.	< -50dB 10MHz worst
....	BSNET lan, RS-422
X-Y, DTMF, other	Yes
....	1179

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

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

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

Manufacturer	pro-bel
Model/Series	Analog systems
8x1/8x8	256x64/144x256
256x64/144x256	< ± 0.2dB 15-20k
< ± 0.2dB 15-20k	< 0.05% 8dBu
< 0.05% 8dBu	> 90dB true RMS DIN
> 90dB true RMS DIN	< -90dB worst
< -90dB worst	-0.5, +0.25dB 8MHz
-0.5, +0.25dB 8MHz	-L0.2°, < 0.2% 4.43MHz
-L0.2°, < 0.2% 4.43MHz	< 0.5%
< 0.5%	> 73dB wtd luminance
> 73dB wtd luminance	< -60dB adjacent
< -60dB adjacent	RS-232C/422/485
RS-232C/422/485	Possible
Possible	1183

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

Manufacturer	Shintron
Model/Series	12X-Q4 (12xC4-12xV4)
4-RGB/pulsex4	12x4
12x4	[For analog video
[For analog video	[component use only
[component use only	....
....	-3dB to 30MHz
-3dB to 30MHz	< 0.25°, < 0.25%
< 0.25°, < 0.25%	10ns
10ns	63dB typical
63dB typical	< -60dB, 5MHz
< -60dB, 5MHz	RS-422 bus
RS-422 bus	Yes
Yes	1185

Manufacturer	Siemens AG
Model/Series	Crossmatic D Audio
32x32	32x96, 96x96
32x96, 96x96	± 0.4dB 40Hz-15kHz
± 0.4dB 40Hz-15kHz	± 0.5% + 22dBu 40Hz
± 0.5% + 22dBu 40Hz	< -92dBq
< -92dBq	> 100dB
> 100dB	....
....	[System for
[System for	[audio applications
[audio applications	[only.
[only.	....
....	≥ 50dB 3.58MHz
≥ 50dB 3.58MHz	RS-232
RS-232	Not applicable
Not applicable	1186

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

Manufacturer	Sigma Electronics
Model/Series	SVC212/SVC213
10x1 component	10x2, 10x3
10x2, 10x3	....
....	0.5% + 18dBm
0.5% + 18dBm	-65dBm
-65dBm	-65dB 15kHz
-65dB 15kHz	± 0.2dB to 8MHz
± 0.2dB to 8MHz	< 0.5°, 0.5%
< 0.5°, 0.5%	70dB
70dB	-60dB to 3.58MHz
-60dB to 3.58MHz	RS-232, other
RS-232, other	Possible
Possible	1189

<sup>1</sup>Allows master switching with any number of slave units.

<sup>2</sup>Video crosstalk rated -70dB for a 40MHz bandwidth.

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

Utah Scientific	
AVS-1B	CAA/CAV-20/10
10x10	10x10
320x300	10x10, 20x10, 4-level
320x300	± 0.05dB 30Hz-20kHz
± 0.05dB 30Hz-20kHz	0.05% 24dBm
0.05% 24dBm	70dBm 15kHz bw
70dBm 15kHz bw	-75dB 30dBm dc-20kHz
-75dB 30dBm dc-20kHz	± 0.1dB to 10MHz
± 0.1dB to 10MHz	± 0.5°, 0.05%
± 0.5°, 0.05%	80dB hum & noise, wtd
80dB hum & noise, wtd	-60dB at 4.43MHz
-60dB at 4.43MHz	RS-422/-232/Dynabus
RS-422/-232/Dynabus	Yes
Yes	1190

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

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

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



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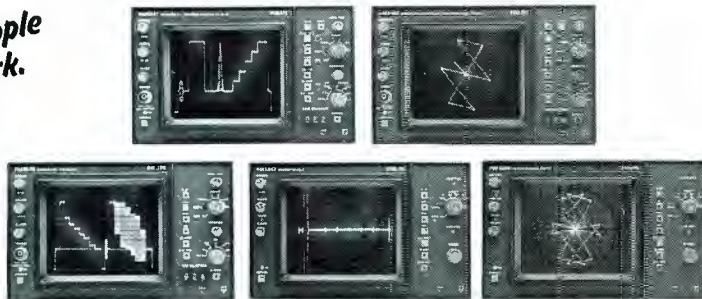
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**Test & Measurement**

# PHILIPS

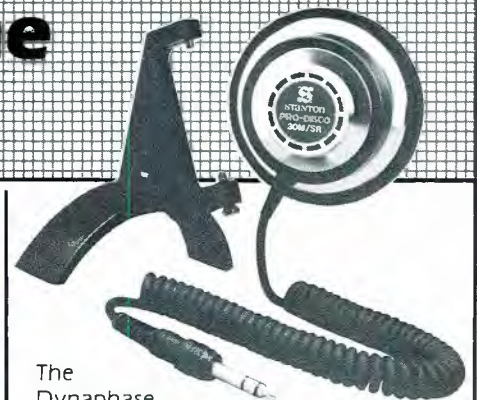
Circle (94) on Reply Card

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

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



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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) <sup>1</sup>	ADS-5000 <sup>2</sup>
Frames per systems	100 frames w/hard drive	180,000 (72,000)	18,000
Worst case access	3.7s FD, 1.2s HD	30-500ms, jump dep	500ms
Programmed sequences	Yes	Yes	Yes
Reader Service Number	960	961	962
<sup>1</sup> Includes 2-channel 16-bit digital audio capability			
<sup>2</sup> 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
Storage medium	Winchester	Winchester, optical	Winchester	5 1/4" Winchester
# of work stations	1	Multiple	2 (6)	2 independent
Output channels	1	2	4-pgm, 4 prvw (12, 12)	Single, dual
Color standards	NTSC	NTSC, CCIR-601	NTSC, PAL, SECAM	NTSC 4-field
Directory catalog	Full screen disk status	MultiViews 12-image	Data list	Still review mode
Integral effects	Priority key, DSK	Option	Yes	3100FX options
Editing control port	RS-232, IEEE-488	Yes	RS-232	PC SCSI interface
Portable system	No	No	Yes (No)	....
Video response	....	[Equipment can be	± 0.2dB to 4.2MHz	± 0.15dB to 4.5MHz
S/N ratio	[Real time play and	[configure to multi	57dB (56dB)	>70dB
Diff. phase, gain	[simultaneous record	[function work	1°, 1%	<1°, <2%
K factor	[during multilayer	[station.	....	....
Chroma luma delay	[image construction.	....	17ns	± 10ns
Time base stability	[Macro program store	....	....	....
TBC requirement	[on 3.5" floppy.	Integral frame buffer	Integral	2-3110FB frame buffers
Composite digital	SMPTE/CCIR 601X	Option	....	Yes
Component digital	No	Option	4:1:1 sampling	....
# of drives max	2 std/4 opt	Various configurations	2 (8)	Multiple
Streaming tape	....	....	No	750-field option
Frames per disk	212s/2-disk	400/300MByte disk	1,066	750 frames
Frames per systems	424s optional	> 450,000	2,132 (8,528)	Expand to 10,000
Worst case access	"Instantaneous"	....	600ms	<0.6s
Programmed sequences	Loops, random access	Yes	Yes	10 seq of 99
Reader Service Number	965	966	967	968

Manufacturer	Optical Disc Corporation	Quantel	Rank Cintel	TEAC
Model Series	RLV Mark II	#610A	Library Systems	Slide File
Storage medium	Optical disc	Optical DRAW system	Winchester	Winchester
# of work stations	1	1	2 (1)	5
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	LV200, 200A (250)
Color standards	NTSC	NTSC, PAL	NTSC, PAL, SECAM	NTSC (monochrome)
Directory catalog	No	....	Data list, proof sheet	None
Integral effects	No	No	Yes (No)	No
Editing control port	....	No	RS-422	RS-232C
Portable system	No	No	If desired	Yes
Video response	4.5MHz bandwidth	[For preparation of	[CLL6000 access to	± 0.5dB to 5.5MHz
S/N ratio	>45dB unwtd	[recordable Laser	[40 drives to total of	[Per CCIR 601
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
Composite digital	Analog	Yes	Yes	RS-170A analog
Component digital	....	No	YCrCb	No
# of drives max	1	1	8 (2)	2
Streaming tape	No	No	No	Yes
Frames per disk	60 minutes CLV	n.a.	800	390
Frames per systems	30 minutes CAV	n.a.	6,400 (1,600)	500,000
Worst case access	....	n.a.	0.5s	1s
Programmed sequences	No	No	Yes	Yes
Reader Service Number	970	971	972	973

## 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 <sup>2</sup> (TBC-7)†	501 TBC†
Function	TBC, synchronizer	TBC only	TBC, framestore (TBC)	TBC
Sample freq/bits	....	14.3MHz/8-bit	4xFsc/9-bit (8-bit)	16.11MHz/8-bit
Correction window	1 field	28 TVL	60 TVL, 1-frame (28 line)	± 8 lines
Video bandwidth	290 TVL	± 0.2dB to 4.2MHz	± 0.2dB to 5MHz (4.2MHz)	± 0.5dB 10Hz-6.4MHz
S/N ratio	>55dB	56dB	>58dB (>56dB)	58dB p-p to RMS
Differential phase/gain	<3°/ <3	2°/2	≤ 2°/ ≤ 2%	1.5°/1.5%
Residual error	....	± 2.5ns chr	< 2.5ns Chr/ < 10ns mono	± 10ns Y, ± 2ns C
Advanced sync out	Yes	Yes	Yes	Yes
Component in	No	Composite	Composite	Y/C, Y/688, Y/629, NTSC
Component out	No	Composite	Composite	Y/C, Y/688, Y/629, NTSC
Velocity compensation	....	Yes	Frame averaging (Yes)	....
Heterodyne processing	Yes	Yes	Yes	Yes
Non-servo capstan	Yes	No	Yes	Yes
Dynamic tracking	Yes	Yes	-1, +3x play, full color	No
Noise reduction	Yes	No	Adaptive comb filter	No
Image enhancement	H, V	No	Effective(No)	H detail
Production effects	Mosaic, poster, freeze	No	Time compress/expand	No
Reader Service Number	783	784	785	786

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

<sup>2</sup>Zeus available in NTSC, PAL, PAL-M, SECAM; TBC-7 available in NTSC, PAL.

<sup>3</sup>Effective enhancement results from Multi-Gen setup with Zeus.

<sup>4</sup>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 <sup>1</sup>	TA-450N, TA-450P	SP-100/SuperPro
Function	TBC	Dual TBC w/effects	TBC, framestore	TBC
Sample freq/bits	14.3MHz/8-bit	8.95-Y/2.2-C/8-bit	13.5-Y/6.75-C/8-bit	4xFsc 8-bit
Correction window	16 TVL	1-frame	2-field	16 lines
Video bandwidth	-0.5dB to 4.2MHz	8.93MHz Y/2.2MHz C	3.5-N, 4.43-P, 5.5-Y	4.2MHz, 5.5MHz dub
S/N ratio	58dB color, 56dB VTR-358	55dB	58dB	58dB
Differential phase/gain	2°/2	2°/2%	2°/2	2°, 2%
Residual error	2° color, 15ns VTR-358	± 15ns Y, ± 2° C	± 2° chr, ± 15ns Y	± 15ns
Advanced sync out	Yes	Yes, with Key out	Yes	Yes
Component in	Composite (Y-688)	Yes	Composite/RGB/YC/YCrCb	Y/C S-VHS U-matic
Component out	Composite (Y-688)	Yes	Composite/RGB/YC/YCrCb	Y/C S-VHS
Velocity compensation	No	....	Yes	....

# Triple Play

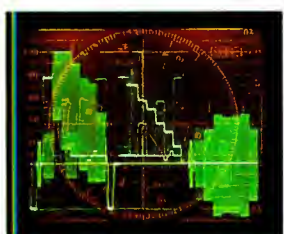
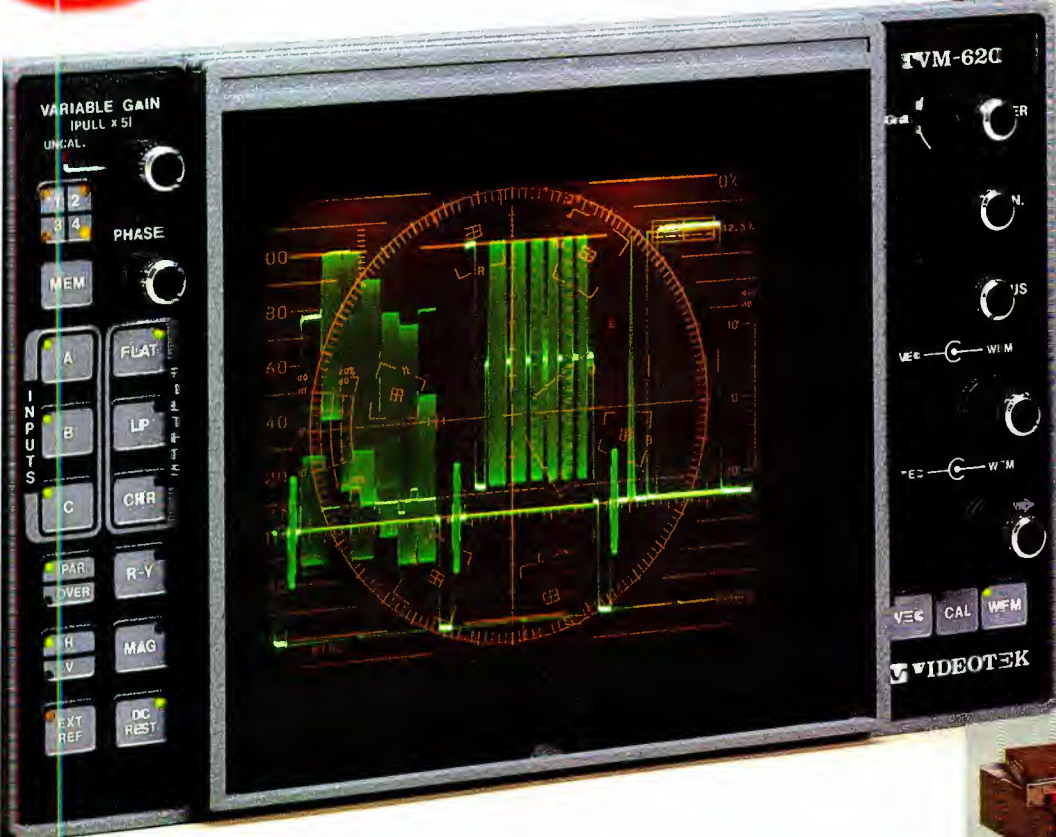
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Circle (97) on Reply Card

Manufacturer		For-A Corporation				Fortel
Model Series	FA-410 (FA-430†)	FA-740 <sup>1</sup>	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	
<b>Reader Service Number</b>	<b>793</b>	<b>794</b>	<b>795</b>	<b>796</b>	<b>797</b>	

<sup>1</sup>AS-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 series <sup>2</sup>	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 <sup>3</sup>	Frame, field freeze	Field/frame freeze	Freeze on loss of ref.	Freeze on loss of ref.
<b>Reader Service Number</b>	<b>798</b>	<b>799</b>	<b>800</b>	<b>801</b>	<b>802</b>

<sup>1</sup>Or interpreted fields.

<sup>2</sup>For use in parallel configured 4:2:2 systems.

<sup>3</sup>Appropriate for in PAL, SECAM applications.

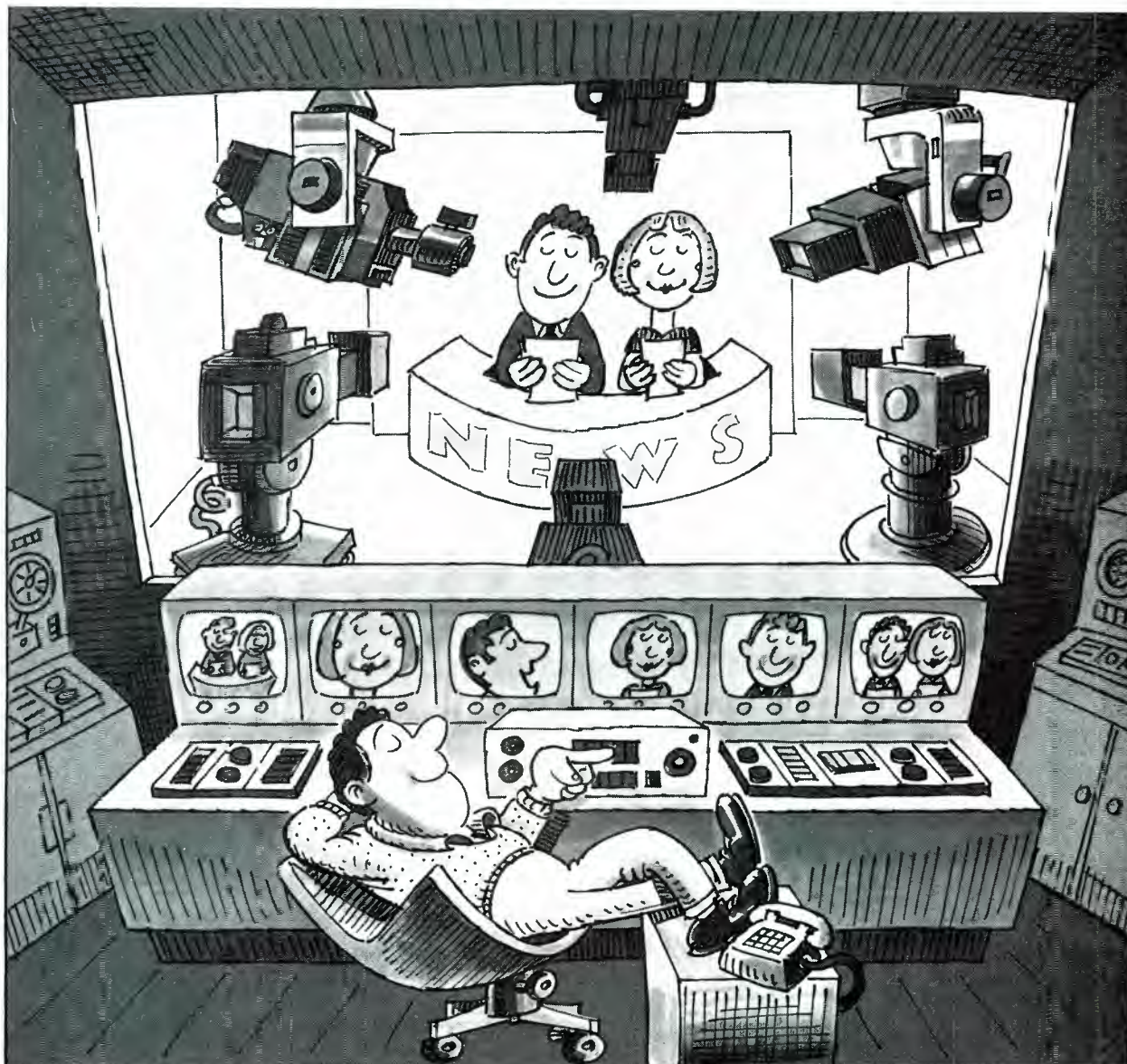
Manufacturer		GML Grove	GML/Gunnerfield Mktg	Harris Video		
Model Series	SYSTEM DVP†		GML4004S PAL/SECAM†	632 NTSC (631 PAL)✓	Model 642	VW-3
Function	TBC, synchronizer <sup>1</sup>	Dual TBC w/effects	Synchronizer	Synchronizer	TBC, synchronizer	TBC, synchronizer
Sample freq/bits	8-bit Y/U/V	13.5MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction window	....	16 TVL	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	±0.5dB to 5MHz
S/N ratio	58dB	55dB	57dB	58dB unwt'd	58dB	56dB
Differential phase/gain	2°/2%	4°/4%	2°/2% (1°/1%)	<2°/2%	<2°/2%	<2°/2%
Residual error	....	±25ns	±10nsL/±2° C (±20nsL)	±2ns sync, ±20ns TBC	±20ns	±20ns
Advanced sync out	2 outputs	Yes	Sync out	16 line advance	Yes	Yes
Component in	Composite only	No	RGB	No	No	No
Component out	Composite only	RGB	RGB	No	No	No
Velocity compensation	....	No	Yes	No	Direct, hetero mode	Yes
Heterodyne processing	Yes	Yes	Yes	No	....	....
Non-servo capstan	....	Yes	Yes	No	....	....
Dynamic tracking	No	Channel A only	No	-1, +3x play	No	No
Noise reduction	No	Noise coring	12dB range L, C	12dB frame recursive	No	No
Image enhancement	10 event memory	....	No	No	No	No
Production effects	Solar, poster, mosaic <sup>2</sup>	Yes	630 compress/psition	No	Field, frame freeze	Field, frame freeze
<b>Reader Service Number</b>	<b>803</b>	<b>804</b>	<b>805</b>	<b>806</b>	<b>807</b>	<b>807</b>

<sup>1</sup>Single & dual channel configurations possible.

<sup>2</sup>W<sup>2</sup>Conceals, reveals, wipes also available.

Manufacturer		Harris Video		Hotronic		
Model Series	550VT (540/560)	634 Component RGB✓	AE61 (AE61B)✓	AF71	AG81	
Function	TBC	Synchronizer	TBC	TBC, synchronizer	TBC/stills/slow motion	
Sample freq/bits	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	
Correction window	16 TVL	1-frame	16 TVL	4-field	32-128 frame	
Video bandwidth	±0.5dB 4.2MHz #540	0.2dB 4.2MHz Luma	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	±0.5dB to 4.2MHz	
S/N ratio	>59dB (56dB)	57dB	58dB	58dB	58dB	
Differential phase/gain	2°/2% (3°/3%)	1°/1%, 17ns C/L delay	<2°/2	<1.5°/1.5	<1.5°, <1.5%	
Residual error	±20ns L, ±2ns C (<±15ns)	±10ns L/±2° C (50dB S/N)	±20ns monochr	±20ns	±20ns	
Advanced sync out	Yes	Sync, blanking	Yes	Yes	Yes	
Component in	No	RGB, NTSC composite	No	Composite	Composite only	
Component out	No	RGB, NTSC composite	No	Composite	Composite only	
Velocity compensation	Not 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	....	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	
<b>Reader Service Number</b>	<b>808</b>	<b>809</b>	<b>810</b>	<b>811</b>	<b>812</b>	

Manufacturer		JVC Company			Leitch Video	Lenco
Model Series	SA-T3000U (SA-T400U)	SA-T300U, -350U	KM-F250U Multiformat	DFS-3000N <sup>2</sup> ✓		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 <sup>1</sup>	±0.15dB to 4.5MHz		-3dB at 3MHz
S/N ratio	>56dB	>56dB	>58dB	>70dB		>55dB



# MULTIPLE CAMERAS. ONE OPERATOR.

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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 <sup>2†</sup>	Starflex 4500 Ministore <sup>✓</sup>
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 <sup>2</sup> , NTSC	Composite only	No
Component out	Y/R-Y/B-Y, composite	Y/R-Y/B-Y, NTSC	YCrCb, Y-C <sup>2</sup> , 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

<sup>1</sup>Values given for composite configuration; 5.5MHz bandwidth for Y component.  
<sup>2</sup>Applicable to both U-Matic and S-VHS VCRs.  
<sup>3</sup>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 <sup>1✓</sup>	S-130 (S-230)	Tx2 <sup>2†</sup> Tx4 <sup>4†</sup>
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 <sup>2</sup>	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	Color field ID pulse
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	Frame freeze
Reader Service Number	818	819	820	821

<sup>1</sup>VITS, Teletext pass facility is an optional available through software change.  
<sup>2</sup>Video response -3dB to 2.6MHz in TBC mode of S-234; includes 3.58MHz output.  
<sup>3</sup>Available for NTSC, PAL-B, PAL-M; offers PAL high-/low-band dubbing.  
<sup>4</sup>Offers low-, high-band PAL, NTSC use.

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\*Ask for info on Pan/Tilt Systems.



**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**

<sup>1</sup>AS-18 audio synchronizer interface: 4-field option; integral diagnostics features.

**NEC America**  
**FS-18<sup>1</sup>** (FS-19)

Synchronizer, TBC opt  
 14.3MHz/8-bit (10-bit)  
 Infinite  
 Y 5MHz (2.4MHz hetero)  
 53dB (60dB)  
 <2°/<2 (<1°/<1%)  
 ---  
 No (Yes)  
 Yes  
 No  
 No  
 Yes  
 Opt for U, Beta, M, C  
 Yes  
 No  
 No  
 No  
 Opt Freeze  
**824**

**Nova Systems**  
**Model 700** (700S)

TBC  
 14.3MHz/8-bit  
 32-line  
 2.5MHz-Y, 1.1MHz-C  
 58dB  
 <2°/<2%  
 ±10ns  
 No  
 Yes  
 Composite (Y/C-3.58)  
 Composite RS-170A  
 No  
 Yes  
 No  
 No  
 No  
 No  
**825**

**Nova Systems**  
**Nova Sync**<sup>✓</sup>

Synchronizer  
 14.3MHz/8-bit  
 1-frame  
 ±0.5dB to 4.2MHz  
 >58dB pp video/rms noise  
 2°/2%  
 ±10ns Y, 2° C  
 No...  
 Looped genlock ref.  
 Composite  
 Composite  
 Yes  
 Direct  
 Yes  
 Yes  
 No  
 No  
 No  
**826**

**Model 511**

TBC  
 14.3MHz/8-bit  
 32 TVL  
 ±0.5dB to 4.2MHz  
 58dB  
 2°/2  
 2° C, ±10ns Y  
 Yes  
 Yes  
 Composite  
 Composite  
 Yes  
 Yes  
 No  
 No  
 No  
**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**

**Panasonic AV**  
**TBC-100 (TBC-200)**<sup>✓</sup>

S-VHS TBC  
 14.3(13.5)MHz 8-bit  
 16-line window  
 5.5MHz-Y/C 2.2MHz-Enc  
 58dB  
 2°, 2%  
 Yes  
 Y/3.58, Y/629  
 Y/3.58, Y/629  
 ---  
 ---  
 No  
 For chroma  
 In chroma  
 No  
**829**

**Panasonic Broadcast**  
**AU-TB50**<sup>✓</sup>

TBC  
 13.5MHz/8-bit  
 32-line  
 Y 4.5MHz, C 1.5MHz  
 >54dB component  
 1°/1%  
 ---  
 10H-21H  
 CTCM Y-C (YPrPb)  
 YPrPb  
 ---  
 ---  
 -1x, +2x  
 No  
 No  
 No  
**830**

**Polar Video**  
**Roger - Dual Channel**

TBC/synchronizer/store  
 17.72MHz, 8-bit  
 1 field, each channel  
 Chroma -3dB at 3.58MHz  
 ---  
 2°, 1%  
 ±25ns rel. to sync in  
 No  
 PAL, VHS, U-matic  
 Composite PAL  
 ---  
 Yes  
 Yes  
 ---  
 By Y/U/V processing  
 Detail, each channel  
 Field freeze/channel  
**831**

**Prime Image**  
**S TBC+ (S TBC-SYNC+)**<sup>✓</sup>

TBC (synchronizer)  
 8-bit luma, chroma  
 16 line (1-frame)  
 4.2MHz  
 58dB  
 1.5°/1.5%  
 ±15ns  
 Yes  
 Y/C S-VHS  
 Y/C S-VHS  
 ---  
 Yes  
 No  
 Yes  
 No  
 No  
**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, ±15rs mono	---	---	---	---
Advanced sync out	---	No	Yes	25H advance	No
Component in	Signal system dependent	No	Encoded/RGB/YC/YCrCb	Encoded/RGB/YUV/U-matic	Composite only
Component out	Signal system dependent	No	Encoded/RGB/YC/YCrCb	Encoded/RGB/YUV/U-matic	Composite only
Velocity compensation	Yes	No	---	Yes	---
Heterodyne processing	Option	Yes	---	Yes	---
Non-servo capstan	No	Yes	---	Yes	---
Dynamic tracking	With 3050, +1, +3x play	No	Yes	Yes	---
Noise reduction	Inherent reduction	No	4-level to 15dB	3-stage selectable	Inherent 3-line comb
Image enhancement	No	No	H-detail	Detail	Independent field freeze
Production effects	No	No	No	Freeze frame only	Audio sync output
Reader Service Number	833	834	835	836	837

†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†
Operating modes	DF/NDF/CF/JS	NDF/CF	NDF/CF
Standards supported	SMPTE, EBU	EBU	EBU PAL 8-field
Time reference	Video, 60Hz, ktal	Video	Video
Data entry for	Time, user bits	Time, user bits	---
Data display of	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
Editor interface	Yes	---	Yes
			800✓
			Not 24fps
			SMPTE
			Video sync
			Time, User Bits
			Time, User Bits
			Play only for jam
			---

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 TLX: 4972400 UMI-ANA  
 FAX: 714-630-4156



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 Anaheim, CA 92807

<b>Manufacturer</b> . . . . .	<b>Adams-Smith</b>
<b>Model Series</b> . . . . .	<b>System 2600†</b>
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
<b>Reader Service Number</b> . . . . .	<b>1005</b>

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

<b>Amtel Systems</b>	
<b>800✓</b>	
No . . . . .	No
No . . . . .	Yes
No . . . . .	No
220Vac . . . . .	Battery
No . . . . .	No
No . . . . .	No
Yes . . . . .	No
No . . . . .	No
<b>1008</b>	<b>1009</b>

<b>Manufacturer</b> . . . . .	<b>Amtel Systems</b>
<b>Model Series</b> . . . . .	<b>Model 6000</b>
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
<b>Reader Service Number</b> . . . . .	<b>1010</b>

<b>Audio Kinetics</b>	
<b>Striper w/Quickstripe</b>	<b>VTL translator‡</b>
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
<b>1011</b>	<b>1012</b>

<b>Cipher Digital</b>	
<b>GEARBOX TC converter‡</b>	<b>CDI-735CD/V/L</b>
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 . . . . .	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
<b>1013</b>	<b>1014</b>

<b>Manufacturer</b> . . . . .	<b>Cipher Digital</b>
<b>Model Series</b> . . . . .	<b>CDI-750 master</b>
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

<b>CDI-700A, -710A readers</b>	<b>CDI-716A generator</b>
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

<b>Datum</b>	
<b>5360 reader (5370 VCG)</b>	<b>5350TC generator</b>
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



The MUSIC 4 system represents the latest technology in SCA audio transmission. Four 5 KHz (or two 10 KHz) channels can be placed on a single 67 or 92 KHz subcarrier.

- Superior channel bandwidth and distortion characteristics are achieved using the patented MUSIC 4 ISB subcarrier modulation.
- Superior S/N ratio when compared to conventional FM subcarrier systems.
- Advanced generator design eliminates subcarrier interference with main stereo channel.
- Generator incorporates off-the-air audio and injection monitoring.
- DATA 4 option available.

**S.C.A. Data Systems Inc.**

3000 Ocean Park Blvd. #3002  
 Santa Monica, CA 90405  
 (213) 452-2506 • Fax: (213) 450-5307

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

Manufacturer		Datum	Denecke	ECCO/Convergence		
Model Series	5303 time processor†		Dcode TC-1 reader✓	TCR-65/-66✓/-67	VCG series✓	VIG-850 master†
Operating modes	DF/NDF/CF/JS		DF/NDF/CF	DF/NDF	DF/NDF	DF/NDF/CF/JS
Standards supported	SMPTE, CBU		SMPTE, EBU	SMPTE	SMPTE	SMPTE, EBU
Time reference	Video		Video	Video	Video	Video, slave to TC
Data entry for	Time, user bits		No	None	No	Time, user bits
Data display of	Time, user bits		Time or user bits	Time, user bits	Time, user bits VCG-77	Time, user bits
Reading speed range	1/20x-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		ECCO/Convergence	ESE		Evertz Microsystems	
Model Series	PTG-56✓ (MTG-55/-57)		727 (257/258) readers	ES 461 generator	453 (456) readers	ECM 4010 master†
Operating modes	DF/NDF/CF(55/57 JS)		DF/NDF	DF/NDF/JS	DF/NDF	DN/NDF/CF/JS
Standards supported	SMPTE		SMPTE	SMPTE	SMPTE & EBU	SMPTE, EBU
Time reference	Video		Video	Video w/color frame	Video w/color frame	Video, xtal
Data entry for	Time		Time	Time/User bits	Time/User bits	Time, user bits
Data display of	Time -56/-57		Time (Not 258)	Time	0.56" Time/UB	Time, user bits
Reading speed range	1/20x-30x -56/-57		....	....	Std (1/20, 20x)	1/20x-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	Yes	No	....
Video display keyer	No		No	No	ES-455, 452 readers	Yes
Display window	No		No	No	Via RS-232C/422	Variable
Reader Service Number	1025		1026	1027	455, 452 adjustable	1028

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, user bits	Time, user bits
Reading speed range	1/20x-70x	± 1/20x-70x L, 0-20x V	± 1/20x-70x	....	1/20x-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		Fostex	Gray Engineering Labs		JVC Company	
Model Series	4010 (4011†)		VID225† (VIE224)	DT113/104F/213	DR115/107B/109B reader	TG-P49U✓
Operating modes	DF/NDF/CF/24-25FPS		DF/NDF	DF/NDF/CF	DF/NDF/CF	DF/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	Yes	No
Time code comparator	Yes	No	No	(-115 4-channel)	No
Video display keyer	4011	No	DT-213 only, variable	Variable format	No
Display window	....	No	DT-213 variable	Variable	No
Reader Service Number	1035	1036	1037	1038	1039

Manufacturer	Shintron			Skotel	
Model Series	#690 ET master†	#647 gen (646 reader)	#640 (641✓) readers	TCG-80N (TCG-80N-FT)	AV TC-20✓ (TC-20 V1)
Operating modes	DF/NDF/CF/JS	DF/NDF	DF/NDF/CF (NDF/CF)	All modes <sup>1</sup>	All modes
Standards supported	SMPTE, EBU	SMPTE, EBU	SMPTE/EBU (EBU only)	SMPTE	SMPTE, EBU
Time reference	Video, xtal	Video	Video	Composite video	Video
Data entry for	Time, user bits	Time, user bits (None)	Time, user bits	Time, User bits	Time, User bits
Data display of	Time, user bits	Time, user bits	Time, user bits	Time, User bits	Time, User bits
Reading speed range	± 1/16-80x	(1/16x-40x)	n.a.	± 10% play	(Pause to 150x)
Editor interface	RS-422 interface	No	No	....	None
VTC code output	Yes	No	No	Option 008, 006	(Read only)
LTC output signal	0dBm, <10Ω source	0dB @ 30Ω	No	0.5-5Vp-p <100Ω	0.1-2V
Synchronizer function	Yes	No	0dB ± 2dB 2Ks	No	No
Power requirement	110/220Vac	110/220Vac	3 AA cells, 4.5Vdc	110Vac	12-14Vdc
User bit recognition	Yes	No	No	....	No
Time code comparator	Yes	No	No	....	No
Video display keyer	Yes	(646 only variable)	No	Yes	(Yes 3-char size)
Display window	15-char/5-line	(Variable)	No	Variable	(Variable position)
Reader Service Number	1040	1041	1042	1043	1044

<sup>1</sup>80N-FT model includes 3/2 film pull-down recognition.

Manufacturer	Skotel			Sony Broadcast	
Model Series	TCR-111 (111C)	TCR-80, TCR-80V†	TCR-112 (132†)	BVG-100 gen/reader✓	BVG-1600 G(1500 R†)
Operating modes	DF/NDF/CF	All modes	DF/NDF/CF	DF/NDF/CF/JS	DF/NDF/CF/JS
Standards supported	EBU/SMPTE	SMPTE	EBU/SMPTE	SMPTE/EBU	SMPTE/EBU
Time reference	Video	....	Video	Video	Video
Data entry for	Time, user bits	No	Time, user bits	Time/user bits	Time/user bits
Data display of	LEDs, time, user bits	Time, User bits	Time, user bits	8-digit time/user	8-digit time/user
Reading speed range	1/16x-40x play	1/16x-40x, ± 45X play	1/16x-40x play	Normal play	1/16x-110x
Editor interface	RS-232/422 on 111C	....	....	No	BVG-1500 only
VTC code output	No	Looped only, TCR-80V	TCR-132 only	SMPTE/EBU	SMPTE/EBU
LTC output signal	Reshaped	Bridged	Reshaped	2.5Vp-p 10KΩ	0-8dBm
Synchronizer function	No	No	No	No	No
Power requirement	110Vac	110Vac	110Vac	9-18Vdc	110-220Vac
User bit recognition	Yes	....	Yes	No	BVG-1500
Time code comparator	Yes	....	Yes	No	BVG-1500
Video display keyer	No	Yes	Yes	No	BVG-1500
Display window	No	Variable	Var size/position	No	8 (9) 1-line
Reader Service Number	1045	1046	1047	1048	1049

Manufacturer	Telcom Research				
Model Series	TCG-550/TCR-660✓	T5010 R/G <sup>1</sup>	T-7000A R/G✓	T800/T900 transtators†	TCR680✓ (T6020 <sup>2</sup> )
Operating modes	All mode	All modes	All modes	24/25/30fr, DF mode	All modes
Standards supported	SMPTE, EBU	SMPTE, EBU	EBU, SMPTE	Auto NTSC, PAL select	SMPTE/EBU
Time reference	Video or sync	Video, sync	Video, sync	....	....
Data entry for	Time	Time, User bits	Time, User bits	None	No
Data display of	Time, User bits	Time, User bits	Time, User bits	Status only	None
Reading speed range	0.1-10x TCR660	....	0.1-5x	....	0.1-8x
Editor interface	No	No	....	No	....
VTC code output	No	No	No	7800	No
LTC output signal	11dB 600Ω TCG550	Dual 11dBm 600Ω	11dBm 600Ω bal	11dBm 600Ω bal	Bridged input only
Synchronizer function	No	No	No	No	No
Power requirement	ac or dc	110Vac	5 AA cells	110Vac	ac, dc
User bit recognition	No	....	No	No	No
Time code comparator	No	....	No	No	No
Video display keyer	No	Yes	No	No	Yes
Display window	No	Variable attributes	No	No	Variable positioning
Reader Service Number	1050	1051	1052	1053	1054

<sup>1</sup>Companion unit T6010 includes reader, timecode character inserter.

<sup>2</sup>Provides 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	DF/NDF, 24/25F, RT
Standards supported	SMPTE, EBU	SMPTE/EBU	SMPTE/EBU	....
Time reference	Video, 60Hz, xtal	Video	Video	Off-tape TC
Data entry for	Time, user bits	Timer, user bits	Timer, user bits	TC, UB
Data display of	Time, user bits	Dual 8-digit	Dual 8-digit	TC, UB, channel
Reading speed range	± 1/16x-60x	1/16x-120x	....	....
Editor interface	RS-422/232C	....	Yes	RS-232
VTC code output	No	No	No	No
LTC output signal	-10, +8dBm	....	+8dBm	No
Synchronizer function	Yes	No	No	16-channel
Power requirement	110/220Vac	100-240Vac	100-240Vac	110-220Vac
User bit recognition	Yes	....	....	Yes
Time code comparator	No	....	....	Yes
Video display keyer	No	305 (opt 310)	205 (opt 210)	No
Display window	No	Variable format	Variable format	No
Reader Service Number	1055	1056	1057	1058

# 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  $\mu\text{P}$ . Most provide individual meters for each audio channel; video metering includes tracking. Luminance bandwidth is  $\pm 0.5\text{dB}$  to  $4.2\text{MHz}$ ; except PAL/SECAM models which extend response to  $>5\text{MHz}$ . In color standards, N - NTSC, P - PAL, S - SECAM. Moire rating with 75% color bars is typical  $-40\text{dB}$  for NTSC Type C units and  $-37\text{dB}$  for PAL/SECAM and/or type B equipment. Models marked with a bullet (•) provide a tape parameter memory.

Manufacturer	Ampex AVSD			Ampex AVSD/Nagra	BTS Broadcast TV Systems
	Model Series	•VPR-3†	•VPR-6	VPR-80	VPR-5 portable
S/N ratio L/C	47dB w/Zeus processor	46dB L, 46dB C	46dB L, 46dB C	46dB L	$>47\text{dB}$ NTSC, $>43\text{dB}$ PAL
Diff phase/gain	$4^\circ/4\%$ max	$4^\circ/4\%$	$4^\circ/4\%$	$4^\circ/4\%$	$<4^\circ/4\%$
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	$\pm 2\text{dB}$ , 50Hz-18kHz	$\pm 2\text{dB}$ , 50Hz-18kHz	$\pm 2\text{dB}$ , 50Hz-15kHz	$\pm 2\text{dB}$ , 50Hz-15kHz	$-3, +2\text{dB}$ , 40Hz-14kHz
AF S/N ratio	56dB (+16dBm out Ch 1/2)	56dB unwdt + 16dBm out	56dB, +16dBm output	56dB, +8dBm out	$>57\text{dB}$ NTSC, $>54\text{dB}$ 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	$\mu\text{P}$ 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	•HCN-230	BVH-2000 (2180)	BVH-2500 Delta-Time
S/N ratio L/C	47dB	$>44\text{dB}$	$>48\text{dB}$	48dB unwdt	48dB unwdt
Diff phase/gain	$<4^\circ/4\%$	$<4^\circ/4\%$	$3^\circ/3\%$	$<\pm 4^\circ, <4\%$	$<4^\circ, <4\%$
K factor 2T	$<1.5\%$	$<20\text{ns}$	$<1\%$	$<1\%$	$<1\%$
Video confidence	Yes	Yes	Yes	Yes	Yes
No. audio channels	3	3 or 2 audio, 1 TC	3	3 analog	3 analog
AF response	$-3, +2\text{dB}$ , 40Hz-14kHz	$-3, +2\text{dB}$ 40Hz-18kHz	$-3, +1.5\text{dB}$ , 50Hz-15kHz	$-3, +1.5\text{dB}$ 50-15k	$-3, +1.5\text{dB}$ 50-15k
AF S/N ratio	57dB ref 254nWb/m	$>7\text{dB}$ ref 254nWb/m	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	$-1/2x, +1/2x$	.....	-1x, +3x	Yes	Still, step, slow
Slow motion mode	No	$-3/4, +1x$ 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
S/N ratio L/C	47(47)dB	$>49\text{dB}$ unwdt V1-K tape	47dB p-pV/RMS noise	$>44\text{dB}$ unwdt
Diff phase/gain	$4^\circ, 4\%$ (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	$-3, +1.5\text{dB}$ 70-15k	$-3, +1.5\text{dB}$ , 50Hz-15kHz	$-3, +1.5\text{dB}$ 50-15k	$-3, +1.5\text{dB}$ 50-15k
AF S/N ratio	$>56\text{dB}$	$>56\text{dB}$ 3% THD, Ch 1/2	56dB 3% distortion	$>56\text{dB}$
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 <sup>†</sup> )	BVH-3000/3010 <sup>†</sup>	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

<sup>†</sup>The Super Motion model records at 3x standard play speed; playback at standard speed creates slow motion.

## Automated Cassette Playback Systems

Video playback automation systems, based on 1", 19mm (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) <sup>1</sup>
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

<sup>1</sup>TCP1000 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
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

<sup>1</sup>Option 352-cassette rotary-bin expansion units for 472, 824, 1176-cassette library.

Type III VTR expansion module provides 5 additional VCR decks.

## Videocassette Systems, 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	>46dB
Audio parameters					
Input connection	Bal 600/10kΩ	Xfmr bal, 3k/10kΩ	Bal 3k/10kΩ	Bal 3k/10kΩ	Bal 3k/10kΩ
Output connection	Bal, low Z	600Ω on -110	Bal low Z	Bal low Z	Bal low Z
Output level	0dBs	+4dBm on -110	+4dBm	+4dBm	+4dBm
S/N ratio	>48dB	48dB 3% THD	>52dB 3% THD	>48dB	>52dB
Distortion	<3%	<2.5%	<2%	<3%	<3%
LTC modules	External units	Integral on -800, -820	Integral	Options	Options
VITC modules	....	External units	External units	....	....
Remote control format	RS-422/45-pin	RS-422	RS-422	RS-422	RS-422
Reference input	Sync, subcarrier	Sync, subcarrier	Sync, subcarrier	Sync, subcarrier	Sync, video
Variable tracking feature	No	On -820	No	On TTV3916	On TTV3936
Reader Service Number	1340	1341	1342	1343	1344

# 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

<i>Video parameters:</i>	
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	Y/Cb, Y-C
<i>Audio parameters:</i>	
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

<i>When different from Betacam SP:</i>	
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

<sup>1</sup>Integral TBC circuitry.

<sup>2</sup>For 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 <sup>1</sup>	CVR-60	BCB-60	BVW-60	TTV-3560
Studio player/VT <sup>1</sup>	CVR-65	BCB-65	BVW-65	TTV-3565
Studio editor <sup>1</sup>	CVR-70	BCB-70	BVW-70	TTV-3570
Studio editor/VT <sup>1</sup>	CVR-75	BCB-75	BVW-75	TTV-3575
<b>Reader Service No</b>	<b>1133</b>	<b>1134</b>	<b>1135</b>	<b>1136</b>
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 <sup>2</sup>
Studio player	CVR-10	BCB-10	BVW-10	...
Studio player/VT <sup>1</sup>	CVR-15	BCB-15	BVW-15	TTV-3615/16 <sup>2</sup>
Studio editor <sup>1</sup>	CVR-40	BCB-40	BVW-40	TTV3635
<b>Reader Service No</b>	<b>1137</b>	<b>1138</b>	<b>1139</b>	<b>1140</b>

## M-II and S-VHS Formats

### M-II

<i>Video parameters:</i>	
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 <sup>2</sup>
<i>Audio parameters<sup>1</sup>:</i>	
Response	-2, 1dB 20-20k
S/N ratio	> 80dB
THD distortion	< 0.6%
No. of tracks	2 linear, 2 AFM

### S-VHS

<i>Video parameters:</i>	
Resolution	> 400TVL
S/N ratio	> 45dB
<i>Audio parameters:</i>	
Response	20-20k
S/N ratio	> 44dB
Dynamic range	> 90dB
Wow/flutter	< 0.005%
No of tracks	2 linear, 2 HD

<sup>1</sup>S-VHS specification provide.

<sup>2</sup>Values 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 <sup>1</sup>
Studio player/VT	...	AU-630 <sup>1</sup>
Studio recorder	...	AU-640 <sup>1</sup>
Studio recorder/VT	KR-860U	AU-650 <sup>1</sup>
...	...	AU-660 <sup>1</sup>
Studio editor	KR-880U	AU-X80 <sup>1</sup>
<b>Reader Service No</b>	<b>1141</b>	<b>1142</b>

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	...	...	...
<b>Reader Service No</b>	<b>1143</b>	<b>1144</b>	<b>1146</b>	...



EDITING SYSTEM



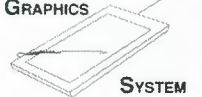
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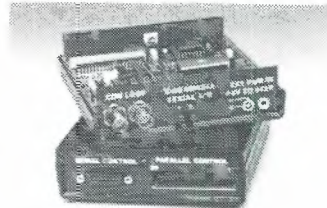
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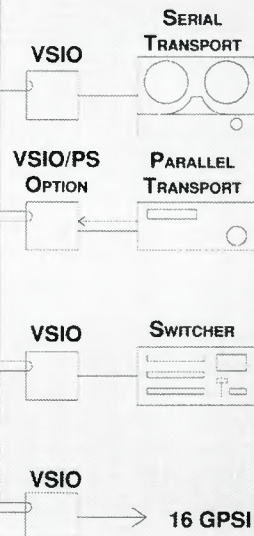
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# Audio equipment specs

## Audio Mixers, On-Air

Audio mixing systems designed for the on-air control room of radio and TV facilities, although they may also serve some production applications. Nearly all provide for switch-selection of nominal mic or line level inputs. Speaker muting circuits are typical. Those marked with a dagger (†) are prepared for installation with automation. Systems not providing talkback circuits are noted with a double dagger (‡). In Audio Response, Hz is understood. AB refers to Actively Balanced, while TB is Transformer Balanced.

Manufacturer	ADM Technology	Arrakis Systems		ATI/Audio Technologies	Auditronics
	Model Series	250SC†	Model 5000	Vanguard series‡	200 series
Modular construction	Yes	No	Yes	Yes	Yes
# of mixing positions	24	6-ch rack-mount	16 (32 input)	8	24
Output channels	Pgm/aud/aux/cue/mono	Pgm/aux/mono	Pgm/aud/mono/mix	Pgm/aud/cue/mono	Pgm/aud/mono/cue
Fader types	Slider, VCA	Rotary/VCA	P&G slider/VCA	Slider, rotary	Slider, VCA
Bus switching by	Push button	Push button	Push button	Membrane	Push button
Input patch points	Yes	No	Prefader	No	Yes
Internal switching by	Electronic	Solid-state	Solid-state	Solid-state	Mechanical, VCA
Machine starts stops	Relay	Relay	Yes	Yes	Yes
Cue circuits	On fader, bus switch	On fader	On fader	On fader	On fader
Metering types	VU, PPM	VU meters	VU meters	VU, VFD opt	VU
Int cue amp speaker	Yes	Amp only	2W/channel	Yes	Yes
Int headphone amp	No	No	...	Yes	Yes
Input connections	TB 600Ω	AB 1k/100kΩ	Bal 1k/100kΩ	AB 20kΩ	AB 150/10kΩ
Output connections	TB 600Ω	Bal 600Ω	Bal 600Ω	AB 600Ω	TB/AB 50Ω
Output level	8dBm	27dBm max	27dBm	4dBm, 26dBm max	4dBm, 30dBm max
AF response	±1dB	±0.5dB 20-20k	±0.5dB 20-20k	±0.25dB	0-1dB 8dBm
Distortion	0.07% 1kHz 24dBm	0.02% 8dBm	0.02% 8dBm	0.15% 18dBm	<0.01% 1kHz 24dBm
S/N ratio, mic/line	-125dBm EIN/72dB	72dB mic/82dB line	62dB mic/82dB line	-124dBm EIN/92dB	-128.5dBm EIN/>82dB
Crosstalk (worst)	-72dB 8dBm 100-10k	-90dB 2kHz	Below noise	-74dB 10kHz	<-83dB 20kHz
Reader Service Number	1418	1419	1420	1421	1422

Manufacturer	Autogram			B.F.E.	Broadcast Audio
	Model Series	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	10S250A (8S250A)‡	10S350A‡	MixTrak 90
Modular construction	Yes	No	No	Yes
# of mixing positions	6	10 (8)	10	18 or 12
Output channels	Pgm/aud/uti/mono/cue	Pgm/aud/cue/mono	Pgm/aud/cue/mono	Pgm, aud, 3 mix-minus
Fader types	Slider	Rotary	Slider	P&G slider w/VCA's
Bus switching by	Push button	Keyswitch	Push button	Pushbutton
Input patch points	Yes	No	No	Yes
Internal switching by	Mech, electronic	Solid-state	Solid-state	Hall effect devices
Machine starts stops	Push buttons	No	No	Yes
Cue circuits	On fader	On fader	On fader, keyswitch	Monitor dim feature
Metering types	VU, peak LED	VU	VU	VU, PPM opt
Int cue amp speaker	Amp only	Yes	Yes	Yes
Int headphone amp	Yes	Yes	Yes	Yes
Input connections	TB/AB 1.5kΩ/20kΩ	AB 54kΩ	AB 54kΩ	Balanced
Output connections	TB 150Ω	TB 600Ω	TB 600Ω	Balanced
Output level	28dBm max	8dBm	8dBm	0, +8dBu, adj
AF response	±0.5dBm	-0.5dB 8dBm	-0.5dB 8dBm	-0.5, 0dB 20-20k
Distortion	<0.02% 28dBm 1kHz	0.075% 1kHz 18dBm	0.05% 1kHz 18dBm	<0.05% 20-20k
S/N ratio, mic/line	-125dBm EIN/90dB	70dB 18dBm	70dB	-128dBu/>80dB
Crosstalk (worst)	-80dB 15kHz	n.a.	n.a.	<-80dB bus/<-75dB R/L
Reader Service Number	461	462	463	464

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/aux/cue
Fader types	Slider, VCA	Rotary	Slider or rotary	P&G slider w/pan
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	2 circuits
Cue circuits	PFL bus switch	On fader	On-fader, push button	On-fader
Metering types	LED, other	VU w/peak LED	VU	VU mechanical
Int cue amp speaker	Yes	No	Yes	Speaker
Int headphone amp	Yes	No	Yes	.....
Input connections	AB/TB 5k/40kΩ	TB 150/15kΩ	AB 150/600Ω	AB 1.2k/10kΩ
Output connections	TB/unbal 600Ω	AB 600Ω	AB 200Ω	AB 600Ω
Output level	6dBm nom	8dBm, 22dBm max	24dBm max	24dBm max
AF response	-1dB 6dBm	±dB 8dBu	-0.5dB 8dBm	±0.2dB
Distortion	0.05%	0.25% 1kHz 22dBm	0.05% 8dBm	0.1% 7kHz 18dBm
S/N ratio, mic/line	< -126dBm EIN	-1.5dBm EIN/74dB	-127dBm EIN/>95dB	-128dBm EIN
Crosstalk (worst)	< -66dB 16kHz 6dBm	-82dB 1kHz 8dBm	-85dB 15kHz 18dBm	-65dB 15kHz 4dBm
Reader Service Number	466	467	468	470

Manufacturer	HoweTech	Logitek	LPB Inc
Model Series	8000 (9000)‡	Series 10000	Series 7500
Modular construction	Yes	Yes	No
# of mixing positions	10 (12)	30, 22, 14	12 or 22
Output channels	Pgm/aud/cue/mono	Pgm1/Pgm2/L + R utility	Pgm/aud/cue/mono
Fader types	Rotary (slider)	Slider, VCA	Slider
Bus switching by	Pushbutton	Pushbutton	Push button
Input patch points	Yes	Yes	No
Internal switching by	Solid-state, EO opt	Solid-state	Solid-state
Machine starts stops	Yes	Optical isolators	Yes
Cue circuits	On-fader, bus switch	Yes	Push button
Metering types	VU, PPM, LED	VU	VU, PPM
Int cue amp speaker	Yes	10W to 8Ω output	Yes
Int headphone amp	Yes	L&R/5W to 8Ω	Yes
Input connections	AB 600Ω/10kΩ	AB 10kΩ	AB 600Ω/10kΩ
Output connections	AB 150Ω	AB 150Ω	AB 150Ω
Output level	4dBm nom	4dBm	4dBm
AF response	±0.1dB 4dBm ref	±0.1dB 4dBm	±0.1dB 4dBm
Distortion	0.03% 1kHz 4dBm	0.025% THD, 0.04% IMD	0.03% 1kHz 4dBm

Logitek	LPB Inc
Perfectionest-8 (12)‡	Citation‡
No	No
8 (12)	8, 10 (24, 30 inputs)
4-pgm/aud/mono/cue	Pgm/mono
Slider, rotary opt	Rotary or slider
Push button	Push button
Yes	No
Solid-state	Solid-state
Yes	10 circuits
On-fader	Bus switch
VU, peak flasher	LED
Yes	Amp. speaker
Yes	.....
AB 1kΩ/600Ω	AB 150/600Ω
AB 600Ω	TB/AB 600Ω
+4dBm	24dBm max
±0.25dB, 4dBm	±0.3dB 8dBm
0.008% 1kHz 4dBm	05% 20-20k 8dBm

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Manufacturer	Soundcraft	Soundtracs	Southern Broadcasting	Studer	Tore Seem Audio A/S
Model Series	SAC-2000	FM Broadcast	Allidesign console†	970	SECON
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 (worst)	n.a.	-75dB 15kHz 8dBm	-75dB 15kHz 8dBm	<-55dB L-R separation	-90dB 1kHz Pgm-Aud-Aux
Reader Service Number	496	497	498	499	500

## Audio Mixers, Portable

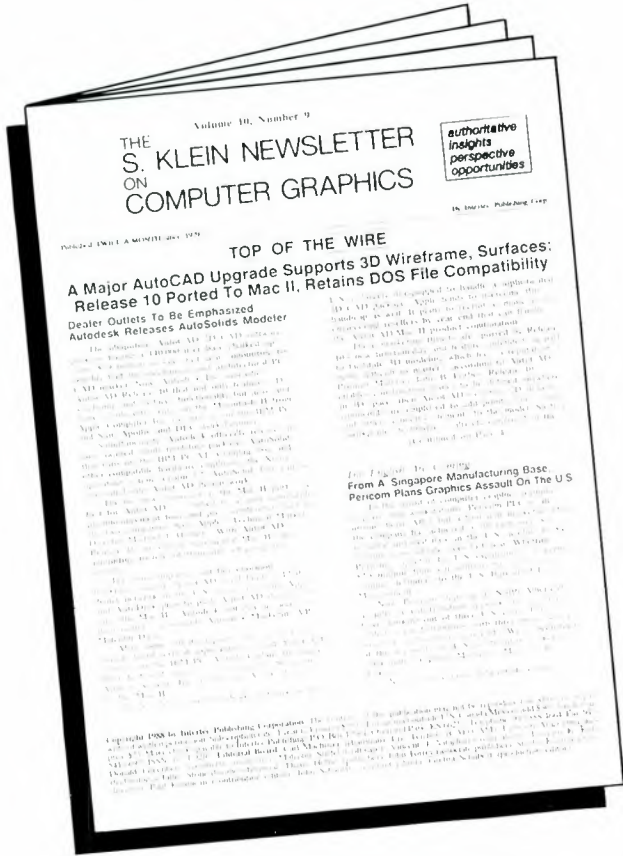
This equipment includes ENG mic mixers to smaller format production consoles, many easily carried by one person. Models with an integral TELCO interface are marked with a dagger (†), while those with compression & limiting are marked with a double dagger (‡). In Audio Response, Hz is understood.

Manufacturer	a&a Systemes de Communications	ADM Technology	Allen/Heath	AMEK Consoles
Model Series	CORA series†‡	Report'2 (Report'4)†‡	RM 1083	BC-II series†
Modular system	Yes	No	Yes	No
# of mixing positions	4	3 (4)	8	8, 16, 24 models
# of inputs	17	2 M/1 L (4 M/L)	16	13, 22, 30
# of mixing buses	2	1 (2)	3	2 or 6
Stereo output	No	No	Yes	3 pairs
Output provisions	Line, telco	Pgm, Telco, phone	Line, aux, phones	Line, monitor, aux
Channel fader type	Rotary, sliders	Rotary	Rotary	TBM slider
EQ, filtering	Yes	Yes	Prefader	4-band, shelving, peak
Test oscillator	Yes	Yes	None	Variable
Metering types	VU meters	LED VU ladder (VU)	VU	VU, PPM, LED
Power requirements	220Vac	2 9Vdc or external dc	110Vac	120Vac
Operating weight	78 lbs	4.5 (22) lbs	.....	.....
AF input connections	Xfmr bal, unbal	Xfmr bal (unbal)	Xfmr bal	Active
Input impedance load	600Ω, 200Ω, 10kΩ	500Ω, 10kΩ	600Ω	150Ω
Input levels	-40, +40dB	-65dB, +12dB	+8dB	.....
Output connections	Active bal	Balanced	Xfmr bal	Unbalanced
Output impedance	600Ω, 1kΩ	600Ω	600Ω	.....
Output level	+12dB max	+12dBm	+8dBm	.....
AF response	±3dB	40-15k	±1dB at +24dB ref	±1dB, 20Hz-20kHz
Distortion	.....	.....	0.07%, 1kHz, +24dBm	<0.05%, +4dBm out
S/N ratio	.....	.....	-125.5dB EIN	-125dBm EIN
Crosstalk	.....	.....	-72dB 8dBm = 0.1-10k	<-60dB 4dBm
Reader Service Number	395	396	397	398

Manufacturer	Audio Developments (Gotham Audio)			Audio-Technica	Audix
Model Series	AD062 (AD062-M)‡	AD160 (AD260) ENG‡	AD145 (AD145-E)	AT4462 Modu-Comm‡	MXT500
Modular system	Yes	No	Yes	No	Yes
# of mixing positions	12, 4-16 opts	4	4/6/8 mic/line	.....	7
# of inputs	4-16	3-m/1-l (4-m/l)	4/6/8, phantom power	6	14
# of mixing buses	A/B/C/Mon L-R/phones	1 mono (1 stereo)	2	L/R	2 main, 2 aux
Stereo output	Yes	No (Yes)	1 pair	Yes	Yes
Output provisions	Line, mic, phones	Line/mic, phones	Line, phones, mon	Line, Modu-Comm phones	Line, aux, phone, mono
Channel fader type	P&G slider (VCA opt)	Rotary	Slider (VCA option)	Rotary	Slider, rotary
EQ, filtering	3-band EQ, HPF	Prefader HPF	Prefader, HPF	No	Yes
Test oscillator	Fixed 1kHz	Fixed 1kHz	Yes	1kHz, 400Hz, 4.5kHz	1kHz fixed
Metering types	VU, PPM (on bridge)	VU, PPM	VU/PPM/LED	Dual VU	Dual VU or PPM
Power requirements	10-24Vdc, 10C cells	10-24Vdc, 9AA (12AA)	10-24Vdc, 10C cells	12-18Vdc, 2 9V cells	110-220Vac/24Vdc
Operating weight	24 lbs 8-in (35 10-in)	3.3 (5.5) lbs	12-16 lbs	4.7 lbs	35 lbs
AF input connections	Xfmr mic, AB line	Xfmr & AB (xfmr bal)	Xfmr bal	Xfmr bal	Xfmr bal
Input impedance load	1kΩ (m), 100kΩ (l)	1kΩ (3kΩ)	1kΩ mic, 10kΩ line	1.5kΩ(m), 47kΩ(l)	1.2kΩ(m), 10kΩ (l)
Input levels	Switched mic/line	Mic/line (switched)	-35, +20dBm, switched	Switched mic/line	Switchable, mic/line
Output connections	Xfmr bal	AB (xfmr bal)	Xfmr bal	Xfmr bal	Xfmr bal, floating
Output impedance	75Ω	20Ω (75Ω)	75Ω	1Ω source	75Ω nominal



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Manufacturer	Audio Developments (Gotham Audio)			Audio-Technica	Audix
Model Series	AD062 (AD062-M)‡	AD160 (AD260) ENG‡	AD145 (AD145-E)	AT4462 Modu-Comm‡	MXT500
Output level	+24dBm maximum	+24dBm	+24dBm into 600Ω	+22dBm maximum	+24dBu max into 600Ω
AF response	±1dB 20-20k	-3, +1dB 10-30k	-3, +1dB 10-30k	-1, +1dB 40-20k	±0.5dB, +24dBm
Distortion	<0.05% 0dBm	0.05%, 1kHz, 0dBm	≤0.05%, 1kHz +0dBm	<0.1% +4dBm	<0.1%, 40-20k, +18dBm
S/N ratio	-126dBm EIN	-125dBm EIN	-126dBm EIN	-127 dBV EIN 150Ω	-125dBm EIN
Crosstalk	<-70dB 40-15k	-60dB 40-15k	<-70dB 40-15k	65dB R-L	<-70dB 18dBm 30-15k
Reader Service Number	400	401	402	403	404

Manufacturer	Bandive/Connectronics		Broadcast Audio	Broadcast Electronics	Calrec
Model Series	SECK 1882 (1282)	SECK62 (SECK112)	System 6RM RackMount	4S50AP (4M50AP/4R50A)	Mini Mixer‡
Modular system	No	No	Yes	No	Yes
# of mixing positions	18 (12)	6 (12)	6	4 max	16 channels max
# of inputs	72 mic/line/tape/ins	6M/6L, 4 aux, (12M/12L)	2/mixer	12 (8/10)	To 18
# of mixing buses	L/R+8 subgroup	L/R, solo	Rotary	1 stereo (1 mono)	2 + aux
Stereo output	Yes	Yes	No	Yes (no)	Yes
Output provisions	Line, mon, group, solo	Line, phones, 4 aux	Pgm, Aud, Cue	Line, aux, phones	Line, aux, link, mono
Channel fader type	Slider, rotary pan	Slider	Rotary	Rotary	Slider
EQ, filtering	Shelving, peak-dip	HF, LF, mid-sweep	None	None	3-band, HF, LF
Test oscillator	30Hz slate tone	.....	No	None (none/fixed tone)	Yes
Metering types	LED bar graph, peak	LED bar graph	VU	VU	Dual VU
Power requirements	120/240Vac	220-240Vac(50Hz)	110Vac, 220Vac opt	110Vac	120/240Vac or ±12Vdc
Operating weight	38 lbs (33 lbs)	11(17.6) lbs ps 2.2 lb	30 lbs	20 (20/10) lbs w/o bat	26 lbs
AF input connections	Active bal	Balanced	TB/AB	Act bal (act/xfmr)	Xfmr bal
Input impedance load	>1kΩ, 50kΩ, 20kΩ, 10kΩ	1kΩ(m), 50kΩ(l)	1.5kΩ/20kΩ	20kΩ	1.2kΩ, 10kΩ
Input levels	-55, +10dBm, +20dB	-60, -30, -15dBu	Mic, line	Switchable mic/line	+8dBu(m), +28dBu(l) max
Output connections	Active bal	Balanced	Xfmr bal	Xfmr bal	Xfmr bal
Output impedance	<50Ω	600Ω, 1kΩ aux	150Ω	600Ω	600Ω, 10kΩ
Output level	+21dBu 20-20k	+21dBm max	28dBm max	+8dBm	+24dBm to 600Ω max
AF response	-1dB, 20-20k	-2dB, 20-20k	±0.5dB 20Hz-20kHz	-1(-2)dB +8dBm	±0.5dB, 30Hz-15
Distortion	<0.005%, 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	-124dBu EIN, 80dB	-127.5dBm EIN, 74dB	<-127dBm EIN/90dB	65(60/70)dB	-127dBu EIN, >80dB
Crosstalk	-95dB 1k/-83dB 10k	.....	<-80dB 15kHz	.....	.....
Reader Service Number	405	406	407	408	409

Manufacturer	Comrex Corporation	D&R Electronica		DDA/Klark-Teknik	Digitec
Model Series	STLX (SLX) Sports‡‡	300 Mark II	700 Mark 3	Series S PA	UPS 6166 (6000 series)
Modular system	No	No	Yes	Yes	Yes
# of mixing positions	2 mic, 2/line	8	12 and 24	16, 24, 32	16
# of inputs	7 max	20	2/channel + aux	16, 24, 32	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	.....	110 or 220 Vac	120/240Vac, int/ext 12Vdc
Operating weight	18 lbs (15 lbs)	.....	.....	.....	55 lbs
AF input connections	Active bal & aux unbal	Balanced	Bal, unbal	Bal, unbal	Xfmr bal
Input impedance load	150Ω	2kΩ, 10kΩ	2kΩ, 10kΩ	>2k/10kΩ	>1kΩ, >5kΩ
Input levels	Switchable mic/line	Mic, line switched	Mic, line switched	Mic, line switched	-70, +20dBu
Output connections	Xfmr bal, aux unbal	Balanced	Balanced	Active bal	Balanced
Output impedance	600Ω	100Ω	100Ω	<75Ω	<50Ω for 600Ω load
Output level	-9, +6dBm	0dBu	+4dBu	+26dBv max	+21dB max
AF response	±0.5dB 50-15k	±0.025dB, 20-20k	0.025dB, 20-20k	<0.75dB, 20-20k	-1, +0.5dB
Distortion	<0.5%, 50-15k	0.039%	<0.01% any level	<0.05%	<0.2%, +12dBu
S/N ratio	-127dB EIN	-126.5dBu EIN >80dB	-126.5dB EIN, 83dB	-127dBv, 84dB	-125dBu EIN
Crosstalk	<-60dB 1kHz	.....	.....	<-80dB 1kHz	<-70dB overall
Reader Service Number	410	411	412	413	414

Manufacturer	EELA/ESL	Electro-Voice	EMT-Franz	Fostex	Gentner Electronics
Model Series	S20(S22) Reportophone‡‡	ELX-1‡‡	EMT 10.00.2‡	Multitracker series‡‡	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	-1.0, 5dB, +6dBm	±3dB 40Hz-12.5kHz(1)	±0.5dB 10Hz-20kHz
Distortion	<0.1%, 200-7k	<0.15% 50-20k +18dBu	0.1%, 1kHz, 6dBm	<0.05% 1kHz	<0.05%
S/N ratio	-122dBm EIN	-128dBm 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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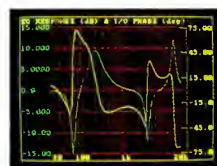
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Manufacturer	Harrison Systems	Ikegami Electronics	JVC Company	Kaitronics	Logitek
Model Series	MX-8 (Pro-7)	ABX-160A	MI-2000U	AM-8000 (VAS-ST)	Stereorack (Audiobook)
Modular system	Yes	Yes	No	No	No
# of mixing positions	10 (36)	16	8	8 (8A+8B)	6
# of 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	-129dBm EIN	>56dB mic, >75dB line	-128dB EIN IHF-Awtd 150Ω	-128dBm EIN	-122dBm EIN (-114dBm)
Crosstalk	-65dB 4dBm 15kHz	<-50dB	<-70dB 1kHz Pgm-Aux	.....	-80dB 4dBm 1kHz
Reader Service Number	420	421	422	423	424

Manufacturer	Micro-Trak	Neve/Siemens	Pacific Recorders & Eng.	Precision Design	Ramko Research
Model Series	Sport mixers†	5422 (542 series)	NewsMixer (StereoMixer)††	ROAM-8‡	P-4MS (P-5MX)
Modular system	No	Yes	Yes	No	No
# of mixing positions	4 max	8 max (12-16)	8 possible	8	4 (5)
# of inputs	5 max	10	2 per channel	8elco (mic or line)	4 (5)
# of mixing buses	1	2 + 2 aux	Mix 1, 2	To telco	2 (1)
Stereo output	No	Yes	No (Yes)	Monaural	Yes (mono)
Output provisions	Line, phones	Line, 2-aux, phones	Mix1/2, Aux (Pgm/Mon)	Line, telco, send bus	Phones & (line)
Channel fader type	Rotary	P&G slider	Rotary	Sliders	Rotary
EQ, filtering	No	3-band, high-pass	3-band EQ/filter opt	3-band	Yes (no)
Test oscillator	None	Variable	Yes	Pink-noise	No
Metering types	VU	VU, PPM	Dual ANSI VU	LCD bargraph	LED ladder (no)
Power requirements	110/220Vac, dc	120Vac or int Vdc	117Vac	ac or D cells	120-240Vac
Operating weight	8 lbs	42 lbs w/batteries	.....	13.75 lbs in case	.....
AF input connections	Xfmr bal	Xfmr bal	Balanced	Electronic bal	Active bal
Input impedance load	600Ω, 150Ω	1.2kΩ(m), 10kΩ(l)	30kΩ (m), 40kΩ (l)	600Ω	.....
Input levels	Switchable mic/line	Switchable mic/line	-70, -35dBu(m), +9dBu (l)	Mic, line	Switchable, mic/line
Output connections	Xfmr bal/telco	Xfmr bal	Balanced	Balanced	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	-126dBu EIN 150Ω source	-109dB EIN	70dB(m), 90dB(l)
Crosstalk	.....	<-60dB 20dBm 15kHz	<-80dB 1kHz (-70dB)	.....	<-65dB 1kHz
Reader Service Number	425	426	427	428	429

Manufacturer	Ramko Research	Ramsa/Panasonic Pro A/V	ReVox	SATT Communications
Model Series	Primus Sidekick‡	WR-133 (WR-500)	WR-M10‡	C279‡ (expander opt)
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(phono)
# 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, Ciip LEDs	LED ladder PPM
Power requirements	9Vdc	120Vac (or 12Vdc)	120Vac, 10W	110-240Vac, ±15Vdc
Operating weight	2.5 lbs	13.2 lbs	24.2 lbs	8.5 lbs
AF input connections	Balanced	Bal/unbal XLR/RCA	Active bal, unbal	Bal mono, unbal stereo
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, -6dBv; -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††	Pluto 3/1 mini‡
Modular system	Yes, multinit possible	No
# of mixing positions	8 expandable to 24	3
# of inputs	8 (to 24)	1 mic/line, 2 mic
# of mixing buses	10	1
Stereo output	Yes	No
Output provisions	line, aux, subgroups	Line, phones
Channel fader type	P&G sliders	Rotary
EQ, filtering	Yes	Low-cut

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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	> 1kΩ, 600Ω, > 10kΩ	1kΩ(m), 10kΩ(l)	1kΩ, 66kΩ, 3.5kΩ	1kΩ, 140kΩ, 43kΩ, 3.3kΩ	150Ω, > 10kΩ, 3.5kΩ
Input levels	+6dBm	Switched mic/mic/line	Mic, line, mix-bus	Mic, line	Switchable mic/line
Output connections	Xfmr bal	Balanced	Xfmr bal & unbal	Xfmr bal & unbal	Xfmr bal
Output impedance	<40Ω	<40Ω	50Ω, 5kΩ, 2.5kΩ, 3.3kΩ	50Ω, 5kΩ, 2.5kΩ, 3.3kΩ	50Ω, 150Ω, 3.5kΩ
Output level	+20dBu into 600Ω	+9dB limiting level	-33dBV to +18dBm	-20dBm, +18dBv	+18dBm, -34dBm mic
AF response	±0.5dB	±0.5dB, 40-15k	±0.2dB 30-20k	±3dB 40-20k	±2dB 30-20k
Distortion	<0.1% 20-20k 20dBu	0.15% 40-15k +9dB	0.4% +15dBm/0.5% IMD	±±0.2%	±0.35% 15dBm/0.5% IMD
S/N ratio	-125dBu EIN, >80dBu	5dB, CCR14 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	Rotary	Rotary	Slider	Rotary (slider)
EQ, filtering	Low-cut prefader	Yes	Low cut	Prefader	Prefader
Test oscillator	1kHz	Fixed	1kHz	1kHz fixed	None (fixed)
Metering types	Dual VU, LED (VU, LED)	PPM, LED	LED VU ladder	VU, PPM, LED	VU (& LED)
Power requirements	11-18Vdc [phantom 48V]	9-18Vdc (D cells)	3 C cells, ext 6-12Vdc	12Vdc, 110-220Vac	9Vdc (12Vdc/120Vac)
Operating weight	2.5 lbs (2.2 lbs)	15 lbs	5 (3, 4) lbs	40.3 lbs	8.6 lbs (28 lbs)
AF input connections	Xfmr bal	Xfmr & (active bal)	Active bal	Active bal	Xfmr (active bal)
Input impedance load	1kΩ, 66kΩ, 24kΩ	600Ω (5kΩ/10kΩ)	10kΩ	10kΩ	600Ω
Input levels	Switchable, mic/line	Switchable mic/line	Mic, line switched	Mic, line	Mic, line
Output connections	Xfmr bal	Xfmr, active bal	Floating bal	Active bal	Xfmr (active bal)
Output impedance	1Ω, 330Ω, 7.5kΩ	50Ω	2kΩ, 10kΩ	150Ω	For 600Ω load
Output level	-34dBV, +16dBm (+18dBm)	+18dBm	+18dBu, +21dBu max	+24dBm	+4dBm
AF response	±2dB 50-15k (30-20k)	±0.5dB, +6dBm	±0.5dB, 30-20k	±0.5dB, 30-20k	±1(0.5)dB, +4dBm
Distortion	<0.25% 4dBm	0.01% 1kHz 6dBm	0.03%	<0.1% 1kHz 4dBm	0.1% (0.03%) 4dBm
S/N ratio	-128dBV EIN (-129dBV)	-129dBm EIN	-129dBm EIN 150Ω source	-125dBm DIN	-125dBm EIN
Crosstalk	-30dB 10kHz	-80dB 8dBm 1kHz	.....	-70dB 4dBm 15kHz	<-70dB (-60dB)
Reader Service Number	440	441	442	443	444

Manufacturer	Soundtracs/	Stellavox	Studer	TASCAM	
Model Series	PC MIDI series†	AMI-48†	Model 961/962†	M-208 (M-216) [M224]	M-06 (M-106)
Modular system	Yes	.....	Yes	No	No (Yes)
# of mixing positions	16 or 24 channel	5 max	17 max	8 (16) [24]	6
# of inputs	32 or 48	10 max	.....	Mic/line/tape per channel	6 mic/6 line/6 insert
# of mixing buses	25	1	6	4 + 2	L + R (and 4-line)
Stereo output	Yes	Yes	Yes	Yes	Yes
Output provisions	Line, aux, mon	Line, aux, phone	Line, aux, phones	Line, aux, phones	Pgm, aux, effects
Channel fader type	Slider w/MIDI ctl	Slider	Slider	Slider	Slider, rotary pan
EQ, filtering	4-band param/shelving	Yes	Yes	Prefader, 3-band	±15dB, 100Hz, 10kHz
Test oscillator	4-tone	Fixed	Variable	None	None
Metering types	Bargraph	PPM	VU or PPM	VU w/peak LED	VU + peak LEDs
Power requirements	Ext ac	18Vdc	110Vac or dc	ac	110-220Vac
Operating weight	90 or 121	9 lbs	35 lbs with batteries	18.75 (26.5) [32] lbs	5.73 lbs (15.4 lbs)
AF input connections	Active bal, unbal	Bal	Balanced	Active bal, unbal	Unbal
Input impedance load	2k/10kΩ mic/line	600Ω	.....	2.8kΩ, 22kΩ	45kΩ, 10kΩ
Input levels	Mic, line switched	Switched mic/line	-70, -10dBu: -10, +20dBu	-70dBV, +24dBV range	-70, +4dBV nom.
Output connections	Unbalanced	Balanced	<50Ω source	Unbalanced	Unbal
Output impedance	50Ω source	200Ω, 600Ω	24dBm, 2.4dBu 300Ω	<100Ω source	100Ω
Output level	+22dBm max	+6 or +15dBm	-1, +0.5dB 4dBm	+20dBu max	0dBu nominal
AF response	-2dB, 25-20k	-1dB @ 6dBm	0.03% 30-15k	-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	-127dBm EIN	-125dBm EIN	-130dB IHF A-wtd	-109dB IHF A-wtd
Crosstalk	-80dB 1kHz	-80dB 6dBm 1kHz	<-80dB 4dBm 15kHz	<-60dB 1kHz	<-60dB 1kHz
Reader Service Number	445	446	447	448	449

Manufacturer	TASCAM			Telfax Communications	UREI Electronics
Model Series	MiniStudio series†	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	5kΩ and 50kΩ	10kΩ	2.4kΩ, 50kΩ	150Ω(m), 600Ω(l)	150/10k/47kΩ
Input levels	Mic, line	Switchable mic/line	-70dBV, -10dBV nom.	Mic or line	Mic, line, phono
Output connections	Unbal	Unbal	XLR & RCA jack	Balanced	Bal, unbal
Output impedance	100Ω source	100Ω	100Ω source, 10kΩ load	600Ω, 10kΩ, 150Ω	<50Ω
Output level	-10dBV	10dBV	+4dBm nom.	+4dBm = 0VU	+20dB max in 200Ω

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Circle (182) on Reply Card

Manufacturer	TASCAM			Telfax Communications	UREI Electronics
Model Series	MiniStudio series <sup>1</sup>	246 Portastudio	338 Studio 8	Ten 32 (Ten 44) <sup>2</sup> ††	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

<sup>1</sup>Series includes Porta One, Porta Two and 05.  
<sup>2</sup>Ten-44 includes a NiCad battery charger.

Manufacturer	Ward-Beck Systems	Yamaha International		
Model Series	T-1202A†	EMX200/EMX300	MC1204/-1604/-2404	M508/M512
Modular system	Yes	Yes	Yes	Yes
# of mixing positions	12	8/12	12/16/24 + 6	8/12
# of inputs	24	8/12	12/16/24 + sub inputs	8/12
# of mixing buses	3	L-R, FB, echo	4 + 2 + 2 + cue	L-R, FB, echo
Stereo output	No	Yes	Yes	Yes
Output provisions	Line, phones	Line, EQ, phone, FB	Line/phone/grp/FB/echo	Line/FB/phones/echo
Channel fader type	Slider	Slider	Slider	Slider
EO, 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	-125dBm 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	Past-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	Yes	With routing	W/routing
Speaker muting	Yes	No	Yes	Yes	3 monitor sets
Lineup oscillator	Fixed frequency	Variable	3-range variable	Yes	Variable
Metering types	VU	VU/PPM	In/LED	Plasma	200-seg plasma
Input connections	Bal 600Ω	TB 600Ω	AB > 1kΩ/10kΩ	AB 150Ω	AB 1k(mj)/10k(1)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	Artrak Systems	Auditronics	Audix Ltd
Model/Series	Model 10000‡	400 series	Series 310
Metering types	VU	VU (bargraph opt)	VU (PPM opt)
Input connections	AB low/high-Z	AB <1.5kΩ/50kΩ	AB <1.5kΩ/50kΩ
Output connection	AB 600Ω	AB 60Ω	AB 60Ω
Output levels	27dB	4dBv ref 0.775Vrms	4dBv ref 0.775Vrms
AF response	±1dB 20-20k	≤0.5dB 20-20k	0.5dB 20-20k
Distortion	0.1%	≤0.05% THD 20-20k	<0.05% THD 20-20k
S/N ratio	-100dB line	≤-129dB EIN, >84dB	<-129dB EIN, >84dB
Crosstalk	-80dB 20kHz	≤-65dB 20-20k	<-65dB 20-20k
Reader Service Number	345	346	347

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	Calrec by AMS			D&R Electronica b.v.
Model/Series	UA8000	Logic 1	Assignable console	M studio (M OB)
Modular construction	Yes	Yes	Yes	Yes
# of mixing positions	64 max	8 + 2	48, 72 (128 max)	To 64
# of mixing buses	32	32	8 grp + 8 aux + 4 main	24grp/8sub/4main/aux
Patch points	Yes	Yes	Computer control	Yes
Stereo output	Yes	Yes	4 pair	Yes
Fader types	Slider	Motorized slider	Slider	Slider
Equalizer	4-band	4-band	4-band	3/4-band
Filtering	High, low-pass	High, low-pass	.....	High, low-pass
Panpots	Yes	Yes	Yes	Yes
Groups subgroups	32 S/9 R	32 S/9 R	8 stereo/8 aux	32 total
Sends returns	Pre & post	Pre & post	Multiple, pre/post	Pre & post
Solo bus	AFL/PFL/in-place	AFL/PFL/in-place	Yes	PFL/AFL/in-place
Compression limiting	Yes	Yes	Yes	Option
Talkback circuits	Yes	Yes	Yes	Available
Speaker muting	Yes	Yes	.....	Yes
Lineup oscillator	Variable	Variable	Yes	6-tone/slate/pink
Metering types	Bargraph	LEDs in Knob	LED bargraph, VU	Bargraph
Input connections	TB/AB 20kΩ	TB/AB 20kΩ	TB/AB >1.2k/10kΩ	TB/AB 1.2k/10k/20kΩ
Output connection	AB <22Ω	AB <22Ω	AB <75Ω	TB 600Ω
Output levels	26dBm max	26dBm max	24dBu max	22dBu max
AF response	±0.25dB 4dBm	±0.25dB 4dBm	-0.25dB 20-20k	±0.5dB 30-15k
Distortion	0.007% 1kHz 20dBm	0.007% 1kHz 20dBm	<0.005% 20dBm	<0.01% 40-16k
S/N ratio	80dB	80dB	<-128.5dB/-90dBu	<-127dBm/-80dBu
Crosstalk	-80dB 100-10k 4dBm	-80dB 100-10k 4dBm	<-90dB 100-10k	.....
Reader Service Number	350	351	352	353

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	DDA/Klark-Teknik			Digitec
Model/Series	DCM 232	AMR-24	D-series‡	UPS6500
Modular construction	Yes	Yes	Yes	μP control
# of mixing positions	32	24	30/38/42 positions	24-48
# of mixing buses	32	24	8+2	8-16
Patch points	Yes	Yes	Yes	μP controlled
Stereo output	Yes	Yes	Yes	Yes
Fader types	Slider	Slider	Slider	Slider/VCA control
Equalizer	4-band	4-band	4-band & 2-band	3-band
Filtering	High-pass	High-pass	High-pass	High, low-pass
Panpots	Yes	Yes	Yes	Yes
Groups subgroups	24 groups	24 groups	8 groups	8-16 groups
Sends returns	4 mono, 2 st, 1 st	2 st, 4m pre/post	8 stereo	6/in monitor system
Solo bus	AFL/PFL/in-place	AFL/PFL/in-place	AFL/PFL	Yes
Compression limiting	No	No	No	.....
Talkback circuits	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes
Lineup oscillator	5 tones	Variable	4 frequencies	6-frequency
Metering types	VU movements	VU	VU & 5-seg LED	VU (PPM/bar graph)
Input connections	AB >2k/10kΩ	AB >2k/10kΩ	AB >2kΩ/>10kΩ	TB >1k/5kΩ
Output connection	AB <75Ω	AB <75Ω	AB <75Ω	TB <20Ω
Output levels	26dBv	26dBv	26dBv	12dB nom, 22dB max
AF response	-0.25dB 20-20k	-0.25dB 20-20k	-0.25dB 20-20k	-1, +0.5dB 30-20k
Distortion	<0.05%	<0.05%	<0.05%	<0.2% typical
S/N ratio	-127dBv/-80dBv	-127dBv/-82dBv	-127dBv/-82dBv	<-125dBm EIN
Crosstalk	<-80dBv 1kHz	<-82dBv 1kHz	<-80dBv 1kHz	<-80dB 20kHz
Reader Service Number	355	356	357	358

Manufacturer	EELA Audio	EMT-Franz	Fostex	Graham-Patten Systems	Grass Valley Group
Model/Series	S-3000 II/VCA (S-300‡)†	EMT 30.16.‡	450 (450-16)†‡	ESAM 608, 612, 616†	AMX-170S w/E-MEM†
Modular construction	Yes	Yes	No	No	No
# of mixing positions	.....	30	8 (16)	8, 12, 16 channel	10
# of mixing buses	30 (13)	2	7	Stereo pgm, pvw	4+2+1
Patch points	Yes	Yes	.....	No	.....
Stereo output	Yes	Yes	Yes	Yes	Yes (PGM A, B)
Fader types	Slider	Slider	Slider	Slider w/VCA	Slider w/VCA
Equalizer	Shelving, swept	3-band parametric	3-band	Sidechain	4-band EQ per input
Filtering	High, low-pass	Hi-pass	No	.....	Hi-/lo-cut
Panpots	Yes	Yes	Yes	No	.....
Groups subgroups	9 grps (variable)	None	4x2	No	Effectively 4
Sends returns	4 each	Echos pre/post	2 pre/3 post	No	.....
Solo bus	AFL (PFL)	Yes	AFL	No	No
Compression limiting	No (Yes)	Yes	No	700 ser sidechain	No
Talkback circuits	Yes	A 113 module	None	No	No
Speaker muting	No (Yes)	Yes	No	No	.....
Lineup oscillator	Yes	63Hz, 1kHz, 10kHz	No	No	400Hz, 1kHz
Metering types	VU, PPM	Analog, LED	VU/PPM/LED	4 VU, PPM	LED ladder
Input connections	AB (& TB) 1.2k/10kΩ	Xfmr bal	AB/unbal 1.2k/10kΩ	AB >20kΩ	RB >20kΩ
Input levels IGNORE	Mic, line switchable	Mic, line switched	Switchable mic, line	+30dBu max	-10, +8dBu

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.

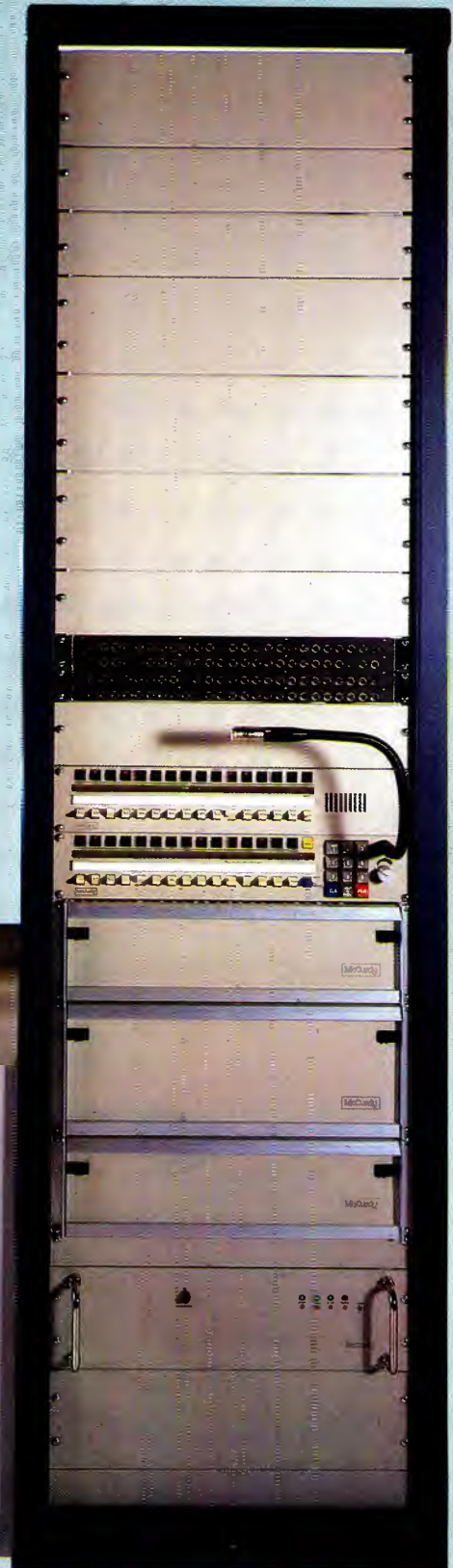
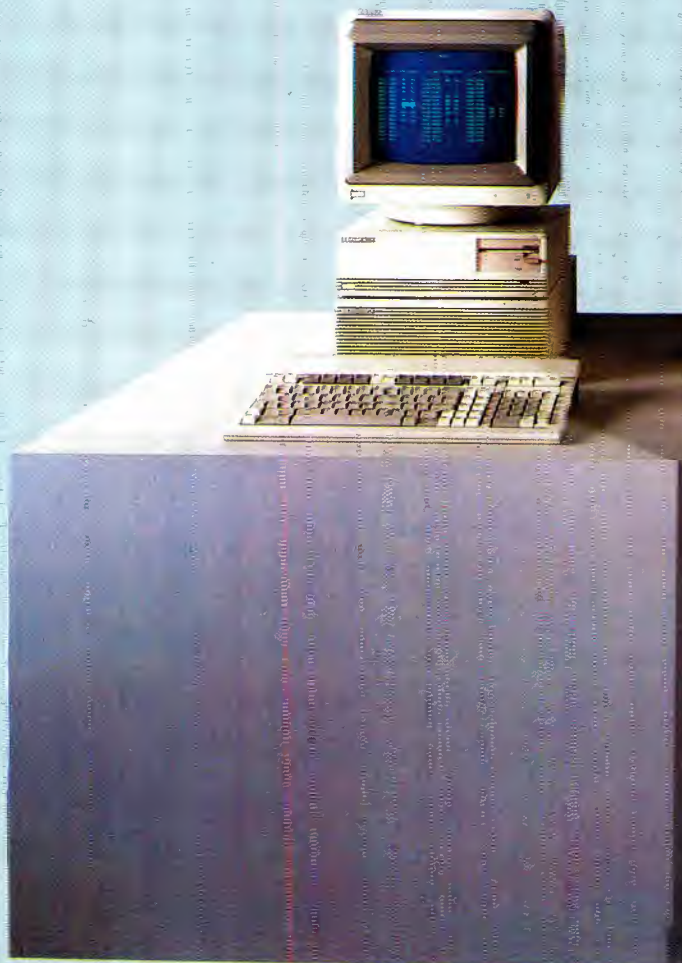
The versatile CS9400+ provides complete point-to-point communications, dynamic Party Lines, interrupted fold-backs (IFB), radio interface, telephone interface and two-wire beltpacks.

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 ever changing 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 beltpacks
  - Interface to dedicated and dial-up telco circuits
  - Two-way radio interface
- New larger system size up to 640x640 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.

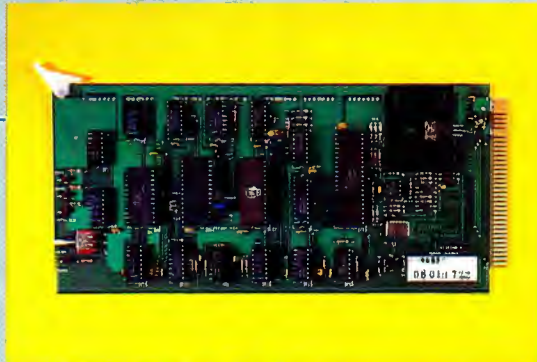
## FR9423 DISTRIBUTION AMPLIFIER FRAME

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

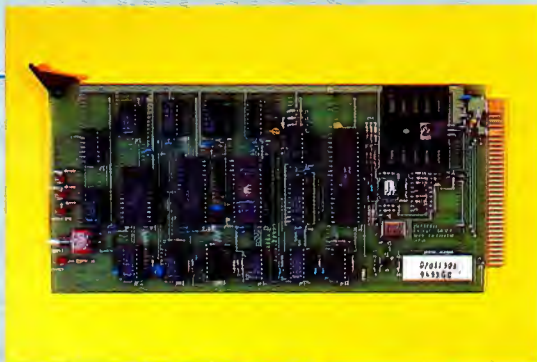
This 3 R.U. (5.25 inches) unit consists of three industry standard high frequency switch mode power supplies. These extremely cool running supplies provide bi-polar 15 volts DC for the analog elements and +12 volts DC for the digital elements. Distribution to the various frames is via gold plated power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



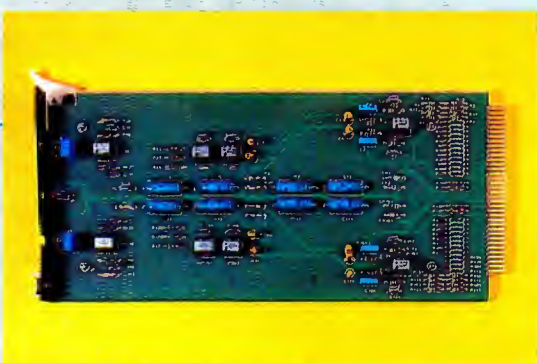
**GC9453 GROUP CONTROLLER CARD**

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.

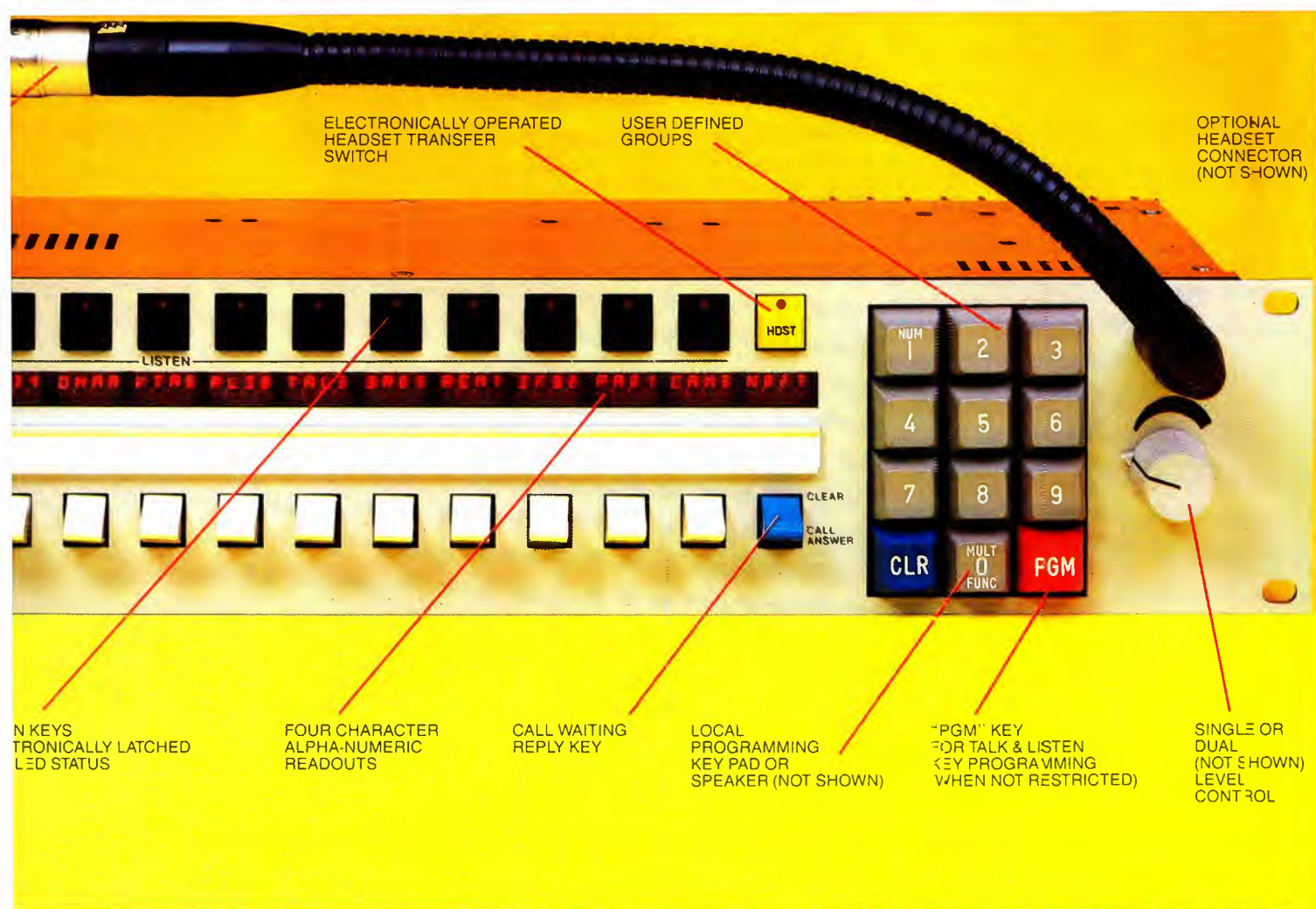
### COB-100

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.







ELECTRONICALLY OPERATED HEADSET TRANSFER SWITCH

USER DEFINED GROUPS

OPTIONAL HEADSET CONNECTOR (NOT SHOWN)

LISTEN

HDST

N KEYS ELECTRONICALLY 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



CLEAR CALL ANSWER

CLR

MULT 0 FUNC

FGM

**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 outputs 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**

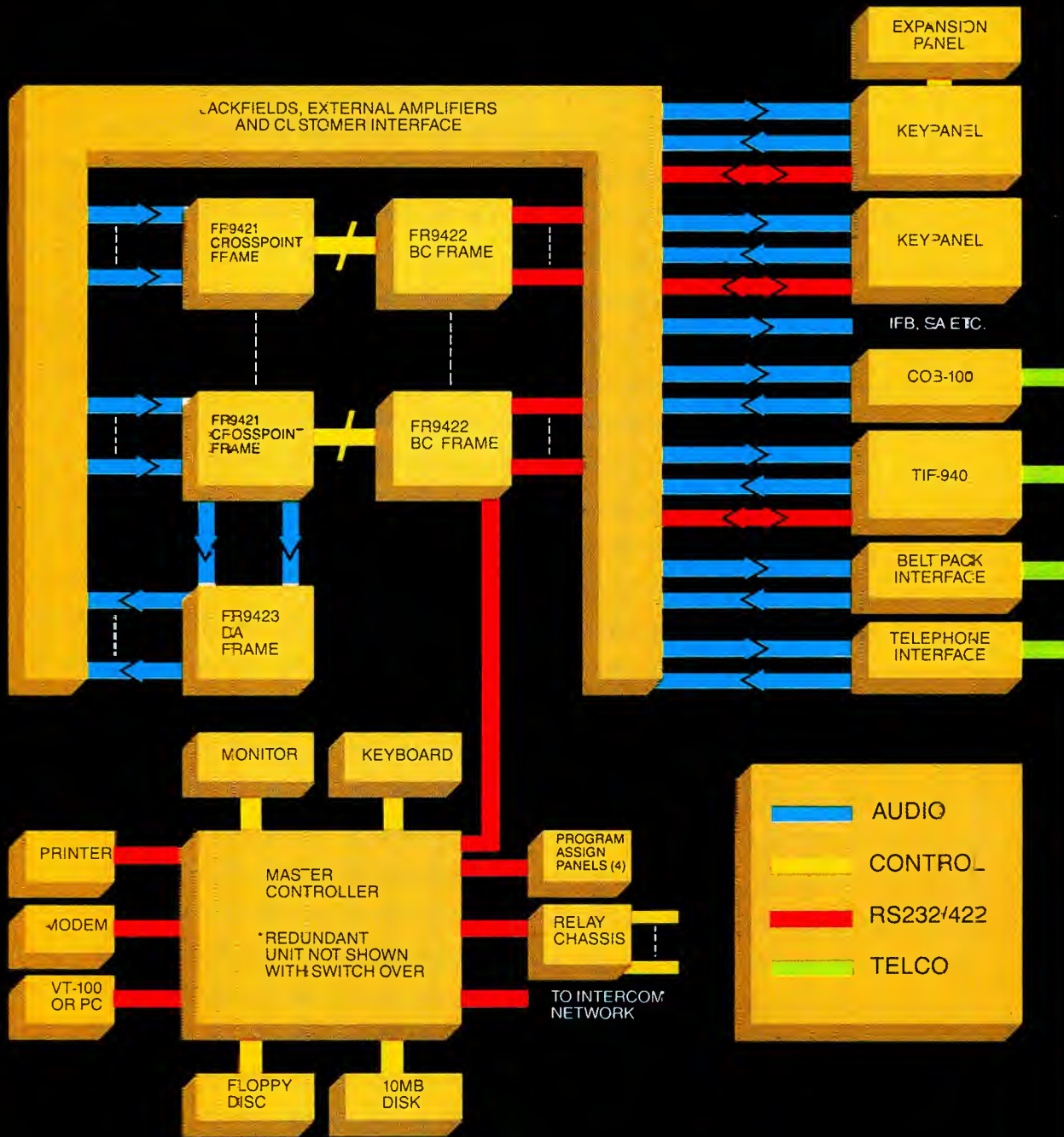
A full range of customer connect and interface panels is available to facilitate the interconnection of stations and external signal lines. Connections can be via DB-25 or RJ-type modular telephone connectors. A full range of patching and crossconnect accessories is also available.

**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+ Ergo 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

108 Carnforth Road, Toronto, Ontario  
Canada M4E 2L4 Tel: (416) 751-6262  
Telex: 06-965533 Telefax: (416) 751-6455

1051 Clinton Street, Buffalo, New York  
14206 Tel: (2-2) 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®

<b>Manufacturer</b>	<b>EELA Audio</b>
<b>Model/Series</b>	<b>S-3000 II/VCA (S-300)†</b>
Output connection	AB (& TB <40Ω)
Output levels	..... (20dBm max)
AF response	± 1dB
Distortion	0.01% (0.06%)
S/N ratio	-127dBm EIN (-126dBm)
Crosstalk	-76dB 1kHz/(-61dB 15k)
<b>Reader Service Number</b>	<b>360</b>

<b>EMT-Franz</b>	<b>Foslex</b>
<b>EMT 30.16.2‡</b>	<b>450 (450-16)††</b>
Xfmr bal <35Ω	Unbal 600Ω
+4dBm nom	10dBv into 10Ω
-1.05dB 30Hz-40kHz	-2, +1dB ref -10dBv
0.1% 1kHz 4dBm	0.05% 1kHz -10dBv
-124dBm EIN/80dB	-126dBm EIN
-70dB 1kHz 0dBm	-60dB 1kHz -10dBv
<b>361</b>	<b>362</b>

<b>Graham-Patten Systems</b>	<b>Grass Valley Group</b>
<b>ESAM 608, 612, 616†</b>	<b>AMX-170S w/E-MEM†</b>
AB <30Ω	AB 60Ω
30dBm max	+22dBu clipping
± 0.5dB	± 1dB 20-20k
<0.1% for 16dBu	0.01% 8dBu 1kHz
100dB per input	CMRR 60dB
<-82dB 15kHz	<-90dB 15kHz
<b>363</b>	<b>364</b>

<b>Manufacturer</b>	<b>Grass Valley Group</b>
<b>Model/Series</b>	<b>• AMX-100M, AMX-100S</b>
Modular construction	No
# of mixing positions	...
# of mixing buses	3
Patch points	No
Stereo output	Yes
Fader types	VCA
Equalizer	None
Filtering	...
Panpots	No
Groups subgroups	No
Sends returns	...
Solo bus	No
Compression limiting	No
Talkback circuits	No
Speaker muting	...
Lineup oscillator	...
Metering types	LED ladder
Input connections	RB > 20kΩ
Output connection	AB 60Ω
Output levels	+22dBu clipping
AF response	± 1dB 20-20k
Distortion	0.01% 8dBu 1kHz
S/N ratio	CMRR 60dB
Crosstalk	<-90dB 15kHz
<b>Reader Service Number</b>	<b>365</b>

<b>Harrison Systems</b>	<b>JVC</b>
<b>PRO-790</b>	<b>•MI-3000U†</b>
Yes	No
20, 28, 36	9
6	Pgm, aux, mon
Yes	No
Yes	Yes
P&G slider w/VCA	Slider, VCAs
3-band	3-band
High, low-pass	None
Yes	Yes
Yes	No
Yes	Through aux
AFL/PFL/in-place	PFL
No	No
Yes	Yes
Yes	Yes
Variable	400Hz, 7kHz
VU, PPM, LED	LED ladder
AB 1.2k/10kΩ	Low-Z, 10k/50kΩ
AB 600Ω	Bal/unbal 600/10kΩ
24dBm	+24dBm max
± 0.2dB 4dBm	-20B 20-20k mic
...	<0.08% 20-20k 20dB
-129dBm EIN mic	<-128dB EIN 150Ω
<-65dB 15kHz	<-70dB 1kHz pgm/aux
<b>366</b>	<b>367</b>

<b>McCurdy Radio</b>	<b>Mitsubishi Pro Audio</b>
<b>SS8900E‡</b>	<b>Westar 8000 (8200)†</b>
Yes	Yes
32 std	...
8 sub, 2 mstr	24
Yes	Yes
Yes	2
Slider	Slider
3/4-band	4-band
High pass	High, low-pass
Yes	Yes
8 sub, 2 mstr	8 groups
4 switch selected	8 pre, 8 post
In-place	In-place, AFL, PFL
No	Option (No)
Option	Yes
Yes	No (No)
No	Variable
VU, PPM	VU, PPM, LED
AB/TB 150/600Ω	TB/AB 10kΩ
AB 150/600Ω	TB/AB 30Ω(75Ω)
24dBm max	28dBm max (26dBm)
± 1dB 30-20k	± 0.5dB (-0.75dB)
<0.01% 18dBm	0.05%
-125dBm EIN	-129dBm (-127dBm) EIN
<-65dB 30-20kHz	-70dB (-90dB)
<b>368</b>	<b>369</b>

<b>Manufacturer</b>	<b>Neve Electronics/Siemens</b>
<b>Model/Series</b>	<b>Digital transfer</b>
Modular construction	Yes
# of mixing positions	.....
# of mixing buses	1 digital, 1 analog
Patch points	No
Stereo output	Yes
Fader types	Motorized slider
Equalizer	4-band digital EQ
Filtering	Digital hi/low-pass
Panpots	.....
Groups subgroups	No
Sends returns	Yes
Solo bus	.....
Compression limiting	Limit/compress/expand
Talkback circuits	No
Speaker muting	No
Lineup oscillator	.....
Metering types	Bar graph
Input connections	Bal digital 75/50kΩ
Output connection	AB 50Ω analog
Output levels	12dBu
AF response	.....
Distortion	.....
S/N ratio	.....
Crosstalk	.....
<b>Reader Service Number</b>	<b>370</b>

<b>V series</b>	<b>Model 8232</b>
Yes	Yes
60	32
4+8 aux	4+6 aux
Yes	Yes
Yes	2 pair
P&G slider	P&G slider
4-band	4-band
High, low-pass	High, low-pass
Yes	Yes
To 4B/48	8 VCA optional
8 pre/post switchable	6 pre/post switched
AFL/PFL/in-place	AFL, in-place
Yes	No
Yes	Yes
Yes	Yes
Variable	Variable
VU+PPM, plasma	VU+PPM, plasma
TB/AB 1.2k/10kΩ	TB/AB 1.2k/20kΩ
AB 15Ω	TB/unbal 10Ω
4/8dBm, 26dBm max	4/8dBm, 22dBm max
± 0.5dB 4/8dBm	± 0.5dB 4/8dBm/0VU
<0.04% 20-20k 20dBm	<0.06% 100-10k 20dB
-125dBm EIN/80dB	-125dBm EIN/76dB
-80dB 20kHz 20dBm	-60dB 15kHz 20dBm
<b>371</b>	<b>372</b>

<b>Orion Research</b>	<b>Pacific Recorders &amp; Eng.</b>
<b>NewsMaker series</b>	<b>ABX series</b>
Yes	Yes
32	18, 26, 34 positions
4 stereo	Pgm, Aux, Util
Yes	Yes
Yes	Yes
P&G slider	Slider
7-band opt	3-band
High, low-pass	Low, high-pass
Yes	Yes
8 stereo	2 multitrack to stereo
4 pre/post stereo	Efx/foldback, 4-telco m-rm
Stereo	Yes
No	Comp/Exp/De-ess
Yes	Yes
Yes	Yes
Option	w/slate
VU	VU, PPM
AB > 1.8k/>60kΩ	Balanced
Bal <75Ω source	Bal, unbal DAs
28dBm max	4-8dBm adj +28dBm max
± 0.1dB	-0.9.0dB 20Hz-20kHz
0.035% 1kHz 4dBu	<0.02% mic 0.008%
-125dBm EIN	-127dBm EIN, -88dBu
-84dB 1kHz 8dBm	-85dB 1kHz
<b>373</b>	<b>374</b>

<b>Manufacturer</b>	<b>Ramko Research</b>
<b>Model/Series</b>	<b>•DC38-10S‡</b>
Modular construction	No
# of mixing positions	10 max
# of mixing buses	2
Patch points	No
Stereo output	Yes
Fader types	Slider
Equalizer	No
Filtering	No
Panpots	No
Groups subgroups	No
Sends returns	No
Solo bus	None
Compression limiting	No
Talkback circuits	Yes
Speaker muting	Yes
Lineup oscillator	Yes
Metering types	LED
Input connections	Bal 150Ω, high-Z
Output connection	Bal 60Ω
Output levels	8dBm nom
AF response	-2dB ref 8dBm

<b>Ramsa/Panasonic Pro A/V</b>	<b>Solid State Logic Ltd</b>
<b>WR-T820B‡</b>	<b>WR-8616 (WR-8428)†</b>
Yes	Yes
20	16 (28)
12	11 (10)
No	No
Yes	Yes
Matsushita MRP slider	Sliders
3-band quasi-param	3-band
High pass	High, low-pass
Yes	Yes
8 groups	2 (4) groups
4 send	2 + 2 effects
Post-fader	Yes
No	No
Yes	Option
.....	Option
1k/10k/slate	1kHz/slate
VU, bar graph	Bar graph & VU
AB 5k/10kΩ	AB 150/600Ω
600/3k/10kΩ	AB 600Ω load
20dBu max	23(24)dBm max
-0.8, +0.5dB 20-20k	-1.5, +0.5dB 20-20k

<b>SL 4000 E series Master</b>	<b>SL 6000 E stereo video</b>
Yes	Yes
64	64
4	6
Yes	Yes
Yes	Yes
Slider	Slider
4-band	4-band
High, low-pass	High, low-pass
Yes	Yes
32/8 VCA	32/8+6
4 pre/post, 4 return	6 pre, 6 post
AFL, PFL, in-place	AFL, PFL, in-place
Expander/gate	Yes
Yes	Yes
Yes	Yes
Variable	Variable
VU, PPM, plasma	VU, PPM, Bargraph
TB/AB 600Ω	600/35Ω
AB <35Ω	Bal <35Ω
26dBm 600Ω	26dBm 600Ω
± 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.



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Circle (121) on Reply Card

[www.americanradiohistory.com](http://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	
WR-T820B‡	WR-8616 (WR-8428)‡
0.08% 18dB 20-20k -130dB typical 60dB 1kHz	0.05% 1kHz -132dB (<-127dB) <-60dB 1kHz
376	377

Solid State Logic Ltd	
SL 4000 E series Master	SL 6000 E stereo video
0.03% 1kHz 4dBm 84dB -64dB 10kHz 4dBm	0.03% 1kHz 4dBm -128.5dB EIN mic -64dB 10kHz 4dBm
378	379

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 5kΩ
Output connection	TB/AB 25Ω
Output levels	26dBm max
AF response	±0.1dB
Distortion	0.02% 1kHz 6dBm
S/N ratio	-129dBm EIN/-115dBm
Crosstalk	-80dBm 1kHz 6dBm
Reader Service Number	380

Sony Pro Audio	
MXP-3000 series	MXP-2036
Yes	Yes
18-52	32
3	4
.....	.....
Yes	Yes
Slider	Slider
Shelving/parametric	3-band
High, low-pass	High-pass
Yes	Yes
8	4 groups
6 pre/8 post	.....
PFL/in-place	Yes
No	Available
Yes	5 outputs
Yes	Yes
Variable	<0.05% THD
VU/PPM	VU, ladder
TB/AB 1.5k/7kΩ	TB/AB 1.2k/10kΩ
TB/AB 120Ω	TB/AB 60Ω nom
22dBm 2kΩ	0dBm nom
-0.3dB 4dBm	±0.5dB
0.1% 1kHz 4dBm	0.05%
80dB	-126dB
-70dB 20kHz	<-70dB
381	382

Soundcraft	Soundtracs/AKG
TS-12	CP6800 series
Yes	Yes
24, 36	.....
Mix, channel	.....
Yes	Yes
Yes	Yes
Sliders	Slider, VCA control
4-band	5-band
High-pass	High-pass
Yes	Yes
12/8	Various config
6/6	Various config
PFL, in-place	In-place
.....	.....
Yes	Yes
Yes	Yes
Yes	11-tone
Yes	Bargraph
AB 2kΩ(m)/10kΩ(l)	AB 4k/10kΩ
5kΩ/600Ω	AB 50Ω
21dBu, 26dBu max	22dBm
-1dB 20-20k 10dBu	.....
0.005% 1kHz	<0.015%
-128.5dB EIN	-127.5dBm/>72dB
-80dB between groups	.....
383	384

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/10kΩ
Output connection	Unbal 50Ω
Output levels	22dBm max
AF response	.....
Distortion	<0.015%
S/N ratio	-127dBm/>78dB
Crosstalk	<-70dB
Reader Service Number	385

Sluder	
Model 963‡	900 Series
Yes	Yes
60-in/4sub/4-master	64
4-8sub/4master/4aux	24
To +6dB	Yes
Yes	Yes
Slider	Slider
3-band	4-band
High-pass	High, low-pass
Yes	Yes
4 or 8	10 groups
4 pre/post switched	5 pre/post switched
Post-fader	In-place
Per channel/system	w/VCA faders
Yes	Yes
Yes	Yes
5-frequency	Variable
VU or bar graph	VU, PPM
TB >5kΩ	TB/AB 75kΩ
TB <50Ω	TB 50Ω
24dBm	6dBm typical
-0.1, 0dB 30-15k	-1.0, 5dB 6dBm
0.03% 4dBm 30-15k	0.1% 31-16k 6dBm
-125dBm EIN mic	-125dBm EIN mic
-80dB 4dBm 15kHz	-85dB
386	387

TASCAM	
M-500 series‡‡	M-600 series
Yes	Yes
12-20	24-32
8main/4aux/2master	16+8+4+2
Access patches	Yes
Yes	Yes
Slider	Slider
3-band	3/4-band
No	High-pass
Yes	Yes
8 main, 4 aux	16 pgm
Yes	16 aux
In-place, PFL	PFL
Sidechain opt	No
Yes	Yes
Yes	Yes
3-tone	4-tone
VU meters	VU
Bal 2k/100kΩ	Bal 2.2k/40kΩ
Bal 100Ω	Bal 100Ω
18dBV maximum	4dBm nominal
±1dB 20-20k	-1.5, +0.5dB 20-20k
0.025% 1kHz	0.015% 14dBm
68dB unwt'd mic-pgm	-130dB EIN DIN
<-70dB 1kHz	<-60dB 1kHz
388	389

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/20kΩ
Output connection	Bal <100Ω
Output levels	8dBm nom, 30dBm max
AF response	<±1dB 20-20k

Wheatstone	
SP-5 (SP-6)‡	3224 series‡
Yes	Yes
32+8 or 4	48
8 groups or 4 stereo	24
8	48
Yes	Yes
Yes	Yes
Wheatstone M-104 slider	Slider
3-band	3-band
High-pass	12dB/oct high-pass
Yes	Yes
8 groups	24 groups
4 pre, post	2 pre/4 post
PFL	AFL/PFL
No	No
Yes	No
Yes	Yes
Yes	No
Variable	Variable tone
VU movement	VU
No	.....
AB 150Ω/20kΩ	AB 150/40kΩ
AB 600Ω	AB <10Ω
22dBm max	28dBm max
±0.5dB 20-20k	±0.1dB 0dBm

Yamaha International	
RMM2408‡‡	PM3000
Yes	Yes
24 max	24, 32, 40
8	19
8	.....
Yes	Yes
Yes	Yes
Slider	Slider
3-band	4-band
High-pass	High-pass
Yes	Yes
8 groups	8, VCA control
2-send switchable	Yes
AFL	In-place
No	.....
No	.....
Yes	Yes
No	Yes
Variable	w/pink noise
VU	VU, peak LED
No	.....
TB 600Ω	Bal/TB 1k/3k/10kΩ
Unbal 600Ω	Bal/TB opt 150Ω
4dBm for 0VU	4dBu nom
-3dB ref 4dBm	-3, +1dB 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.

The E-Series features gapless "punching" so there's no blank space after the punch-out point. Only recorders which are much more expensive offer this sophisticated function. But since you can't run a fully automated system without it, Fostex includes gapless punch-in/out as standard equipment on the E-Series.

Also standard is a synchronizer port which will interface with all SMPTE time code based systems. When used with the Fostex synchronizer, Model 4030, you can then use our software program to perform sophisticated audio assembly editing.

Models E-8 and E-16 are multitrack recorders with built-in noise reduction.

Models E-2 and E-22 (not shown) are 2-track master recorders with a third, center channel for SMPTE time code control. This is a standard feature, not an option. You will have complete compatibility with existing 2-track tapes, plus the ability to run computer derived edit decision lists and full automation.

Servo control of the reels in the edit mode will help you pinpoint cues and spot erase. When the pitch control is engaged, the exact percentage of speed deviation is displayed so that when you need to re-set the control, you can do so precisely, and the real-time counter features search-to-zero even from the negative domain.

The E-2 uses 1/4" tape at 7-1/2 & 15 lps (15 & 30 lps speeds are optional); the E-22 uses 1/2" tape at 15 & 30 lps.

When an E-Series recorder is used with Fostex Model 4050 — autolocator and SMPTE to MIDI controller — you have programmable punch-in/out, 100-point autolocate capability, 10 programmable edits, a SMPTE time code generator / reader (all four formats), plus the ability to locate to the bar and beat.

So if you're looking for a professional recording instrument, there's a Fostex E-Series recorder that can help you with two important "E" words: Efficiency and Effectiveness. The E-Series can also help you achieve the most important "E" word of all: Excellence.

## Fostex®

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Circle (122) on Reply Card





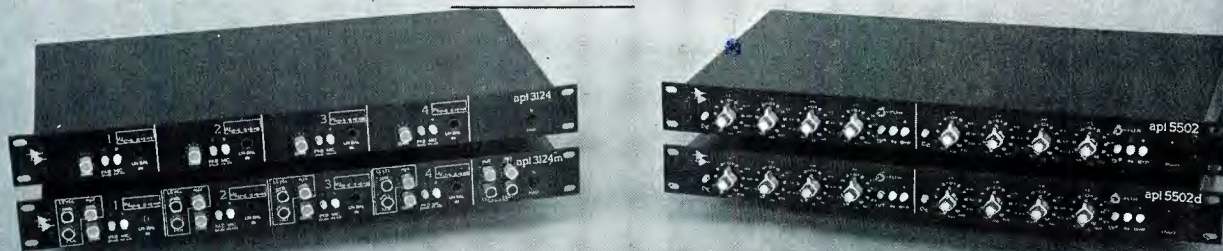
# Audio Cassette Decks

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 7/8 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	μP control	TTL	Mechanical	μP 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, belt	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	1-7/8ips	1.875ips
No. of heads	Single 4-track	2	2	3 (2)
Meter types	L/R VU meters	VU & peak LEDs	Bar graph	Bar graph
Input connection	10kΩ unbal, 600Ω bal	Unbal	Unbal	Bal or (unbal)
Input level	-10dBm for 0VU	-60dBv 10kΩ	-50dBv 10kΩ	+4dBm (-10dBv 50kΩ)
Output connection	Bal or unbal, 600Ω	Unbal	Unbal	Bal or (unbal)
Output level	4dBm nom., +18dBm max	-10dBv, 10kΩ	-20dBv 20kΩ	+4dBm
AF response	-3.0dB, 35-14k	-3, +2dB, 20-18k	±3dB, 20-12.5k ref to -10dBm	±3dB, 20-20k
S/N ratio	50dB	71dB wtd w/Dolby C	50dB unwtd	70(68)dB A-wtd(1)
Crosstalk Pgm-Pgm	>35dB separation	-50dB, 1kHz, 0VU	-40dB 1kHz, 0VU	-60dB 1kHz, 0VU
Distortion	1.5%, 315Hz, 1 7/8ips	1.5%, 315Hz	1.5%, 1kHz, 0VU	0.9(1)%, 400Hz, 0VU
Wow, flutter	.....	<0.02%	±0.1%	0.048% (0.06%)
Equalization	Types I, II	3180μs + 70μs	3180μs + 70μs	3180μs + 120μs/70μs
Reader Service Number	1360	1361	1362	1363

Manufacturer	Studer	TASCAM	Yamaha International
Model/series	A721	122mkII (112R/112)¹	238 Syncaset 234 Syncaset MT44-D (MTIX²)
Deck control logic	μP control	TTL (w/reverse)	TTL
Timer	Yes	Index & (tape timer)	Tape counter
Cue track	No	In FF, RWD modes	No, 3 autolocators
Capstan motor, drive	dc-servo, direct	FG-servo, direct	dc servo, direct
Reel motor	dc-servo	dc reel & ancillary	dc-servo, hysteresis
Play speeds	1.875ips	1.875ips ± 12% (± 15%)	3.75ips ± 12% pitch
No. of heads	3	1-E, 1-R, 1-P, Acculign	2.8-track
Meter types	Peak program	L/R VU, peak LED (ladder)	VU, peak LEDs
Input connection	Xfmr bal	XLR 40kΩ bal, RCA 30kΩ	8 RCA unbal 30kΩ
Input level	+4dBu, 10kΩ	+4dBm, -10dBv	-10dBv
			Unbal line, instr/mic 100kΩ mic, 22kΩ line
			Time & (tape) modes
			No
			dc-servo
			dc-servo
			1.875ips ± 10% pitch
			4-track R/P, E
			LED bar graph
			Unbal 50k(10k)Ω
			-10dB (+10dBu max)

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212-704 6692

Circle (124) on Reply Card

<b>Manufacturer</b> . . . . .	<b>Studer</b>
<b>Model/series</b> . . . . .	<b>A721</b>
Output connection . . . . .	Xfmr bal. <50Ω source
Output level . . . . .	+4dBu into 600Ω
AF response . . . . .	-3. +2dB 20-≥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
<b>Reader Service Number</b>	<b>1365</b>

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

	<b>TASCAM</b>		<b>Yamaha International</b>
<b>122mkII (112R/112)†</b>	<b>238 Syncaset</b>	<b>234 Syncaset</b>	<b>MT44-D (MTIX)*</b>
Xfmr 100Ω bal. RCA 100Ω	Unbal. RCA	Unbal. RCA, 1/4" phone	Unbal 2.5k(1k)Ω
+4dBm, -10dBv	-10dBv nominal	-10dBv nominal	-10dB (-10dBu)
±3dB, 25-17k, -20VU	±3dB, 30-16k	±3dB, 40-14k	≤3dB 20-12.5k
160nWb/m=0VU, std tape	...	0VU, 160nWb/m	20dB, 20nWb/m
80dB w/Dolby C >1kHz	>93dB IHF-A w/dbx NR	>95dB IHF-A dbx NR	67dB Dolby C (85 dbx)
<45dB, 1kHz, 0VU	-50dB w/o dbx	-50dB, 1kHz, 0VU	>50(55)dB separation
1%, 400Hz, 0VU	0.8%, 400Hz 0VU w/dbx	1%, 1kHz, 0VU	<1%
0.04% NAB. ±0.08% DIN	0.04%	0.06%	0.06% (<0.05%)
3180μs +70μs, 120μs	3180μs +70μs	3180μs +70μs	3180μs +120μs/70μs
<b>1366</b>	<b>1367</b>	<b>1368</b>	<b>1369</b>

## 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.

<b>Manufacturer</b> . . . . .	<b>APPEL</b>	<b>Audi-Cord</b>		<b>Broadcast Electronics</b>
<b>Model/series</b> . . . . .	<b>•Model 578†</b>	<b>Series A, S, TDS</b>	<b>PT90RPS‡ (PhaseTrak90)</b>	<b>Series 2100C✓</b>
Deck control logic . . . . .	Transistor	CMOS devices	.....	TTL & CMOS devices
Remote control bus . . . . .	No	Yes	Simple remote	None
Replay inhibit . . . . .	Yes	Yes	Yes	No
Record timer . . . . .	Yes	Yes	Optron	No
Sec. Tert tones . . . . .	Yes	Yes	Sec. Tert. AFSK	No
Phase correction . . . . .	n.a.	None	Non-encoded type	No
Capstan motor . . . . .	ac-synchronous	as-synchronous	dc-servo	ac-synchronous
Play speeds . . . . .	7.5	7.5	7.5 (3.7, 15 options)	3.75, 7.5
Sec. tert output . . . . .	TTL	Solid-state	Solid-state	Relay closure
Meter types . . . . .	VU rec/play/erase	VU movement	LED VU	Taut-band A
Monaural model . . . . .	.....	S21, A21	PT90P	2100RP
Play only model . . . . .	Model 557	S11/-16, A11/-16	PT90PS	2100P
Multideck model . . . . .	Model 2214	TDS-1, TDS-6 twins	.....	None
Input connection . . . . .	Balanced	Xfmr bal	Active bal	Active bal
Input level . . . . .	-5/+20dB, 5kΩ	-22/-12dBm	+8dBm	-10dBm
Output connection . . . . .	Balanced	Xfmr bal	Active bal	Active bal
Output level . . . . .	+12dBm nom. 110Ω source	-8dBm	+24dBm, as 75Ω source	0dBm
AF response . . . . .	±1.5dB, 40-12.5k	±2dB, 50-15k	±2dB, 40-16k	±2dB, 50-15k
S/N ratio . . . . .	1dB under saturation	1kHz, 160nWb/m	250nWb/m	10dB, 160nWb/m
Crosstalk L-R . . . . .	54dB	>47dB stereo	-80dB w/Dynafex NRS	>52dB
Crosstalk Pgm-Cue . . . . .	.....	<-50dB	-50dB	-50dB, 1kHz
		<-50dB	-50dB	-50dB, 1kHz

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Circle (125) on Reply Card

<b>Manufacturer</b> . . . . .	<b>APPEL</b>
<b>Model/series</b> . . . . .	<b>*Model 578†</b>
Distortion . . . . .	<1.5% 1kHz
Wow, flutter . . . . .	±0.3% unwt'd
<b>Reader Service Number</b> . . . . .	<b>1370</b>

<b>Audi-Cord</b>
<b>Series A. S. TDS</b>
1% 1kHz, 160nWb/m
0.15% peak wtd
<b>1371</b>

<b>PT90RPS† (PhaseTrak90)</b>
<1.5% tape dependent
0.12% DIN wtd 7.5ips
<b>1372</b>

<b>Broadcast Electronics</b>
<b>Series 2100C✓</b>
2%
≤0.15%
<b>1373</b>

<b>Series 3000A✓</b>
<2%, tape dependent
≤0.15% DIN wtd 7.5ips
<b>1374</b>

<b>Manufacturer</b> . . . . .	<b>Cartridge Technology</b>
<b>Model/series</b> . . . . .	<b>CT-1001†✓</b>
Deck control logic . . . . .	CMOS devices
Remote control bus . . . . .	15-pin D-connector
Record timer . . . . .	Yes
Sec. Tert tones . . . . .	Yes
Phase correction . . . . .	No
Capstan motor . . . . .	dc-servo
Play speeds . . . . .	3.75
Sec. tert output . . . . .	Solid-state
Meter types . . . . .	VU/PPM movement
Monaural model . . . . .	✓
Play on y model . . . . .	✓
Multideck model . . . . .	✓
Input connection . . . . .	Active bal (Xfmr opt)
Input level . . . . .	-10/0dBm (30kΩ)
Output connection . . . . .	Floating xfmr bal
Output level . . . . .	-10/0dBm (150Ω)
AF response . . . . .	±2dB, 20-16k
	405nWb/m
S/N ratio . . . . .	>50dB 22-22k PPM
Crosstalk L-R . . . . .	<35dB, 15kHz
Crosstalk Pgm-Cje . . . . .	<36dB, 1kHz
Distortion . . . . .	1.5%, 1kHz, 405nWb/m
Wow, flutter . . . . .	<0.12% DIN wtd
<b>Reader Service Number</b> . . . . .	<b>1375</b>

Options include Maxtrax head and dbx Type II Noise Reduction.

<b>Fidelipac</b>
<b>CTR34 Dynamax 3-deck</b>
CMOS devices
50-pin D-connector
No
Yes
No
ac synchronous
7.5ips
Solid-state, relay
LED bargraph VU
CTR33
No play only
3-deck
Diff bal bridged 10kΩ
-17, +20dBm (26 max)
Diff bal 440Ω source
+20dBm 600Ω
±2dB, 50-16k
250nWb/m, 1kHz
>58dB hum/noise
-50dB, 1kHz
1% max
0.15% DIN wtd, 7.5ips
<b>1376</b>

<b>Dynamax CTR10†</b>
CMOS devices
50-pin D connector
No
Yes
No
ac-synch
7.5
Solic-state, relay
Bar graph VU
CTR13
CTR11/-12
Use CTR34
Diff bal bridge 10kΩ
-17, +20dBm (26 max)
Diff bal 440Ω source
+20dBm 600Ω load
±2dB, 50-16k
10dB, 250nWb/m
61dB unwt'd, 0VU
-50dB 1kHz, 0VU
-50dB
0.8% max
≤0.12%
<b>1377</b>

<b>Dynamax CTR100†</b>
CMOS devices
50-pin D connector
Yes
Yes
Yes
dc-servo
3.75, 7.5, 15, var
Solid-state, relay
Bar graph
CTR123
CTR111/-112
Diff bal bridge 10kΩ
-17/+20dBm (26 max)
Diff bal 440Ω source
+20dBm 600Ω load
±2dB, 50-16k
10dB, 250nWb/m
51dB unwt'd, 0VU
-50dB 1kHz, 0VU
-50dB
0.8% max
≤0.12%
<b>1378</b>

<b>ITC/EM</b>
<b>Delta series†</b>
μP
Simple remote
Ext timer trigger
Yes
No
dc-servo
7.5 (3.5, 15 opt)
Solid-state, relay
Taut-band A
Delta IV/I
Delta I-M/-S
Delta III-M/-S
TB 20kΩ, AB 150/600Ω
-18, +18dB, 20kΩ load
TB 275Ω, AB 150Ω
-18, +18dBm, 150Ω source
±2dB, 50-16k
10dB, 250nWb/m
≥6dB unwt'd, 0VU
<-5)dB, 1kHz, 0VU
<-5)dB
1.5% THD, 1kHz, 0VU
0.15% DIN wtd
<b>1379</b>

<b>Manufacturer</b> . . . . .	<b>International Tapetronics/3M</b>
<b>Model/series</b> . . . . .	<b>99B series</b>
Deck control logic . . . . .	μP
Remote control bus . . . . .	Simple remote
Record timer . . . . .	Ext timer trigger
Sec. Tert tones . . . . .	Yes
Phase corrector . . . . .	Yes, ELSA system
Capstan motor . . . . .	dc-servo
Play speeds . . . . .	7.5 (3.75, 15, var opt)
Sec. tert output . . . . .	Solid-state, relay

<b>OMEGA series</b>
μP
Simple remote
No
Sec only
No
dc-servo
7.5 (3.75 opt)
Solid-state

<b>Otari</b>
<b>CTM-10SR†</b>
μP
Yes
LED min/sec
Yes
No automatic
dc servo
3.75, 7.5, 15ips
Solid-state

<b>Pacific Recorders &amp; Engineering</b>
<b>Tomcat†✓</b>
μP control
Yes
✓
Yes
None
dc-servo
7.5, 15, also record
Solid-state

<b>Micromax††✓</b>
CMC S devices
Yes
✓
Yes
✓
dc-servo
7.5 ps
Solid-state



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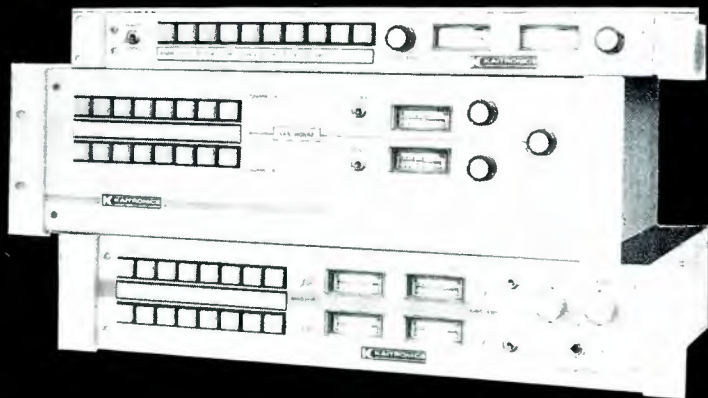
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Manufacturer	International Tapetronics/3M	Otari	Pacific Recorders & Engineering
Model/series	99B series	OMEGA series	CTM-10SR†
Meter types	Taut-band A/peak LED	Taut-band A	VU, peak LEDs
Monaural model	RPME	OMEGA mono player	CTM-10MR
Play only model	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, 0VU	±2dB 20-16k
S/N ratio	≥56dB bias/no signal	≥56dB bias, no signal	53dB
Crosstalk L-R	-50dB 1kHz	<-50dB, 1kHz, 0VU	<48dB 1kHz
Crosstalk Pgm-Cue	-50dB 1kHz	<-50dB	<48dB 1kHz
Distortion	≤0.8%, 1kHz, 250nWb/m	≤1.5%, 1kHz, 0VU	<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
No. of tracks	2 or 2+time code	2	2, mono, stereo, sync'd
Tape width	1/4"	1/4", 1/2"	1/4"
Deck control logic	μP 8085	μP 8085	μP system
Edit interface type	RS-232, RS-422	Via optional remote	Sync, RS-232
Recording timer	LCD display	LCD display	LED readout option
Cue track	Center track TC	No	SMPTC TC center
Phase correction	Yes	No	No
Capstan drive	Direct	Direct	Direct
Reel motor	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
No. of heads	3 (6 on TC model)	3 amorphous metal	2
Meter types	VU on bridge unit	2 VU on bridge unit	VU panel
Equalization	NAB, IEC1, IEC2	NAB, CCIR, DIN, AES	NAB, CCIR
Input connection	Bal >10kΩ, 5kΩ w/xfmr	Xfmrless bal, 10kΩ	Balanced, >15kΩ
Input level	+6dBm, +24dBm max	0dBm min, +24dBm max	0dBu min, +22dBu max
Output connection	Bal, xfmr opt <45Ω	Xfmrless bal, <40Ω	Balanced, <50Ω source
Output level	+24dBm max	+24dBm max	+20dBu max
AF response	±1.5dB, 20-16k 7.5ips	±1.5dB 20-16k 7.5ips	±2dB, 31-16k 7.5ips
S/N ratio	>71dB stereo 7.5ips	>70dB 1020nWb/m 7.5ips	>71dB 7.5ips
Crosstalk Cue-Pgm	<-80dB L/R-TC	.....	.....
Crosstalk Pgm-Pgm	<-55dB stereo/-65dB 2-tr	<-60dB 1/4" 1kHz	<-40dB stereo/-46dB mono
Distortion	<0.6% max stereo/2-tr	<0.6%, 510nWb/m	<1%
Wow, flutter	±0.06% 7.5ips	<0.06% DIN 45507 7.5ips	<0.06%, 7.5ips
Reader Service Number	1389	1390	1391

Manufacturer	Lyrec A/S	Nagra-Kudelski	Otari
Model/series	TR-55 (TR-533)	IV-STC	MTR-10-2
No. of tracks	2 (24)	3	2
Tape width	1/4", 1/2" (2")	1/4"	1/4"
Deck control logic	μP control	Mechanical	μprocessor
Edit interface type	Audio/tape controller	To synchronizers	RS-422
Recording timer	On panel, controller	Mechanical	Yes
Cue track	None	SMPTC time code	SMPTC center option
Phase correction	Yes	No	Yes

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Circle (127) on Reply Card


Manufacturer		Lycrc A/S		Nagra-Kudelski		Otari	
Model/series	TR-55 (TR-533)	IV-STC	T-Audio Time Code	MTR-10-2	MTR-100A		
Reel motor	dc servo (ac-servo)	dc	Servo	dc-servo	dc-servo		
Tape speeds	7.5/15(15/30±33%), var	3.75, 7.5, 15 ips	3.75-30ips, var	3 57-30ips, var	7.5, 15, 30		
No. of heads	3	4	4	3 or 4	ERP		
Meter types	VU movements	VU movements	LED indicators	VU, peak LEDs	24 VU w/peak LED		
Equalization	NAB, CCIR (& AES)	NAB, CCIR, NAGRA	NAB, DIN, IEC	NAB, IEC, AES-30ips	NAB, IEC, AES-30ips		
Input connection	Xfmr bal(floating) 8kΩ	Bal, unbal	Bal, floating 10kΩ	Active bal, xmtr opt	AB > 10kΩ		
Input level	-6, +24dBm max	Mic, line levels	390mV-4.4V	+4dBm	Switchable level		
Output connection	Xfmr bal(floating) <40Ω	Resistive bal	Bal floating 30Ω	Active bal, xmtr opt	AB <5Ω source		
Output level	+24dBm max	1V to 5kΩ	775mV-4.4V	+28dBm max	Switchable level		
AF response	±1dB/60-18k(2dB/30-20k)	2dB 30-30k	±1.5dB 30-15k 7.5ips	±2dB, 20Hz-25kHz	±2dB, 30-22k 15ips		
S/N ratio	62dB unwtd	>72dB	72dB	73dB unwtd 30ips	70dB		
Crosstalk Cue-Pgm	.....	.....	.....	-60dB	.....		
Crosstalk Pgm-Pgm	-40dB 1kHz (<-46dB)	<-60dB 1kHz	<-88dB	-60dB 1kHz 0VU	<-55dB 1kHz		
Distortion	0.4%, 1kHz 0VU	<1% 810nWb/m 400Hz	0.3% NAB 7.5ips	0.25% 1kHz 0VU	0.5%, 1kHz		
Wow, flutter	0.04% 15ips pk wtd	0.028% NAB, 15ips	<0.025% 7.5ips	0.04%	<±0.04%, 30ips		
Reader Service Number	1394	1395	1396	1397	1398		

Manufacturer		Otari		ReVox	
Model/series	MX-55	MX5050B-II (MX-50)	B77 Mk II	C270 (C274, C278)	PR99 Mk II
No. of tracks	1, 2, 2TC, 4	2	2 or 4	2 (4, 8)	2
Tape width	1/4"	1/4"	1/4"	1/4" (or 1/2")	1/4"
Deck control logic	μP	TTL	.....	μP	TTL, μP
Edit interface type	.....	None	External option	Remote control, RS-232	Remote control
Recording timer	Yes	Yes	Yes	Yes	Yes
Cue track	Search 0 Cue 3-cue	No (Search 0 -- 1 cue)	No	Zero, address locators	No
Phase correction	.....	No	.....	.....	.....
Reel motor	Induction torque	ac-synchronous	Triac control	ac servo	Triac control
Tape speeds	3.75/7.5, 7.5/15	3.75/7.5/15/var	2-speed -- variable	3-speed ±0.2% + var	3 7.5-15ips
No. of heads	ERP-P	4 (ERP)	3	3	3
Meter types	VU w peak LED	VU peak LEDs	VU movements	VU w/peak LEDs (LED bar)	VU movements
Equalization	IEC NAB	NAB IEC	NAB, IEC	NAB or CCIR	NAB, CCIR
Input connection	AB > 10kΩ	AB > 10kΩ	Unbal 2.2k 110k 220kΩ	Bal > 1.2k/5kΩ	Bal > 1.2k/5kΩ, Unb 100kΩ
Input level	-30dB max	10kΩ	0.15mV-40mV	-10, -10dBu, 22dBu max	-10, -10dBu
Output connection	AB <200Ω source	AB 600Ω load	Unbal >20kΩ load	Bal, <80Ω, XLR	Bal, <50Ω
Output level	-26dB max bal	-27dB max	1.55V 20kΩ minimum	-22dBu out, 600Ω load	-22dBu out, 600Ω load
AF response	±2dB 30-22k 15ips	±2dB 20-20k 15ips	-3, -2dB, 30-20k 7.5	±2dB, 30-18k 7.5ips	-3, -2dB, 30-20k 7.5
S/N ratio	>70dB 15ips	72dB unwtd (≥54dB)	>66dB NAB, 7.5ips	>64dB NAB, 7.5ips	>66dB NAB, 7.5ips
Crosstalk Cue-Pgm	<-55dB 1kHz	<-55dB	.....	.....	.....
Crosstalk Pgm-Pgm	.....	-55dB 1kHz, 0VU	<-45dB stereo 1kHz	<-50dB stereo 1kHz	<-45dB stereo 1kHz
Distortion	<0.3% 1kHz	0.5% 1kHz (>0.3%)	<0.2% 7.5ips	<1.2% 7.5ips	<0.3% 7.5ips
Wow, flutter	<±0.06% 15ips	0.04% 15ips (0.06%)	<0.08% 7.5ips	<0.07% 7.5ips	<0.08% 7.5ips
Reader Service Number	1399	1400	1401	1402	1403



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Circle (128) on Reply Card


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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 $\mu$ processor	$\mu$ P, TTL, CMOS
Edit interface type	No	Serial, parallel	RS-232, RS-422
Recording timer	Tape counter	.....	Yes
Cue track	Yes	on APR-5003	SMPTE center track <sup>2</sup>
Phase correction	.....	No	Yes
Reel motor	dc	dc	dc servo
Tape speeds	3-75, 7.5ips	7.5, 15, 30ips $\pm$ 50%	3.75-30ips, variable
No. of heads	3	.....	5 possible
Meter types	VU movement	.....	Tautband A
Equalization	.....	NAB, AES	NAB, IEC, DIN
Input connection	Bal, 10k $\Omega$	.....	Balanced
Input level	-70dBs, +4dBs	.....	-72dBm mic
Output connection	Unbal 600 $\Omega$	.....	Balanced
Output level	1V to 10k $\Omega$ load	.....	+6dBm typical
AF response	$\pm$ 30B, 30-18k, 7.5ips	-1.5, +.75dB, 30-20k	-2, +1dB 30-20k
S/N ratio	.....	>67dB 7.5ips	70dB
Crosstalk Cue-Pgm	<-90dB audio-TC	.....	-90dB
Crosstalk Pgm-Pgm	.....	.....	-55dB 1kHz 0VU
Distortion	.....	Variable per bias	0.5% 1kHz 0VU
Wow, flutter	$\pm$ 0.08% 7.5ips	.....	0.02%
Reader Service Number	1404	1405	1406
			1407

\*Modular head block system allows the head configuration and tape width of the machine to be changed with alternate parts.  
<sup>2</sup>Also five Locstart memories available

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	$\mu$ P control	$\mu$ P control
Edit interface type	Serial, parallel	AQ-65 autolocator
Recording timer	LED display	5-digit LCD or LED
Cue track	Address & autolocator	SMPTE center option
Phase correction	Yes	Timecode on 2T, RTZ/STC
Reel motor	ac servo	No
Tape speeds	3.75, 7.5, 15 +7/-7 HT	dc servo, eddy current
No. of heads	3 (optional -track)	7.5-15 or 15-30
Meter types	VU movement	3 (NAB, DIN)
Equalization	NAB, CCIR switched	VU w/peak LEDs
Input connection	Xlfr bal >10k $\Omega$	IEC/CCIR, NAB
Input level	-30dB min, +24dBu max	Bal 10k $\Omega$
Output connection	Xlfr bal <50 $\Omega$	+4/28dBm
Output level	+24dBu max to 600 $\Omega$	Bal <20 $\Omega$
		+28dBm max

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Manufacturer	Studer		TASCAM		
Model/series	A807	A810	ATR-60 series	ATR-80-24	Model 42B (44)
AF response	±2dB, 30-16k, 7.5ips	±2dB, 20-16k, 7.5ips	±2dB, 30-16k, 7.5ips	±3dB, 40-20k	±2dB 30(40)-16k
S/N ratio	72dB, ASA-A wtd 7.5ips	>65dB rms, 7.5ips stereo	72dB NAB wtd 7.5ips	69dB 0 wtd	68(67)dB A-wtd 7.5ips
Crosstalk Pgm-Pgm	<-55dB separation	<-55dB stereo, 1kHz	<-57dB, 2-track	<-55dB, 1kHz 0VU	<-55dB 1kHz 0VU
Distortion	<1% NAB, 7.5ips 1kHz	0.6%, stereo, 1kHz	0.6%, 2-track 1kHz	0.8%, 0VU, 1kHz	0.8% 0VU, 1kHz
Wow, flutter	0.07% 7.5ips	<0.07% 7.5ips	0.09% 7.5ips	0.05% NAB wtd	0.06% NAB wtd
Reader Service Number	1409	1410	1411	1412	1413

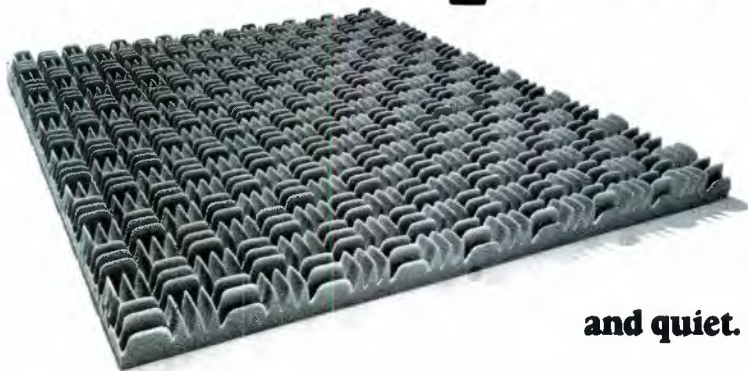
Manufacturer	TASCAM		TTC/Scully Tape	
Model/series	Model 48	ATR-80 series	280B series <sup>1</sup>	250 series <sup>2†</sup>
No. of tracks	8	24	1, 2, 4	1, 2, 3
Tape width	½"	2"	½, ¼	¼"
Deck control logic	μP control	3 8-bit μPs	Solenoid	Solenoid
Edit interface type	For SMPTE synchronizer	RS-232C/422	No	No
Recording timer	Yes	LED display	No	No
Cue track	Cue by RTZ, STC	AQ-80 autolocator	No	No
Phase correction	No	.....	No	No
Reel motor	dc servo	PWM servo	ac hysteresis	Torque
Tape speeds	15ips ±12% pitch control	15/30 ips	3.75-30 available	3.75/7.5, 7.5/15
No. of heads	3	3	3	3
Meter types	8 VU	VU movements	VU option	VU
Equalization	IEC/CCIR, NAB	NAB, IEC switched	NAB, IEC	NAB or IEC
Input connection	Bal 10kΩ, unbal 50kΩ	Bal 10kΩ or 600Ω	Xfmr bal	Bal 10Ω line
Input level	+4/28dBm, -10/18dBV	+4dBm nom, +28dBm max	200mV 10kΩ min	200mV min 250-600Ω
Output connection	Bal 20Ω, unbal 60Ω	Bal/unbal, 20Ω source	Xfmr bal 60Ω source	Unbal (xfmr bal opt)
Output level	+28dBm, +18dBV max	+4dBm, +28dBm max	+24dB max 600Ω load	+17dBm max, 600Ω
AF response	±3dB, 40-20k	35-20k (15ips)	±2dB 30-15k	±2dB, 50-15k, 7.5ips
S/N ratio	69dB Q wtd	71dB a-wtd IEC 15ips	68dB 2-TR, 7.5ips	>66dB 7.5ips
Crosstalk Pgm-Pgm	<-55dB, 1kHz 0VU	<-55dB 1kHz 0VU	<-60dB 250nWb/m 1kHz	.....
Distortion	0.8%, 0VU, 1kHz	<0.5%, 1kHz	<3%	<0.7%, 250nWb/m level
Wow, flutter	0.05% NAB wtd	±0.06% peak DIN 45507	0.05% w/dc-servo	<0.1% 7.5ips
Reader Service Number	1414	1415	1416	1417

<sup>1</sup>For playback only use 285B series  
<sup>2</sup>For playback only use 255 series.

## Audio Dynamics/Level Control Processors

Functions include compression, limiting, AGC action, expansion control over audio signal levels. Multiband processing is noted with a bullet (•); digital processing is noted with a dagger (†); non-stereo products are marked with a double dagger (‡); matrix processing is indicated with a check (✓). When no product (in a group of 5) offers a specific design function, that function has been deleted.

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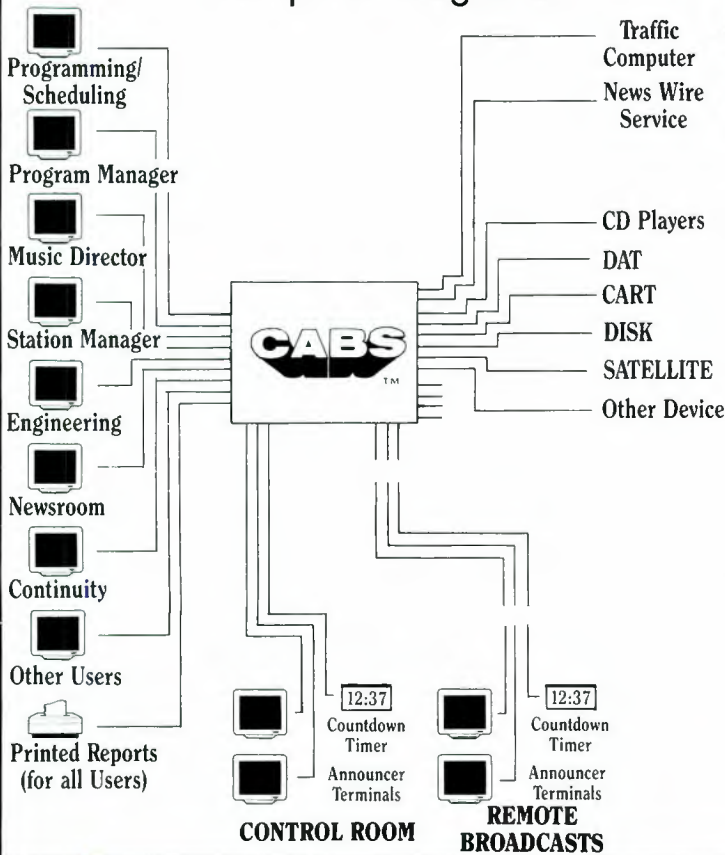


Manufacturer	Aphex Systems			ATI/Audio Technologies	Audio Developments
Model/Series	#300 Compellor (-303 <sup>1</sup> )	• 612 expander/gate	-700 Dominator✓	Emph'a'Sizer‡	AD066-1 Port-a-Flex‡
Design function					
AGC	12dB leveling	No	.....	No	.....
Compression	1:1.1 to 20:1	No	.....	Yes	2:1 to 20:1
Limiting peak	12dB ceiling	No	Zero overshoot	Yes	Yes
Limiting pre emp	No	No	Opt 703/704	Pre/post/side EQ	.....
Expansion	.....	Variable	.....	Yes	.....
Gate threshold	Yes	-50, +20dBm	.....	Yes	.....
Programmable	No	Adjustable	No	User	.....
Meter type	LED ladder	LED indicators	LED ladder	LED bargraph	PPM
Meter functions	In/out/GR/peak/VU	Below, hold, above	Gain reduction	Output, GR	In/Out/Gain Reduction
Time constants	Program dependent	Adjustable	Program dependent	Variable	Switch selected
Input connection	AB/unbal	Servo bal 80kΩ	AB	Xfmr, AB	20kΩ diff bal
Input level	27dBm	+4dBm, +21dBm max	24dBm	Mic, line levels	+18dBv max
Output connection	AB/unbal	Servo bal 65Ω	AB/unbal	.....	<75Ω xfmr bal
Output level	27dBm	+25dBm max bal	24dBm	+24dBm or mic level	+18dBm max
AF response	±1dB 5Hz-65kHz	-0.2,0dB 5Hz-100kHz	±0.5dB 20-50k	±0.25dB, 30Hz-20kHz	±0.5dB 20Hz-20kHz
Distortion	<0.1% 1kHz 20dBm	0.006% +20dBm	<0.04% 1kHz 20dBm	0.2%, +22dBm	<0.1% 1kHz 0dB
S/N ratio	95dB 27dBm unwdt	87dB w/hum unity gain	80dB unwdt 20dBm	80dB	>70dB
Reader Service Number	1280	1281	1282	1283	1284

<sup>1</sup>Model #303 includes Aphex aural exciter spectral enhancement.

Manufacturer	Broadcast Electronics	Brooke Siren Systems		CRL Systems	
Model/Series	FM-601 limiter	DPR 402	• FDS360 limiter	• AM-4 (AM-4S✓)	•BAP-2000 FM/TV‡
Design function					
AGC	Yes	No	No	AGC-400 (SGC-800)	2-band, pgm dep
Compression	Yes	Yes	No	SEC-400 (SEC-800)	.....
Limiting peak	Yes	Yes	Yes	Yes	Yes
Limiting assym	No	No	No	Yes	.....
Limiting pre emp	Flat, 25/75ms	De-ess/adj side chain	No	per NRSC	to 20dB
Expansion	Yes	Yes	No	Dynafex NR	Dynafex NR
Gate threshold	Yes	No	No	-10,-30dB adj	TV sync filter
Programmable	User	User, factory set	User	Yes	Adjustable
Meter type	3 meters	LED bargraph	None	LED ladder	LED
Meter functions	2 VU, 1 gain	In, out, GR	.....	GR, peaks	GR, relative output
Time constants	Variable	Variable	Fixed	Adjustable	Adjustable
Input connection	Xfmr bal 600Ω	AB bridging	AB bridging	AB, unbal	AB, bridging 10kΩ
Input level	+20dBm	+20dBv	n.a.	4dBm	-20, +20dBm
Output connection	Xfmr bal 600Ω	Unbalanced	Unbal xfmr opt	AB, unbal	AB <100Ω
Output level	+20dBm max	+20dBm max	+20dBm max	4dBm	-20, +20dBm
AF response	±0.5dB, 30Hz-20kHz	±1dB, 25Hz-20kHz	Adjustable	±1dB 50Hz-15kHz	±1dB 50Hz-15kHz ops
Distortion	0.75%	0.15%, 1kHz	0.05%	<0.5%	<0.25% operation
S/N ratio	>60dB	86dB	85dB	65dB unwdt	>75dB ops 5kHz
Reader Service Number	1285	1286	1287	1288	1289

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Manufacturer	CRL Systems	D&R Electronica	Dorrough Electronics	EMT-Franz/Gotham
Model/Series	• FM-4/-3/-2/-1	TVS-3010 <sup>1</sup> (-3001)	Compressor/limiter	-DAP-610 FM/TV/AM† EMT 227 DX-limiter‡
Design function				
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.

Manufacturer	EMT-Franz/Gotham Audio	Eventide	Furman Sound
Model/Series	EMT 266X transient EMT 257/260/261‡	Omnipressor‡	LC-6 LC-3A (LC-X)
Design function			
Compression	No	261	Yes
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	GR
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

Manufacturer	Harris Broadcast	Inovonics	ITAME SA
Model/Series	• Ulti-Male 91‡	260 TV/FM (+255 FM)†	• 222††† Mod. 90A‡
Design function			
AGC	110dB dynamic range	Yes	No
Compression	Yes	Yes	No
Limiting peak	Yes	Yes	Yes
Limiting assym	....	No	Yes
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	+0.15dBm 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

Manufacturer	Marti	Urban Associates
Model/Series	CLA-40A‡	Co-Operator (#424A) • 8182A Optimod-TV <sup>1</sup> • 8100A Optimod-FM <sup>2</sup> • 9100A Optimod-AM <sup>3</sup> †
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
Programmable	Switch select	Yes
Meter type	Meter	User, program dep
Meter functions	Output, GR	Bargraph (VU meters)
Time constants	0.8/2/5s release	GR, VU, voltage
Input connection	Balanced 600Ω	Adjustable
Input level	+20dBm max	AB bridging
Output connection	Balanced 600Ω	-10dBm
Output level	+20dBm max	AB 93Ω
AF response	± 0.5dB, 50Hz-15kHz	> +20dBm
Distortion	<1% any compr lvl	± 0.25dB

Manufacturer . . . . . Marli		Urban Associates			
Model/Series . . . . . CLA-40A‡		Co-Operator (#424A)	• 8182A Optimod-TV <sup>1</sup>	• 8100A Optimod-FM <sup>2</sup>	• 9100A Optimod-AM <sup>3,4</sup>
S/N ratio . . . . .	66dB @ +10dBm	>85dB	75dB	>75dB	75dB
Reader Service Number . . . . .	1305	1306	1307	1308	1309

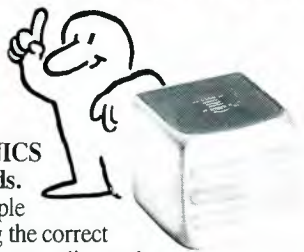
<sup>1</sup>Studio chassis and stereo generator are available  
<sup>2</sup>ACC-022 filter option.  
<sup>3</sup>Day-night, transmitter 1-2 switch; 9100B contains NRSC pre-emp and 10kHz low-pass filtering per NTSC AM program.

Manufacturer . . . . . ProTech Audio		Symetrix			
Model/Series . . . . . 663CL (663CL1)‡		CL-150B Fast RMS‡	525 dual	•528 voice‡ processor	544 quad gate
Design function . . . . .		No	No	No	No
AGC . . . . .	No	No	No	No	No
Compression . . . . .	20dB, 2.1 ratio	Yes	1:1-20:1	Yes	Yes
Limiting peak . . . . .	No	Peak & RMS	Peak & RMS	Yes	Yes
Limiting pre emp . . . . .	No	De-ess	De-ess	De-ess	No
Expansion . . . . .	No	No	1-4	Downward	Downward
Programmable . . . . .	User	No	Threshold, comp	Threshold/comp ratio	Threshold/comp
Meter type . . . . .	Meter	LED bargraph	LED bargraph	LED bargraph	LED bargraph
Meter functions . . . . .	Compression, output	GR, de-ess, output	GR, Exp, Output	GR, de-ess, output	GR, output
Time constants . . . . .	0.05-0.5ms a/0.05-5s r	Fixed & adjustable	Pgm dependent	Fixed	Fixed, adjustable
Input connection . . . . .	Xfmr bal 600Ω(unbal)	AB bridging	Bal, >40kΩ	AB bridging	Bal >45Ω
Input level . . . . .	+27dBm max	+18dBm max	+18dBm max	+18dBm max	+18dBm max
Output connection . . . . .	Xfmr bal 600Ω(unbal)	AB or UB	AB xfmr opt	AB xfmr opt	Unbal 100Ω
Output level . . . . .	+27dBm (+20dBm) max	+24dBm max bal	+18dBm max	+24dBm max	+19dBm max
AF response . . . . .	±0.5dB (0.25dB) 20-20k	-1.0dB 20-20k	-1.0dB 20-20k	19Hz-22kHz	20Hz-20kHz
Distortion . . . . .	0.4% 6dB compression	0.03-0.09%	0.025% 10dB GR	0.05%	0.025% 10dB GR
S/N ratio . . . . .	>78dB	....	....	-127dBm EIN	<-86dBm 20kHz bw
Reader Service Number . . . . .	1310	1311	1312	1313	1314

Manufacturer . . . . . Symetrix		UREI		Valley International	
Model/Series . . . . . 501‡		1176LN (1178)‡	7110‡	Commander‡	440‡
Design function . . . . .		No	No	Yes	Yes
AGC . . . . .	No	No	No	Yes	Yes
Compression . . . . .	Yes	No	1.5-∞:1	No	Yes
Limiting peak . . . . .	Peak, RMS 1:∞	Yes	Yes	No	Yes
Limiting pre emp . . . . .	No	No	No	No	Sibilance processor
Expansion . . . . .	....	No	No	Yes	Yes
Programmable . . . . .	Threshold/comp	Yser	Compression ratio	User, auto	User, auto
Meter type . . . . .	LED bargraph	VU meter	VU	LED bargraph	3 LED bargraphs
Meter functions . . . . .	GR, output	Output, GR	Output, GR	GR	GR comp/lim, in, out
Time constants . . . . .	Fixed, adjustable	20-800*s, 0.05-1.1s	Program dependent	Variable	Adjustable
Input connection . . . . .	Bal or unbal	AB bridging	AB bridging 20kΩ	AB bridging	AB bridging
Input level . . . . .	+18dBm max	+20dBm max	+22dBu	+24dBm	+24dBm max
Output connection . . . . .	Bal or unbal	Xfmr bal 600Ω	Xfmr bal 150Ω	AB 50Ω	AB 40Ω
Output level . . . . .	+26dBm max bal	+24dBm	+22dBm into 600Ω	+24dBm into 600Ω	+24dBm max
AF response . . . . .	-1.0dB 20-20k	±1dB, 20Hz-20kHz	±0.5dB, 20Hz-20kHz	n.a.	n.a.

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<b>Manufacturer</b> . . . . .	<b>Symetrix</b>	<b>UREI</b>	<b>Valley International</b>
<b>Model/Series</b> . . . . .	<b>501‡</b>	<b>1176LN (1178)‡</b>	<b>Commander‡ 440‡</b>
Distortion . . . . .	<0.25%	+L0.5% 50-15k/1 1s	<0.01%, 1kHz
S/N ratio . . . . .	-95dBu 20dB GR	81dB	<-83dB 20Hz-20kHz
<b>Reader Service Number</b> . . . . .	<b>1315</b>	<b>1316</b>	<b>1318</b>

<b>Manufacturer</b> . . . . .	<b>Valley International</b>	<b>Wheatstone</b>	<b>Yamaha International</b>
<b>Model/Series</b> . . . . .	<b>400 mic processor‡</b>	<b>• DDP Processor‡</b>	<b>Dynamite</b>
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	De-essing
Gate threshold . . . . .	Noise gate w/o comp	Yes	No
Programmable . . . . .	User	Yes	Noise gate mode
Meter type . . . . .	2 LED bargraphs	LED	User
Meter functions . . . . .	In. out. VU, GR	LED	LED bargraph
Time constants . . . . .	Fixed	Adjustable	GR
Input connection . . . . .	AB bridging	AB, bridging	Variable
Input level . . . . .	+26dBm max	+24dBm max	Balanced, 20kΩ
Output connection . . . . .	AB <50Ω	AB <50Ω	+18dBm max
Output level . . . . .	+26dBm	+24dBm max	Balanced 10Ω
AF response . . . . .	.....	.....	+22dBm max
Distortion . . . . .	<0.05%	<0.01%	±0.5dB, 20Hz-50kHz
S/N ratio . . . . .	-128dBm EIN	>93dB unwt'd	0.04%
<b>Reader Service Number</b> . . . . .	<b>1320</b>	<b>1321</b>	<-83dB 20Hz-20kHz

## 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.

<b>Manufacturer</b> . . . . .	<b>AKG Acoustics</b>	<b>AMS/Advanced Music Systems</b>
<b>Model/Series</b> . . . . .	<b>TDU-8000 + R800</b>	<b>MSP-126</b>
Design features . . . . .	Delay	Effects processor
Talkshow delay . . . . .	No	Reverb, effects
Plate/room . . . . .	No	DMX15-80S (SB dual)
Reverb/echo . . . . .	No	TIMEFLEX <sup>1</sup>
Pitch change . . . . .	No	RMX 16†

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Manufacturer	AKG Acoustics			AMS/Advanced Music Systems		
Model/Series	TDU-8000 + R800	MSP-126	ADR68K†	DMX15-80S (SB dual)	TIMEFLEX <sup>1</sup>	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

<sup>1</sup>Performs time compression, expansion with pitch preservation, stereo imaging and correct monophonic summing. Equipment operates with through timecode lock.

Manufacturer	AMS/Advanced Music	ART/Applied Research & Technology			Audio/Digital	
Model/Series	A/V Sync	DR1 (DR2a)	PD3	#1500†	ADD-2 (ADD-3)	TC-4
Design features	A/V sync	Reverb	Delay, sync	Digital delay	Digital delay	Broadcast delay
Talkshow delay	No	No	No	No	No	Catchup opt
Plate/room	No	21(9) rooms	No	Effective	No	No
Reverb/echo	No	w/effects	Effective	Echo	Effective	No
Phasing/flanging	No	No	No	Yes	No	No
Programmable	User, automatic	Factory, user	No	User	User	User
Delay type	Digital	Digital	Digital	Digital	Digital	Digital
Delay range	1.2s	25s (12.8s) decay	255ms	0.15-1500ms	0-490ms	6.8s
Stereo implementation	3-channel	Yes (Stereo out)	1-in, 3-channel out	....	No	w/2 units
AF bandwidth	18kHz	14kHz (10kHz)	20kHz	22kHz	20kHz	15kHz
Input connection	AB, bridging	Balanced	AB	n.a.	Act bal (xfmr opt)	AB, unbal
Output connection	AB	Unbalanced	AB	n.a.	AB (xfmr opt)	AB, unbal
Dynamic range	90dB	>90dB (75dB)	90dB unwt'd	>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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Manufacturer	.Audio/Digital	BEL Electronics	EMT-Franz (Gotham Audio)	Eventide	
Model/Series	TC-5	BD 320	EMT 445	EMT 251, 252/252S EMT 246 reverb	BD 931 (BD 932)
Reverb/echo	Effective	Yes	No	0.4s-4.5s	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 48/44.1kHz	Digital
Delay range	500ms, exp to > 1s	8s std, expandable	Dual 1ms-10.9s	Initial to 999ms	3.2, 6.4 s
Stereo implementation	No	Possible	w/2, 4, 6 outputs	2/4/6 outputs	(BD 932 only)
AF bandwidth	20kHz	15kHz for 8s	30Hz-20kHz	0-12kHz, z	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	AES/EBU interfaces
Reader Service Number	1252	1253	1254	1255	1257

Manufacturer	Eventide	Fostex	Furman Sound	Industrial Research	
Model/Series	H3000 Ultraharmonizer BD 955 (BD 980) <sup>2</sup>	SP2016†	3180✓	RV-3†	DF-4015
Design features	Effects <sup>1</sup>	Broadcast delay	Special effects	Reverb system	Reverb
Talkshow delay	3.06s (No)	w/catchup	3.2s	No	No
Plate/room	Yes	No	Yes	No	Yes
Reverb/echo	Yes	No	Yes	Yes	Yes
A/V synchronizer	No	Yes (No)	No	No	No
Phasing/flanging	Yes	No	Yes	No	No
Time reversal	Yes	No	No	No	Yes
Programmable	User and factory	User	Factory, user		Factory
Delay type	Digital	Digital	Digital	Multiple spring	Digital
Delay range	To 1.5s	6.4s (10s)	3.2s	270ms	n.a.
Stereo implementation	Yes	w/2 inputs (Yes)	Yes	No	Stereo out
AF bandwidth	± 1dB 5-20k	7.5-15kHz (20kHz)	15kHz or 8kHz	10kHz	11kHz
Input connection	Bal, bridging, 100kΩ	Bal bridging (act)	AB	Unbalanced	n.a.
Output connection	Bal <100Ω	AB	AB	Unbalanced	n.a.
Dynamic range	> 92dB	90dB	87dB		79dB
Remote control	Keyboard, MIDI	Yes	Yes		On, off
Interfaces	IEEE, MIDI	No	IEEE, MIDI		No
Reader Service Number	1258	1259	1260	1261	1262

<sup>1</sup>Effects processor includes -200%, 100% time modification with -3, +1-octave pitch change on 2 channels.  
<sup>2</sup>Provides some time modification capability.

Manufacturer	JBL/UREI	Klark Teknik	Lexicon
Model/Series	7922	DN 716 DN 780	#200† (PCM60) 2400 <sup>1</sup> (1200) 480L (224X)†
Design features	Dual output delay	3-output delay	Digital reverb
Talkshow delay	No	No	Yes
			Reverb
			No
			Time modifier
			No
			Effects processor
			No

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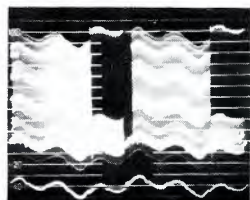
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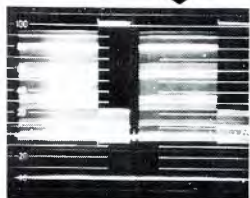
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Circle (140) on Reply Card

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 Mfgr.	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 ±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 w/catchup	AF sync	Stereo reverb
Talkshow delay	No	No	No	No	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 (480ms)	2.048s	936ms	1-988ms	4s	30ms fixed - 2s
Stereo implementation	No	Yes (mono in)	Mono in, stereo out	ADU-10S	2-3 channel	Yes
AF bandwidth	16kHz	20kHz	15kHz	±1dB 20Hz-20kHz	20kHz	6kHz midband adj
Input connection	AB bridging	Xfmr bridging	AB bridging	Act bal, 20kΩ	Bal bridging	AB
Output connection	Unbal	Xfmr	Unbal	Act bal, 600Ω	Balanced	Xfmr bal
Dynamic range	90dB DIN	>90dB	80dB	>90dB	90dB	....
Remote control	Yes	From interface	Yes	ADR-10-L panel	HPD-6377 panel	No
Interfaces	No	RS-232/422, video control module	MIDI	RS-422	Video, frame pulses	No
Reader Service Number	1270	1271	1272	1273	1274	1275

Manufacturer	Tektronix	Yamaha International		
Model/Series	118-AS	REV-7	YDD-2600†	SPX90†
Design features	A/V sync	Reverb	Delay	Effects

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- 215-1 Line driver V DA, bal/unbal in-out 75/125 ohms.
- 220\* DC 12 V powered video DA, 8 outputs.
- 230\* 10 outputs video/2 ch audio, dubing system DA.
- 232\* 20 outputs video/2 ch audio, dubing system DA.
- 233\* 50 outputs video/2 ch audio, dubing system DA.
- 240-1 Plain vanilla audio DA, 12 outputs.
- 240-2 VCA audio DA, remote control system DA.
- 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	Comrex Corporation			Gentner Electronics
Model	LX-T/LX-R	PLXmicro/TH-X	PTLX/RTLX <sup>2</sup>	EFT-3000 digital
AF output level	0dBm 600Ω	Auto leveling to 0dBm	0dBm	-15, +10dBm
Packaging	Desktop (opt rack)	Rack-mount	Rack-mount	Rack, table-top
Reader Service Number	601	602	603	604
				605

<sup>1</sup>Wideband hybrid with manual or auto answer.  
<sup>2</sup>Integral Telco interface; multiband companding audio control.  
<sup>3</sup>1- and 2-line operation are possible with this unit.

Manufacturer	Rood Megatronics BV				Kahn Communications
Model/Series	System 112M/112D	System 114/110 <sup>2</sup>	System 2010/1100 <sup>2</sup>	System 111M/1110 <sup>3</sup>	LPGP-1T/R
System type	Single 2-wire	Dual 2-wire, splitband	Dual 2-wire, splitband	Dual 4-wire <sup>2</sup>	2-line
Frequency offset	350Hz	350Hz, 2.1kHz	350Hz, 2.1kHz	350Hz, 2.1kHz	Harmonic decode tones.
AF response	± 0.5dB 50-3k <sup>1</sup>	± 0.5dB, 50-4.95k	± 1.5dB 50-4.95k	± 0.5dB 50-4.95k	50-50k
Translation error	± 1Hz	± 1Hz	± 1Hz	± 1Hz	0 error
Transmitter	112M	<b>BAX 114M (110M)</b>	<b>BAX 2010</b>	111M	LPGP-1-T
Source inputs	Mic, line, 10kΩ/600Ω	Mic, line 600Ω/12kΩ	Mic, line 600Ω/12kΩ	Mic, line 600Ω/12kΩ	Mic, line
Output connection	Xfmr bal, 600Ω	Xfmr bal	Xfmr bal, 600Ω	Xfmr bal	600Ω bal
Output level	-6dBm companded	0dBm ± 9dBm adj.	to ± 12dBm	± 12dBm adj.	0dBm
Packaging	Portable	Portable	Portable	Rack-mount & portable	Portable
Powering	R14S bat. 4 D cells	90-220Vac, 40-400Hz	.....	110-220Vac	110-220Vac
Receiver	112D	<b>BAX 110D</b>	<b>BAX 110D</b>	111D	LPGP-1-R
Input connection	Xfmr bal	Xfmr bal, 600Ω	Xfmr bal, 600Ω	Xfmr bal, 600Ω	
600 bal/unbal					
Input level	-30, +17dBm	-30, +17dBm	-30, +17dBm	-30, +17dBm	-20dBm
AF output connection	Active bal 600Ω	Active bal	Active bal	Active bal, 600Ω	0dBm 600Ω
AF output level	0-12dBm adj companded	± 9dBm adj	± 9dBm adj	0-12dBm adj	0dBm 600Ω
Packaging	Rack-mount	Rack-mount	Rack-mount	Rack-mount	
Reader Service Number	606	607	608	609	610

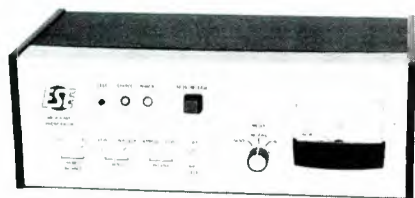
<sup>1</sup>With recorder response ± 1dB 100Hz-6.1kHz.  
<sup>2</sup>Systems employ integral companding circuitry.  
<sup>3</sup>Includes 2-transmit, 2-retrieve channels.

## 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 ≤ 0.005%. In Audio Response, Hz is understood.

Manufacturer	AKG Acoustics	Beyer Dynamic		Cetec Vega
Model Series	System 185	System TS185	System 185	77Dynex II/R-33 ProPlus
RF frequency	130-190MHz (130-225MHz)	135-240MHz	135-250MHz	150-174/174-216MHz
Audio response	-2dB 40-20k(-15k)	-2dB, 40-14k	± 2dB, 40-20k	± 1.5dB 45-15k
S/N ratio	> 90dB, > 85dB <sup>1</sup>	> 56dB (MCE-5 mic)	> 56dB mic dependent	> 100dB
				CVX "Reporter" series
				150-216MHz
				± 1.5dB 60-14k
				101dB

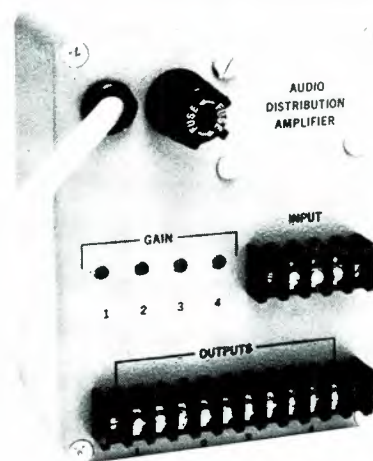
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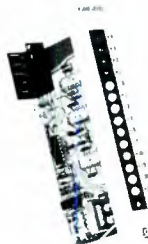
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Manufacturer	<b>AKG Acoustics</b>
Model Series	System 185
Distortion, system	<0.2%
Modulation control	Switchable limiter
Companding function	Low Noise compander
Transmitter model	<b>T185.10W (T185.10N)</b>
Transmitter packaging	Hand-held
RF output level	≈25mW (35mW)
Carrier deviation	±60Hz (±12kHz)
Microphone type	Dynamic, condenser
Power requirement	9Vdc
Operating weight	13.6 oz w/mic, bat
Receiver model	<b>SR185.10 (SR185.11)</b>
Sensitivity	1μV for >35dB (55dB)
Spurious rejection	>110dB
Output connection	Bal 600Ω, unbal
Audio output level	+6dBm or variable
Power requirement	110-220Vac, 15-27Vdc ext
Metering	AF, RF, battery levels
Panel indicators	LED ladder displays
Antenna types	50Ω SO-239 for whips
Diversity receiving	[SR185.11]
Multichannel system	No
Reader Service Number	1193

\*With companding, 1mV into the receiver.

<b>Beyer Dynamic</b>	
System TS185	System 185
<2%	<0.5%
Limiting	Limiting
Yes	Yes
<b>TS185US</b>	<b>S-185</b>
Pocket transmitter	Handheld
50mW (3mW radiated)	2mW
±12kHz nom, ±13kHz peak	±45kHz nom, ±65kHz peak
Electret, dynamic	Electret or ribbon
9Vdc	9Vdc
220gm	360gm
<b>NE185 US</b>	<b>NE-185</b>
1μV >85dB SNR companded	1μV 35dB w/LN-compandor
>110dB	>75dB
Bal, XLR	Bal XLR <600Ω, unbal
-20dBm, +6dBm	+6dBm
110Vac, 15-27Vdc ext	110/220Vac, 15-27Vdc
RF/transmit level, +Vdc	+Vdc, RF/audio level
LED ladder, points	LED displays
TTA 85MA whip	¼-λ whip, SO239
Available	Yes
1 or 3-channel	1- & 3-channel models
1194	1195

<b>Cetec Vega</b>	
77Dynex II/R-33 ProPlus	CVX "Reporter" series
<0.5%, 0.2% typical	0.5% max
Limiting/compression	.....
Dynex II	.....
<b>Model 77 Dynex II</b>	<b>T-23 (T-24)</b>
Bodypack	Bodypack (Handheld)
50mW	50mW nom
±15kHz	15kHz max
Electret, dynamic	Electret
9Vdc	9Vdc
5oz	7oz (9.5oz)
<b>R-33 ProPlus</b>	<b>R-26 portable</b>
<2.5μV, 50dB S/N	<1.9μV, 50dB S/N
>-70dB	-80dB
Bal, 600Ω, 150Ω	Bal, XLR
Line, mic selectable	Mic, line selectable
9Vdc, 10-20Vdc ext	4 9Vdc, 10.5-18Vdc ext
RF, AF, battery	RF, AF, battery
LED display	VU scale meter
Various	¼-λ whip
No	No
No	No
1196	1197

Manufacturer	<b>Cetec-Vega</b>	
Model Series	Pro 1B/1H systems	T-80 series/R-40 series
RF frequency	150-216MHz	150-216MHz
Audio response	±1.5dB, 100-13k	±1.5dB 90-15k
S/N ratio	103dB typical	>100dB
Distortion, system	<0.4%	0.15% THD/IMD typical
Modulation control	Limiting, compression	Limiting, compression
Companding function	Dynex II	Dynex II
Transmitter model	<b>T-37 (T-36/-39)</b>	<b>T-81/82/83/84/87</b>
Transmitter packaging	Bodypack (handheld)	Handheld
RF output level	50mW (40mW)	50mW
Carrier deviation	±15kHz	±15kHz
Microphone type	Electret	Dynamic, electret, ribbon
Power requirement	9Vdc	9Vdc
Operating weight	6oz (10oz)	9-13.5oz per model

<b>ComTek</b>	
Model 72 (172)†	
170-216MHz	±3dB (-2dB) 40-15k
75dB (95dB) unwtwd	
<1% (0.5%)	
Compression	No (Yes)
<b>M72L, P, H</b>	
Pocket pack	
50mW	
±30kHz, ±15kHz in US	
Dynamic, electret	
9Vdc	
4 oz	

<b>Edcor</b>	
E COM Highband	E COM Highband
150-216MHz	150-216MHz
±2dB 200-16k	±2dB 200-16k
.....	.....
1%	1%
Soft compression	Soft compression
.....	.....
<b>E COM 1 Lavalier</b>	<b>E COM 1</b>
Pocket pack	Hand-held
100mW	100mW
±7.5kHz	±7.5kHz
Various lavalier	EV671 element
9Vdc	12Vdc
10.7 oz w/o battery	8.7 oz w/o battery

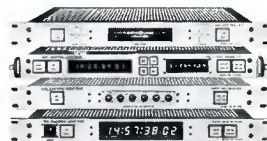
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Circle (146) on Reply Card

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Circle (147) on Reply Card

Manufacturer	Cetec-Vega	ComTek	Eddcor
Model Series	Pro 1B/1H systems	T-180 series/R-40 series	Model 72 (172)†
Receiver model	R-31A (66B portable)	R-4¼/2/42W	MR-182 (PR-72B)
Sensitivity	<2.2µV 50dB S/N	<0.7µV, 20dB quieting	1µV 20dB quieting
Spurious rejection	<-80dB	-90dB	>90dB (-60dB)
Output connection	Bal 600Ω, 150Ω	Bal XLR	Balanced 250-600Ω
Audio output level	Mic, line selectable	Mic, line selectable	100mV or line
Power requirement	110Vac or (ext dc)	110-220Vac, +12Vdc	12-24Vdc, 115Vac (9V)
Metering	RF, AF (and battery)	RF, VU/AF proc. diversity	AF, RF, power
Panel indicators	LED displays (VU meter)	Meter, point LEDs	...
Antenna types	Whip	Whip, dipole	¼" whip
Diversity receiving	No	R-42 only	No
Multichannel system	No	No	One
Reader Service Number	1198	1199	1200

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

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Manufacturer	Lectrosonics
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
<b>Transmitter model</b>	<b>M185</b>
Transmitter packaging	Bodypack
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Any type
Power requirement	9Vdc alkaline
Operating weight	5.3oz
<b>Receiver model</b>	<b>CR185</b>
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
<b>Reader Service Number</b>	<b>1208</b>

<sup>1</sup>Without 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
<b>Transmitter model</b>	<b>TX501 (TX503)</b>
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)
<b>Receiver model</b>	<b>MDR-530 (MDR-540)</b>
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)
<b>Reader Service Number</b>	<b>1209</b>

Nady Systems	
Model Series	TX100/MR110 <sup>1</sup>
RF frequency	150-216MHz
Audio response	±1dB, 50-15k
S/N ratio	>80dB typ noise floor
Distortion, system	<0.3%
Modulation control	50dB range
Companding function	No
<b>Transmitter model</b>	<b>TX101 (TX102) (TX203)</b>
Transmitter packaging	Pocket (handheld)
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Various
Power requirement	1-9V [2-batteries]
Operating weight	8.5oz [10.5oz]
<b>Receiver model</b>	<b>MR110 camera receiver</b>
Sensitivity	<20µV for 80dB S/N
Spurious rejection	80dB adj chan rej
Output connection	Bal, 3-pin Preh connector
Audio output level	-53dBv
Power requirement	12Vdc camera, 40ma
Metering	RF, battery
Panel indicators	LED multifunction
Antenna types	Whip on BNC 50Ω
Diversity receiving	No
Multichannel system	No
<b>Reader Service Number</b>	<b>1211</b>

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
<b>Transmitter model</b>	<b>101/201HT, GT, LT</b>
Transmitter packaging	Handheld, Instr, Body
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Attached electret
Power requirement	9Vdc
Operating weight	8.5oz, 2.5oz, 2.5oz
<b>Receiver model</b>	<b>101 VHF (201 VHF)</b>
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
<b>Reader Service Number</b>	<b>1212</b>

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

Nady Systems	
Model Series	VHF 151 VR
RF frequency	170.225, 170.85MHz
Audio response	±3dB, 25-20k
S/N ratio	.....
Distortion, system	<0.3%
Modulation control	None
Companding function	Yes
<b>Transmitter model</b>	<b>151 VR/LT</b>
Transmitter packaging	Pocket/belt package
RF output level	50mW
Carrier deviation	±15kHz
Microphone type	Attached electret
Power requirement	9Vdc

RF Technology	
Model Series	RM-102 (RM-100)
RF frequency	947-952MHz <sup>1</sup>
Audio response	±1dB 50-10k
S/N ratio	60dB unwt'd
Distortion, system	1% w/AGC
Modulation control	Soft limiting
Companding function	No
<b>Standard Unit</b>	<b>SK2012-6 (SK2012-90)</b>
Transmitter packaging	Pocket pack
RF output level	50mW
Carrier deviation	±50kHz
Microphone type	External mic
Power requirement	9Vdc

Sennheiser Electronics	
Model Series	SK2012/EM1036 <sup>2</sup>
RF frequency	30-45MHz (138-250MHz)
Audio response	40-20k
S/N ratio	>73dB (>90dB)
Distortion, system	<1%
Modulation control	Switchable limiting
Companding function	HiDyn switchable
<b>Standard Unit</b>	<b>SK2012-6 (SK2012-90)</b>
Transmitter packaging	Pocket pack
RF output level	<10mW (ca 30mW)
Carrier deviation	±8-10kHz (±40-56kHz)
Microphone type	Electret, lavalier
Power requirement	3-1.5V alk. Mn cells

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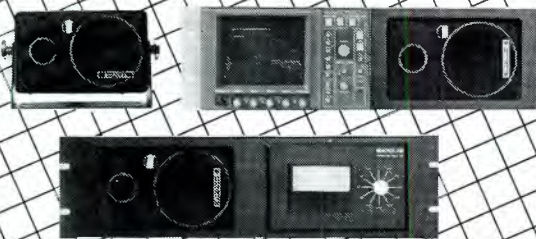
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Circle (151) on Reply Card

Manufacturer	Nady Systems			RF Technology	Sennheiser Electronics
Model Series	1200 VHF systems	VHF 151 VR	VHF 501 VR	RM-102 (RM-100)	SK2012/EM1036 <sup>2</sup>
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	1.5 $\mu$ V, 20dB quieting	1.5 $\mu$ V, 20dB quieting	1.5 $\mu$ V, 20dB quieting	....	3 $\mu$ V (1.5 $\mu$ V)
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 20 $\Omega$ (XLR 10 $\Omega$ )
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

<sup>1</sup>Available for Canadian use in 902-928MHz spectra.  
<sup>2</sup>Also available for 460-960MHz.

Manufacturer	Sennheiser Electronics	Shure Brothers		Sony Broadcast	
Model Series	SKM4031/EM1001	W10BT/W25DR (W20R)	W15BT/W25DR (W20R)	UHF systems	VHF systems
RF frequency	30-45MHz (138-250MHz) <sup>1</sup>	150-216MHz	150-216MHz	470-900MHz	174.6-215.4MHz
Audio response	70-20k	$\pm$ 1dB 50-15k	$\pm$ 1dB 50-15k	$\pm$ 2dB 75-13k	$\pm$ 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 [J/58]	WRT27/27A	WRT210/WRT220
Transmitter packaging	Handheld	Body pack	Hand-held	Body pack	Hand-held
RF output level	10mW (30mW)	50mW max	50mW max	6mW	50mW into 50 $\Omega$
Carrier deviation	40-56kHz	$\pm$ 12kHz 50 $\mu$ s pre-emp	$\pm$ 12kHz 50 $\mu$ s pre-emp	$\pm$ 150kHz	$\pm$ 1.9kHz -64dB
Microphone type	Super cardioid dynamic	Electret condenser <sup>2</sup>	Condenser [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	3 $\mu$ V (2.5 $\mu$ V)	<0.5 $\mu$ V for 12dB SINAD	<0.5 $\mu$ V for 12dB SINAD	20dB $\mu$ 30dB S/N	>65 $\mu$ V 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	$\frac{3}{8}$ "- $\lambda$ whips ( $\frac{1}{4}$ "- $\lambda$ )	$\frac{3}{8}$ "- $\lambda$ whips ( $\frac{1}{4}$ "- $\lambda$ )	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

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

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Circle (153) on Reply Card

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	
<b>Transmitter model</b>	<b>Mark 50A-dbs</b>	
Transmitter packaging	Body, pocket pack	
RF output level	50mW	
Carrier deviation	±10kHz	
Microphone type	SM87, ECM-50	
Power requirement	9Vdc	
Operating weight	6 oz	
<b>Receiver model</b>	<b>Mark 2L-RFSD</b>	
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	
<b>Reader Service Number</b>	<b>1223</b>	

Manufacturer		Telex Communications			
Model Series		HT-400/FMR-4	WHM/FMR50	WT-400/ENG-4	WT-50/FMR-2
RF frequency	165-216MHz	150-186MHz	150-186MHz	165-216MHz	150-186MHz
Audio response	50-15k	±1dB 50-15k	±1dB 100-15k	±1dB 100-15k	±2dB 50-15k
S/N ratio	102dB w/companding	98dB A-wtd	104dB companded	>90dB ultimate	>90dB ultimate
Distortion, system	<0.5%	<0.5%	<0.5%	<0.3%	<0.3%
Modulation control	Compression	Compressor	Compressor	Compressor	Compressor
Companding function	Yes	Yes	Yes	Yes	Yes
<b>Transmitter model</b>	<b>HT-400 series</b>	<b>WHM410/WHM500</b>	<b>WT-400</b>	<b>WT-50 (WT-50G instrument)</b>	
Transmitter packaging	Handheld	Handheld	Pocket/body pack	Pocket/body pack	
RF output level	45mW	15mW max	50mW max, 45mW typical	50mW	
Carrier deviation	±12kHz	±12kHz	±12kHz	±12kHz	
Microphone type	Dynamic, condenser	Dynamic/condenser	Dynamic, electret	Various	
Power requirement	9Vdc or 8.4Vdc Nicad	9Vdc	9Vdc	8.4V Nicad or 9Vdc	
Operating weight	14.8-16.4oz	16oz/14oz	5.5oz	5.4oz	
<b>Receiver model</b>	<b>FMR-4</b>	<b>FRM-50</b>	<b>ENG-4</b>	<b>FMR-2 (FMR-2G)</b>	
Sensitivity	<0.5µV for 12dB SINAD	<0.5µV for 12dB SINAD	0.5µV for 12dB SINAD	<0.5µV, 12dB SINAD	
Spurious rejection	<-70dB	<-75dB	<-70dB	<-70dB	
Output connection	Bal XLR 8/600/10kΩ	XLR bal 200Ω	XLR bal 600Ω	XLR bal 8/600/10kΩ	
Audio output level	Mic, line selectable	Mic level	Mic, line selectable	Mic, line selectable	
Power requirement	110-220Vac	110-220Vac, 13.6Vdc ext	4 AA alk/nicad, 12-24Vdc	110Vac, 13.6Vdc ext	
Metering	RF, AF, Freq	RF presence, AF	RF, AF, battery	AF, RF	
Panel indicators	Carrier presence	LED ladder/7-segment	Meter	2 LED ladder displays	
Antenna types	Whip furnished	¼-λ, ½-λ whips	Whip	Whip	
Diversity receiving	Yes	Pos-i-Phase	No	Pos-i-Phase	
Multichannel system	To 4 channels	No	4-channel	No	
<b>Reader Service Number</b>	<b>1224</b>	<b>1225</b>	<b>1226</b>	<b>1227</b>	

## Shotgun Microphones

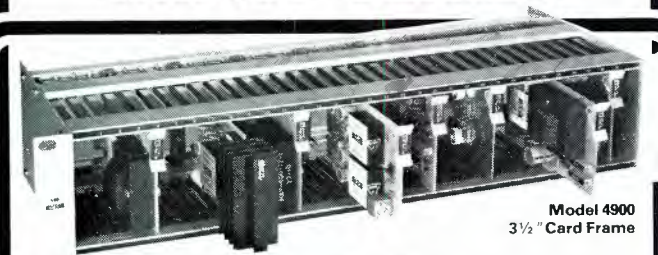
Manufacturer		AKG Acoustics		Audio-Technica		Beyer Dynamic		Electro-Voice	
Model No.		D-900E	CK8/CK8X/CK9 capsules	AT4071 (AT4073)	MC736 (MC737 long)	Model DL42			
Frequency response	20-20k	60-12k	30-20k (30-18k)	30-20k	40-20k	50-12k			
Polar pattern	Hypercardioid	Hypercardioid	Hypercardioid	Lobar (narrow dir)	Cardioid/lobe	Hypercard, line			
Output impedance	600Ω	200Ω	120Ω <sup>1</sup>	250Ω bal, no xlmr	150Ω	150Ω			
Output level	11mV/Pa	-49.5dBm	10mV/Pa-15mV/Pa	62mV/Pa (56mV/Pa)	25mV/Pa	-50dB(1)			
Maximum SPL	128dB 0.5% THD	50Pa (128dB SPL)	137dB for 0.5% THD	127dB (129dB)	122dB (128dB preattn)	-125dBm hum pickup			
Output Noise	18dB-A per DIN	-125dBm	15dB-A DIN equiv	12dB (14dB) typical	4.5fVp	74dB			
S/N ratio	.....	.....	79dB	.....	12-48Vdc	Dynamic, not required			
Power required	B18 18Vdc supply	Dynamic	B18 18Vdc	12-48Vdc phantom	.....	13 oz			
Filters	Bass cut	Bass rolloff	Bass cut	Hi-pass/Lo-cut	.....	Coil cord, handle			
Weight	6.2oz	18oz	4.2oz + preamp	5.8oz (4.2oz)	195g (250g)	Windscreen, case			
Accessories	Stand adapter, wind screen, options.	Stand adapter, case, other options.	Preamp, stand adapter capsule cord, opts	Clamp, carrying case	Case, windscreens	1233			
<b>Reader Service Number</b>	<b>1228</b>	<b>1229</b>	<b>1230</b>	<b>1231</b>	<b>1232</b>	<b>1233</b>			

<sup>1</sup>Based on C460B studio mic preamp with CK8X; CK8/CK9 operate with C451 preamp  
<sup>2</sup>Where 0dB = 1mW/10dynes/cm<sup>2</sup>.

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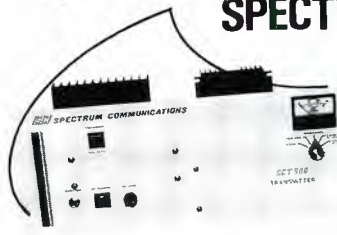


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Manufacturer	Electro-Voice	Georg Neumann/Gotham	Sennheiser Electronic	Shure Brothers		
Model No.	RE45N/D	KMR81i (KMR82i)	RSM 190i MS-stereo	MKH 416 P48 U3	MKH-816 P48 U3	Shure Brothers SMB9 Condenser
Frequency response	150-15k	40-18k (40-20k)	40-18k	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
Pcwer 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 ±0.00025%. Receivers are dual conversion design with a balanced audio signal output. In AF response, Hz is understood.

Manufacturer	Marti Electronics	Moseley Associates	TFT		
Model/Series	RPT-15/CR-10	RPT-2/AR-10	RPT-30/CR-10	RPL-4000	8888 system
Typical range	15 miles	6 miles	25 miles	.....	.....
Audio response	± 1.5dB 50-15k	± 1.5dB 50-15k	± 1.5dB 50-15k	to 7.5kHz (or 15kHz)	± 1dB 50-15k (50-7.5k)
System S/N ratio	55dB 100% mod unwt'd	55dB 100% mod unwt'd	55dB 100% mod unwt'd	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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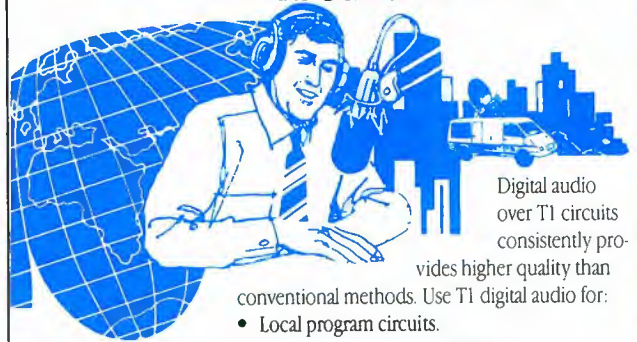
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Manufacturer	Marti Electronics			Moseley Associates	TFT
Model/Serial	RPT-15/CR-10	RPT-2/AR-10	RPT-30/CR-10	RPL-4000	8888 system
Power requirements	120Vac, 13Vdc	120Vac, 13Vdc	120Vac, 13Vdc	13.6Vdc, 120Vac	1-13.8Vdc, 115/230Vac
Metering functions	AF, RF, dc, decode	AF, RF, dc, decode	AF, RF, dc, decode	AF, RF, V, LO	RF, AF, V
Auto relay decoder	27Hz	27Hz	27Hz	Yes	Yes
Reader Service Number	1486	1487	1488	1489	1490

## Audio Distortion Analyzer

These systems measure total harmonic distortion (THD) in audio systems. Some also have the capability of measuring Intermodulation Distortion (IMD). Those marked with a bullet (•) have video or X-Y scope display capability. A dagger (†) indicates a port to drive an X-Y plotter or hardcopy printer; a double dagger (‡) indicates availability of an AM detector. A check (✓) denotes units with functions specifically for audio recording systems. In audio frequency ranges, Hz is understood.

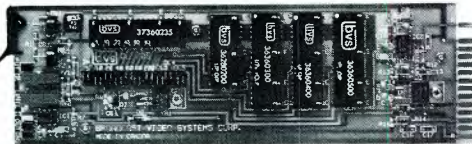
Manufacturer	Amber Electro Design			ASACA/ShibaSoku	Audio Precision
Model Number	3501 (3501a)‡	•5500 (5400)‡✓	•5300‡✓	•725B automatic	•System One†✓ <sup>1</sup>
Frequency range	10-100k, 4-range	10-100k	8.5->500k	5-500k	10-100k
Input level	30mV-100V, 100kΩ (300Va)	30mV-100V, 100kΩ	-100, +40dBV	0.1-100V	100μV-140V, 100kΩ
Input connection	Bal/float opt (std)	Active bal	Bal, unbal	BNC float/ground	Active bal
Fundamental reject	> 100dB 1kHz	> 100dB @ 1kHz	Yes	> 90dB	110dB
Auto level set	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes
Minimum THD figure	0.0008% or -102dB	0.001%	-100dB/0.001% THD + N	0.001% w/o noise-hum	0.0003%
THD accuracy	± 1dB 20-20k	± 1dB	± 2dB 10-100k	± 5%	± 5%
IMD measurement	SMPTE/DIN/CCIF	SMPTE/DIN/CCIF	SMPTE, DIN, CCIF	± 10%	SMPTE, CCR, DIM/TIM
IMD accuracy	± 1dB SMPTE/DIN	± 1dB	± 0.5%	± 0.5%	± 10%
Minimum IMD	0.001%	0.001%	< 0.003% 3k-10k	0.0001%	0.0001%
ac Volts accuracy	-128, +42dBm, ± 0.5dB	-100, +40dBm, ± 1% fs	-100, +40dBV ± 0.1dB	30μV-100V ± 3%	-114, +45dBm ± 1% fs
Audio noise range	-120dBm	-120dBm	to < 2.5μV	> 100dB	-114dBm
Signal generator range	10-100k @ +28dBm	10-100k +30dBm 600Ω	Use 5100 10-100k	No	10-204k, 30dBm
Generator stability	± 1%	± 0.5%	± 0.5%	± 0.5%	± 0.5%
Generator output	Xfmr, bal/unbal	Xfmr, bal, unbal	Bal, unbal	5-500k, autorange	Xfmr bal
Frequency counter	Option 358	5-digit	with 5200	Analog meter w/LEDs	Yes
Meters/displays	True RMS movement	LED/7-seg display	7-seg displays	Yes	CRT bar graph
Digital design	No	Yes	Yes	Yes	IBM-PC base
Automated measurements	.....	GPIB, RS-232	IEEE-488 interface	GPIB option	Through PC bus
Reader Service Number	668	669	670	671	672

<sup>1</sup>Software/hardware package for use with IBM PC.

Manufacturer	Boonton Electronics	Hewlett Packard	Panasonic Factory Automation		
Model Number	•1120 analyzer†	1130 analyzer	8903B/8903E†	VP-7721P	VP-7722P†
Frequency range	10-140k	10-140k	20-100k	5-159.9k	10-110k/to 10th harm
Input level	3mV-300V, 100kΩ	3mV-300V, 100kΩ	425V peak, 100kΩ	0.1V-100Vrms 100kΩ	0.05-100Vrms, 100kΩ
Input connection	Diff. bal or unbal	Diff. bal or unbal	Balanced, BNC	Floating	BNC, floating
Fundamental reject	Resid THD + noise-10dB	Resid THD + noise-10dB	> 100dB	> 86dB overall	> 140dB
Auto level set	Yes	Yes w/autoranging	Yes	Yes	Yes

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<b>Manufacturer</b> .....	<b>Boonton Electronics</b>
<b>Model Number</b> .....	<b>-1120 analyzer†</b>
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
<b>Reader Service Number</b> .....	<b>673</b>

<b>Manufacturer</b> .....	<b>Polomac Instruments</b>
<b>Model Number</b> .....	<b>-AA-51 Analyzer†✓</b>
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
<b>Reader Service Number</b> .....	<b>678</b>

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

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

<b>Model Number</b> .....	<b>1130 analyzer</b>
Yes	Yes
0.003%	0.003%
± 1dB, 20-20k	± 1dB, 20-20k
No IMD	No IMD
.....	.....
.....	.....
3mV-300V ac/dc	3mV-300V ac/dc
SINAD	SINAD
Model 1110 oscillator	Model 1110 oscillator
± 1ppm/year	± 1ppm/year
Osc bal or unbal	Osc bal or unbal
5-200k	5-200k
LED 7-seg displays	LED 7-seg displays
Yes	Yes
IEEE-488	IEEE-488
<b>674</b>	<b>674</b>

<b>RE Instruments</b>	<b>-RE201 dual channel✓</b>
20-25k	20-25k
2mV-15.5V, 300kΩ	2mV-15.5V, 300kΩ
Active bal	Active bal
105dB, 20Hz-12.5kHz	105dB, 20Hz-12.5kHz
Yes	Yes
Yes	Yes
0.001%	0.001%
± 2.5dB, THD-70dB	± 2.5dB, THD-70dB
SMPTE, DIN 45403	SMPTE, DIN 45403
± 2.5dB, IMD-50dB	± 2.5dB, IMD-50dB
<-67dB	<-67dB
-51.8, +25.7dBu ± 3%	-51.8, +25.7dBu ± 3%
<-93dB 40Hz-25kHz	<-93dB 40Hz-25kHz
1-25k, 0.8m-8.87V	1-25k, 0.8m-8.87V
± 20ppm	± 20ppm
Active, floating bal	Active, floating bal
4-25k by 0.1Hz	4-25k by 0.1Hz
CRT alphanumerics	CRT alphanumerics
Programmable 100 setups	Programmable 100 setups
GPIB, IEEE-488	GPIB, IEEE-488
<b>679</b>	<b>679</b>

<b>Sound Technology</b>	<b>-1710A</b>
10-110k	10-110k
0.03mV-110V, 200kΩ	0.03mV-110V, 200kΩ

<b>Hewlett Packard</b>	<b>8903B/8903E†</b>
Yes	Yes
<-90dB, 0.003%	<-90dB, 0.003%
± 1dB, 20-20k	± 1dB, 20-20k
No	No
.....	.....
.....	.....
0.3mV-300V ± 2%	0.3mV-300V ± 2%
-85dB (17μV) 80kHz BW	-85dB (17μV) 80kHz BW
20-100k for 8903B	20-100k for 8903B
0.3% of setting	0.3% of setting
0.6mV-6V open circuit	0.6mV-6V open circuit
± 0.004% + 1 digit	± 0.004% + 1 digit
Digital readout	Digital readout
Yes	Yes
HP-IB	HP-IB
<b>675</b>	<b>675</b>

<b>Rohde &amp; Schwarz</b>	<b>UPA analyzer†✓</b>
10-100k(300kHz harm)	10-100k(300kHz harm)
12mV to 400Hz, 1.2mV	12mV to 400Hz, 1.2mV
Bal (600Ω), unbal (10kΩ)	Bal (600Ω), unbal (10kΩ)
.....	.....
Yes	Yes
Yes	Yes
-90dB to 0dB range	-90dB to 0dB range
± 1dB to 100kHz	± 1dB to 100kHz
No	No
.....	.....
.....	.....
10μV-300V unbal(35V bal)	10μV-300V unbal(35V bal)
0-120dB SNR	0-120dB SNR
UPA-B6 opt (10-100k)	UPA-B6 opt (10-100k)
± 0.01%	± 0.01%
Bal, unbal	Bal, unbal
8-250k	8-250k
LCD displays	LCD displays
Yes	Yes
IEEE-488/IEC 625-1	IEEE-488/IEC 625-1
<b>680</b>	<b>680</b>


<b>Panasonic Factory Automation</b>	<b>VP-7721P</b>
Yes	Yes
0.003% fs (10 ranges cover to 100%)	0.003% fs (10 ranges cover to 100%)
.....	.....
.....	.....
0.1mV-100V 13-range	0.1mV-100V 13-range
0-100dB SNR	0-100dB SNR
5-159.9k	5-159.9k
± 2% overall	± 2% overall
600Ω	600Ω
No	No
Input, test meters	Input, test meters
μP controlled	μP controlled
Yes	Yes
<b>676</b>	<b>676</b>

<b>SUN-2 System†</b>	10-100k
-84, +32dBm, 1MΩ	-84, +32dBm, 1MΩ
Xfmr bal or unbal	Xfmr bal or unbal
>65dB	>65dB
Auto ranging	Auto ranging
No	No
0.06%	0.06%
± 0.1dB	± 0.1dB
DIN	DIN
.....	.....
.....	.....
Yes	Yes
Yes	Yes
SUN-2/S 10-100k	SUN-2/S 10-100k
.....	.....
Telephone jacks	Telephone jacks
No	No
LED displays	LED displays
μP control	μP control
No	No
<b>681</b>	<b>681</b>

<b>Schmid Telecomm. Zurich</b>	<b>-S2-340 rcvr/xmtr†</b>
20-20k	20-20k
-100, +20dB autorange	-100, +20dB autorange
Floating, bal	Floating, bal
>80dB overall	>80dB overall
Yes	Yes
-70dB THD	-70dB THD
.....	.....
.....	.....
-100, +20dB ± 0.1dB	-100, +20dB ± 0.1dB
Integrated over time	Integrated over time
20-10k	20-10k
± 0.03%	± 0.03%
Floating bal	Floating bal
Yes	Yes
Analog meter & CRT	Analog meter & CRT
Yes	Yes
GPIB	GPIB
<b>682</b>	<b>682</b>

<b>Technical Projects</b>	<b>-MJS401D/MD404B†✓</b>
10-300k	10-300k
100V, 100kΩ	100V, 100kΩ



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Schmid Telecomm. Zurich		Sound Technology		Technical Projects	
Manufacturer	Schmid Telecomm. Zurich				
Model Number	SIAT <sup>1</sup>	•1710A	•1510A (1530A BTSC)†	•3100A/3200A (3200B)†	•MJS401D/MD404B†
Input Connection	.....	Active bal	Active bal 100kΩ	Active bal	Active bal
Fundamental reject	.....	> 100dB 1kHz	100dB, 1kHz	110dB	94dB at 1kHz
Auto level set	.....	Yes	Yes	Yes	Yes
Auto null set	.....	Yes	Yes	Yes	Yes
Minimum THD figure	.....	0.002%	0.01%	0.001%	0.002%
THD accuracy	.....	± 10%	± 5% of full scale	± 10%	± 2%
IMD measurement	.....	SMPTE, DIN	SMPTE 4:1	SMPTE	SMPTE
IMD accuracy	.....	± 4%	.... (± 5%)	± 4%	± 2%
Minimum IMD	.....	0.0025%	.... (0.01%)	0.001%	0.02%
ac Volts accuracy-70, +21dBm	.....	± 0.2dBm ± 2%	± 0.15dBm, ± 0.05% fs	-107, +40dBm, ± 0.1dB	± 1% (-0.1, +1dB)
Audio noise range	.....	W/stereo crosstalk	-79dBm	.... < -115dBm, 30kHz bw 600Ω	± 2%
Signal generator range	.....	40-15k programmable	10-110k +26dBm	1-105k @ 30dBm	10-300k, +30dBm
Generator stability	.....	± 2%	.... (Xtal ctl)	± 0.03%	± 1% (-0.1, +1dB)
Generator output	.....	Active bal	Act bal. floating	Active bal	Active bal/unbal
Frequency counter	.....	No	No	Yes	Yes
Meters/displays	.....	LED displays, printer	RMS, AVG, PEAK scales	LEDs and meter movement	Multistandard movement
Digital design	.....	Yes	No	Yes	In part
Automated measurements	.....	Remote via RS-232	μP-based	Yes	GPIB IEEE-488 opt
Reader Service Number	.....	683	GPIB-488	GPIB, RS-232	687
		684	685	686	

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

Tektronix		Wandel & Goltermann	
Manufacturer	Tektronix		
Model Number	AA501	•AA5001†	•NFA-1†
Frequency range	10-100k	10-100k	15-200k (receiver)
Input level	60mV-200V, 100kΩ	60mV-200V, 100kΩ	140nV-30V, 600Ω, 100kΩ
Input connection	Balanced	Balanced	Bal, unbal, BNC/XLR/CF
Fundamental reject	10dB <sup>1</sup>	10dB <sup>1</sup>	90dB at 1kHz
Auto level set	Yes	Yes	Auto range -135dB, +30dB
Auto null set	Yes	Yes	Auto tune to harmonics
Minimum THD figure	0.0025%	0.0025%	0.003% typical
THD accuracy	± 10%	± 10%	± 0.003% absolute
IMD measurement	Opt: SMPTE/DIN/CCIF)	Opt: SMPTE/DIN/CCIF	By any procedure
IMD accuracy	± 10%	± 10%	± 0.01%
Minimum IMD	0.0018%	0.0018%	0.01%
ac Volts accuracy	-108, +48dBm ± 2% fs	-108, +48dB ± 2% fs	-135dB, +30dB
Audio noise range	-108dBm	-108dBm	-100dBm A-wtd < -90 CCIR
Signal generator range	10-100k, 28dBm	10-100k, 28dBm	10-50k, full level
Generator stability	± 0.01%	± 0.01%	± 30ppm worst case
Generator output	Balanced	Balanced	Bal, unbal, BNC/XLR/CF
Frequency counter	No	No	Yes w/SNR-10dB
Meters/displays	LED displays	LED displays	CRT graph/numeric
Digital design	Yes	Yes	Yes
Automated measurements	No	GPIB	GPIB/IEEE, IEC
Reader Service Number	688	689	690

<sup>1</sup>Value is below specified residual THD & noise or actual THD, whichever is greater.

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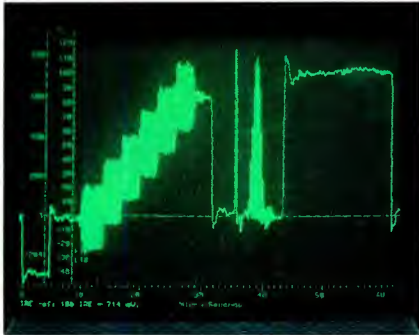
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... And detailed technical specifications are available.

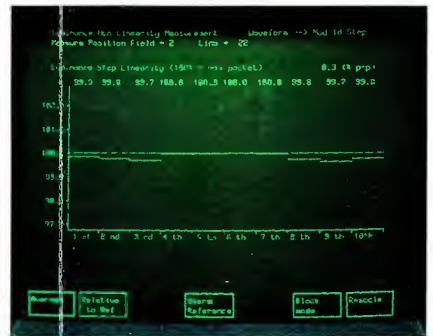
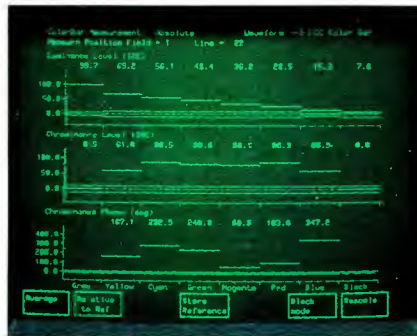
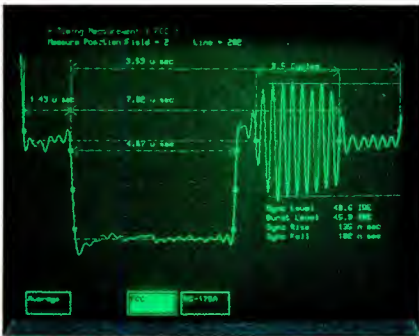
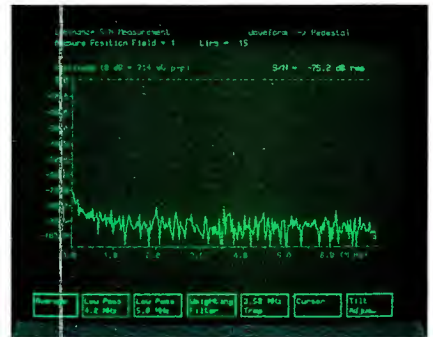
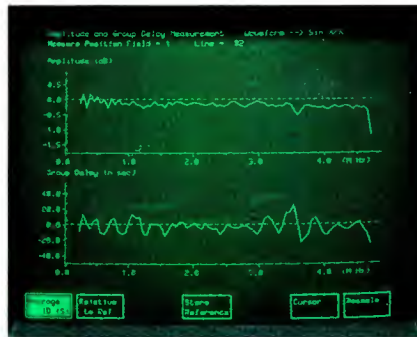
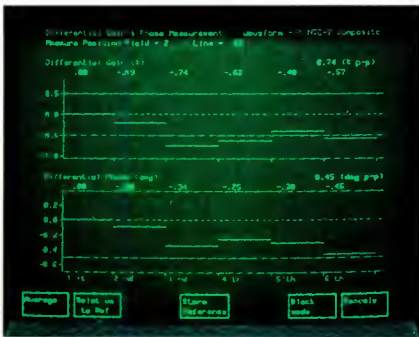
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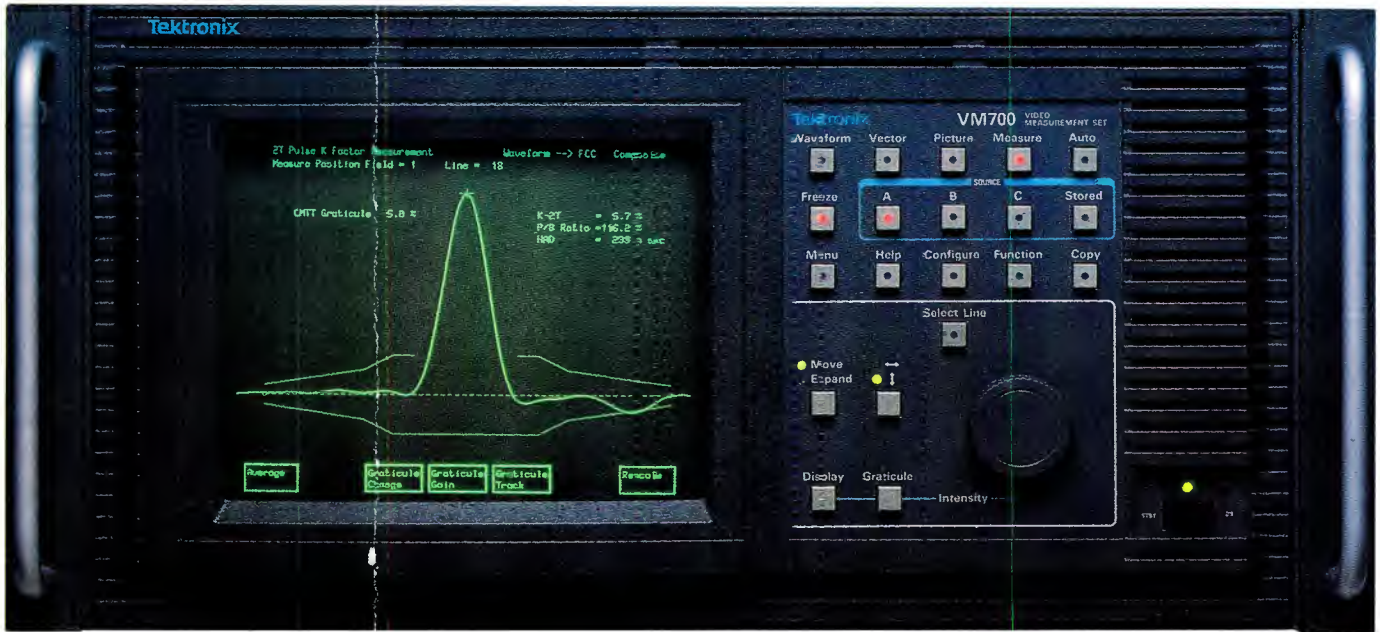
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All functions are controlled by a few simple, front-panel pushbuttons. Results are accurate and repeatable. And it's all done by one powerful package, at a very reasonable price.

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Circle (166) on Reply Card

# 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 (80% final)	54kVA for 20kW	28.4kW 100% mod	2.6kW, 100% mod
System efficiency	....	80% final, 40% modulator	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

†20kW system uses two 10kW units with the PS-10/77 combiner.

Manufacturer	Continental Electronics/Varian				
Model Series	317C-3‡	315-R1	418D-2†‡	420B†‡	419F-2†‡
Service band	Broadcast	Broadcast	Shortwave	Shortwave	Shortwave
RF output rating	50kW	5kW	100kW	500kW	250kW
RF output connector	3½" EIA female	1½"	6" EIA 75/300Ω	9" EIA 75/300Ω	9" EIA 75/300Ω
Carrier stability	± 5Hz	± 5Hz	± 1x10 <sup>-4</sup> Hz	± 1x10 <sup>-4</sup> Hz	± 1x10 <sup>-4</sup> 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	4CX35000C	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 <sup>2</sup>	42m <sup>2</sup>	35m <sup>2</sup>
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	0.95	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 <sup>3</sup>	SX-A series <sup>4</sup>
Service band	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast, shortwave	Broadcast
RF output rating	110kW	12kW	25kW (15kW)	10kW	5kW (2.5kW, 1kW)
RF output connector	6½"	1½"	....	1½"	5kW (1½", Type N)
Carrier stability	± 5Hz	± 5Hz	± 5Hz	± 5Hz	± 20Hz
Carrier shift	3% 100% mod, 400Hz	3%, 100% mod 400Hz	3%, 100% mod, 400Hz	3%	2%
Modulation max	125%	125%	125%	125%	125%
AF input connection	Xfmr bal	Xfmr bal	....	Xfmr bal	Act bal 600Ω
AF response	± 1.5dB, 50Hz-10kHz	± 1.5dB, 50Hz-10kHz	± 1dB, 50Hz-7.5kHz	± 1dB, 50Hz-10kHz	± 1.5, +.5dB 20Hz-12.5kHz
THD distortion	3% 95% mod	2.5% 95% mod	<2.5%	<2% 95% mod	≤ 1%
AM noise figure	-55dB unwt'd	-55dB unwt'd	-60dB unwt'd	-60dB unwt'd	<-60dB
Final amp device	4CV100000E	3CX10000A3	4CX20000B/8990 tetrode	4CX15000	Modular MOSFET
Modulator final device	4CV50000E	4CX3000A	4CX20000B/8990 tetrode	4CX5000A	Solid-state
Stereo exciter preferred	Motorola	Motorola	Any exciter	Any exciter	Harris STX-1B exciter
Floor space required	237"Wx55"D	76.5"Wx34"D	140"Wx30D	70"Wx31"D	28"Wx30"D
Input ac power required	460Vac 3φ	240Vac 3φ	380-450Vac 3φ (220Vac)	208-240Vac 3φ	220/440Vac 3φ
Power factor	0.89	0.89	0.9	0.9	....

Manufacturer	CSI Electronics			Elcom Bauer		Harris Broadcast SX-A series <sup>4</sup>
	Model Series	T-100-A1†‡	T-10-A1†	725 (715C)‡§	710C <sup>3</sup>	
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

<sup>1</sup>Other models in this series include: T-25-A1, 27.5kW; T-1-A1, 1.1kW; T-50-A1, 55kW; T-3-A1, 3kW; T-5-A1, 6kW.  
<sup>2</sup>Model 715C includes two 4CX5000A modulators driving a 4CX15000A final.  
<sup>3</sup>Other similar models in the series include 701B, 1kW; 705C, 5kW.  
<sup>4</sup>The 1kW and 2.5kW systems may operate from 220Vac 1φ; dissipation for 1kW, 22.5kW; for 2.5kW, 5.8kW.

Manufacturer	Harris Broadcast				ITAME SA Tauro-S series‡
	Model Series	SW-100B (SW-50B)†	VP-100B† (VPD-200A)	DX-10 Digital AM	
Service band	Shortwave	Broadcast	Broadcast	Broadcast	Broadcast
RF output rating	100kW (50kW)	100kW (200kW <sup>1</sup> )	10kW	50kW rated	10kW (5kW, 2kW)
RF output connector	300Ω bal	230Ω unbal	1½"	3½" EIA	1½" (LC female)
Carrier stability	±1x10 <sup>9</sup> Hz Xtal	±10Hz (±20Hz)	±10Hz	±10Hz	±5Hz & options
Carrier shift	<2% 95% mod 1kHz	<2% 100% mod (≤2.5%)	2%	<2% 100% mod 1kHz	<2% 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		≤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	....
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

<sup>1</sup>VPD-200A combines two VP-100B systems, doubling tube count; vapor-phase cooling is used in both systems.

Manufacturer	.L.P.B Inc	Marconi Communications				
		Model Series	AM-60 (AM-30, AM-5)	B6034 (6035/-36/-37) <sup>1</sup>	B6140 (B6141/6142)	B6127 (B6126 <sup>2</sup> )
Service band	Broadcast	Broadcast	Broadcast	Shortwave	Shortwave	Broadcast
RF output rating	60W (30W, 5W)	50kW (100/150/200kW)	50kW	3kW (7.5kW, 12.5kW)	500kW (300kW)	1kW
RF output connector	SO-230 UHF	3½" (6½") 50Ω	3½" (6½") 50Ω	50Ω unbal	300Ω bal, 50-75Ω unbal	7/16" 50Ω
Carrier stability	±10Hz	±10Hz (hi stab opt)	±10Hz (hi stab opt)	< ±1ppm/year	< ±10Hz	±10Hz
Carrier shift	2% 100% mod	<4%, 100% mod	<4%, 100% mod	....	2.5% 100% mod 400Hz	<5% 100% mod
Modulation max	110-120%	125%	125%	100%	100% Pulsam Modulation	100%
AF input connection	Xfmr bal	Xfmr bal	Xfmr bal	600Ω bal	600Ω bal	600Ω bal
AF response	±1dB, 20Hz-15kHz	±1dB, 30Hz-6kHz	<3%, 90% mod	-2, +1 60Hz-6kHz	±1dB, 50Hz-6kHz	±2dB, 40Hz-10kHz
THD distortion	<2%	<3%, 90% mod	<3%, 90% mod	<2.5% 90% mod	<4% 90% mod	<3%, 90% mod
AM noise figure	-55dB	-58dB unwt'd	-58dB unwt'd	<-55dB	<-55dB	-60dB unwt'd
Final amp device	Solid-state	2 4CX35000C tetrode	2 4CX1500B tetrode	Power tetrode	TH558 Hypervapotron	Solid-state modules
Modulator final device	Solid-state	2 4CX1500B tetrode	Motorola	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	32"Wx22"D
Input ac power required	110Vac 1φ	380-415Vac 3φ	100-250/380-440Vac	308-415Vac 3φ	230Vac 3φ	230Vac 3φ
Power factor	....	>0.9	>0.9	>0.9	>0.9	>0.9
Power consumption	250W (150W, 45W)	<129kVA	....	...(429kW)	3.5kW 100% mod	3.5kW 100% mod
System efficiency	25%	52% at carrier	....	>62% (64%)	48%	48%
Fault logic architecture	Relay	CMOS, TTL, relay	MOS/TTL, relay	MOS/TTL, relay	CMOS/TTL	CMOS/TTL
μP diagnostics	No	No	Yes	Yes	No	No
Reader Service Number	711	712	713	714	715	715

<sup>1</sup>Combinations of 50kW units with bridged-T circuits form 100kW, 150kW and 200kW. Values are given for 50kW equipment.  
<sup>2</sup>The 300kW system uses Thomson TH537 and EIMAC 4CW25000A tetrodes.

Manufacturer	.Marconi Communications	McMartin Industries	Nautel		
			Model Series	B6040	BA- K series
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" (7½")	50Ω unbalanced	3½" EIA flange
Carrier stability	±10Hz (hi stab opt)	±5Hz	±5Hz	±5Hz	greater of ±5Hz or ±5ppm
Carrier shift	<5%	<5%	<3% (<2%, <1%)	<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	CMOS/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
Service band	Broadcast	Broadcast, shortwave	Broadcast, shortwave
RF output rating	20W	3kW	10kW
RF output connector	UHF SO-239	¾"	1½"

# Audio Transformers

Choose from a wide variety of types and packages

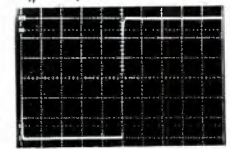
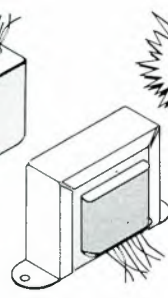
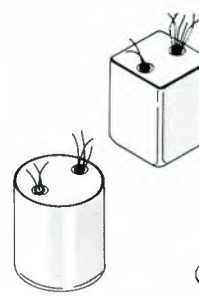
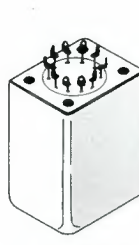
**Computer optimized design**

**100% tested – consistent quality**

**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 <sup>1</sup>	Typical THD Below Saturation (%) 20 Hz / 1 kHz	Frequency Response (dB ref. 1 kHz) 20 Hz / 20 kHz	Band-Width <sup>2</sup> -3 dB @ (kHz)	20 kHz Phase <sup>6</sup> (degrees)	Over-Shoot (%)	Noise Figure (dB)	Magnetic Shield <sup>4</sup> (dB)	Number of Faraday <sup>4</sup> Shields	PRICES		
													Package <sup>5</sup>	1-19	100-249

### MICROPHONE INPUT

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 87.04	52.36 57.55	36.12 39.70
JE-13K7-A	Mic in for 990 or I.C.	150-3750	1:5	+8	0.036/0.003	-0.09 / -0.21	85	<1	<2	2.3	-30	1	1	80.55	53.26	36.87
JE-115K-E (Improved)	Mic in for I.C. opamp	150-15K	1:10	-2.5	0.125/0.010	-0.25 / -0.06	95	<1	<1	1.5	-30	1	3	58.09	38.41	30.11

### LINE INPUT

JE-11P-9	Line in	15K-15K	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	15K-15K	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	36K-2200 (10K-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	30K-1800 (10K-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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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	20K-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 9/16"
2 = 1 3/16" × 1 3/16"		× 1 5/8"
3 = 1 1/8" Diam.		× 1 1/4"
4 = 1 1/2" × 1 3/4"		2 1/2" w/ solder terminals
5 = 1 5/8" Diam.		× 1 3/4"
6 = 1 1/4" Diam.		× 1 5/8"

## NICKEL CORE OUTPUT TRANSFORMERS<sup>7</sup>

Model	Construction	Nominal Impedance Ratio Pri-Sec	Turns Ratio Pri:Sec	20 Hz Max Output Level <sup>8</sup> across (n) windings (dBu)	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 <sup>6</sup> (degrees)	Over-Shoot (%)	Package <sup>11</sup>	PRICES			
													1-19	100-249	1000	
JE-11-BMCF	Bifilar 80% nickel	600-600	1:1	+26	1	-1.1	40 Ω	0.002/0.002	>10MHz	<0.5	<1 <sup>10</sup>	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	>10MHz	<0.5	<1 <sup>10</sup>	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	>10MHz	<0.5	<1 <sup>10</sup>	9	51.24	33.88	23.38	
JE-123-BLCF	Quadfilar	600-600 150-600	1:1 1:2	+32	2	-1.1	20 Ω	0.041/0.003	>450 170	<0.5 <1	<1 <sup>9</sup>	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	>10MHz 245	<0.5 <0.5	<1 <sup>9</sup>	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	>10MHz	<0.5	<1 <sup>10</sup>	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	>10MHz	<0.5	<1 <sup>10</sup>	10	28.72	18.99	13.10	
JE-112-LCF	Quadfilar	600-600 150-600	1:1 1:2	+20.4	2	-1.6	29 Ω	0.114/0.003	>450 205	<0.5 <1	<1 <sup>9</sup>	10	34.44	22.77	15.71	
JE-123-ALCF	Quadfilar	66.7-600	1:3	+26.5	3	-1.3	8 Ω	0.125/0.003	-0.04 / +0.06	190	<1	<6 <sup>9</sup>	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 <sup>9</sup>	8	70.01	35.38	24.41

7. Multifilar construction has no faraday shield: cannot be used as input transformer. All specifications are for 0 Ω source, 600 Ω load.

8. Max output level = 1% THD; dBu = dBv ref. 0.775 V

9. Source amplifier -3 dB @ 100 kHz

10. Source amplifier -3 dB @ 200 kHz

11. Output transformers are horizontal channel frame type with wire leads, vertical channel frames available. PC types available.

### PACKAGE DIMENSIONS:

W	L	H	Mounting Centers
7 = 1 1/2" × 2 3/16"		× 1 15/16"	2 3/16"
8 = 1 5/16" × 1 5/16"		× 1 5/8"	2 3/8"
9 = 1 5/8" × 1 1/2"		× 1 3/8"	2"
10 = 1 1/4" × 1 1/4"		× 1 3/8"	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 <sup>1</sup>	AM-10000D <sup>†</sup>
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	0.1kVA	9.6kW 100% mod	27kW 100% mod
System efficiency	.....	80%	80%
Fault logic architecture	.....	Relay	Relay
μP diagnostics	No	No	No
<b>Reader Service Number</b>	<b>721</b>	<b>722</b>	<b>723</b>

<sup>1</sup>Other models in the series include: AM-1000B, 1kW; AM-2500B, 2.5kW; AM-5000C, 5kW; AM-25000C, 25kW; AM-50000C, 50kW.

## FM Radio Transmitters

RF transmitting equipment using frequency modulation and operating in the 88-108MHz spectrum (CCIR II band). Intermediate power amplifiers are solid-state unless the model is marked with a dagger (†). All models are capable of operating in FM multiplex stereo service, with each manufacturer providing appropriate exciters and generators. All systems include an auto recycle feature. When a separate power supply cabinet is needed, the model is marked with a double dagger (‡).

Manufacturer	AEG/Bayly	Broadcast Electronics		CCA
Model Series	S-3206 (-3185/-3175)	S-3217	FM-10A (FM-35A) <sup>†‡</sup>	FM500G
RF output rating	5kW (1.5kW/1kW)	10kW (3k/5k modes)	10kW (35kW)	500W
RF output connection	1 <sup>1</sup> / <sub>2</sub> " female	1 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>2</sub> "	50Ω type N
Operating VSWR	.....	.....	< 1.8:1	.....
Modulation capability	± 100kHz	± 100kHz	> ± 200kHz	± 150kHz
Final amp device	Solid-state modular	RS 2032CL tetrode	4CX7500A tetrode(1)	4CX3500A tetrode(1)
AF input connection	Unbalanced > 2kΩ	Unbalanced	Bal 600Ω, unbal 10kΩ	Bal/unbal resistive
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
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
FM noise figure mono	< -64dB unwt'd	< -62dB unwt'd	-72dB 75μs deemph	-75dB 75μs deemph
Wideband composite input	Yes	Yes	Yes	Yes
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
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	.....
Fault logic architecture	BCD encoded	BCD encoded	μP system	μP system
μP diagnostics	Yes w/memory	Yes w/memory	MVDS w/remote control	MVDS w/remote control
<b>Reader Service Number</b>	<b>724</b>	<b>725</b>	<b>726</b>	<b>727</b>

<sup>1</sup>Additional models in this series and their final output device include: FM-20A, 4CX12000A/8989; FM-30A, 4CX20000A/8990. The FM-35A uses a 4CX20000C tetrode in the power amplifier.

<sup>2</sup>Additional 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) <sup>†</sup>	814C solid-state	814R-1 (814B/815A)	816-2B (817R-2B) <sup>1</sup>
RF output rating	5kW (10kW/20kW)	35kW (70kW)	3.8kW	2.4kW (4.3kW/5kW)	20kW (40kW)
RF output connection	1 <sup>1</sup> / <sub>2</sub> " (1 <sup>1</sup> / <sub>2</sub> ", 3 <sup>1</sup> / <sub>2</sub> ")	1 <sup>1</sup> / <sub>2</sub> " (1 <sup>1</sup> / <sub>2</sub> ", 3 <sup>1</sup> / <sub>2</sub> ")	1 <sup>1</sup> / <sub>2</sub> " EIA	1 <sup>1</sup> / <sub>2</sub> " EIA male	3 <sup>1</sup> / <sub>2</sub> " (1 <sup>1</sup> / <sub>2</sub> ", 3 <sup>1</sup> / <sub>2</sub> ")
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
<b>Reader Service Number</b>	<b>729</b>	<b>730</b>	<b>731</b>	<b>732</b>	<b>733</b>

<sup>1</sup>Additional models in this series include 816-3, rated 25kW; 816-4, rated 27.5kW; 817R-1, rated 50kW; and 817-R4 rated 55kW.

Manufacturer	Continental Electronics	Elcom-Bauer		Energy-Onix	
Model Series	817A	610A (625A <sup>†</sup> /610C) <sup>†</sup>	61000	605-FAT (605C <sup>†</sup> /603) <sup>1</sup>	MK-15 (MK-30) <sup>2</sup>
RF output rating	60kW	10kW (25kW/10kW)	1kW w/Fluorinert cooling	5kW (5kW/3kW)	15kW 30kW
RF output connection	6 <sup>1</sup> / <sub>2</sub> " EIA male	3 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>2</sub> "	1 <sup>1</sup> / <sub>2</sub> "	1 <sup>1</sup> / <sub>2</sub> " 3 <sup>1</sup> / <sub>2</sub> "
Operating VSWR	< 2:1	.....	.....	.....	.....
Modulation capability	± 150kHz	± 150kHz	± 200kHz	± 200kHz (± 150kHz)	± 200kHz
Final amp device	4CX40,000G	3CX10000A7 (15000A7)	Solid-state modules	4CX3500A (3CX3000A7)	3CX10000A7 (-20000A7)
AF input connection	Active bal	Bal 600Ω, unbal 10kΩ	Bal, unbal, 10kΩ	Bal 600Ω, unbal 10kΩ	Balanced
AF response	0.5dB, 20Hz-15kHz	± 0.1dB 30Hz-100kHz	± 0.1dB 30Hz-100kHz	± 0.1dB 30Hz-100kHz	0.2dB, 30-100k



# WATTS UP?



**When-and-if you're ready to UP your transmitting power, will your FM transmitter be ready too? If it's one of the QEI "New Reliables" FMQ series, the answer is YES!**

Our new 3.5KW, 5KW and 10KW transmitters were designed to give you a clear upgrade path to higher power. In just a few hours, your 3.5KW or 5KW QEI FM transmitter can be upgraded to a factory-equivalent 5KW or 10KW unit, right in the field. QEI's unique modular solid state drivers and interchangeable P.A. assembly make these power upgrades easy...and very economical.

If you're shopping for a 10KW unit in the first place, the QEI FMQ-10000 has lots to recommend it. No other FM transmitter packs this much power, reliability and performance into a single 24" wide rack cabinet. And the FMQ-10000 is designed to operate on single-phase power, so there's no need to pay for installing new three-phase electric service.

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

transmitters can serve as the driver section for QEI's 20, 30 or 60KW transmitters, again resulting in major cost savings.

Every QEI "New Reliables" FM transmitter is built to deliver ultra-dependability and performance. So—whether your station is thinking of upping its power down the road, or if the power you start with is the power you stay with—you'll be glad you chose QEI. Call us toll-free at (800) 334-9154 for the full story.



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Manufacturer	Continental Electronics	Elcom-Bauer		Energy-Onix
Model Series	817A	610A (625A‡/610C)†	61000	605-FAT (605C†/603) <sup>1</sup> MK-15 (MK-30) <sup>2</sup>
THD distortion	0.2%, 20Hz-15kHz	<0.25%	0.08%, 0.1% IMD	0.08% (0.1% IMD)
Pre emphasis	25/50/75µs	75µs	75µs	25, 50, 75µs
AM noise figure	-55dB	<-50dB	<-60dB	-40dB, -50dB nonsync
FM noise figure mono	-72dB unwt'd	<-65dB	<-72dB	<-75dB
Wideband composite input	Yes	Yes	Yes	Yes
Floor space required	72Hx128Wx40D*	70"Wx30"D	23"Wx30"D	23"Wx34"D (35"Wx30"D)
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	0.9
Power consumption	99kVA	21kW (38kW)	2.7kVA	8.2kW (8.9kW/7.1kW)
System efficiency	64%	80% final amp	.....	.....
Monitoring output	10-40Vrms, 50Ω	2V 50Ω	Yes	Yes
Fault logic architecture	µP based	Relay	CMOS/TTL	Solid-state
µP diagnostics	No	No	No	DTMF remote control (No)
Reader Service Number	734	735	736	737 738

<sup>1</sup>Additional models of the series include 601A, rated 1kW; 602A, rated 2kW; 603 uses 4CX3500A.  
<sup>2</sup>Model MK-1.5, rated 1.5kW, uses 3CX300A7 triode.

Manufacturer	Harris Broadcast	ITAME SA	ITELCO
Model Series	FM-40K‡ (FM-K series)	HT-10FM (HT-FM series)	Tauro 30kW <sup>4</sup> T-294 (T-234) <sup>5</sup>
RF output rating	40kW (1kW, 50kW <sup>1</sup> )	10kW <sup>3</sup>	30kW (10k/5k/3k/1kW)
RF output connection	3/4" (1/4", 6/16")	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 3φ <sup>2</sup>	240Vac 3φ	220-380Vac 3φ
Typical power factor	0.95	.....	.....
Power consumption	60kW (2.1kW, 80kW)	15.7kW	43kW
Monitoring output	Yes	Yes	Yes
Fault logic architecture	µP	µP	µP
µP diagnostics	.....	ColorStat/StatusPlus	Yes
Reader Service Number	739	740	741 742

<sup>1</sup>Additional models include 100W, 300W; 1kW system uses 4CX1000A tetrode; 50kW system includes 8990 tetrode.  
<sup>2</sup>1kW system operates on 240V, single phase supply.  
<sup>3</sup>Series includes 3.5kW, 5kW, 20/25kW, 30/35kW systems.  
<sup>4</sup>Other products range from 1kW to 10kW.  
<sup>5</sup>Other products range from 50W to 27.5kW.

Manufacturer	Marconi Communications	McMartin Industries	QEI Corporation	
Model Series	B6525 (B6526)	BF- M series†	FMQ-series	FMQ-3500, -5000 695T1kW
RF output rating	10kW (20kW) <sup>1</sup>	50W-30kW <sup>2</sup>	10kW (20kW, 30kW)	3.5kW, 5kW
RF output connection	3/4" EIA	Power dependent	1/2" (3/16" 3/8")	1/2"
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

<sup>1</sup>Other models include 1kW and 2kW systems.  
<sup>2</sup>Systems available with combiners to double power output with parallel configurations.

Manufacturer	Rohde & Schwarz	TEM-Milano <sup>2</sup>	Thomson-LGT	TTC/Wilkinson Div
Model Series	NU-series (NR-series)	NU-series	AR20E (AR10F)	EMF series(1) FM-5000†
RF output rating	1kW to 5kW <sup>1</sup>	5kW, 10kW	2kW (10kW)	100W-5kW
RF output connection	BNC to 1/2" EIA	Defiñiz D	1/2" 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)	States 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 mono	<-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	>0.9
Power consumption	2kW to 8.86kW	10.5kVA, 21kVA	<3.8kVA (<21.3kVA)	0.3kW-10.5kW
Monitoring output	Yes	Yes	Yes	Yes

COMPONENT

COMPOSITE



# Does your right hand know what your left hand is doing?

Working back and forth between component and composite video formats can create flaws that NTSC signals mask. What goes in and what comes out may *look* the same on the surface ... but underneath that composite signal can lie errors that add up to major problems with every tape generation.

MAGNI understands how important it is to have the most accurate video signals possible. That's why *every* 1515 includes test signals designed to transcode legally between formats,

like the Dual Timing Pulses signal for interchannel timing. Because it looks at the same signal components at all points in the processing chain, what you see really is what you get.

No camouflaged errors, no hidden surprises.



Whatever your component format of choice — Beta, M-II, SMPTE, or maybe all three — there's a 1515 to get you there and back again. Without letting your signal get out of hand.

## **MAGNI**

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Circle (169) on Reply Card

Manufacturer	Rohde & Schwarz		TEM-Milano <sup>2</sup>	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

<sup>1</sup>Solid-state systems are constructed from 500W modules.  
<sup>2</sup>Available in US through Comad Communications.  
<sup>3</sup>Series includes options for FM mono, stereo, multiplex, RDS and SCA operations.  
<sup>4</sup>Additional models in series include FM-10000J, 10kW; FM-25000J, 25kW.

Manufacturer	TTC/Wilkinson Div	Varian TVT		Vector Technology
Model Series	FM-2500J <sup>1</sup>	LDM-1239 <sup>2</sup>	LDM-1245 <sup>2</sup>	FMT-25 (FMT-20) <sup>3</sup>
RF output rating	2.5kW	1kW	5kW	25kW (20kW)
RF output connection	¾"	Type N	1½"	3½"
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	240Vac 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

<sup>1</sup>Other models in the series include FM-1000J 1kW and FM-1500J 1.5kW.  
<sup>2</sup>The series includes LDM-1238, 0.5kW; LDM-1237, 0.3kW; LDM-1248, 0.1kW; LDM-1244, 4kW; LDM-1243, 3kW; LDM-1242, 2kW.  
<sup>3</sup>The series also includes FMT-12 12kW using 3CX10000A7; FMT-5 5kW and FMT-3 3kW, both using 3CX3000A.

## VHF TV Transmitters

RF transmission for television signals in the low- and high-band VHF spectra. All systems use solid-state visual IPA devices, unless marked with a dagger (†); aural IPA stages are solid-state. IF level modulation is common to all systems. BTSC MTS stereo operation is common to all; systems designed for dual aural carrier stereo are noted with a check (✓). These systems are designed primarily for full service applications, not translator service.

Manufacturer	Acrodyne	Harris Broadcast			
Model/series	FL/30KL(KH) series <sup>1</sup>	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 <sup>2</sup>	9007/8984 tetrode <sup>2</sup>	8984 tetrode <sup>2</sup>	8988
Aural power output	3kW	4.5/6kW	3/3.5kW/6/7kW <sup>4</sup>	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 <sup>3</sup>	61kW/78kW/130kW/158kW	107kW (216kW)	28.5kW
Reader Service Number	938	939	940	941	942

<sup>1</sup>Series includes models ranging from 1kW to 50kW.  
<sup>2</sup>Visual driver is 8988 tetrode. TVD-series uses two TV- systems in parallel.  
<sup>3</sup>TVD-series consumption is slightly greater than double that of the TV-series.  
<sup>4</sup>Aural output optionally at 20% of visual.

Manufacturer	Itelco	LDL Communications/Larcan		Marconi Communications	
Model/series	T100 (T300) series <sup>1</sup>	TTC 30L (TTC 50LH)	TTS22M (TS44M)	B7540 series <sup>2</sup>	B7530 series <sup>4</sup>
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 <sup>3</sup>	Solid-state <sup>5</sup>
Aural power output	2kW	3kW (5kW)	2.2kW (4.4kW)	0.1kW (0.2kW)	0.1kW (0.2kW)
Carrier deviation	± 50kHz	± 200kHz	± 200kHz	± 50kHz	± 50kHz
AF response	+ 0.5dB per curve	± 0.5dB	± 0.5dB	± 1dB, 30Hz-15kHz	± 1dB, 30Hz-15kHz
Harmonic distortion	< 0.3%	0.5%	0.5%	< 0.5%	< 0.5%
AM, FM noise	< -2dB, < -0dB	-60dB, -60dB	-60dB, -60dB	-50dB, -60dB	-50dB, -60dB
Aural PA device	Solid-state	Solid-state	Solid-state	4-cavity klystron <sup>3</sup>	Solid-state
Cooling system	Forced air	Forced air	Forced air	Forced air	Forced air

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Manufacturer	Helco	LDL Communications/Larcam		Marconi Communications	
Model/series	T100 (T300) series <sup>1</sup>	TTC 30L (TTC 50LH)	TTS22M (TS44M)	B7540 series <sup>4</sup>	B7530 series <sup>4</sup>
Input ac power	110/208Vac	208-242Vac 3 $\phi$	208-242Vac 3 $\phi$	380-415Vac 3 $\phi$	380-415Vac 3 $\phi$
Power consumption	.....	63kVA (120kVA)	45kW (90kW)	<38kW (to 129kW)	<4.9kW (to <59.5kW)
Power factor	>0.9	0.95	>0.95	>0.9	>0.9
Reader Service Number	943	944	945	946	947

<sup>1</sup>Series includes standard and multiplexed systems with power ranges from 2W to 20kW visual.  
<sup>2</sup>Transmitters applicable to CCIR transmission standards G, I, M and N, using NTSC, PAL and SECAM color.  
<sup>3</sup>Applicable klystron devices available from EEV, Thorn EMI/Varian, Valvo.  
<sup>4</sup>Transmitters applicable to CCIR transmission standards B, M and N with NTSC, PAL and SECAM color.  
<sup>5</sup>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 <sup>1</sup>	EVHF 10000S <sup>1</sup>
Frequency band	VHF CCIR III (CCIR-1)	VHF CCIR I/III	VHF CCIR III	VHF CCIR III	VHF CCIR I/III
Visual peak power	35kW (30kW)	1-5kW	2kW or 6kW	2-20kW range	10kW
Carrier level regulation	2%	1%	.....	.....	.....
Modulation capability	0%	10% or better	10% or better	<0.3dB	100%
Response vs brightness	$\pm 0.5$ dB	<0.1%	<0.1%	<0.3dB	<0.7dB
ICPM uncorrected	$\geq \pm 3^\circ$	.....	.....	.....	$= \pm 1^\circ$
Diff phase, gain	$\geq \pm 3^\circ, \geq \pm 3\%$	$\pm 3^\circ, 5\%$	$\pm 2^\circ, 2\%$	$\pm 3^\circ$	$\pm 3^\circ, 3\%$
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	$\pm 100$ kHz	$\pm 25$ kHz	$\pm 25$ kHz	$\pm 50$ kHz	$\pm 100$ kHz
AF response	$\pm 0.5$ dB, 30Hz-15kHz	0.2dB, 50Hz-15kHz	$\pm 3$ dB, 30Hz-15kHz	$\pm 1$ dB, 30Hz-15kHz	$\pm 0.5$ dB, 30Hz-15kHz
Harmonic distortion	0.5%	0.5%, -60dB IMD	<2%, $\pm 30$ kHz 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) 3 $\phi$	220Vac, 1/2/3 $\phi$	220-380Vac 3 $\phi$	220-380Vac 3 $\phi$	220-380Vac 3 $\phi$
Power consumption	66kW (60kW) black	.....	20kVA, 6kW no mod	52kVA for 20kW	.....
Power factor	$\geq 0.9$	0.9	>0.9	>0.9	>0.95
Visual PA efficiency	>78.4%	.....	.....	.....	.....
Reader Service Number	948	949	950	951	952

<sup>1</sup>Systems available using internal or external diplexing.

Manufacturer	Thomson-LGT	Townsend Broadcast
Model/series	8000 VHF series <sup>1</sup>	TA15TH/L
Frequency band	VHF CCIR I, II, III	VHF CCIR I/III
Visual peak power	1W-30kW(1)	15kW
Carrier level regulation	$\geq 0.3$ dB	3%
Modulation capability	100%	1%
Response vs brightness	<0.7dB	$\pm 0.75$ 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	$\geq 64$ 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 <sup>2</sup>	1.5kW
Carrier deviation	$\pm 100$ kHz	$\pm 75$ kHz
AF response	$\pm 0.5$ dB, 30Hz-15kHz	$\pm 0.5$ dB, 30Hz-15kHz
Harmonic distortion	<1%	0.5%
AM, FM noise	$\geq 46$ dB hum	-55dB, -58dB
Aural PA device	Solid-state	Solid-state
Cooling system	Forced air	Forced air
Input ac power	220-380Vac 3 $\phi$ 2kW	230Vac 3 $\phi$
Power consumption	0.3-85.5kW model dep	35kVA
Power factor	>0.95	0.9
Reader Service Number	953	954

<sup>1</sup>5kW to 30kW systems available with one tube; PA devices include TH-354, -371 tetrodes in tube-type designs.  
<sup>2</sup>Power level in dual-aural carrier stereo systems is  $\frac{1}{20}$  and  $\frac{1}{100}$  of visual.

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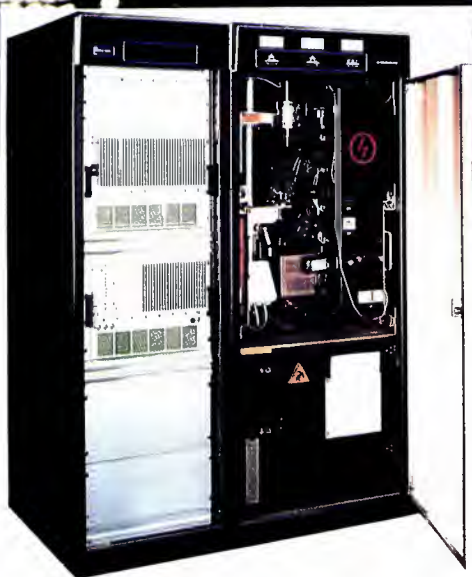
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## UHF TV Transmitters

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	Acrodyne			Comark/Thomson	
Model Series	TRU 10 KVC	TRU 30 KV	FL series	CCT-U-60SK SK-series	CIT-U-60SE S-series
Visual peak power	10kW	30kW	5kW, 10kW, 30kW	60kW <sup>1</sup>	60kW <sup>2</sup>
Carrier level regulation	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	3%	3%
Modulation capability	3%	3%	3%	97%	97%
Response vs brightness	$\pm 0.75$ dB	$\pm 0.75$ dB	$\pm 0.75$ dB	$\pm 0.75$ dB	$\pm 0.75$ dB
ICPM uncorrected	$\pm 2^\circ$	$\pm 2^\circ$	$\pm 2^\circ$	.....	.....
Diff phase gain	$\pm 2^\circ, 5\%$	$\pm 2^\circ, 5\%$	$\pm 2^\circ, 5\%$	$\pm 3^\circ, 0.5$ dB	$\pm 3^\circ, 0.5$ dB
LF linearity	5%	5%	5%	1dB or better	<1dB
S/N ratio (AM)	.....	.....	52dB	>55dB	55dB
K factor 2T, 12.5T	2%, 5%	2%, 5%	2%, 5%	2%, 5%	2%, 5%
Harmonics below visual	-60dB	-60dB	-60dB	<-60dB	<-60dB
Visual PA device	Tetrode	Tetrode	Tetrode	Klystron	Klystron
Aural power output	1kW	1kW	10% or 20% of visual(1)	6kW or 12kW	6kW
Carrier deviation	.....	.....	$\pm 50$ kHz	$\pm 25$ kHz, $\pm 50$ kHz	$\pm 25$ kHz
AF response	$\pm 1$ dB, 10Hz-15kHz	$\pm 1$ dB, 10Hz-15kHz	$\pm 1$ dB, 10Hz-15kHz	$\pm 0.5$ dB, 30Hz-15kHz	$\pm 0.5$ dB, 30Hz-15kHz
Harmonic distortion	.....	.....	0.5%	0.5% max, $\pm 50$ kHz	0.5%, $\pm 50$ kHz dev
AM, FM noise	-52dB, -60dB	-50dB, -60dB	-52dB, -60dB	<-50dB, <-60dB	-50dB, -60dB

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Manufacturer	Acrodyne			Comark/Thomson	
	Model Series	TRU 10 KVC	TRU 30 KV	FL series	CCT-U-60SK SK-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 3φ	230Vac, 3φ	230Vac 3φ	480Vac 3φ	460-500Vac 3φ
Power consumption	26kVA	55kW	20kW, 30kW, 58kW	....	....
Visual PA efficiency	....	....	....	> 120% figure of merit	> 70% beam
<b>Reader Service Number</b>	<b>908</b>	<b>909</b>	<b>910</b>	<b>911</b>	<b>912</b>

<sup>1</sup>The series extends to 120kW and 240kW using hybrid combiners.  
<sup>2</sup>Additional models are rated at 10kW and 30kW; 120kW and 240kW use hybrid combiners.

Manufacturer	Model Series	EMCEE		Harris Broadcast	
		TTU-5000DP (-100DP) <sup>‡</sup>	TU-1000EP/U <sup>‡</sup>	TV-60UX (-120UX)	TVE-60S (-120S)
Visual peak power	10kW	5kW (0.1kW)	1kW	60kW (120kW)	60kW (120kW)
Carrier level regulation	3%	2%	2%	φ3%	<2%
Modulation capability	97%	2%	2%	0%	0%
Response vs brightness	± 0.5dB	± 0.5dB	± 0.5dB	± 0.75dB	± 0.75dB
ICPM uncorrected	....	± 2°	± 2°	± 2°	± 2°
Diff phase gain	± 2°, 3% max	53°, 5%	± 3°, 0.5dB	< ± 3°, <0.5dB	≤ ± 3°, ≤0.5dB
LF linearity	± 2% max	5%	5%	<1dB	<1dB
S/N ratio (AM)	>55dB	55dB	55dB	55dB	55dB
K factor 2T, 12.5T	2%, 5%	2%	2%, 2%	2%, 5%	2%, 5%
Harmonics below visual	<-60dB	-60dB	-60dB	-70dB	-70dB
Visual PA device	Tetrode	TH-382 tetrode	Solid-state	Klystron, ext cav	Klystron <sup>‡</sup>
Visual IPA type	....	TH-327 & solid-state	Solid-state	....	Solid-state
IF level modulation	Yes	Yes	Yes	Yes	Yes
Aural power output	1kW	0.5kW (0.01kW)	0.1kW	12kW	12kW (24kW)
Carrier deviation	± 75kHz	> ± 25kHz	± 100kHz	± 120kHz	± 120kHz
AF response	± 0.5dB, 30Hz-15kHz	± 0.2dB, 30Hz-110kHz	± 0.5dB, 20Hz-100kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz
Harmonic distortion	0.5dB, ± 25kHz dev	0.15%	0.1%	0.5%, 100% mod	0.5%, 100% mod
AM, FM noise	<-50dB, <-60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -60dB	-55dB, -59dB
Aural PA device	Tetrode	Diplexed	Diplexed	Klystron, ext cav	Klystron <sup>‡</sup>
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%
<b>Reader Service Number</b>	<b>913</b>	<b>914</b>	<b>915</b>	<b>916</b>	<b>917</b>

<sup>1</sup>Models rated 1kW, 2kW and 5kW also available.  
<sup>2</sup>Models TTU100E, 100W, and TTU10E, 10W are of total solid-state design.  
<sup>3</sup>Transmitters designed around integral cavity klystron, VPK-5550 series.

Manufacturer	Model Series	Information Transmission		Midwest Communications/Technologix		NEC
		ITS-230 (ITS-232)	ITS-242 (ITS-235)	TX-120 RDP <sup>‡</sup>	TX-120 SL <sup>‡</sup>	
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°	....	....	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 <sup>‡</sup>	
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	Tetrode	Diplexed	EEV klystron	EEV klystron	Klystron <sup>‡</sup>	
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) <sup>‡</sup>	
Power factor	....	....	0.9	0.9	0.9	
Visual PA efficiency	....	....	43-48% overall <sup>‡</sup>	43-48% overall <sup>‡</sup>	60-75%	
<b>Reader Service Number</b>	<b>918</b>	<b>919</b>	<b>920</b>	<b>921</b>	<b>922</b>	

<sup>1</sup>Fully redundant system.  
<sup>2</sup>With pulser power supply, add 15-20% to system efficiency.  
<sup>3</sup>Reduced redundancy.  
<sup>4</sup>Designed around Amprex YK-1265 (YK-1233) or EEV K3672 (K3271) external cavity klystrons.  
<sup>5</sup>Power consumption indicated without/with pulser power supply in operation.

Manufacturer	Model Series	Rohde & Schwarz		Thomson-LGT	
		NT325A1 (NT354A1) <sup>‡</sup>	NT414A1 (425A1) <sup>‡</sup>	NT424A1 (NT444) <sup>‡</sup>	EUHF 20000S-60000S <sup>‡</sup>
Visual peak power	5kW	2kW (5kW)	10kW (20kW)	20kW (40kW)	20kW/30kW/60kW
Carrier level regulation	1% or better	± 0.3dB	± 0.3%	± 0.3%	....
Modulation capability	....	75%	>75%	>75%	100%
Response vs brightness	<5%	<0.3dB	<0.3dB	<0.3dB	≤ 0.3dB
ICPM uncorrected	....	....	....	....	≤ 3°
Diff phase gain	± 3°, ≤ 5%	± 3°, 5%	± 3°, 5%	± 3°, 5%	± 3°, 0.5dB
LF linearity	≤ 2%	....	>0.9	>0.9	± 1%
S/N ratio (AM)	>60dB L, >54dB C	>63dB wtd	>63dB wtd	>63dB wtd	>60dB
K factor 2T, 12.5T	<1%, <1%	<2% for 20T pulse	<2%, 20T pulse	<2%, 20T pulse	± 1.5 2T
Harmonics below visual	<-60dB	-60dB	<20mW, <-60dB	<20mW, <-60dB	-60dB
Visual PA device	Tetrode	TH-393 (TH-382)	Tetrode	Klystron	Klystron
Aural power output	0.5kW	0.2kW (0.5kW)	1kW (2kW)	2kW (4kW)	1/2 <sup>1</sup> /1/2 <sup>1</sup> /1/2 <sup>1</sup> /OE <sup>1</sup>
Carrier deviation	> ± 50kHz	± 30kHz	± 30kHz	± 30kHz	± 100kHz
AF response	± 0.2dB	1dB, 30Hz-15kHz	< ± 1dB, 30Hz-15kHz	< ± 1dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz
Harmonic distortion	<0.5%	0.4%	<0.4% to 50kHz dev	<0.4% to 50kHz dev	<0.5%
AM, FM noise	<3dB, <3dB	-46dB, -56dB	-46dB, -56dB unwtd	-46dB, -56dB unwtd	-50dB, -60dB
Aural PA device	Diplexed	Multiplexed	Tetrode	Klystron	Diplexed
Cooling system	Forced air	Forced air	Air (air/vapor)	Hypervapotron	Forced air
Input ac power	220-380Vac 1/2/3φ	220Vac 3φ	220-380Vac 3φ	220-380Vac 3φ	220-380Vac 3φ



Manufacturer	PESA	Rohde & Schwarz			Thomson-LGT
Model Series	TR-series	NT325A1 (NT354A1)†	NT414A1 (425A1)††	NT424A1 (NT444)††	EUHF 2000S-6000S†
Power consumption	....	11kVA (20kVA)	28kVA (60kVA)	79kVA (120kVA)	80kW-135kW
Power factor	> 0.9	> 0.9	> 0.9	> 0.9	> 0.95
Reader Service Number	923	924	925	926	927

†Aural = 1/100 Visual for dual channel sound system.

Manufacturer	Thomson-LGT		Townsend	TTC/Television Technology	
Model Series	EUHF 2000S/-DS††	8000 series UHF†	TA 60TA	UHF 60S Silverline	UHF 10MA(D)
Visual peak power	2kW	2W-30kW	60kW	60kW <sup>2</sup>	10kW
Carrier level regulation	..	..	2%	< 4%	< 4%
Modulation capability	100%	100%	1%	....	....
Response vs brightness	0.7dB, 0.5dB	0.7dB, 0.5dB	± 0.1dB	....	....
ICPM uncorrected	± 1°	± 1°	± 2°	....	....
Diff phase gain	± 3°, 5%	± 3°, 0.95	± 3°, 5%	≤ ± 4°, ≤ 0.5dB	≤ ± 2°, ≤ 0.25dB
LF linearity	± 1%	5%	10%	1.5dB	< 1.5dB
S/R ratio (AM)	> 60dB	> 63dB	55dB	50dB	55dB
K factor 2T, 12.5T	1.5%	1.5% 2T	2%, 5%	....	2%
Harmonics below visual	-60dB	-60dB	-60dB	-65dB	< -65dB
Visual PA device	TH-393 combined V/A	TH-382, -582 tetrode	Klystron	Klystron	Klystrode (klystron opt)
Aural power output	0.2kW (100W + 20W)(1)	1/10, 1/20, 1/100	6kW	6kW	1kW
Carrier deviation	± 100kHz	± 100kHz	± 100kHz	± 25kHz	± 25kHz
AF response	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB	+ 1dB, 30Hz-15kHz	± 1dB, 30Hz-15kHz
Harmonic distortion	< 0.5%	< 0.5%	-54dB THD/IMD	1%	1%
AM, FM noise	≤ -50dB, -60dB	-50dB, -60dB	-50dB, -58dB	-55dB, -55dB	-55dB, -55dB
Aural PA device	Common amplification	Diplexed	Klystron	Klystron	Diplexed
Cooling system	Forced air	Forced air	Water	Vapor-phase	Forced air
Input ac power	220-380Vac 3φ	220-380Vac 3φ	480Vac, 3φ	480Vac 3φ	230Vac 1φ, 480Vac 3φ
Power consumption	24kW (19kW)	0.3-80kW	130kW	....	4.8kVA
Power factor	> 0.95	> 0.95	0.9	0.9	0.9
Visual PA efficiency	....	....	....	....	66% overall
Reader Service Number	928	929	930	931	932

†Solid-state systems to 2kW; tube PAs 1kW to 20kW; klystrons 20kW, 30kW.  
<sup>2</sup>Models for 120kW, 240kW also available.

Manufacturer	TTC/Television Technology			Varian TVT	
Model Series	Silverline UHF-30SK	XL1000U (XL100U) <sup>1</sup>	LDM-1740 (LDM-1741/42)	LDM-1790/1791 <sup>2</sup>	LDM-1780 (1781)
Visual peak power	30kW	1kW (100W)	10kW (15kW/30kW)	30kW/60kW-70kW	5kW (10kW)
Carrier level regulation	< 4% black-to-white	....	± 2%	± 2%	2%
Modulation capability	....	95%	95%	95%	95%
Response vs brightness	....	0.5dB	± 0.5dB	± 0.5dB	± 0.5dB
ICPM uncorrected	....	± 2°	± 4°	± 4°	± 4°
Diff phase gain	≤ ± 4°, ≤ 0.25dB	± 2°, 0.25dB	± 3°, 0.3dB	± 3°, 0.5dB	± 3°, 0.5dB
LF linearity	< 1.5dB	1dB	0.9dB	0.9dB	0.9dB
S/N ratio (AM)	55dB	55dB	60dB	60dB	60dB
K factor 2T, 12.5T	2%	2%	2%, 2%	2%, 2%	2%, 2%
Harmonics below visual	< -65dB	-80dB	-70dB	-70dB	-70dB
Visual PA device	Klystron	TH-347 tetrode	Klystron PT5050(5080)	Klystron PT5093/5090	TH-382 (TH-392)
Aural power output	6kW	100W (10W)	10% of visual	10% of visual	10% of visual
Carrier deviation	± 25kHz	± 40kHz	± 100kHz	± 100kHz	± 100kHz
AF response	± 1dB 30Hz-15kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz	± 0.5dB, 30Hz-15kHz
Harmonic distortion	1%	0.5%	0.5% 100% mod 1kHz	0.5% 100% mod 1kHz	0.5%
AM, FM noise	≤ -55dB/ ≤ -55dB	-55dB, -55dB	-50dB, -60dB	-50dB, -60dB	-50dB, -60dB
Aural PA device	Diplexed	Diplexed	Diplexed (PT5050/5080)	Diplexed(PT5093/5090)	Diplexed (TH 327)
Cooling system	Forced air	Forced air	Vapor phase	Vapor-phase	Forced air
Input ac power	230Vac 1φ, 480Vac 3φ	230Vac 1-3φ (110Vac)	380/220, 415/240Vac	460/226, 480/272Vac	380/220Vac
Power consumption	....	4.8kVA (500VA)	65kW (41kW/ 73kW)	130kW/112-147kW	21kVA (23kVA)
Power factor	0.9	0.9	0.9	0.9	0.9
Visual PA efficiency	....	....	15% (58%, 62%)	26%/78-68%	37% (75%)
Reader Service Number	933	934	935	936	937

<sup>1</sup>LPTV models XL20U 20W, XL10U 10W available.  
<sup>2</sup>LDM-1790/1791 can be combined in various combinations to achieve powers of 120-140kW, 240kW, 280kW, 517kW; the systems are designed around ACE type klystrons.

# Aural STL Systems

Manufacturer	ITAME		Marti	Micro Controls/MCI	
Model/Series	Mod. UHF-450A <sup>1</sup>	Mod. UHF-900A <sup>2</sup>	STL-10	STL-30	PTS-10C <sup>3</sup> (PTS-10DC) <sup>4</sup>
System type	Composite	Composite	Dual	Dual	Composite
Audio response	± 0.1dB, 30-60k	± 0.1dB, 30-60k	± 0.3dB, 20-15k	± 0.3dB, 20-15k	± 0.4dB 30-55k
Distortion	< 1% 40-70k	< 1% 40-70k	0.3% 20-15k	0.5% 20-15k	< 0.4%, 0.25% IMD
S/N ratio	70dB 100% mod	70dB 100% mod	73dB 100% mod	70dB 100% mod	> 65dB
Stereo separation	....	....	....	....	≥ 40dB
Hot standby system	Option	No	No	No	Yes
Transmitter No.	UHF-900A	UHF-900A	STL-10	STL-30	PTS-10C
RF power output	10W	9W (20W opt)	10W	30W	7-10W
RF output connector	Type N	Type N	UG-58	UG-58	SO-239 UHF
Frequency stability	< 5 parts/million	< 5 parts/million	± 0.00025%	± 0.00025%	± 500Hz
AM noise rating	< -70dB spurious/harmonic	< -70dB spurious/harmonic	< -60dB spurious	< -60dB spurious	....
Audio level	+ 12dBm 600Ω; 3.5V 22kΩ	+ 12dBm 600Ω; 3.5V 22kΩ	8dB, 600Ω	....	....
Metering	RF for/rev dcV	RF for/rev dcV	RF final/driver-1/dcV	RF/main ch mod/dcV	SWR,VSWR, RF, DC
	Main ch mod	Main ch mod	Main/mux mod, multiplier	Mux mod	....
Rack space needed	3.5"	3.5"	3.5"	3.5"	....
Receiver No.	UHF-450A	UHF-900A	R-10	R-10	PRS-10
Signal conversion	Dual	Dual	Dual	Dual	Dual superhet
Sensitivity	30μV, 65dB S/N	30μV, 65dB S/N	4μV, 50dB S/N	4μV, 50dB S/N	2μV 20dB SNR
Bandwidth	3dB IF BW 280kHz	3dB IF BW 280kHz	> 200kHz for FM stereo	> 200kHz for FM stereo	380kHz 3dB IF
Metering	RF/baseband/Vdc	RF/baseband/Vdc	RF/LO/subcarrier/dcV	RF/LO/subcarrier/dcV	RF/AF/DC
	Pgm	Pgm	AF levels/mixer	AF levels	....
Rack space needed	3.5"	3.5"	3.5"	3.5"	....
Reader Service Number	1476	1477	1478	1479	1480

<sup>1</sup>Range is 400-400MHz.  
<sup>2</sup>Models available in 790-960MHz, 830-862MHz spectra.  
<sup>3</sup>Available for 215-235MHz, 300-325MHz, 450-470MHz, 942-950MHz & 1.2GHz.  
<sup>4</sup>For AM stereo applications.

Manufacturer	Moseley Associates			TFT	
	Model	PCL-6000 series <sup>1</sup>	CL-100 comm link	PCL-606/C <sup>5</sup> (PCL-606)	Model 7700B
System type	Comp stereo or mono	Data <sup>4</sup> /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 <sup>2</sup>	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 <sup>3</sup>	±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

<sup>1</sup>Values given for composite system.

<sup>2</sup>System also available for 300-470MHz.

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

<sup>4</sup>Specifications given for data model.

<sup>5</sup>Values given for 600kHz spacing; system available for 300kHz or 600kHz spacing.

## AM Modulation Monitors

These AM modulation measurement instruments include AGC circuitry and internal calibration facilities. They are ATS compatible.

Manufacturer	Belar Electronics	Boonton Electronics	Broadcast Electronics	Harris Broadcast	ITAME SA
Model	AMM-3 (AMM-2B)	8200 Analyzer <sup>1</sup>	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	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 <sup>2</sup> )	+10dBm, 100% mod
Audio connection	Unbal	Bal	Bal, unbal	Bal/unb (Xfmr AB/unb)	600Ω bal
Audio response, mono	±0.5dB 20-25k	per carrier frequency	-0.5dB 20-20k	-0.5dB	±0.5dB 20-20k
Audio distortion, mono	0.25% 25kHz	0.1%	0.15%	0.15%	....
Audio S/N ratio, mono	75dB	0.05% res. AM	75dB unwtD	75dB unwtD	75dB 100% mod
Meter or display type	Analog meter	Digital display	LED bar graph	LED bargraph (dual)	Modulation, RF level
Oscilloscope test output	Yes	From detector	Yes	Yes (No)	....
Remote metering output	Yes	No-	Yes	Yes	Yes
Failure alarms	Carrier off or -10, +5% carrier level)	None	Carrier, modulation	Carrier, mod (No)	Carrier failure
Reader service number	1461	1462	1463	1464	1465

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

<sup>2</sup>For R, L, L+R, L-R.

Manufacturer	Rohde & Schwarz	TFT
Model	Model FAM <sup>1</sup>	753-755A
Frequency range	55k-120MHz <sup>2</sup>	500k-4MHz
Off-air RF input	10mV-3V	100μV
Direct input	....	1-10Vrms 50Ω
Input attenuator	Programmable	Yes
Measurable modulation range	100%	-100, +125%
Peak modulation indicator	....	Adjustable
Peak flasher accuracy	....	±% 400kHz
Audio output level	350mV-1V	0dBm
Audio connection	Unbalanced	Xfmr, act bal, unbal
Audio response, mono	10Hz-200kHz	±0.5dB 20-25k
Audio distortion, mono	≤0.4%	0.05%
Audio S/N ratio, mono	≥60dB	75dB unwtD
Meter or display type	7-seg LEDs	Analog meter
Oscilloscope test output	AM, FM outputs	No
Remote metering output	IEC-bus interface	Yes
Failure alarms	No	Carrier, modulation
Reader service number	1466	1467

<sup>1</sup>Equipment is also capable of modulation measurements for FM and PM transmissions.

<sup>2</sup>Option B1 extends range to 1GHz; B2 to 1.36GHz.

## FM Modulation Monitors

These FM modulation measurement instruments include remote metering outputs and are ATS compatible. Internal calibrator circuitry and carrier failure indications are standard.

Manufacturer	Belar Electronics	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

<b>Manufacturer</b> .....	<b>Belar Electronics</b>
<b>Model</b> .....	<b>FMM-2</b>
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
<b>Reader Service Number</b> .....	<b>1468</b>

<b>QEI</b>
<b>MODEL 691</b>
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
<b>1469</b>

<b>Rohde &amp; Schwarz</b>
<b>FKD/FKDL</b>
....
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
<b>1470</b>

<b>TFT</b>
<b>Model 884 stereo</b>
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 10kΩ
Analog meter
Yes
....
Integral
TFT-730A, 845
<b>1471</b>

## 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%.

<b>Manufacturer</b> .....	<b>Belar Electronics</b>
<b>Model</b> .....	<b>TVM-1</b>
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
<b>Reader Service Number</b> .....	<b>1472</b>

<b>Belar Electronics</b>
<b>TVM-100</b>
-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

<b>Tektronix</b>
<b>751 BTSC</b>
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 <sup>1</sup>
No
EL bargraph, digital
....
....
Loss, unlocked pilot
Stereo phase reversal
Integral
SAP, PRO integral
<b>1474</b>

<b>TFT</b>
<b>MODEL 850</b>
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
<b>1475</b>

<b>TFT</b>
<b>701</b>
Any TV channel
250μV 50Ω
Yes
100% ± 25kHz
± 0.2dB 50-15k
6dBm active bal
± 0.2dB 50-15k
0.25%
75dB de-emphasized
....
Analog meter
No
No
Power, frequency
Shunt to ground
....
....
<b>600</b>

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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 <sup>1</sup>	Hamlet Video	Hitachi Denshi	Leader Instruments
Model/Series	EV4021	HVI 200 Series <sup>†</sup>	V-069 (V-068)	V-089 (V-088)
Display size	8x10cm rect	128-linesx8.5μs <sup>3</sup>	6" rect	3.5"
Graticule	Internal	Electronic	Internal	External
Waveform monitor mode	Yes	VCTR, WFM, dual	Vector only	Vector only
Function control from	Manual	Front panel only	Manual	Manual
Standards	NTSC, PAL/M	NTSC or PAL	NTSC (PAL)	NTSC (PAL/N)
Integral calibrator	No	Yes	Yes	Yes
Composite video inputs	A, B	Model HVI 203	A, B	A, B
Subcarrier input	Yes	Video, blackburst	Blackburst	Composite sync
Composite sync input	.....	Composite only	Blackburst	Composite sync
Display references	A, B, ext	Ref or display	A, B, ext	A, B
Diff phase, gain mode	1°, 1%	None	2°..... ± 1°	2°..... ± 1°, ± 1%
VITS line selector	No	No	No	No
Luminance measurements	No	In WFM mode	None	No
Reader Service Number	1426	1427	1428	1430

<sup>1</sup>Represented by Broadcast Video Systems.

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

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

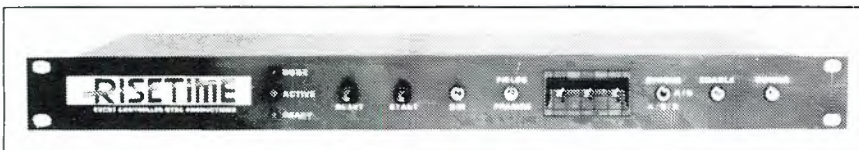
Manufacturer	Magni Systems	Philips T&M	Snell & Wilcox
Model/Series	VS 560 (VS 561) <sup>†</sup>	VS 530 (VS 531)	PM 5667 (PM 5668)
Display size	8x10cm	8x10cm	8x10cm rect
Graticule	Internal	Internal	Internal
Waveform monitor mode	Vectors, audio phase	Vectors, audio phase	SC/H φ PM5668
Function control from	Manual, remote <sup>1</sup>	Manual, remote <sup>2</sup>	Manual, remote
Standards	NTSC/CAV (PAL/CAV)	NTSC (PAL)	NTSC, PAL/G/M/N
Integral calibrator	Yes	Yes	Yes
Composite video inputs	2 inputs w/3 channels	3 inputs	A, B
Subcarrier input	Yes	Yes	Yes
Composite sync input	Yes	Yes	Yes
Display references	Int, ext	Int, ext	A, B, ext
Diff phase, gain mode	<1°, <1%	<1°, <1%	<1°, <1%
VITS line selector	On WFM560/561	On WFM530/531	No
Luminance measurements	No	No	None
Reader Service Number	1431	1432	1433

<sup>1</sup>From WFM560, by RS-232.

<sup>2</sup>From WFM530, by RS-232.

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Manufacturer	System Video <sup>1</sup>
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

<sup>1</sup>Represented by AF Associates.

Tektronix	
R520A series	1720†
5"	5½"
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
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	External	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 iG, linearity	Flat, L-P, chroma iG, linear	Flat, L-P, chroma Linear	Flat, L-P, chroma	IRE, flat, iG Chroma
Timebases	H, 2H, 2H mag V, 2V, 2V mag	H, 2H, 2H mag V, 2V, 2V mag	V, 2V, 3V H, 2H, 3H, mag	V, 2V, 2V mag H, 2H, 2H mag	2V, 2V mag, 2H 1µs/div x20
Magnification factors	...	...	1-line to 100ns/8 div	Blanking in 9cm	Yes
RGB/YRGB displays	No (RGB/component)	No	AB, ABC parade	Black	YRGB option
DC restore	Back porch	Back porch	Indiv restore	No	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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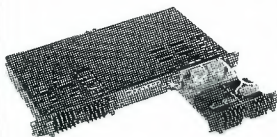
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Manufacturer		Hitachi Denshi	Leader Instruments	Magni Systems		
Model/Series		•V-099 (-098) portable	LBO-5860B (5865B)	1527†	WFM-530 (WFM-531)	WFM-560 (WFM-561)
Display size	3.5" rect	8x10cm	8x10cm	8x10cm on 1525 display	8x10cm	8x10cm
Graticule	...	Internal	Internal	Int, ext	Internal	Internal
Available for	NTSC (PAL)	NTSC, PAL/SECAM opt	NTSC, PAL/SECAM opt	NTSC	NTSC (PAL)	NTSC/CAV (PAL/CAV)
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma ∂G possible	Flat, L-P, chroma ∂G, transients	Flat, L-P, chroma ∂G, transients	Flat, L-P, chroma 1520 ∂G, ∂φ	Flat, chroma, L-P	Flat, chroma, L-P
Timebases	2H, 2V, 1μs/div 2V mag	2H, 1μs, 2V 2V mag	2H, 1μs, 2V 2V mag	2-H, 2-V	H, 2H, 2V, V Mag	
Magnification factors	x20	x20	x20	x5	x5	
RGB/YRGB displays	No	Option	Option	No	Yes	Yes
DC restore	Blanking	Back porch	Back porch	Back porch	Back porch	Back porch
VITS line select	No	7-21 (525)	7-21 (525)	No	Any line	Any line
Programmable	No	No	No	No	16 memories	16 memories
Remote controllable	No	No	No	No	RS-232	RS-232
Composite inputs	A, B	A, B	A, B	A, B	3 channels	2 inputs, 3 channels
Component inputs	No	No	No	No	....	2 sets
Line strobe pulse	No	Yes	Yes	No	Yes	Yes
Vectorscope function	No	No	No	Yes	Limited components use	Full components
AF stereo phase mode	No	No	No	(Tone source)	No	No
Waveform comparison	No	No	No	No	Yes	Yes
Reader Service Number	1446	1447	1448	1448	1449	1450

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
Display size	8x10cm	10x13cm	10x13cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Electronic	Electronic	Int, ext	Internal	Internal
Available for	NTSC, PAL/-M/-G/-N	PAL	PAL	NTSC, PAL/-M, SECAM	NTSC, PAL (multistd)	NTSC (PAL/-M)
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes
Vertical Response	Flat, chroma, ∂G chroma (∂φ)	Flat, LP, ∂-staircase	Flat, LP, ∂-staircase	Flat, chroma, LP IRE, ∂G	Flat, LP, chroma (30MHz/dual-mode fltr)	Flat, IRE, (luma) Chroma
Timebases	H, 2H, V, 2H Mag	0.1-100ms/div, 1/2/5 steps, 54 field/s	0.1-100ms/div, 1/2/5 steps, 54 field/s	H, 2H, 2H mag V, 2V, 2V mag x5, x10, x20, x25, x50	H, 2H, 2V (10ns/div) 2H/2V mag (1/2/3-line) x25 (& x10, x20)	H, 2H, 2H mag V, 2V, 2V mag x10, x20
Magnification factors	x10 (x10H/x20V)	....	....	Yes	Yes (Parade, overlay)	Yes
RGB/YRGB displays	Yes	....	....	Back porch or sync	Back porch	Back porch or sync
DC restore	Back porch	to black	to black	Single & 15-line	Any one (& 14-line)	Internal jumper set
VITS line select	1-263/1-262, 1-625	1-625, F1-4, rep 2/4/8	1-625, F1-4, rep 2/4/8	No	Yes	All functions
Programmable	No	Yes	Yes	Yes	Yes	Yes
Remote controllable	Yes	RS-488, IEC-625	RS-488, IEC-625	A, B, aux	A, B	A, B
Composite inputs	A, B	Yes	Yes	No	(3 each A & B)	No
Component inputs	No	....	....	Yes	Yes	....
Line strobe pulse	(Yes)	10 waveform memory	10 waveform memory	No	No	∂φ in R-Y mode
Vectorscope function	No (with SC/H φ)	No	No	No	No	No

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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
Reader Service Number	1451	1452	1453	1454 1455
Manufacturer	Tektronix		Videotek	
Model/Series	1750 series combo	WFM-300 component†	+1710	TVM-620 combo TSM-60 (TSM-50)
Display size	8x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Electronic, accur 1%	Internal	Internal, etched
Available for	NTSC (PAL)	525/60 625/50 RGB(1)	NTSC/PAL	NTSC, PAL/-M
Internal calibrator	Yes	Yes	Yes	Yes
Vertical Response	Flat, IRE (luma) chroma	"Lightning, Bowtie" displays	Flat, L-P	Flat, L-P, chroma
Timebases	H, 2H, 2H mag V/2V, 2V mag	1H, 2H, 2V and 2V mag	2H/2H Mag 2V/2V Mag	H/2H/3H, V/2V/3V V-mag, H-mag
Magnification factors	x2, x10, x20, x50	x20	x10	x5 V, x10 H
RGB/YRGB displays	Yes	Parade, overlay	No	Yes
DC restore	Back porch or sync	Back porch	Back porch	Back porch
VITS line select	8-23 (6-21, 319-334)	Any line	None	No
Programmable	All functions	---	No	65C02 tactile ctl panel
Remote controllable	Yes	Yes	No	No
Composite inputs	A, B	No	A & B	A, B, C
Component inputs	No	RGB or YCrCb <sup>1</sup>	No	No
Line strobe pulse	Yes	Any 2, any 15	No	Yes
Vectorscope function	SC/H $\phi$ measurements	Yes	Burst phase	R-Y $\phi$ mode
AF stereo phase mode	No	No	Yes	No
Waveform comparison	Overly vector/waveform	Overlay, parace	No	WFM/vector overlays
Reader Service Number	1456	1457	1458	1459 1460

<sup>1</sup>Transcoders for YIQ, YCrCb available.

## TV Demodulators

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

Manufacturer	Barco Industries	Philips T&M	Rohde & Schwarz	Tektronix
Model	VSD 1000BG	PM5560M <sup>1</sup>	EKF2D (EKF2K)	EMFT series <sup>2</sup> 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/IF/CATV
Channel selection	Fixed, PLL-tuned	Thumb-wheel PLL	Tunable, crystal	Tunable, crystal
RF input impedance	50 $\Omega$ , 75 $\Omega$	50 $\Omega$	50 $\Omega$ , 75 $\Omega$	50 $\Omega$ , 75 $\Omega$
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 $\mu$ V-300mV	250 $\mu$ V-5mV
IF input level	10-40dBmV	70mV $\pm$ 3dB 50 $\Omega$	5mV-100mV	5mV-100mV
Input level indicator	LED display	Vision & IF meters	Meter	Panel meter

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(203) 622-2804

<sup>1</sup> FMX is a registered trademark of Broadcast Technology Partners

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Circle (184) on Reply Card

## GRIP HEADS

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## MATTHEWS CATALOG

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"THE REEL THING"

Circle (203) on Reply Card



<b>Manufacturer</b>	<b>Barco Industries</b>
<b>Model</b>	<b>VSD 1000BG</b>
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
<b>Reader Service Number</b>	<b>1491</b>

<sup>1</sup>Models for CCIR -B/G, -D/K and -I standards.  
<sup>2</sup>EMFK crystal control, EMFT continuous tuning, EMTD crystal/AFC.

<b>Philips T&amp;M1</b>
<b>PM5560M<sup>1</sup></b>
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
....
<b>1492</b>

<b>Rohde &amp; Schwarz</b>
<b>EKF2D (EKF2K)</b>
....
Yes
Int/ext trigger
Yes
Yes
....
Yes
....
2-75Ω
0-50kHz
+6dBm ± 30kHz
Yes
Sync, blanking
....
No
No
....
<b>1493</b>

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

<b>Textronics</b>
<b>1450-1</b>
50Ω
Yes
Int, ext
Yes
Yes
Yes
Yes
2-75Ω
50mV/kHz 600Ω
....
Yes
....
....
US/BTSC system
<b>1495</b>

<b>Manufacturer</b>	<b>Telemet</b>
<b>Model</b>	<b>3713-A1 (-A2)</b>
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
Inter-carrier 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

<b>4500-B1 (-B2)[-F1]</b>
VHF (UHF)
[Any channel]
Fixed channel, xtal
75Ω F (S0-239)
300μV-30mV
....
None
....
Internal
No
....
2-75Ω
Yes
+3dBm 600Ω
Yes
....
No
No

<b>4501-B</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

<b>Videotek</b>
<b>DM-140S</b>
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 (176) on Reply Card



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Hauppauge, N.Y. 11788  
516-582-3322

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	Magni Systems	Marconi Instruments	PESA Electronica	Philips T&M	Rohde & Schwarz
Model Series	2015 PCATS (2021 <sup>1</sup> )	2924 universal analyzer	SWAT	PM5578	UVF video analyzer
Controlling computer	MS PC-DOS	Proprietary	Proprietary	Proprietary	Proprietary
Video signal generator	Multistandard	2926, 2913, other	Uses program video	External	Bar, dot only
System control mode	IBM-PC/compatible(1)	via GPIB, serial	.....	Yes	Yes
Programmable	Yes (4 signal sets)	Yes	.....	.....	.....
Standards	NTSC/PAL/CAV/HDTV	NTSC, PAL, SECAM	NTSC, PAL	NTSC/PAL	PAL
External data storage	Yes	Possible	Printout or PC	Possible	.....
Auto logging mode	No	Yes	RS-232 link	Yes	Yes
Waveform plotting	Yes	.....	.....	On CRT only	Yes
Parameter limits	No...	3 sets, upper/lower	Yes	RS-232	IEC-625/IEEE-488
Out of tolerance alarm	No...	Visual on CRT	Yes	Set via jumpers	EEPROM, user defined
Carrier failure alarm	No...	.....	Per programming	Yes	Blinking LED
Modulation loss alarm	No...	.....	Per programming	VITS low LED	No
Measurements per	Any reference	NTC-7/FCC/CCIR/CBC	CCIR/RS-170A	CCIR/NTC-7	CCIR-569-1
Tests made on line	Any line	Individual lines	Total signal	Lines 17/18, 2-field	Individual lines
Reader Service Number	1325	1326	1327	1328	1329

<sup>1</sup>2021 is designed with front-panel controls for standalone operation.

Manufacturer	Tektronix	Thomson Video	
Model Series	1980 ANSWER	VM700 measurement set	TTV8400 Thom-CAT
Controlling computer	Proprietary	Motorola 68020	Apple
Video signal generator	External (TEK1910)	No (Picture mode)	TTV8410 Prodigie
System control mode	Manual	Manual, programmable	Yes
Programmable	No	Yes	Yes
Standards	NTSC	NTSC, PAL	NTSC, PAL
External data storage	Yes	Also internal	Floppy disk
Auto logging mode	Yes	Via RS-232C	Yes
Waveform plotting	Yes	Raster scan display	Yes
Parameter limits	User defined	User programmable	Yes
Out of tolerance alarm	Printer	On-screen message	User defined
Carrier failure alarm	No	No	Printer, CRT
Modulation loss alarm	No	No	None
Measurements per	RS170A/NTC-7/CCIR-569	RS-170A/NTC-7/RS-250B	CCIR-569
Tests made on line	Any VBI line	Any line	1-line, 1-field
Reader Service Number	1330	1331	1332

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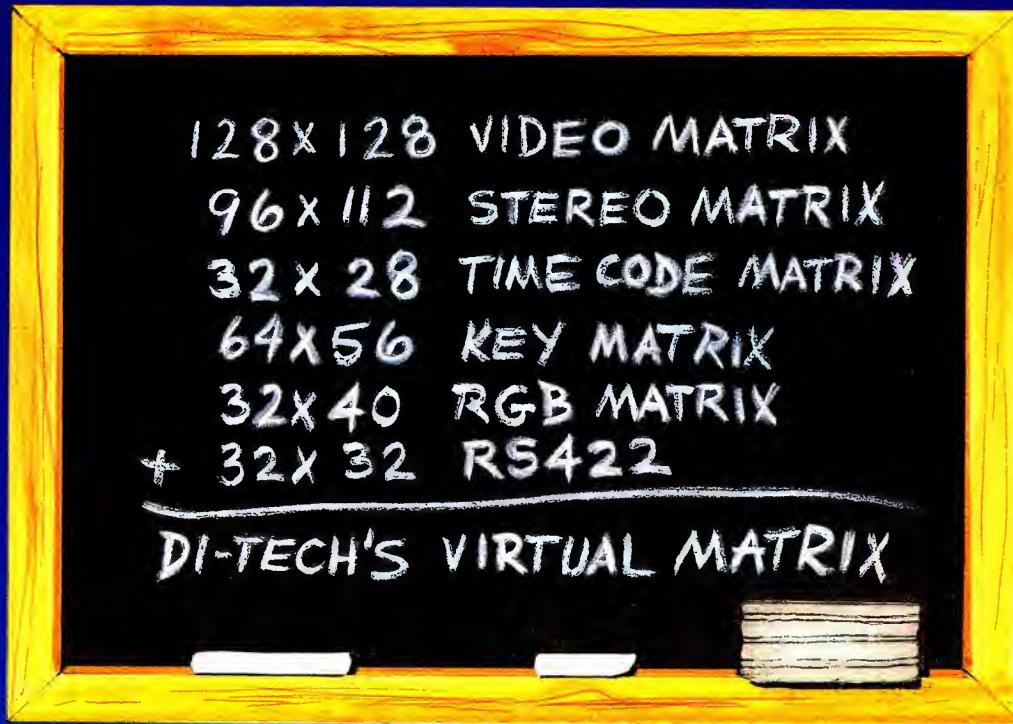
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Comrex Corp.	56	31	617/443-8811	Shively Labs	88	50	207/647-3327
Conex Electro Systems	220	150	206/734-4323	Sony Mag. Tape Div.	73	40	201/930-7669
Control Concepts Corp.	100	60	607/724-2484	Sound Technology	10	8	408/378-6540
Daily Electronics Corp.	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
Datek, 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	Telematics 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	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				

# It all adds up.

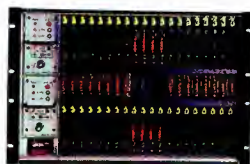


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9. ... Recd files from system.
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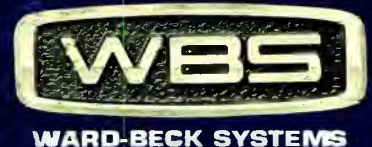
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