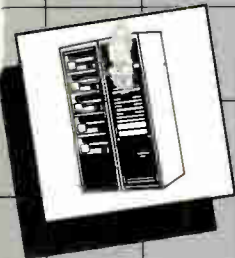
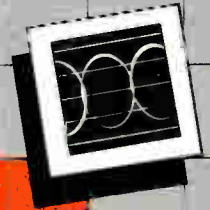
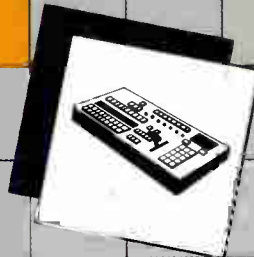
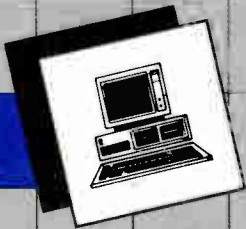
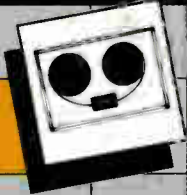


# BROADCAST<sup>®</sup> engineering

AN INTERTEC PUBLICATION

1992 ANNUAL ISSUE/\$20

## REQUIREMENT ANNUAL



Your key to buying  
hardware

World Radio History



# SYSTEM 5

## 100 MHz BANDWIDTH ROUTING SWITCHER

SYSTEM 5 takes the guesswork out of selecting a routing switcher ... for any size facility. Its ultra wide 100MHz video bandwidth gives you the confidence required to plan for future signal formats and is essential today for RGB graphics, HDTV and component video.

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## A SWITCH INTO THE FUTURE



**PESA**

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If you've been putting off doing stereo field remotes for fear of risking a fragile, expensive stereo mic, Shure's new VP88 is what you've been waiting for.

The VP88 is an advanced single point stereo condenser mic that not only recreates the sonic environment with extraordinary audio fidelity, but meets Shure's legendary standards for ruggedness and reliability.

The VP88 is built to withstand the punishment of field remotes. And, it comes at a price you'll find surprisingly affordable.

#### TRUE MS STEREO.

The VP88 features a forward facing Mid capsule, perpendicular Side capsule and built-in stereo matrix to assure a wide, natural, uncolored

response for stereo imaging. Yet, it's perfectly mono compatible.

To enable you to control the degree of stereo spread and ambience pick-up, the VP88 has three switch-selectable stereo modes

or direct mid and side output. And it's designed to provide the wide dynamic range and low noise you need for remote broadcasts.

#### THE FEATURES YOU NEED.

The VP88 can be powered by a self-contained battery or phantom power so you can go where the action takes you. It includes switchable low-frequency rolloff for reduced ambient noise and a built-in "pop" screen.

In addition to camera mounting, the VP88 can be used on a stand, fishpole, or boom. And the mic comes with a wide range of standard and optional accessories to accommodate your most challenging stereo miking requirements.

So whether you're just beginning to look at stereo miking, or you want to take your stereo to the next level — consider the advantages of the Shure VP88. It's making stereo miking an affordable proposition.

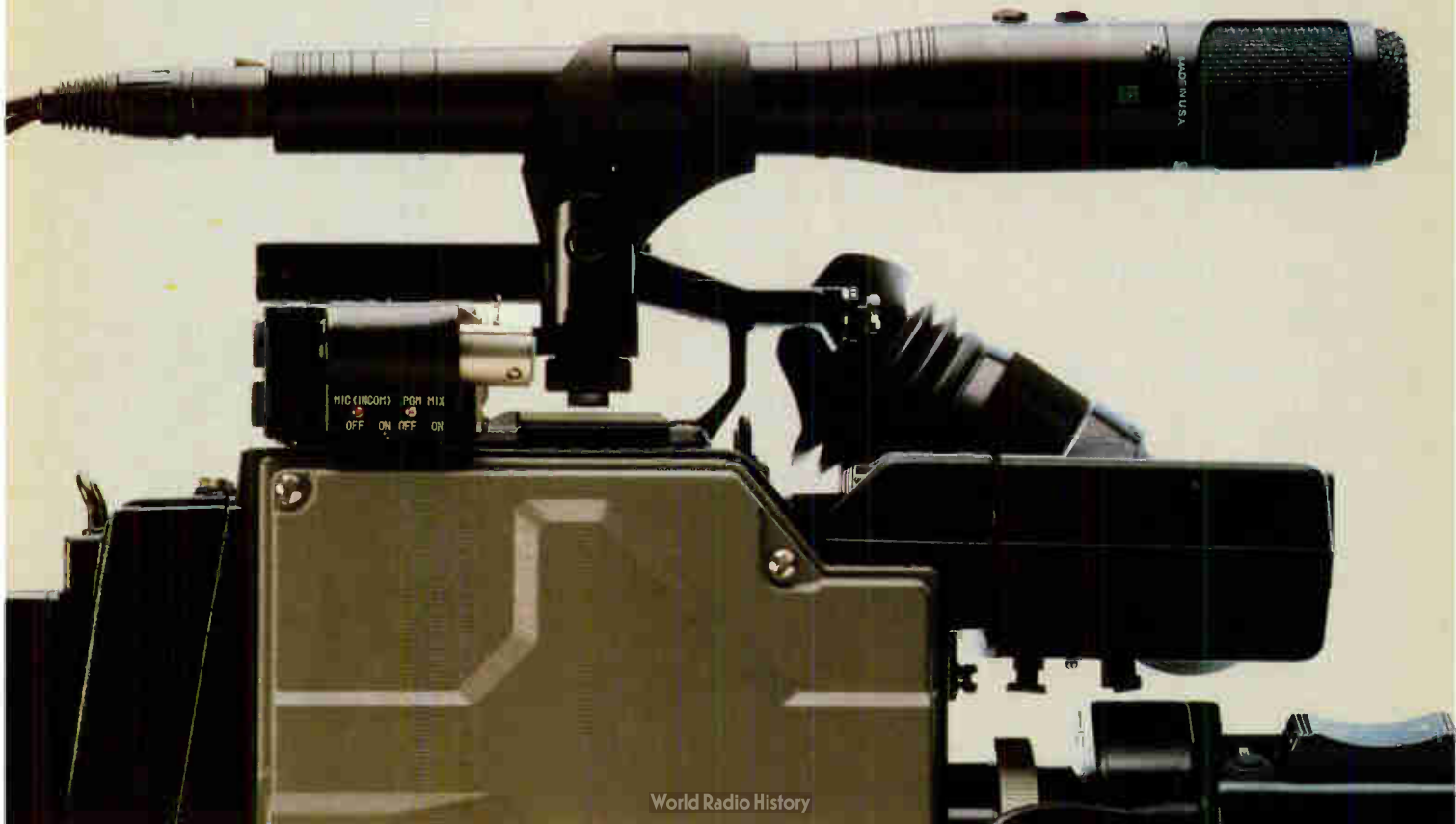
For the name of your nearest dealer and our free brochure, call or write Shure, 222 Hartrey Avenue, Evanston, IL 60202-3696. 1-800-25-SHURE. The Sound of the Professionals®... Worldwide.

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Stereosurround  
Compatible

Circle (5) on Reply Card



# Shure's New VP88 Stereo Microphone Offers A New Level Of Reliability And Affordability.



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### ON THE COVER

The annual Equipment Reference Manual is a comprehensive directory 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 design by Kim Bracken, graphic designer.)

## BROADCAST engineering

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INTRODUCING OUR S9x5.5 ENG/EFP LENS

The point of news coverage and field production is to be in close. Broad in scope. With no distortion. All while capturing shots as appealing as a wide slice of pepperoni pizza.

Nikon's new S9x5.5 lens, with internal focus, was made to order. Search far and wide and you'll find, for being near (about 1') and wide (77.3° x 61.9°), no one else gives more. The crisp image, sharp from corner to corner, comes courtesy of Nikon's famed optics and ED glass. You glide through the 9x zoom ratio - from 5.5mm to 49.5mm - smoothly. And we include a 1.7x extender.

The internal focus extends your creative options to include matte boxes and a full range of filters. And, like all Nikon ENG/EFP lenses, its lightweight design and rigid construction can't be topped.

The S9x5.5. Expect no less from Nikon. After all, we create the world's finest video lenses - from a complete line of HDTV lenses to converters that transform your Nikon F-series SLR lenses into a complete menu of special effects lenses for your CCD camera.

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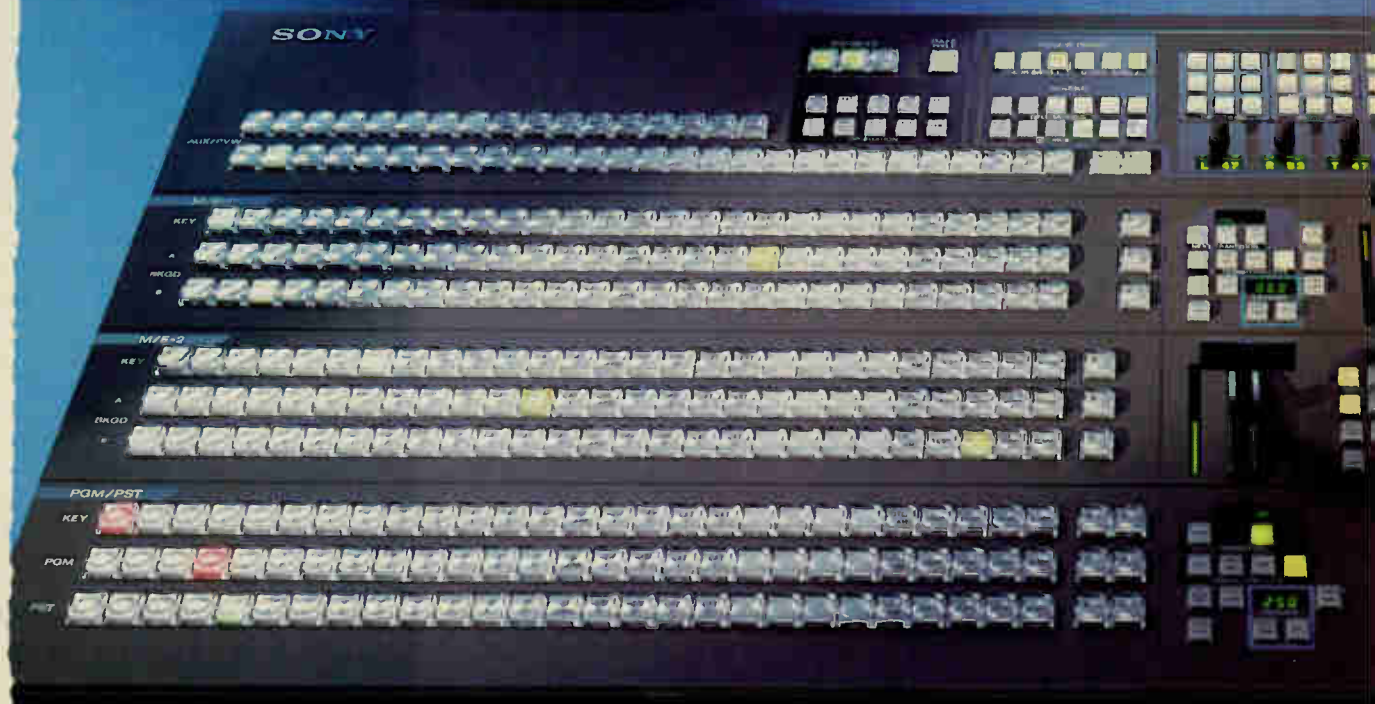
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**SONY**



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Just call 1-800-635-SONY, ext. 712, to learn more.

Once you do, you'll realize it really has never been easier to switch.

**Business and Professional Group.**

## Welcome readers

Welcome to the 1992 *Broadcast Engineering* Equipment Reference Manual and Buyers Guide. Continuing the tradition, this 11th reference issue contains a wealth of information regarding manufacturers and many facts on the latest equipment for broadcast, cable and production environments.

Buying hardware today is difficult and there is an abundance of equipment and options available. The task for the engineering manager is to select the best product for the given application. That can be a difficult task. Fortunately, the Equipment Reference Manual and Buyers Guide is your key to making the correct hardware purchases.

We've incorporated several features to make your search for the best equipment even easier. The fold-out tab pages quickly guide you to different sections of this issue: Buyer's Guide Product Listings, Manufacturers' Addresses and Specification Comparisons. Color highlighting throughout the issue alerts you to those companies that have their products advertised in this issue. In the Product Directory, a number of closely related categories (for example, audio mixers, microphones, and transmitters) have been combined to make your search faster. One list shows all players, with logical code letters following their names to indicate which type of equipment they offer.

Additional tab pages alert you to the Audio Products, Video Products and RF & Test Products sections within this issue. These sections also contain color highlighting of company names to alert you to advertisers.

This issue contains the most complete listing of products and specifications available in one source for this industry. The information is based on data provided by those companies responding to our request for assistance. Multiple requests for information

were directed to all participants of previous directories, to new companies exhibiting at trade shows and those appearing in our New Products columns during the year. There are more than 1,000 companies listed in the Manufacturer Address listing. If a company is missing from this compendium, it is because we received no information from that company after repeated requests.

Thank you for helping *Broadcast Engineering* in our efforts to continue the tradition of serving the industry in a first-class form. If we can be of further assistance, please let us know.



Pat Blanton,  
directory editor

Carl Bentz,  
special projects editor





## “What I Like About the Odetics Cart Machine.”

“When I joined WTVH two years ago, the existing cart handling equipment was more than 15 years old. There was a real need for a new, more reliable cart machine. I took a serious look at the machines out there, then settled on the Odetics TCS2000.

Since we installed the TCS2000, everyone here has come to share my appreciation of its capabilities. We’ve especially liked the computer-based playlist. We had been manually checking play information against a paper log. Now we download the information directly from our traffic computer, and the TCS2000 generates a playlist. With the human-error factor eliminated, on-air discrepancies have become practically non-existent.

The efficiency of the Odetics equipment has streamlined our entire operation. Our older technology machine would hold only 24 spots at a time. We load over 400 spots into the new machine. Also, we use the Odetics machine’s multi-cut feature, and that’s increased our on-line spot capability by about 33 percent.

At WTVH we run 2-1/2 hours of local news every day, so last-minute changes are routine. Using the Odetics keyboard, we

can insert new material up to 30 seconds before going on air. Deletions need only two seconds lead time.

One of the most useful aspects of the machine’s software is the reports it generates. For example, I can pull a report any time showing what spots are needed that are not already in the machine. In the past, we might not know we were missing a spot until just before air time.

This machine has certainly made my own job a lot easier. That’s what I like most of all. I don’t hear any more comments at staff meetings about spots being lost on-air, and it’s a pleasure to see those blank discrepancy reports.

If you’re considering installing a new cart machine, give me a call at (315) 425-5555. I’ll be glad to talk with you firsthand about the advantages the Odetics TCS2000 has brought to WTVH.”

**Jim Bernier, Director of Engineering  
WTVH Syracuse**

**Odetics  
Broadcast**



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Circle (7) on Reply Card

World Radio History

# Buyers' Guide Product Categories

## Audio Products

Color highlights denote advertisers; see ad index

## Audio Products

### AMPLIFIERS

D audio distribution P microphone pre-amp  
 Advanced Video Associates D  
**AEQ-Applicaciones Electronicas Quasar** D  
 Aiphone Intercom Systems D  
 AIR Corp. D/P  
 Allen Avionics, Inc. D/P  
 Alphaton D  
 Altec Lansing D  
 AMEK Systems & Controls P  
**Aphex Systems Ltd.** D  
 API-Audio Products Inc. D/P  
 Arrakis Systems D/P  
 Ashly Audio P



**ATI-Audio Technologies Inc.** D/P  
 Audio Design D  
 Audio Developments Ltd. D/P  
 Auditorics, Inc. D/P  
 Avitel Electronics Corp. D  
 BAL D  
 BBE Sound P  
 Beaveronics, Inc. D  
 Benchmark Media Systems, Inc. D/P  
 BFE AG D/P  
 BGW Systems, Inc. P  
 Biamp Systems P  
 Bogen Communications P  
 Brabury International D  
 Broadcast Devices Inc. D/P  
**Bryston Vermont Ltd.** D  
 BSM Systems Inc. D  
 BTS Broadcast Television Systems D  
 Canford Audio plc D/P  
 Central Dynamics D  
 Channelmatic, Inc. D  
 CRL Systems P  
 J.E. Cuesta & Co. Inc. D  
 Dateatek Corp. D  
 Di-Tech Inc. D  
 D&R Electronica b.v. P  
 DTL Broadcast Ltd. D  
 DYMA Engineering, Inc. D/P  
 DYNAIR Electronics, Inc. D  
 EDCOR Electronics P  
 EELA Audio D/P  
 ESE D  
 Farrtronics D  
 FM Acoustics Ltd. D/P  
 FM Systems, Inc. D  
 Focusrite Audio Eng. Ltd. P  
**Full Compass Systems, Ltd.** D  
 Fumeo S.p.A. D  
**Gentner Electronics Corp.** D  
 GML/George Massenburg Labs P  
 Grass Valley Group D  
 James Grunder & Associates Inc. D  
 Harris Allied Broadcast Equipment P  
 HEDCO D  
 Henry Engineering D  
 HES Electronics D/P  
 Icon Electronics Corp. D  
 Image Video Ltd. D  
 IRP, A Knowles Div. D  
**ITAME, S.A.** D/P  
 ITI Electronics, Inc. P  
 Jensen Transformers P  
 JNS Electronics, Inc. D/P  
 Laird Telemedia Inc. D  
 Lectrosonics, Inc. D/P  
**Leitch Inc.** D  
**Logitek Electronic Systems, Inc.** D/P  
 MBI Broadcast Systems Ltd. D

McCurdy Radio Industries D  
 Modular Audio Products D/P  
 Modulation Sciences D  
 Moseley Associates, Inc. D  
 MTC/Mycomp Technologies Corp. D  
 Mullidyne Electronics, Inc. D  
 Neumade Products Corp. D  
 Neve A Siemens Co. D  
 NTP Elektronik A/S D/P  
 nVision, Inc. D  
 Omicron Video D  
 Opamp Labs, Inc. D/P  
 Pacific Recorders & Eng. Corp. D/P  
**PESA America Inc.** D  
 Philip Drake Electronics D  
 PKE International D/P  
 Pro-Bel Ltd. D  
 Professional Sound Corp. D/P  
 ProTech Audio Corp. D/P  
 QMI D  
 Radio Systems Inc. D/P  
 Ram Broadcast Systems D/P  
 Ramko Research D/P



Rane Corp. D/P  
 RE Broadcast D  
 Reliance Comm/Tec D  
 Richmond Sound Design, Ltd. D  
 ROH Products D  
 Russco Electronics Mfg. Inc. D  
 S.A.V. D  
 Sandar Electronics D  
 Scantex Labs Inc. D  
 SCV Audio D/P  
 Seem Audio A/S D/P  
 Shintron Co., Inc. D  
**Shure Brothers Inc.** D/P  
 Siel Sistemi Elettronici SRL D  
 Sierra Video Systems D  
 Sigma Electronics, Inc. D  
 Solulec Ltd. (H.A.) D  
 Sonosax SA D/P  
 Spectra Sonics D/P  
 Spectrum Communications Corp. D  
 Studio Technologies, Inc. P  
 Summit Audio Inc. P  
 Symetrix Inc. P  
 Target Technology D  
 TC Electronic P  
 Tech Electronics, Inc. D  
 Telex Communications, Inc. D  
 Texar/Gentner Electronics D  
 360 Systems D  
 Total Audio Concepts Ltd. P  
 Trident Audio USA P  
 Utah Scientific, Inc. D  
 Valley International, Inc. P  
 Video Accessory Corp. D  
 Videoquip Research Ltd. D/P  
 Videotek, Inc. D  
 Vortex Communications D  
 Ward-Beck Systems, Ltd. D  
**Wheatstone Corp.** D  
 World Video P  
 Yamaha Pro Audio Products P

### AMPLIFIERS, MONITOR, POWER

**AEQ-Applicaciones Electronicas Quasar**  
 Aiphone Intercom Systems  
 AIR Corp.  
 Alesis Corp.  
 Altec Lansing  
 API-Audio Products Inc.  
 Arrakis Systems  
 Ashly Audio, Inc.  
**ATI-Audio Technologies Inc.**  
 Benchmark Media Systems, Inc.  
 BGW Systems, Inc.  
 Biamp Systems

Bogen Communications, Inc.  
 Broadcast Devices Inc.  
**Bryston Vermont Ltd.**  
 BSM Systems Inc.  
 Canford Audio plc  
 Carver Corp.  
 Carvin  
 Conex Electro Systems  
 Crown  
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 DYMA Engineering, Inc.  
 EDCOR Electronics  
 EELA Audio  
 Electro-Voice Inc.  
 Farrtronics  
 FM Acoustics Ltd.  
 Fumeo S.p.A.  
 Furman Sound, Inc.  
**Gentner Electronics Corp.**  
 Hill Audio Ltd.  
 Icon Electronics Corp.  
 IRP, A Knowles Div.  
**ITAME, S.A.**  
 ITI Electronics, Inc.  
 JBL Professional  
 JNS Electronics, Inc.  
 KINTEK, Inc.  
 Lectrosonics, Inc.  
**Logitek Electronic Systems, Inc.**  
 Mobile-Cam Products  
 Modular Audio Products  
 Moseley Associates, Inc.  
 Nady Systems, Inc.  
 Numark Electronics  
 Opamp Labs, Inc.  
 Panasonic Professional Audio Systems  
 Philip Drake Electronics  
 PKE International  
 ProTech Audio Corp.  
 QSC Audio Products, Inc.  
 Ram Broadcast Systems  
 Ramko Research  
 Rane Corp.  
 Renkus-Heinz, Inc.  
 ROH Products  
**Rohde & Schwarz**  
 Russco Electronics Mfg. Inc.  
 S.A.V.  
 SCV Audio  
 Seem Audio A/S  
 Siel Sistemi Elettronici SRL  
 Somich Engineering  
 Sonosax SA  
 Spectra Sonics  
 Symetrix Inc.  
 Target Technology  
 Tech Electronics, Inc.  
 Telex Communications, Inc.  
 Texar/Gentner Electronics  
 TOA Electronics, Inc.  
 UREI  
 US Audio  
 Videoquip Research Ltd.  
 Wohler Technologies, Inc.  
 World Video Inc.  
 Yamaha Pro Audio Products

### CABLE, AUDIO, MIC

1-/multiple pair, shielded.  
 Arcor Broadcast Products  
 Audio-Technica U.S., Inc.  
 BARCO-EMT GmbH  
 Beyer Dynamic Inc.  
 Bi-Tronics, Inc.  
 C.A.E.  
**Canare Cable, Inc.**  
 Canford Audio plc  
 Chester Audio & Video Cable Alcatel  
 Clark Wire & Cable  
 Connectronics Corp.  
**Cooper Industries Benden**  
 Electro-Voice Inc.

FM Acoustics Ltd.  
**Full Compass Systems, Ltd.**  
**Gepco International, Inc.**  
 Har-Ken Specialties  
 JNS Electronics, Inc.  
 Marshall Electronics  
 MicroFone  
**Mohawk Wire & Cable Corp.**  
 Nema Electronics International  
 Neutrik USA, Inc.  
 ORA Electronics  
 Professional Sound Corp.  
 S.A.V.  
 SCV Audio  
 Seam-Tech  
 Sennheiser Elektronik KG  
**Shure Brothers Inc.**  
 Spectrum Communications Corp.  
 Teledyne Thermatics  
 Trompeter Electronics, Inc.  
 Veam Litton Systems, Inc.  
 Videoquip Research Ltd.  
 Whirlwind  
 Wireworks Corp.

### CD PLAYERS

Audio Design  
 Barco, Inc.  
 BARCO-EMT GmbH  
 Broadcast Automation, Inc.  
 Canford Audio plc  
 Carver Corp.  
 Denon America, Inc.  
 DKW Systems  
 EuroSon America, Inc.  
 Gefen Systems  
 Gotham Audio Corp.  
 Leonardo Software  
 Numark Electronics  
 PKE International  
 Ram Broadcast Systems  
**Sony Business & Professional Group**  
 Studer Revox America Inc.  
 TASCAM  
 TEAC  
 The Management  
 TM Century, Inc.

### DELAY SYSTEMS

Systems, devices introducing audio delays to compensate signal delays in video processing; excludes audio effects and reverb.  
 Allen Avionics, Inc.  
 Audio Digital  
 Axon Digital Design  
 BARCO-EMT GmbH  
 Dalanco Spry  
 Digital Audio Research  
 Eventide Inc.  
 Gotham Audio Corp.  
 IRP, A Knowles Div.  
 Klark-Teknik  
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 Merlin Engineering Works, Inc.  
 Ram Broadcast Systems  
 Spectra Sonics  
 TC Electronic  
**Tektronix Inc.**  
 TFT Inc.

### DIGITAL WORKSTATIONS

Hard disk recorders, software.  
 AGAP  
 AKG Acoustics, Inc.  
 Alpha Audio  
 AMS Industries Siemens  
 Antex Electronics  
 Ariel Corp.  
 Audio Design

CEDAR Audio Ltd.  
Cipher Digital, Inc.  
Computer Concepts Corp.  
Concept Productions  
Corporate Computer Systems  
Dalanco Spry  
Digidesign Inc.  
Digital Audio Research  
DKW Systems  
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Fairlight ESP PTY Ltd.  
Fougerolle Audio  
**Gentner Electronics Corp.**  
Gotham Audio Corp.  
Hybrid Arts, Inc.  
IGM Communications  
IMC/Akai  
International Tapetronics Corp.  
JLCooper Electronics  
Lexicon Inc.  
MacroMedia Design  
McCurdy Radio Industries  
New England Digital Corp.  
Opcode Systems, Inc.  
Otari Corp.  
PKE International  
Racom Broadcast Ltd.  
Richmond Sound Design, Ltd.  
Roland Pro Audio/Video Group  
S.A.V.  
Schafer World Communications Corp.  
Sentry Systems  
Solid State Logic  
Sonifex Ltd.  
Studer Revox America Inc.  
Symetrix Inc.  
Texar/Gentner Electronics  
The Management  
360 Systems  
Videoquip Research Ltd.  
**Wheatstone Corp.**

**DUPLICATORS, AUDIO**

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Canford Audio plc  
Gauss  
Graff Electronic Machines Ltd.  
Lyrec Mfg. A/S  
Otari Corp.  
S.A.V.  
Telectro Systems Corp.  
Telex Communications, Inc.

**DYNAMICS PROCESSORS**

Compression, limiting, expansion, noise reduction, de-essing, spectral exciter.

AEV  
AIR Corp.  
Alesis Corp.  
AMEK Systems & Controls, Ltd.  
AMEK/TAC US Operations  
Antex Electronics



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Focusrite Audio Eng. Ltd.  
Furman Sound, Inc.  
GML/George Massenburg Labs  
Gotham Audio Corp.  
Inovonics Inc.  
IRP, A Knowles Div.  
**ITAME, S.A.**  
JBL Professional  
JNS Electronics, Inc.  
JVC Professional Products Co.  
Kahn Communications, Inc.  
KINTEK, Inc.  
Klark-Teknik  
Lectrosnics, Inc.  
Lexicon Inc.  
**Logitek Electronic Systems, Inc.**  
Modular Audio Products  
Modulation Sciences  
Neve/A Siemens Co.  
NTP Elektronik A/S  
Orban Associates/AKG Acoustics  
PKE International  
ProTech Audio Corp.  
QMI  
Ram Broadcast Systems



Rane Corp.  
Renkus-Heinz, Inc.  
S.A.V.  
SCV Audio  
Seem Audio A/S  
Sescom, Inc.  
Somich Engineering  
Summit Audio Inc.  
Symetrix Inc.  
Tayo Industries  
Tectan  
Texar Ltd.  
Texar/Gentner Electronics  
Total Audio Concepts Ltd.  
UREI  
Valley International, Inc.  
**Wheatstone Corp.**  
Yamaha Pro Audio Products

**EBS EQUIPMENT**

Encoders, decoders  
Gorman-Redlich Mfg. Co.  
**Leitch Inc.**  
S.A.V.  
Siel Sistemi Elettronici SRL  
TFT Inc.

**EFFECTS PROCESSORS**

Plate/room simulation, reverb, flanging, chorus functions; profanity delays; may include simple delay function (excludes delay-only devices).

AKG Akustische u. Kino-Geräte GmbH  
Alesis Corp.  
AMS Industries/Siemens Co.  
ASC-Tube Traaps  
Audio Design  
Audiocontrol Industrial  
BARCO-EMT GmbH  
D&R Electronica b.v.  
Eventide Inc.  
Gotham Audio Corp.  
Klark-Teknik  
Lexicon Inc.  
Numark Electronics  
Roland Pro Audio/Video Group  
S.A.V.  
Spectra Sonics

Studio Technologies, Inc.  
TC Electronic  
TOA Electronics, Inc.  
White Instruments/C Van R, Inc.  
Yamaha Pro Audio Products

**EQUALIZERS**

HP-/LP-Filters, parametric, psophometric, swept, etc.  
AIR Corp.  
Alesis Corp.  
Altec Lansing  
AMEK Systems & Controls, Ltd.  
**Apex Systems Ltd.**  
API-Audio Products Inc.  
Ashly Audio, Inc.  
**ATI-Audio Technologies Inc.**  
**Audio Animation Inc.**  
Audio Developments Ltd.  
BFE AG  
Biamp Systems  
CEDAR Audio Ltd.  
CRL Systems  
D&R Electronica b.v.  
dbx Professional/AKG Acoustics  
Electro-Voice Inc.  
Flying Fur Industries  
Focusrite Audio Eng. Ltd.  
Furman Sound, Inc.  
GML/George Massenburg Labs  
Gotham Audio Corp.  
Harrison by GLW  
IRP, A Knowles Div.  
**ITAME, S.A.**  
JBL Professional  
JNS Electronics, Inc.  
Klark-Teknik  
Lectrosnics, Inc.  
MicroAudio, Inc.  
Modular Audio Products  
Neve/A Siemens Co.  
NTP Elektronik A/S  
Orban Associates/AKG Acoustics  
Pacific Recorders & Eng. Corp.  
PKE International  
QMI  
Ram Broadcast Systems



Rane Corp.  
Richmond Sound Design, Ltd.  
Roland Pro Audio/Video Group  
S.A.V.  
SCV Audio  
Solid State Logic  
Spectra Sonics  
Summit Audio Inc.  
Symetrix Inc.  
Total Audio Concepts Ltd.  
TC Electronic  
TEAC  
TOA Electronics, Inc.  
Trident Audio USA  
TTE, Inc.  
UREI  
Valley International, Inc.  
Ward-Beck Systems, Ltd.  
**Wheatstone Corp.**  
White Instruments/C Van R, Inc.  
Yamaha Pro Audio Products

**FADERS ATTENUATORS**

Console replacement and automated faders; audio attenuator pads  
**Apex Systems Ltd.**  
API-Audio Products Inc.  
BFE AG  
Canford Audio plc  
D&R Electronica b.v.  
FSR, Inc.  
GML/George Massenburg Labs  
Harrison by GLW  
Henry Engineering

JLCooper Electronics  
Lectrosnics, Inc.  
Neve/A Siemens Co.  
NTP Elektronik A/S  
Penny & Giles, Inc.  
Richmond Sound Design, Ltd.  
S.A.V.  
Schafer World Communications Corp.  
Selco Products Co.  
Shalloco, Inc.  
Stanton Magnetics Inc.  
**Television Technology Corp.**  
Trident Audio USA  
Ward-Beck Systems, Ltd.

**HEADPHONES, HEADSETS**

AKG Akustische u. Kino-Geräte GmbH  
Audio-Technica U.S., Inc.  
Beyer Dynamic Inc.  
Birns & Sawyer Inc.  
Broadcast Electronics, Inc.  
Canford Audio plc  
Cine 60, Inc.  
David Clark Co.  
Clear-Com Intercom Systems  
Countryman Associates Inc.  
Dynatech Tactical Communications  
EDCOR Electronics  
Fostex Corp. of America  
HM Electronics  
Koss Corp.  
Multidyne Electronics, Inc.  
Nady Systems, Inc.  
Numark Electronics  
Philip Drake Electronics  
Plantronics  
R-Columbia Products Co., Inc.  
Ram Broadcast Systems  
RE Broadcast  
ROH Products



**Sennheiser Electronic Corp.**  
Setcom Corp.  
**Shure Brothers Inc.**  
**Sony Business & Professional Group**  
Stanton Magnetics Inc.  
Systems Wireless Ltd.  
Technical Projects, Inc.  
Telectro Systems Corp.  
Television Equipment Associates  
Telex Communications, Inc.  
Telfax Communications  
TOA Electronics, Inc.  
Valcom Ltd.  
Yamaha Pro Audio Products

**INTERCOMS**

Aiphone Intercom Systems  
Alphaton  
Ampco Sound Lab (ASL)  
Atlas Soundolier  
Bogen Communications, Inc.  
Brabury International  
Canford Audio plc  
David Clark Co.  
Clear-Com Intercom Systems  
Comrex Corp.  
Comtek Communications Technology, Inc.  
EELA Audio  
Fartronics  
Heikki Malkki Ltd.  
HES Electronics  
HM Electronics  
JNS Electronics, Inc.  
Lee Dan Communications, Inc.  
Marti Electronics  
Philip Drake Electronics  
PKE International  
Professional Sound Corp.  
ProTech Audio Corp.  
R-Columbia Products Co., Inc.  
Ram Broadcast Systems

ROH Products  
S.A.V.  
Setcom Corp.  
Studio Technologies, Inc.  
Swintek Enterprises, Inc.  
Systems Wireless Ltd.  
Technical Projects, Inc.  
Telectro Systems Corp.  
Television Equipment Associates  
Telex Communications, Inc.  
Telos Systems  
TOA Electronics, Inc.  
Vega, A Mark IV Co.  
Ward-Beck Systems, Ltd.  
**Wheatstone Corp.**

**MICS & ACCESSORIES**

A Windscreens direct boxes booms, stands; H Hand-held, stand, shotgun; L Lavalier; W Wireless  
AKG Acoustics, Inc. A/H/L/W  
Alphaton L  
AMS Industries/Siemens H  
API-Audio Products Inc. A  
Ariel Corp. H  
**ATI-Audio Technologies Inc.** A  
Atlas/Soundolier A  
Audio Visual Assistance A  
Audio-Technica U.S., Inc. A/H/L/W  
Audix Corp. H/L/W  
Beyer Dynamic Inc. A/H/L/W  
Birns & Sawyer Inc. A/H  
Black Audio Devices A  
Bogen Communications, Inc. A  
Broadcast Electronics, Inc. A/H/L  
Brüel & Kjær A/H  
Canford Audio plc A/H/W  
Carvin H  
Cine 60, Inc. A/H/L



Comtek Comm. Technology W  
Countryman Associates Inc. A/H/L/W  
Crown H  
Dynatech Tactical Communications A/W  
Electro-Voice Inc. A/H/L/W  
Fostex H  
Gotham Audio Corp. A/H  
Har-Ken Specialties A  
HM Electronics H/L/W  
Karl Heitz, Inc. A  
Keith Monks Sound Systems A  
Lectrosomics, Inc. W  
LTM Corp. of America A  
MicroFone A/H/L/W  
Micron Audio Products Ltd. A/H/L/W  
Milab Microphones H  
Nady Systems, Inc. H/L/W  
Numark Electronics H  
Panasonic Professional Audio Systems H/L  
Professional Sound Corp. A/L  
Ram Broadcast Systems A/H/L/W  
Theodore A Rapp Assoc./Tram L  
R-Columbia Products L/W  
ROH Products A/W  
Samson Technologies W  
Sanken Microphone  
Audio Interviewal Design H/L  
Schoeps Schalltechnik A/H  
Seam-Tech A



Sennheiser Electronic A/H/L/W



Shure Brothers Inc. A/H/L/W  
Sony Business & Professional H/L/W

Spectra Sonics A/L/W  
Spectrum Communications Corp. H/W  
Swintek Enterprises, Inc. H/L/W  
Systems Wireless Ltd. W  
Technical Projects, Inc. A  
Telectro Systems Corp. H/W  
Telex Communications, Inc. A/H/L/W  
TOA Electronics, Inc. H/L/W  
Vega, A Mark IV Co. H/L/W  
Whirlwind A  
Yamaha/Pro Audio H

**MIXERS, PORTABLE/ENG MIC**

P Portable, ENG Mic; O On-air Radio  
TV: S Studio Production, Recording,  
Reinforcement, ESAM

AEQ P/O  
AEV P/O  
Altec Lansing P/S  
AMEK Systems & Controls P/O/S  
AMEK/TAC US Operations P/O/S  
AMS Industries/Siemens S  
API-Audio Products Inc. P/O/S  
Arrakis Systems O/S  
Ashly Audio, Inc. P/S



**ATI-Audio Technologies Inc.** P/O  
Audio Developments Ltd. P/S  
Audio Teknology Inc. P  
Audio-Technica U.S., Inc. P  
Audiotronics O/S  
BARCO-EMT S  
Biamp Systems P/S  
Broadcast Automation S  
Canford Audio plc P/S  
Carvin P/S  
Comrex Corp. P  
D&R Electronica b.v. P/O/S  
DDA/Dearden Davies Assoc. O/S  
dbx Professional/AGK Acoustics P  
EDCOR Electronics O/S  
EELA Audio P/O/S  
Electro-Voice Inc. P/S  
Fidelipac O/S  
Focusrite Audio Eng. S  
**FOR-A** S  
Fostex O/S  
**Full Compass Systems** P/O  
Furman Sound, Inc. P  
**Gentner Electronics** P  
GML/George Massenburg Labs S  
Gotham Audio O/S  
Graham-Patten Systems S  
Grass Valley Group P/S  
Hallikainen & Friends P/O  
Harris Allied O  
Harrison by GLW P/O/S  
Henry Engineering S  
Hill Audio Ltd. P/O/S  
IRP, A Knowles Div. P/O  
**ITAME, S.A.** P/O/S  
JLCooper O/S  
JVC Professional Products Co. P  
Kaitronics Corp. P/O  
Lectrosomics O  
**Logitek Electronic Systems, Inc.** P/O  
LPB Inc. O  
MBI Broadcast Systems Ltd. P/O/S  
McCurdy Radio Industries O  
MicroAudio, Inc. P  
Micro Controls, Inc. O  
Micron Audio Products Ltd. P  
Nady Systems, Inc. P  
Neotek S  
Neve/A Siemens Co. P/O/S  
Numark Electronics O/S  
Opamp Labs S  
Otari S  
Pacific Recorders & Eng. O/S  
Panasonic Professional Audio Systems P/S  
Philip Drake Electronics O/S  
PKE International O  
Professional Sound Corp. P/O/S

ProTech Audio Corp. O/S  
Quad Eight Electronics S  
Racom Broadcast Ltd. P  
Radio Systems Inc. O/S  
Ram Broadcast Systems P/O  
Ramko Research P/O/S  
Rane Corp. S  
Richmond Sound Design, Ltd. P  
Russco Electronics Mfg. Inc. P/O/S  
Samson Technologies S  
S.A.V. P/O/S  
Scantex Labs S  
Schafer World Comm. P/O/S  
Seem Audio A/S P/O/S



Sennheiser Electronic Corp. P/O



Shure Brothers Inc. P/O/S  
**Sierra Automated Systems** O  
Solid State Logic O/S  
Sonosax SA P/O/S  
**Sony Business & Professional** P/O/S  
Soundcraft Electronics P/O/S  
Soundtracs PLC P/O/S  
Spectra Sonics P/O  
Stanton Magnetics Inc. P  
Studer Revox America Inc. P/O/S  
TASCAM S  
Telex Communications, Inc. O  
Telfax Communications P  
The Management O  
TOA Electronics S  
Total Audio Concepts Ltd. P/O/S  
Trident Audio O/S  
Unitronic P/O  
US Audio P/S  
Vortex Communications P  
Ward-Beck Systems O/S  
Westec Studio Equipment S  
**Wheatstone Corp.** P/O/S  
Yamaha/Pro Audio Products S

**MUSICAL INSTRUMENTS  
MIDI EQUIPMENT**

Includes instrumental pickups & microphones.

**Aphex Systems Ltd.**  
Audio-Technica U.S., Inc.  
Digidesign Inc.  
Eventide Inc.  
Hybrid Arts, Inc.  
IMC/Akai  
JLCooper Electronics  
Lexicon Inc.  
Lone Wolf  
Nady Systems, Inc.  
Opcode Systems, Inc.  
Rane Corp.  
Roland Pro Audio/Video Group  
Telfax Communications  
Yamaha Pro Audio Products

**RECORDERS, AUDIO**

C Cartridge, NAB includes digital units emulating standard cart machines; S Cassette; D Digital, all formats; R Reel  
Accurate Sound Corp. S/R



Alesis Corp. D  
Apogee Electronics D  
Asaca/Shibasoku C/D  
Audi-Cord Corp. C  
Audio Design D  
BARCO-EMT GmbH C/D

Broadcast Automation, Inc. C/R  
Broadcast Cartridge Service C/S  
Broadcast Electronics, Inc. C  
Canford Audio plc C/S/D/R  
Concept Productions D  
Corporate Computer Systems C  
Dictaphone Corp. S/D/R  
Digital Audio Technologies SA R  
Fidelipac Corp. C  
Fostex D/R  
Fougerolle Audio D  
Gotham Audio D  
IMC/Akai S/D  
International Tapetronics Corp. C  
**ITAME, S.A.** C  
JVC Professional D  
Lyrec Mfg. R  
MacroMedia Design C/D  
Nagra Kudelski D/R  
Neve/A Siemens Co. D  
Otari Corp. C/D/R  
Pacific Recorders & Eng. Corp. C  
Panasonic Pro Audio Systems D  
Perflectone D/R  
PKE International C  
Radio Systems Inc. C/D  
Ram Broadcast Systems C/S/D/R  
Rangertone Research R  
Schafer World Communications Corp. C  
Sharp/LCD Products S/D  
Sonifex Ltd. C  
**Sony Business & Professional** D/R  
Studer Revox America S/D/R  
TASCAM S/D/R  
TEAC S/R  
Telectro Systems S/D/R  
**Television Technology Corp.** C/R  
The Management D  
360 Systems C/D  
Tiffen Mfg. Corp. S  
TM Century, Inc. C  
Uher of American S/R  
**Wheatstone Corp.** C  
Yamaha/Pro Audio Products S/D

**RECORDING HEADS, AUDIO**

Auteri Associates, Inc.  
International Electro-Magnetics  
Northern Magnetics, Inc.  
Nortonics Co., Inc. o Applied Magnetics  
Saki Magnetics Inc.  
Studer Revox America Inc.  
**Television Technology Corp.**

**RECORDING TAPE**

All audio formats  
**Ampex Recording Media Corp.**  
Audiopak, Inc.  
Broadcast Cartridge Service  
Canford Audio plc  
Cine 60, Inc.



DIC Digital  
Dictaphone Corp.  
Fidelipac Corp.  
International Tapetronics Corp.  
Maxell Corp. of America  
Panasonic Professional Audio Systems  
Sony Magnetic Products Co.  
3M Professional A/V & Specialty Products  
Zonal Ltd.

**ROUTING SWITCHERS**

A Audio, V video and data signal distribution switching systems.  
Adrienne Electronics Corp. A/V  
Amtel Systems, Inc. A/V  
API-Audio Products Inc. A  
Arrakis Systems A  
Artel Communications Corp. V  
Asaca/Shibasoku Corp. of America A/V



# For Putting Video On Fiber, The Choice Is Clear.

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Mail Station 72  
4900 West 78<sup>TH</sup> Street  
Minneapolis, Minnesota 55435  
FAX (612) 893-3050



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**AutoPatch**

- AutoPatch/XN Technologies** . . . . . **A**
- Avitel Electronics Corp. . . . . **A/V**
- BAL . . . . . **V**
- BARCO . . . . . **A/V**
- Brabury International . . . . . **V**
- Broadcast Video Systems, Ltd. . . . . **V**
- BSM Systems Inc. . . . . **A/V**
- BTS Broadcast Television Systems . . . . . **A/V**
- Canford Audio plc . . . . . **A**
- Dwight Cavendish Co. . . . . **V**
- CEL Electronics** . . . . . **V**
- Central Dynamics . . . . . **A/V**
- Channelmatic, Inc. . . . . **A/V**
- ChronTrol Corp. . . . . **V**
- Communications Specialties . . . . . **V**
- Computer Concepts Corp. . . . . **V**
- Conex Electro Systems . . . . . **A**
- Creston Electronics, Inc. . . . . **A/V**
- Datatek Corp. . . . . **A/V**
- DiCon Fiberoptics . . . . . **V**
- Di-Tech Inc. . . . . **A/V**
- DKW Systems . . . . . **A**
- DTL Broadcast Ltd. . . . . **V**
- DYNAIR Electronics, Inc. . . . . **A/V**
- EELA Audio . . . . . **A**
- Ergo Industries . . . . . **A**
- ESE . . . . . **A/V**
- FOR.A Corp. of America** . . . . . **A/V**
- Fougerolle Audio/Video . . . . . **A/V**
- FSR, Inc. . . . . **A**
- Gennum Corp. . . . . **V**
- Gentner Electronics Corp.** . . . . . **A**
- Ghielmetti Inc. . . . . **A/V**
- Gotham Audio Corp. . . . . **A**
- Grass Valley Group . . . . . **A/V**
- Harrison by GLW . . . . . **A**
- HEDCO . . . . . **A/V**
- HES Electronics . . . . . **A**
- Icon Electronics Corp. . . . . **V**
- Image Video Ltd. . . . . **A/V**
- IMC/Akai . . . . . **A/V**
- Integrated Switching Systems . . . . . **V**
- Intelvideo, Inc. . . . . **V**
- International Tapetronics Corp. . . . . **A**
- IRIS Technologies, Inc. . . . . **V**
- Jem-Fab Corp.** . . . . . **V**
- JNS Electronics, Inc. . . . . **A/V**
- Kaitronics Corp. . . . . **V**
- Laird Telemedia Inc. . . . . **A/V**
- Leitch Inc.** . . . . . **A/V**
- Logitek Electronic Systems, Inc.** . . . . . **A**
- MBI Broadcast Systems Ltd. . . . . **A**
- McCurdy Radio Industries . . . . . **A**
- Monroe Electronics, Inc. . . . . **A/V**
- Moseley Associates, Inc. . . . . **A**
- Multidyne Electronics, Inc. . . . . **A/V**
- NTP Elektronik A/S . . . . . **A**
- nVision, Inc. . . . . **A**
- Omicron Video . . . . . **A/V**
- Opamp Labs, Inc. . . . . **V**
- Pacific Recorders & Eng. Corp. . . . . **A**
- Panasonic Communications/Systems . . . . . **V**
- PESA America Inc.** . . . . . **A/V**
- Philip Drake Electronics . . . . . **A/V**
- PKE International . . . . . **A**
- Pro-Bell Ltd. . . . . **A/V**
- ProTech Audio Corp. . . . . **A**
- Questech Ltd. . . . . **V**
- Ram Broadcast Systems . . . . . **A**
- Ramko Research . . . . . **A**
- Richmond Sound Design, Ltd. . . . . **A**
- ROH Products . . . . . **A**
- Sandar Electronics . . . . . **V**
- S.A.V. . . . . **A/V**
- Scantex Labs Inc. . . . . **A**
- Seem Audio A/S . . . . . **A**
- Shintron Co., Inc. . . . . **A/V**
- Sierra Automated Systems** . . . . . **A**
- Sierra Video Systems . . . . . **V**
- Sigma Electronics, Inc. . . . . **A/V**
- Sony Business & Professional** . . . . . **A/V**

- System Video . . . . . **V**
- Target Technology . . . . . **A/V**
- Telfax Communications . . . . . **A**
- Texar/Gentner Electronics . . . . . **A**
- The Management . . . . . **A**
- 360 Systems . . . . . **A**
- Thomson Broadcast** . . . . . **V**
- Titus Technological Labs . . . . . **A**
- Utah Scientific, Inc. . . . . **A/V**
- VG, Inc. . . . . **V**
- Video Data Systems . . . . . **V**
- Videoquip Research Ltd. . . . . **A/V**
- Videotek, Inc. . . . . **A/V**
- Vidcraft Inc. . . . . **A/V**
- Vistek Electronics Ltd. . . . . **A/V**
- Vortex Communications . . . . . **V**
- Whirlwind . . . . . **A**

**SPEAKERS ENCLOSURES**

Includes integrated amplifier-speaker units.

- AEQ-Applicaciones Electronicas Quasar**
- Aiphone Intercom Systems
- AKG Akustische u. Kino-Geräte GmbH
- Altec Lansing
- Atlas/Soundolier
- Audix Corp.
- Auernheimer Labs & Co.
- Auratone Corp.
- Bogen Communications, Inc.
- Canford Audio plc
- Carvin
- Electro-Voice Inc.
- Fostex Corp. of America
- Gauss
- Genelec Oy
- JBL Professional
- KINTEK, Inc.
- Koss Corp.
- Lakeside Associates Inc.
- Numark Electronics
- Panasonic Professional Audio Systems
- QMI
- Ram Broadcast Systems
- Renkus-Heinz, Inc.
- ROH Products
- Samson Technologies Corp.
- SCV Audio
- Spectra Sonics
- Tannoy North America
- Target Technology
- Telectro Systems Corp.
- Tiffen Mfg. Corp.
- TOA Electronics, Inc.
- Turbosound Ltd.
- UREI
- Vandenbergh Profenex B.V.
- Westlake Audio Pro Products Mfg. Group
- Wohler Technologies, Inc.
- Yamaha Pro Audio Products

**STEREO CORRECTORS, SYNTHESIZERS**

Includes audio phase correction systems.

- Axon Digital Design
- BBE Sound, Inc.
- Broadcast Devices Inc.
- FM Systems, Inc.
- JNS Electronics, Inc.
- KINTEK, Inc.
- Modulation Sciences
- Orban Associates/AKG Acoustics
- Philip Drake Electronics
- Ram Broadcast Systems
- Studio Technologies, Inc.
- Titus Technological Labs

**TELEPHONE BANDWIDTH EXTENDERS**

- Canford Audio plc



Comrex Corp.

**Gentner Electronics Corp. ITAME, S.A.**

- Kahn Communications, Inc.
- Marcom
- Racom Broadcast Ltd.
- Ram Broadcast Systems
- Telfax Communications
- Texar/Gentner Electronics
- Titus Technological Labs

**TELEPHONE HYBRIDS**

**AEQ-Applicaciones Electronicas Quasar**

- AEV
- Broadcast Services/EME
- Canford Audio plc
- Comrex Corp.
- D&R Electronica b.v.
- EELA Audio
- ESE

**Gentner Electronics Corp. Henry Engineering**

- Intraplex, Inc.**
- ITAME, S.A.**
- ITI Electronics, Inc.
- NTP Elektronik A/S
- Old Dominion Broadcast Eng. Service
- PKE International
- Professional Sound Corp.
- Racom Broadcast Ltd.
- Ram Broadcast Systems
- Reach Electronics, Inc.
- ROH Products
- Seem Audio A/S
- Sonifex Ltd.
- Studer Revox America Inc.
- Symetrix Inc.
- Telfax Communications
- Telos Systems
- Texar/Gentner Electronics

**TEST, ALIGNMENT RECORDS, TAPES, CDS**

- R.B. Annis Co.
- Asaca/Shibasoku Corp. of America
- Boland Communications
- Canford Audio plc
- Consultronics
- Geneva Group of Companies, Inc.
- Horita Co.
- JRF Magnetic Sciences Inc.
- Multidyne Electronics, Inc.
- Prosonus
- Sonifex Ltd.
- Standard Tape Lab, Inc.
- Titus Technological Labs

**TRANSFORMERS**

Audio matching & fitting

- Alphaton
- Atlas/Soundolier
- Audio-Technica U.S., Inc.
- Bogen Communications, Inc.
- Canare Cable, Inc.**
- Canford Audio plc
- Deerfield Laboratory
- EDCOR Electronics
- ESE
- FSR, Inc.
- Har-Ken Specialties
- ITI Electronics, Inc.
- Jensen Transformers Inc.
- JLCooper Electronics
- Microtran Co. Inc.
- Modular Audio Products
- Neutrik USA, Inc.
- North Hills Electronics, Inc.**
- ProTech Audio Corp.
- Richmond Sound Design, Ltd.
- SCV Audio
- Shure Brothers Inc.**
- Spectra Sonics
- Telectro Systems Corp.
- Valley International, Inc.
- Whirlwind

**TURNABLES PHONO**

Including cartridges and tone arms

- BARCO-EMT GmbH
- Broadcast Electronics, Inc.
- Canford Audio plc
- EELA Audio
- Gotham Audio Corp.
- Numark Electronics
- Ram Broadcast Systems
- Russco Electronics Mfg. Inc.
- Shure Brothers Inc.**
- Stanton Magnetics Inc.
- Telex Communications, Inc.

**Video Products**

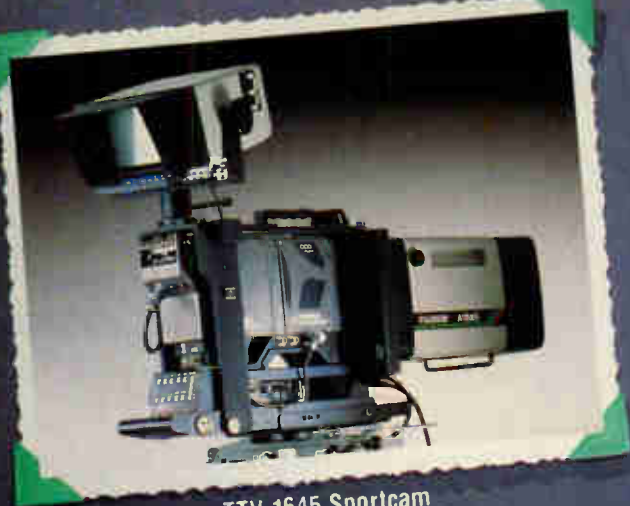
**AMPLIFIERS DISTRIBUTION**

Video, Pulse, Clamp, EQ

- Advanced Video Associates
- Allen Avionics, Inc.
- Avitel Electronics Corp.
- BAL
- Beaveronics, Inc.
- BPI/Porta-Pattern
- Brabury International
- BSM Systems Inc.
- BTS Broadcast Television Systems
- BURLE INDUSTRIES, INC.**
- Dwight Cavendish Co.
- Central Dynamics
- Channelmatic, Inc.
- Communications Specialties Inc.
- Datatek Corp.
- Di-Tech Inc.
- Digital Processing Systems Inc.
- DTL Broadcast Ltd.
- DYMA Engineering, Inc.
- DYNAIR Electronics, Inc.
- ESE
- FM Systems, Inc.
- Fumeo S.p.A.
- Grass Valley Group
- HEDCO
- Icon Electronics Corp.
- Image Video Ltd.
- JNS Electronics, Inc.
- Laird Telemedia Inc.
- Leitch Inc.**
- McCurdy Radio Industries
- Mobile-Cam Products
- Modulation Sciences
- MTC/Mycomp Technologies Corp.
- Multidyne Electronics, Inc.
- Multiplex Technology, Inc.
- Omicron Video
- Opamp Labs, Inc.
- PESA America Inc.**
- Philip Drake Electronics
- Pro-Bell Ltd.
- QSI Systems, Inc.
- Ram Broadcast Systems
- RE Broadcast
- S.A.V.
- Sandar Electronics
- Shintron Co., Inc.
- Sierra Video Systems
- Sigma Electronics, Inc.
- Solutec Ltd. (H.A.)
- Tech Electronics, Inc.
- Thomson Broadcast**
- TRW LSI Products Inc.
- Utah Scientific, Inc.
- VG, Inc.
- Video Accessory Corp.
- Videoquip Research Ltd.
- Videotek, Inc.
- Vistek Electronics Ltd.
- Vortex Communications

**ANIMATION EQUIPMENT**

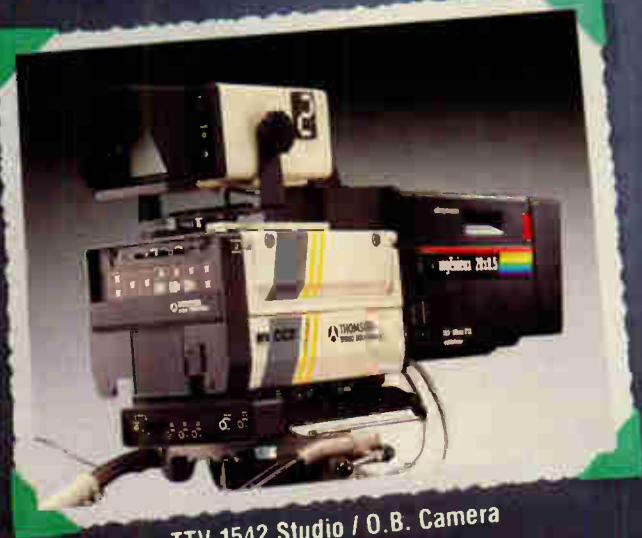
Film & digital video  
AIM Graphics, Inc.



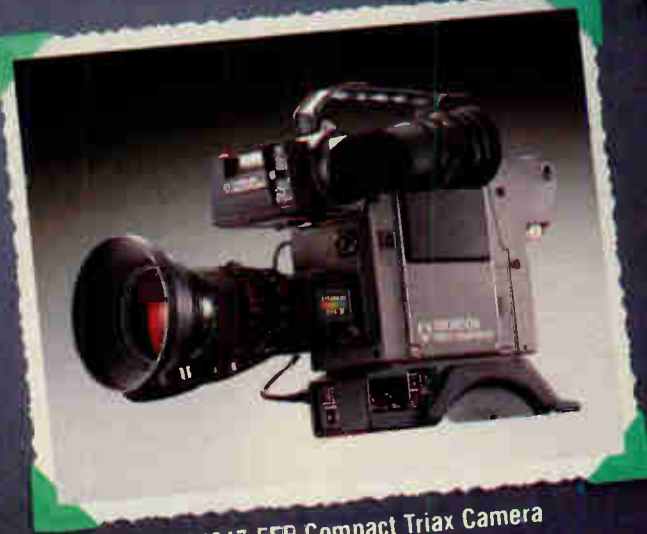
TTV 1645 Sportcam



TV 1647 ENG Camera



TTV 1542 Studio / O.B. Camera



TTV 1647 EFP Compact Triax Camera

## There's more to creating a family of cameras than putting your name on them.

Thomson's new generation of CCD cameras is actually a camera "family." Each camera gives you virtually identical video performance. Every one uses the same high resolution, 450,000 pixel CCD sensors. Each delivers equally high quality colorimetry, sensitivity, signal-to-noise, resolution, and registration. And each offers the specific features you need whether your production is in the studio, outside, at a news or sports event.

But the relationships run far deeper. Thomson's concept of *family* means each camera not only uses the same CCU, it can use Thomson's master control panel, operational control

panels and set-up control panels. Thus, a multi-camera production using Thomson studio, ENG and EFP cameras provides absolutely uniform video performance with the added efficiency and cost benefits of total component compatibility and system integration. One final family trait. Each camera is equipped for today and prepared to accept tomorrow's enhancements. It's part of Thomson's Theory of Evolution.

Put the family to all the tests (including price) against any cameras you might be considering. For more information or to arrange an on-site, side-by-side demonstration, call Thomson Broadcast tollfree at 1-800-882-1824.

 **THOMSON BROADCAST, Inc.**

P.O. Box 5266 Englewood, New Jersey 07631 (201) 569-1650 FAX (201) 569-1511

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Circle (9) on Reply Card  
World Radio History

Aurora Systems  
Autodesk/Multimedia Div.  
Bencher, Inc.  
Birns & Sawyer Inc.  
BTS GmbH  
Century Precision Optics  
Digital Arts  
Display Systems International, Inc.  
Dubner Computer Systems, Inc.  
Dynatech ColorGraphics, Inc.  
Fumeo S.p.A.  
Getris Images  
Grass Valley Group  
JLCooper Electronics  
Kavouras Inc.  
Lazerus  
Leightronix, Inc.  
MPB Technologies Inc.  
Neilson-Hordell Ltd.  
Pinnacle Systems  
**Quantel Inc.**  
Rank Cintel  
TDI America  
Time Arts Inc.  
United Media  
Vac Systems Corp.  
Videomedia, Inc.  
Visionetics International

**CAMERA CABLES**

Multicore triaxial  
Arcor Broadcast Products  
Bi-Tronics, Inc.  
BTS GmbH  
C.A.E.  
**Canare Cable, Inc.**  
Canford Audio plc  
Chester Audio & Video Cable/Alcatel  
Cine 60, Inc.  
Clark Wire & Cable  
**Cooper Industries Benden**  
**Gepco International, Inc.**  
Hitachi Denshi America, Ltd.  
JVC Professional Products Co.  
Marshall Electronics  
**Mohawk Wire & Cable Corp.**  
Nemal Electronics International  
**Panasonic Broadcast Systems Co.**  
Panasonic Communications & Systems Co.  
Seam-Tech  
Teledyne Thermatics  
**Telemetrics Inc.**  
**Thomson Broadcast**  
VDO-PAK

**CAMERA REMOTE CONTROLS**

For remote camera adjustments. lens control: may include camera positioning. CCU capability  
Birns & Sawyer Inc.  
**BURLE INDUSTRIES, INC.**  
Cohu Inc., Electronics Div.  
Concept W Systems, Inc.  
DNF Industries  
Egripment USA Inc.  
**Fujinon Inc.**  
Hitachi Denshi America, Ltd.  
Innovision Optics  
JVC Professional Products Co.  
Mathews Studio Equipment, Inc.  
Neilson-Hordell Ltd.  
Panasonic Communications & Systems Co.  
**Telemetrics Inc.**  
**Thomson Broadcast**  
TSM  
Vicon Industries Professional Products  
Vinten Broadcast

**CAMERA STABILIZERS**

Specialized lens systems and camera support products to reduce image vibration, operator or mounting instability.  
Carter Cartop Inc., Harry  
Century Precision Optics  
FSR, Inc.  
Schwem Technology  
**Telemetrics Inc.**

**CAMERA IMAGING DEVICES**

Tube CCDs  
CCTV Corp  
**EEV**  
**FOR A Corp. of America**  
Hitachi Denshi America, Ltd.  
**Ortel Corp.**  
Richardson Electronics, Ltd.  
**Sony Business & Professional Group**  
Teltron Inc.  
**Thomson Tubes Electroniques**

**CAMERAS VIDEO**

C Camcorder 1-piece and still video acquisition products; E ENG/EFP portable and docking units; S Studio models  
Ampex Corp. . . . . C/E  
BTS . . . . . C/E/S  
Fumeo S.p.A. . . . . C  
GE Support Services/RCA Broadcast . . . S  
Hitachi Denshi America . . . . . E/S  
Ikegami Electronics (USA), Inc. . . . C/E/S  
JVC Professional . . . . . E/S  
**Panasonic Broadcast Systems Co.** C/E/S  
Panasonic Communications/Systems C/E/S  
PERROTT Engineering Labs . . . . . E  
Sharp LCD Products . . . . . C  
Shook Electronics . . . . . E  
**Sony Business & Professional Group** C/E/S  
**Thomson Broadcast** . . . . . C/E/S  
Vision Quest . . . . . C/E

**CAPTIONING, VBI DATA SYSTEMS**

Includes Teletext, Videotext equipment.  
Colorado Video Inc.  
Computer Prompting Corp.  
EEG Enterprises, Inc.  
Logica Space & Comm /Broadcast  
MPB Technologies Inc.  
Multiplex Technology, Inc.  
**PESA America Inc.**  
Skotel Corp.  
Softel Systems  
VG Electronics Ltd.  
Video Data Systems

**CHARACTER GENERATORS, TITLERS**

Video titling systems: excludes time code character insertion  
Abekas Video Systems  
AF Associates  
Ampex Corp.  
Aston Electronic Designs Ltd.  
Aston from Paltex/Paltex Imaging Systems  
AVS Broadcast  
BTS Broadcast Television Systems  
Display Systems International, Inc.  
Evertz Microsystems Ltd.  
**FOR A Corp. of America**  
Grass Valley Group  
Horita Co.  
Laird Telemedia Inc.  
Lazerus  
**Leitch Inc.**  
MFJ Enterprises Inc.  
MPB Technologies Inc.  
Multiplex Technology, Inc.  
Nexus Engineering Corp.  
Outland Technology Inc.  
Panasonic Communications & Systems Co.  
**PESA America Inc.**  
QSI Systems, Inc.  
Quanta Corp.  
**Quantel Inc.**  
Ram Broadcast Systems  
Ryley Communications  
S.A.V.  
Sigmacon Industries  
Spaceward Graphics Ltd.  
TDI America  
Teledac Inc.  
Texscan MSI  
VG Electronics Ltd.  
Video Data Systems

Vortex Communications  
World Video Inc.

**COLOR CORRECTION EQUIPMENT**

Providing color balance, component level adjustments, color enhancement.  
Allen Avionics, Inc.  
Broadcast Systems Design  
BTS GmbH  
daVinci Systems, Inc.  
Digi-Grade Systems/DGS  
**FOR A Corp. of America**  
James Grunder & Associates Inc.  
Intelvideo, Inc.  
Laird Telemedia Inc.  
**Leitch Inc.**  
Pandora International  
Rank Cintel  
S.A.V.  
Showline Video  
Snell & Wilcox  
**Sony Business & Professional Group**  
**Thomson Broadcast**  
Vidicraft Inc.  
Vistek Electronics Ltd.

**DELAYS PULSE/VIDEO**

Simple delay-lines and packaged delay systems.  
Allen Avionics, Inc.  
Avitel Electronics Corp.  
BAL  
Brabury International  
Broadcast Video Systems, Ltd.  
Di-Tech Inc.  
DYMA Engineering, Inc.  
Eventide Inc.  
Icon Electronics Corp.  
Intelvideo, Inc.  
**Leitch Inc.**  
Matthey Electronics  
Omicron Video  
**PESA America Inc.**  
Philip Drake Electronics  
Pro-Bell Ltd.  
RF Technology, Inc.  
S.A.V.  
Shintron Co., Inc.  
Sigma Electronics, Inc.  
Television Equipment Associates  
**Thomson Broadcast**  
Utah Scientific, Inc.

**DIGITAL EFFECTS SYSTEMS**

Abekas Video Systems  
Alta Group, Inc.  
Ampex Corp.  
AVS Broadcast



**CEL Electronics**  
Digital FX  
Digital Support Group  
Dubner Computer Systems, Inc.  
Dynatech ColorGraphics, Inc.  
ECHOlab, Inc.  
Electrohome  
Fairlight ESP PTY Ltd.  
**FOR A Corp. of America**  
Fougerolle Video  
Getris Images  
Grass Valley Group  
Holtronic, Inc.  
Imaging Systems  
JVC Professional Products Co.  
Lazerus  
**Leitch Inc.**  
**Microtime, Inc.**  
Nova Systems, Inc.  
Pinnacle Systems  
**Quantel Inc.**  
Questech Ltd.  
S.A.V.  
**Sony Business & Professional Group**

TDI America  
**Thomson Broadcast**  
Videoplex Inc.

**DUPLICATORS, VIDEO**

Dwight Cavendish Co.  
Century Precision Optics  
JVC Professional Products Co.  
Leightronix, Inc.  
Matco Mfg. & Test Co.  
Panasonic Communications & Systems Co.  
Recortec, Inc.  
Sharp/LCD Products  
Tech Electronics, Inc.

**EDITING CONTROLLERS**

Includes cuts-only, A/B rol, large scale on-line off-line, ATR and transport synchronizers(not frame synchronizers).  
Abekas Video Systems  
Adams-Smith  
Adelaide Works Inc.  
Ampex Corp.  
Amtel Systems, Inc.  
BTS Broadcast Television Systems  
Calaway Editing  
**CEL Electronics**  
Channelmatic, Inc.  
Cipher Digital, Inc.  
CMX Div. of Chyron  
Convergence Editing/Paltex International  
CV Technologies  
DNF Industries  
Ediflex Systems  
Editing Machines Corp.  
Evertz Microsystems Ltd.  
**FOR A Corp. of America**  
FutureVideo  
Grass Valley Group  
Horita Co.  
JLCooper Electronics  
JVC Professional Products Co.  
M&R Data Services  
MPB Technologies Inc.  
NEC America/Broadcast Equipment  
Paltex Editing Systems  
**Panasonic Broadcast Systems Co.**  
Panasonic Communications & Systems Co.  
Pandora International  
**Quantel Inc.**  
S.A.V.  
Sigmacon Industries  
**Sony Business & Professional Group**  
**Thomson Broadcast**  
Time Logic, Inc.  
TouchVision Systems, Inc.  
United Media  
Videomedia, Inc.

**ENCODERS, DECODERS**

Scan converters; component to composite, composite to component; computer to video.  
Accom, Inc.  
Allen Avionics, Inc.  
Asaca/Shibasoku Corp. of America  
Axon Digital Design  
BAL  
BPI/Porta-Pattern  
Brabury International  
Broadcast Systems Design  
Broadcast Video Systems, Ltd.  
BTS Broadcast Television Systems  
**CEL Electronics**  
Central Dynamics  
Communications Specialties Inc.  
Croma Research Ltd.  
dbx Professional/AKG Acoustics  
Digital Processing Systems Inc.  
Dubner Computer Systems, Inc.  
Ensemble Designs  
Faroudja Labs, Inc.  
**FOR A Corp. of America**  
Fougerolle Video  
Grass Valley Group  
James Grunder & Associates Inc.



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**Fujinon's Pegasus III 14 x 8.5 CCD lens is the light way to catch all the action.** The Pegasus III, and the Lynx III 18X zoom are both lightweight, extremely dependable and offer unmatched optical performance. And, as you've come to expect from Fujinon, they're both backed by the best technical support in the industry.

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Midwestern 3 N. 125 Springvale, West Chicago, Illinois 60185 (708) 231-7888  
Western 129 E. Savarona Way, Carson, California 90746 (213) 532-2861  
FUJI PHOTO OPTICAL CO., LTD. 324, Uetake-Machi 1-Chome, Omiya City, Saitama  
Pref. 330, Japan Cable: Fujipto Omya TELEX: J22885, J22887 Phone: 0486 (63) 0111



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I-Den Videotronics Corp.  
 Icon Electronics Corp.  
 Ikegami Electronics (USA), Inc.  
 Instant Replay, Inc.  
 Intelveideo, Inc.  
**Intraplex, Inc.**  
 Laird Telemedia Inc.  
**Leitch Inc.**  
 Magni Systems, Inc.  
 Merlin Engineering Works, Inc.  
 Moseley Associates, Inc.  
 Omicron Video  
 Optical Electronics  
 Panasonic Communications & Systems Co.  
 Quanta Corp.  
 Questech Ltd.  
 RGB Spectrum  
 S.A.V.  
 Shintron Co., Inc.  
 Showline Video  
 Sigma Electronics, Inc.  
 Snell & Wilcox  
**Sony Business & Professional Group**  
 System Video  
**Thomson Broadcast**  
 TouchVision Systems, Inc.  
 ULTIMATTE Corp.  
 VGV, Inc.  
 Video International Development Corp.  
 Vistek Electronics Ltd.  
 Vortex Communications

**FILM CAMERAS/EDITORS**

Includes motion picture film cameras and editing equipment.

Adelaide Works Inc.  
 Arriflex Corp.  
 Birns & Sawyer Inc.  
 CMX a Div. of Chyron  
 Ediflex Systems  
 Lightworks The O.L.E. Partnership  
 Mitchell Camera Corp.  
 Neumade Products Corp.  
 Pioneer Technology Corp.  
 Plastic Reel Corp. of America  
**Quantel Inc.**  
 Steenbeck, Inc.

**FILTERS, OPTICAL**

Includes visual effect, ND illumination level compensation and color correction.

Birns & Sawyer Inc.  
 Century Precision Optics  
 Da-Lite Screen Co., Inc.  
 Schneider Corp.  
 Television Equipment Associates  
 Tiffen Mfg. Corp.

**FORMAT TRANSLATORS**

For inter-format conversions among video component types

Adelaide Works Inc.  
 Avitel Electronics Corp.  
 Brabury International  
 Broadcast Systems Design  
 Broadcast Video Systems, Ltd.  
**CEL Electronics**  
 Digital Processing Systems Inc.  
 Fougerolle Video  
**Leitch Inc.**  
 Nova Systems, Inc.  
 Omicron Video  
 Questech Ltd.  
 Shintron Co., Inc.  
 Sierra Video Systems  
**Thomson Broadcast**  
 Vistek Electronics Ltd.

**GENERATORS SAFE AREA/SOURCE ID**

Asaca/Shibasoku Corp. of America  
 Boland Communications  
 Broadcast Video Systems, Ltd.  
 Cromia Research Ltd.  
 Digital Processing Systems Inc.  
 Gray Engineering Labs, Inc.  
 Icon Electronics Corp.  
**Leader Instruments Corp.**  
**Leitch Inc.**  
 Magni Systems, Inc.  
 Multidyne Electronics, Inc.  
 QSI Systems, Inc.  
 Sigma Electronics, Inc.  
 Target Technology  
 Video Data Systems  
 Videotek Research Ltd.  
 Videotek, Inc.  
 Vistek Electronics Ltd.  
 Vortex Communications  
 World Video Inc.

**GRAPHICS SYSTEMS**

Dedicated and PC-based products; software packages

Accu-Weather, Inc.  
 Advanced Designs Corp.  
 AIM Graphics, Inc.  
 Artel Communications Corp.  
 Aurora Systems  
 Autodesk/Multimedia Div.  
 Aydin Controls  
 BTS GmbH  
 Design CAD Inc.  
 Digital FX  
 Display Systems International, Inc.  
 Dubner Computer Systems, Inc.  
 Dynatech ColorGraphics, Inc.  
 Ensemble Designs  
**FOR A Corp. of America**  
 Getris Images  
 Imaging Systems  
 Laird Telemedia Inc.  
 Lazerus  
 Logica Space & Comm./Broadcast  
 Media Computing, Inc.  
 Modern Media Consulting  
 Modgraph, Inc.  
 MPB Technologies Inc.  
**PESA America Inc.**  
 Pinnacle Systems  
 Processor Sciences, Inc.  
**Quantel Inc.**  
 Rank Cintel  
 Recortec, Inc.  
 Rix Softworks Inc.  
 Spaceward Graphics Ltd.  
 Teledac Inc.  
**Thomson Broadcast**  
 Time Arts Inc.  
 Video Data Systems  
 Visionetics International  
 Vortex Communications

**HARDCOPY PRINTERS, VIDEO**

Hitachi Denshi America, Ltd.  
 Mitsubishi Electronics/Pro Electronics  
**Nikon Photo Electronic Imaging Products**  
 Panasonic Communications & Systems Co.  
 Sharp Electronics /LCD Products  
**Sony Business & Professional Group**

**HDTV, ATV EQUIPMENT**

For images of more than 1,000-line structure; interlace, sequential scans; excludes CAD and non-video products.

Adrienne Electronics Corp.  
 Asaca/Shibasoku Corp. of America  
 Aston Electronic Designs Ltd.  
 Avitel Electronics Corp.  
 BTS Broadcast Television Systems  
 Cromia Research Ltd.  
 Di-Tech Inc.  
 Electronic Visuals Ltd.

ESE  
 Faroudja Labs, Inc.  
**FOR A Corp. of America**  
**Fujinon Inc.**  
 GE/Projection Display Products  
 Grass Valley Group  
 Hitachi Denshi America, Ltd.  
 Ikegami Electronics (USA), Inc.  
 Kairionics Corp.  
 Magni Systems, Inc.  
 nVision, Inc.  
 Omicron Video  
 Pandora International  
**Quantel Inc.**  
 Rank Cintel  
 S.A.V.  
 Shintron Co., Inc.  
 Sigma Electronics, Inc.  
 Snell & Wilcox  
**Sony Business & Professional Group**  
**Tektronix Inc.**  
**Thomson Broadcast**  
 TRW LSI Products Inc.  
 Vac Systems Corp.  
 Vistek Electronics Ltd.

**KEYERS**

DSK, chroma, linear, luminance, compositing  
 Accom, Inc.  
 Aston from Paltex  
 Beaveronics, Inc.  
 Broadcast Video Systems, Ltd.  
 BTS GmbH  
**CEL Electronics**  
 Central Dynamics  
 FloriCal Systems, Inc.  
**FOR A Corp. of America**  
 Getris Images  
 Imaging Systems  
 Omicron Video  
 Paltex Editing Systems  
 Pinnacle Systems  
 Pro-Bell Ltd.  
 Questech Ltd.  
 S.A.V.  
**Thomson Broadcast**  
 ULTIMATTE Corp.  
 Videotek, Inc.  
 Vistek Electronics Ltd.  
 Vortex Communications

**LENS SYSTEMS**

Fixed and zoom units for video cameras, including adapters, extenders  
 Birns & Sawyer Inc.  
 Buhl Optical Co.  
 Canon USA/Broadcast Equipment  
 Century Precision Optics  
 Film/Video Equipment Service Co.  
**Fujinon Inc.**  
 Innovision Optics  
 Neumade Products Corp.  
**Nikon Photo/Electronic Imaging Products**  
 Schneider Corp.  
 Tamron Industries Inc.  
 Tiffen Mfg. Corp.  
 VDO-PAK  
 Vicon Industries/Professional Products  
 VMI-Visual Methods Inc.

**LIGHTING EQUIPMENT**

C Control and dimming systems; I Instruments and lighting kits; L Lamps for stage, studio  
 Apollo Audio Visual/Lighting . . . . . L  
 Arriflex Corp. . . . . I  
 Birns & Sawyer Inc. . . . . I/L  
 Brabury International . . . . . I  
 CAE Inc. . . . . C/I  
 Celco Inc. . . . . C/I  
 Cine 60, Inc. . . . . I/L  
 Colortran, Inc. . . . . C/I  
 Creston Electronics, Inc. . . . . C  
 Dedotec USA, Inc. . . . . I/L  
 Dove Systems . . . . . C

Frezzolini Electronics, Inc. . . . . I  
 Gray Supply Co. . . . . L  
 Innovision Optics . . . . . I  
 Koto Luminous Corp. . . . . L  
 Lamp Technology Inc. . . . . L  
 Lowell-Light Mfg. Inc. . . . . I  
 Lumirol, Ltd. . . . . C/I/L  
 Matthews Studio Equipment, Inc. . . . . I  
 Mole-Richardson Co. . . . . C/I/L  
 L. E. Nelson Sales Corp. . . . . C/I/L  
 Neumade Products Corp. . . . . L  
 Omni Q Inc. . . . . C  
 Packaged Lighting Systems, Inc. . . . . C/I/L  
 PERROTT Engineering Labs Inc. . . . . I  
 Philips Lighting . . . . . L  
 RDS Corp. . . . . C/I/L  
 Sachtler . . . . . I  
 George R. Snell Associates . . . . . L  
 Union Connector Co., Inc. . . . . C  
 Vantage Lighting . . . . . L  
 VDO-PAK . . . . . I  
 Veam/Litton Systems, Inc. . . . . C

**MONITORS, MONO, COLOR**

S Sun shade accessories

Aiphone Intercom Systems  
 Asaca/Shibasoku Corp. of America  
 Aydin Controls  
 Barco, Inc.  
 Brabury International  
**BURLE INDUSTRIES, INC.**  
 CCTV Corp.  
 Conrac Display Products Group  
 Cromia Research Ltd.



Dotronix, Inc.  
 Electrohome  
 Electronic Visuals Ltd.  
 Hitachi Denshi America, Ltd.  
 Hoodman Corp. . . . . S



I-Den Videotronics Corp.  
 Ikegami Electronics (USA), Inc.  
 JVC Professional Products Co.  
**Leader Instruments Corp.**  
 Melford Electronics Ltd.  
 Mitsubishi Electronics/Pro Electronics  
 MultiVideo Image Display Co.  
**Panasonic Broadcast Systems Co.**  
 Panasonic Communications/Systems Co.  
**PESA America Inc.**  
 Recortec, Inc.  
 S.A.V.  
 Sharp Electronics /LCD Products  
**Sony Business & Professional Group**  
 Vicon Industries/ Professional Products  
 Video Display Corp.  
 Videoplex Inc.  
 Videotek, Inc.  
 Vistek Electronics Ltd.  
 World Video Inc.

**NOISE REDUCTION SYSTEMS**

Accom, Inc.  
 Allen Avionics, Inc.  
 AVS Broadcast  
 BTS Broadcast Television Systems  
**CEL Electronics**  
 Digital Processing Systems Inc.  
**FOR A Corp. of America**  
 Nova Systems, Inc.  
 Optical Electronics  
 Rank Cintel  
 S.A.V.  
 Snell & Wilcox  
**Sony Business & Professional Group**  
 Video Accessory Corp.



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**EEV**

## Technology for the Broadcast Industry

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CANADA: EEV Canada Ltd, 67 Westmore Drive, Rexdale, Ontario M9V 3Y6. Telephone: (416) 745 9494 Telex 06 989363 Fax: (416) 745 0618  
UK: EEV, Waterhouse Lane, Chelmsford, Essex CM1 2QU, England. Telephone: (0245) 493493 Telex: 99103 Fax: (0245) 492492

Subsidiary of the General Electric Company plc of England. **S&C**

Circle (11) on Reply Card

World Radio History



**SUPPORT SYSTEMS**

H Pan/Tilt Heads, including automated camera positioning products; P Pedestals, Tripods, Dollies, including automated systems.

- AF Associates . . . . . H/P
- Arriflex Corp. . . . . H/P
- Bencher, Inc. . . . . P
- Birns & Sawyer Inc. . . . . P
- Bogen Photo Corp. . . . . P
- Broadcast Microwave Services, Inc. . . . . H/P
- BURLE INDUSTRIES, INC.** . . . . . H
- Canon USA /Broadcast Equipment . . . . . H
- CCTV Corp. . . . . H
- Century Precision Optics . . . . . H/P
- DNF Industries . . . . . H
- Egripment USA Inc. . . . . H/P
- Fujinon Inc.** . . . . . H
- Geneva Group of Companies, Inc. . . . . P
- Innovation Optics . . . . . H/P
- Karl Heitz, Inc. . . . . H/P
- Matthews Studio Equipment, Inc. . . . . H/P
- Miller Fluid Heads (USA) Inc. . . . . H/P
- Mitchell Camera Corp. . . . . H/P
- Mobile-Cam Products . . . . . H
- Mole-Richardson Co. . . . . P
- Neilson-Hordell Ltd. . . . . H/P
- O'Connor Engineering . . . . . H/P
- Panasonic Communications Systems . . . . . H
- Panther Corp. of America . . . . . P
- Penny & Giles, Inc. . . . . H
- Precision Specialties, Inc. . . . . H/P
- Radamec EPO Ltd. . . . . H/P
- RDS Corp. . . . . H/P
- Sachtler . . . . . H/P
- Telemetrics Inc.** . . . . . H/P
- Tiffen Mfg. Corp. . . . . P
- TSM . . . . . H/P
- ULTIMATE Corp. . . . . H
- Velbon International Corp. . . . . H/P
- Vicon Industries Professional Products . . . . . H
- Vinten Broadcast . . . . . H/P

**PRODUCTION SYSTEMS, INTEGRATED**

May include functions of time base correction, switching, effects, graphics.

- Abekas Video Systems
- Arriflex Corp.
- CEL Electronics**
- Digital FX
- Dynatech ColorGraphics, Inc.
- FOR.A Corp. of America**
- Grass Valley Group
- MPB Technologies Inc.
- S.A.V.
- Sony Business & Professional Group**
- Thomson Broadcast**
- Vistek Electronics Ltd.

**PROJECTORS, VIDEO**

Large screen systems using CRT, LCD light sources.

- AmPro Corp. Esprit Projection Systems
- Barco, Inc.
- Buhl Optical Co.
- Da-Lite Screen Co., Inc.
- EEV**
- Electrohome
- GE/Projection Display Products
- Hitachi Denshi America, Ltd.
- Ikegami Electronics (USA), Inc.
- Lazerus
- Mitsubishi Electronics/Pro Electronics
- Neumade Products Corp.
- Nytone Inc.
- Panasonic Communications Systems
- Research Technology International
- S.A.V.
- Sharp Electronics/LCD Products
- George R. Snell Associates
- Sony Business & Professional Group**
- Telex Communications, Inc.

**PROMPTING SYSTEMS, SOFTWARE**

Dedicated and PC-based.

- BASYS Automation Systems
- BDL/Autoscript Ltd.
- Beacon Software, Inc.
- Blue Feather Co.
- Comprompter, Inc.
- Computer Prompting Corp.
- EDS Portaprompt Ltd.
- Listec Video Corp.
- Magic Telem prompting, Inc.
- maney logic
- Media Computing, Inc.
- QTV
- S.A.V.
- Telescript, Inc.
- Video Data Systems

**RECORDERS, VIDEO**

H 1/2" non-digital; U 1/4" U-matic; O 1" Type B or C non-digital; D D-1 D-2, 1/2" Digital; K Solid-state recorders.

- Ampex Corp. . . . . H/O/D
- BTS Broadcast Television Systems . . . . . H/O/D
- DNF Industries . . . . . H/U/O/D
- Getris Images . . . . . K
- Hitachi Denshi America, Ltd. . . . . H/O/D
- Instant Replay, Inc. . . . . H
- JVC Professional Products Co. . . . . H/D
- Merlin Engineering Works, Inc. . . . . K
- Mitsubishi Electronics/Pro Electronics . . . . . H
- NEC . . . . . K
- Odetics Broadcast** . . . . . H/U/D
- Panasonic Broadcast Systems Co.** . . . . . H/D
- Panasonic Communications/Systems . . . . . H/K
- Questech . . . . . K
- Sharp Electronics Corp. LCD Products Div. . . . . H
- Sony Business & Professional** . . . . . H/U/O/D
- Thomson Broadcast** . . . . . H/U/D
- Vicon Industries Professional Products . . . . . H

**RECORDERS STILL STORES**

Includes still video reproduction products; optical and magnetic videodisc systems.

- Abekas Video Systems
- Accom, Inc.
- Asaca/Shibasoku Corp. of America
- Aston Electronic Designs Ltd.
- Aston from Pallex
- BTS GmbH
- CEL Electronics**
- Leitch Inc.**
- Logica Space & Comm /Broadcast
- Nikon Photo/Electronic Imaging Products**
- Oktel, LP
- Optical Disc Corp.
- Panasonic Communications & Systems Co.



- Prime Image
- Sony Business & Professional Group**
- TEAC

**RECORDING HEADS, VIDEO**

- Ampex Corp.
- BTS GmbH
- CMC Technology Datatape Inc.
- International Electro-Magnetics
- Odetics Broadcast**
- Panasonic Broadcast Systems Co.**
- Panasonic Communications/Systems
- Saki Magnetics Inc.
- Videomagnetics

**RECORDING TAPE**

- All video formats
- Ampex Recording Media Corp.**
- BTS GmbH
- Cine 60, Inc.
- DIC Digital
- Fuji Photo Film USA

- JVC Professional Products Co.
- Maxell Corp. of America
- Odetics Broadcast**
- Panasonic Broadcast Systems Co.**
- Panasonic Communications/Systems
- PolyQuick**
- Sony Magnetic Products Co.
- 3M Professional A/V & Specialty Products

**SIGNAL ENHANCERS**

- Detail correction, enhancement equipment.
- BBE Sound, Inc.
- Broadcast Systems Design
- BTS GmbH
- Faroudja Labs, Inc.
- Geneva Group of Companies, Inc.
- Intelveo, Inc.
- Nova Systems, Inc.
- Optical Electronics
- Shintron Co., Inc.
- Snell & Wilcox

**STANDARDS CONVERTERS**

Inter-standard conversion between composite video; NTSC, PAL-N/M, SECAM; may include video component input and output capabilities.

- Adelaide Works Inc.
- AF Associates
- Allen Avionics, Inc.
- AVS Broadcast
- BTS GmbH



- CEL Electronics**
- FOR.A Corp. of America**
- Fougerolle Video
- FSR, Inc.
- James Grunder & Associates Inc.



- I-Den Videotronics Corp.
- Instant Replay, Inc.
- Leitch Inc.**
- LNR Communications, Inc.
- OKI Electric Industry Co., Ltd.
- Quantel Inc.**
- Snell & Wilcox
- Thomson Broadcast**
- TRW LSI Products Inc.
- Video International Development Corp.
- Vistek Electronics Ltd.
- Vizcom/Satellite Systems
- Vortex Communications

**SWITCHERS, VIDEO**

O TV on-air master control; P Production studio video

- Abekas Video Systems . . . . . P
- Alta Group, Inc. . . . . P
- Ampex Corp. . . . . P
- AVS Broadcast . . . . . P
- BTS Broadcast Television Systems . . . . . O/P
- Central Dynamics . . . . . P
- Channelmatic, Inc. . . . . O
- ChronTrol Corp. . . . . O
- ECHOlabs, Inc. . . . . P
- FOR.A Corp. of America** . . . . . P
- Fougerolle Video . . . . . P
- Grass Valley Group . . . . . O/P
- James Grunder & Associates Inc. . . . . P
- Image Video Ltd. . . . . O
- IRIS Technologies, Inc. . . . . O/P
- JVC Professional Products . . . . . P
- Kaltronics Corp. . . . . O
- MPB Technologies Inc. . . . . P
- Multidyne Electronics, Inc. . . . . O/P
- Omicron Video . . . . . O/P

- Panasonic Communications Systems . . . . . P
- PESA America Inc.** . . . . . O



- Prime Image . . . . . P
- Philip Drake Electronics . . . . . O
- Ross Video Ltd. . . . . P
- Sandar Electronics . . . . . O/P
- Sony Business & Professional** . . . . . O/P
- Tech Electronics, Inc. . . . . O
- Thomson Broadcast** . . . . . O/P
- Utah Scientific, Inc. . . . . O/P
- VGV, Inc. . . . . P
- Videotek, Inc. . . . . P
- Vistek Electronics Ltd. . . . . O/P

**SWITCHERS VIDEO ROUTING**

See Routing Switchers page 12.

**SYNC/PATTERN GENERATORS**

Produces video drive pulses, subcarrier, blackburst, color bar, test patterns.

- Asaca/Shibasoku Corp. of America
- Brabury International
- BTS GmbH
- Digital Processing Systems Inc.
- FOR.A Corp. of America**
- Grass Valley Group
- HEDCO
- Horita Co.
- Icon Electronics Corp.
- Leader Instruments Corp.**
- Leitch Inc.**
- Magni Systems, Inc.
- MPB Technologies Inc.
- Multidyne Electronics, Inc.
- Omicron Video
- Optical Electronics
- QSI Systems, Inc.
- RE Broadcast
- Rohde & Schwarz**
- S.A.V.
- Shintron Co., Inc.
- Sigma Electronics, Inc.
- System Video
- Tektronix Inc.**
- Telcom Research
- Thomson Broadcast**
- Video Accessory Corp.
- Videotek, Inc.
- Vistek Electronics Ltd.
- Vortex Communications

**TBCs SYNCHRONIZERS**

Video signal timing correction equipment.

- Alta Group, Inc.
- Ampex Corp.
- BTS GmbH



- CEL Electronics**
- Digital Processing Systems Inc.
- Ensemble Designs
- FOR.A Corp. of America**
- Fougerolle Video
- GE-Marconi Communication Ltd.
- James Grunder & Associates Inc.
- Hotronc, Inc.



- I-Den Videotronics Corp.
- JVC Professional Products Co.
- Leitch Inc.**
- Microtime, Inc.**
- Nova Systems, Inc.
- Panasonic Communications & Systems Co.

# Prime Image

Prime Image  
 Questech Ltd.  
 Showline Video  
 Snell & Wilcox  
**Sony Business & Professional Group**  
**Tektronix Inc.**  
**Thomson Broadcast**  
 Videotek, Inc.  
 Vistek Electronics Ltd.

## TELECINESYSTEMS

Film-to-video presentation, transfer  
 Adelaide Works Inc.  
 BTS Broadcast Television Systems  
 Buhl Optical Co.  
 Digi-Grade Systems/DGS  
 daVinci Systems, Inc.  
 Fumeo S.p.A.  
 GE-Marconi Communication Ltd.  
 Ikegami Electronics (USA), Inc.  
 Laird Telemedia Inc.  
 Magna-Tech Electronic Co., Inc.  
 Pandora International  
 Rangertone Research  
 Rank Cintel  
 Snell & Wilcox  
**SONDOR AG**  
 Steenbeck, Inc.  
 Tamron Industries Inc.  
**Thomson Broadcast**

## TELECONFERENCING SYSTEMS

American Laser Systems  
 AMX Corp.  
 Artel Communications Corp.  
 Canon USA Inc. Broadcast Equipment Div.  
**CEL Electronics**  
 Colorado Video Inc.  
 DYNAIR Electronics, Inc.  
**FOR.A Corp. of America**  
**Fujinon Inc.**  
 Lectrosonics, Inc.  
 Microdyne Corp.  
 Nytone Inc.  
 Orchard Communications Inc.  
 Radamec EPO Ltd.  
 George R. Snell Associates  
**Sony Business & Professional Group**  
**Telemetrics Inc.**  
 Telos Systems  
 Videoplex Inc.  
 Vortex Communications

## TEST CHARTS, SLIDES

Includes illuminators  
 Asaca/Shibasoku Corp. of America  
 Birns & Sawyer Inc.  
 BPI/Porta-Pattern  
 Brabury International  
 BTS GmbH  
 Century Precision Optics

## TEST ALIGNMENT TAPES

Ampex Corp.  
 Geneva Group of Companies, Inc.

## TIME CODE EQUIPMENT

Generators, readers, character insertion;  
 film frame counting, film data products.  
 A/Z Associates  
 Adams-Smith  
 Adelaide Works Inc.  
 Adrienne Electronics Corp.  
 Avitel Electronics Corp.  
 Axon Digital Design  
 Beaveronics, Inc.  
 BTS GmbH  
 Calculated Industries  
 Cipher Digital, Inc.  
 CV Technologies

Denecke Inc.  
 DTL Broadcast Ltd.  
 ESE  
 Evertz Microsystems Ltd.  
 Fast Forward Video  
**FOR.A Corp. of America**  
 Fougerolle Video  
 FutureVideo  
 Gray Engineering Labs, Inc.  
 Horita Co.  
 JLCopper Electronics  
 JRF Magnetic Sciences Inc.  
 JVC Professional Products Co.  
**Leitch Inc.**  
 Magna-Tech Electronic Co., Inc.  
 Multidyne Electronics, Inc.  
 Nesbit Systems Inc.  
 Opcode Systems Inc.  
 Otari Corp.  
 Rangertone Research  
 Shintron Co., Inc.  
 Skotel Corp.  
**Sony Business & Professional Group**  
 TASCAM



Telcom Research  
 Torpey Controls & Eng. Ltd.  
 TouchVision Systems, Inc.  
 TrueTime, Inc.  
 United Media  
 Vid-Video, Inc.  
 Video Data Systems  
 VideoLab  
 Vortex Communications

## TIME MODIFICATION EQUIPMENT

Products permitting time compression,  
 expansion of recorded material.

Adams-Smith  
 Allen Avionics, Inc.  
 BTS GmbH  
 Eventide Inc.  
 Questech Ltd.  
 TouchVision Systems, Inc.  
 VideoLab

## VITS, VIRS GENERATORS, INSERTERS

Aston Electronic Designs Ltd.  
 Digital Processing Systems Inc.  
**Leitch Inc.**  
 Multidyne Electronics, Inc.  
 Philips TV Test Equipment  
**Rohde & Schwarz**  
 System Video  
**Tektronix Inc.**

## WEATHER DISPLAYS, RADAR SERVICES

D weather graphics display systems,  
 radar electronics; S weather data services

Accu-Weather, Inc. . . . . D/S  
 Advanced Designs Corp. . . . . D/S  
 Alden Electronics, Inc. . . . . D/S  
 Colorado Video Inc. . . . . D  
 Dubner Computer Systems, Inc. . . . . D  
 Dynatech ColorGraphics, Inc. . . . . D  
**EEV** . . . . . D  
 Ellason Avionics . . . . . D  
 Grass Valley Group . . . . . D  
 Kavouras Inc. . . . . D/S  
 Modern Media Consulting . . . . . D/S  
 MPB Technologies Inc. . . . . D  
 Texas Electronics, Inc. . . . . D/S  
 Video Data Systems . . . . . D  
 WeatherNews America . . . . . S

If your company's information is missing  
 from this directory, see note on page 32.

# RF Products

## ANTENNA POSITIONING SYSTEMS

Microwave and ES/TVRO antenna  
 controllers.  
 Advent Communications, Ltd.



Astroguide International  
 Bi-Directional Microwave of Diversified  
 Marketing  
 Broadcast Microwave Services, Inc.  
 Comtech Antenna Systems, Inc.  
 Hallikainen & Friends, Inc.  
 Hero Communications  
 Microdyne Corp.  
 Mobile-Cam Products  
 Precision Specialties, Inc.  
 Radamec EPO Ltd.  
 Radiation Systems, Inc. SatCom Technolo-  
 gies Div.  
 RF Technology, Inc.  
 Telesat International, Ltd.

## AM ANTENNA EQUIPMENT

R Remote indicators, monitors; S  
 Sampling equipment; T Tuning units; A  
 Directional arrays  
 ABB Infocom Ltd. . . . . R/S/T/A  
 Alan Dick & Co. Ltd. . . . . T/A  
 Audiolab Electronics, Inc. . . . . T/A  
 CCA Electronics . . . . . T  
 Central Tower Inc. . . . . A  
**Continental Electronics Corp.** . . . . S/T/A  
 Delta Electronics Inc. . . . . R/S  
 Eagle Wichita . . . . . S  
 Elcom Bauer . . . . . T  
 Electronics Research Inc. . . . . S/A  
 Geleco Electronics Ltd. . . . . R/S/T/A  
 GE-Marconi Communications Ltd. . . . . T/A  
 Gorman-Redlich Mfg. Co. . . . . R  
 Hallikainen & Friends, Inc. . . . . R  
 Ham-Pro Antennas/Kopbs Corp. . . . . T  
 Harris Allied Broadcast Equipment . . . . R/T/A  
**ITAME, S.A.** . . . . T  
 Kahn Communications, Inc. . . . . A  
 Kintronics Labs, Inc. . . . . S/T/A  
 LBA Technology, Inc. . . . . S/T/A  
 LeBlank & Royle Telcom Inc. . . . . A  
 Lightning Revention Systems . . . . . T/A  
 MFJ Enterprises Inc. . . . . T  
 Lawrence L. Morton Associates . . . . . A  
 Potomac Instruments, Inc. . . . . R  
 Precision Specialties, Inc. . . . . R  
 RF Technology, Inc. . . . . R  
 Stainless Inc. . . . . A  
 Stellar Communications . . . . . A  
 Telefunken Sendertechnik GmbH . . . . T/A  
 Telesat International, Ltd. . . . . R  
 Tenco Tower . . . . . A  
 Tylon Towers . . . . . A

## ANTENNAS TRANSMITTING

F FM radio; M Microwave; ENG ITFA  
 MDS; STL ICR; S Satellite R/T; TVRO; T  
 UHF/VHF TV  
 Advent Communications, Ltd. . . . . S  
 Alan Dick & Co. Ltd. . . . . F/T  
 Andrew Corp. . . . . M/S/T



Astroguide International . . . . . M/S  
 Audiolab Electronics . . . . . M  
 Blonder-Tongue Labs, Inc. . . . . S  
 Broadcast Electronics, Inc. . . . . F/M  
 Broadcast Microwave Services . . . . . M  
 Cablewave Systems . . . . . F/M/T  
 Central Tower Inc. . . . . F

Comad Communications Ltd. . . . . F/T  
 Comark Communications. . . . . F  
 Comtech Antenna Systems, Inc. . . . . S  
 Comwave Div. Communication Microwave M  
 DB Elettronica Telecomunicazioni S.p.A. E/M/T  
 Dielectric Communications . . . . . F/T  
 Electronics Research Inc. . . . . F/T  
 Elenos . . . . . M  
 EMC EE Broadcast Products . . . . . M/T  
 FUBA Communication/Hans Kolbe & Co E/S/T  
 Gabriel Electronics Inc. . . . . M  
 GE-Marconi Communication Ltd. . . . . F/T  
 Ham-Pro Antennas/Kopbs Corp. . . . . M  
 Harris Allied Broadcast Equipment . . . . F/T  
 Hero Communications . . . . . S  
 ISS Engineering, Inc. . . . . S  
 J&L Associates . . . . . F/M/T  
 Jampro Antennas Inc. . . . . FT  
 Kathrein-Werke KG . . . . . F/M/S/T  
 LDL Communications, Inc. . . . . FT  
 Loral Microwave-Narda . . . . . M  
 Lucas EpSCO Inc. . . . . S  
 Mari Electronics . . . . . M  
**Micro Communications, Inc.** . . . . F/M/T  
 Microdyne Corp. . . . . S  
 Microwave Networks Inc. . . . . M



Microwave Radio Corp. . . . . M  
 Nucomm Inc. . . . . M  
 Precision Specialties, Inc. . . . . M  
 Racon . . . . . M  
**Radiation Systems/Mark Antennas** . . . . M  
 Radiation Systems/SatCom Technologies . . . . S  
 RF Technology, Inc. . . . . M  
**Rohde & Schwarz** . . . . . F/T  
 Scala Electronic Corp. . . . . F/M/T  
 Shively Labs Div. of Howell Labs, Inc. . . . . F  
 SIRA s.r.l. . . . . F/T  
 Spectrum Communications Corp. . . . . F  
 Swager Communications . . . . . M



SWR Inc. . . . . F/T  
 Teko Telecomm SRL . . . . . M  
 Telefunken Sendertechnik GmbH . . . . . F  
 Telesat International, Ltd. . . . . S  
 Tenco Tower Co. . . . . F/M/T  
 Tenna Systems Ltd. . . . . F/T  
**Thomson-LGT** . . . . . F/T  
 Valcom Ltd. . . . . F  
 Vizcom Satellite Systems . . . . . S/T

## ATTENUATORS, RF

Allen Avionics, Inc.  
 AVA Electronics Corp.  
 Bird Electronic Corp.  
 Blonder-Tongue Labs, Inc.  
 Coaxial Dynamics  
 Comark Communications.  
 DB Elettronica Telecomunicazioni S.p.A.  
 Dielectric Communications  
 Electro Impulse Lab, Inc.  
 FUBA Communication/Hans Kolbe & Co.  
 Harris Allied Broadcast Equipment  
**Kay Elemetrics Corp.**  
 Kintronic Labs, Inc.  
 Loral Microwave-Narda  
 Penstock, Inc.  
 RF Industries  
**Rohde & Schwarz**  
 Spectrum Communications Corp.  
 Tech Labs Inc.  
 Tenna Systems Ltd.  
 Trompeter Electronics, Inc.

## DECIDER SYSTEMS

Andrew Corp.  
 Astroguide International  
 Comtech Antenna Systems, Inc.

Dielectric Communications  
Electronics Research Inc.  
Environmental Technology, Inc.



Ice Crackers, Inc.  
Jampro Antennas Inc.  
Lucas Epsco Inc.  
Shively Labs Div. of Howell Labs, Inc.  
Telesat International, Ltd.  
Vizcom/Satellite Systems

**ENG COMPONENTS & ELECTRONICS**

Astroguide International  
AVA Electronics Corp.  
Broadcast Microwave Services, Inc.  
C.A.E.  
Eagle Wichita  
JNS Electronics, Inc.  
Lucas Epsco Inc.  
Marti Electronics



Microwave Radio Corp.  
Mobile-Cam Products  
Nucomm Inc.  
RF Industries  
RF Technology, Inc.  
Sennheiser Elektronik KG  
Shook Electronics USA, Inc.  
Swintek Enterprises, Inc.  
Tectan  
Wolf Coach Inc.

**EXCITERS, RF GENERATORS**

A AM/Stereo, F FM/Stereo, SCA, T TV/Stereo, PRO, SAP  
ABB Infocom Ltd. . . . . A/F  
Advent Communications Ltd. . . . . F/T

**APHEX SYSTEMS**

**Aphex Systems Ltd.** . . . . . F  
BBE Sound, Inc. . . . . A/F/T  
Bext Inc. . . . . F/T  
Broadcast Electronics, Inc. . . . . A/F  
CCA Electronics, Inc. . . . . F  
Cemlys S.A. . . . . F  
Comad Communications Ltd. . . . . F  
Comark Communications, Inc./Thomson-CSF . . . . . T  
**Continental Electronics Corp.** . . . . . A/F  
CRL Systems . . . . . F/T  
DB Elettronica Telecomunicazioni S.p.A. . . . . F/T  
Delta Electronics Inc. . . . . A  
Dorrough Electronics . . . . . F  
Elcom Bauer . . . . . A/F  
Elenos . . . . . F



ELIT-Elettronica Italiana S.p.A. . . . . F/T  
EMCEE Broadcast Products . . . . . T  
Energy-Onix . . . . . F  
FM Systems, Inc. . . . . F  
GE-Marconi Communications Ltd. . . . . F/T  
**Gentner Electronics Corp.** . . . . . A/F  
Harris Allied Broadcast Equipment . . . . . F/T  
Inovonics Inc. . . . . F  
ISS Engineering, Inc. . . . . T  
**ITAME, S.A.** . . . . . A/F  
ITELCO S.p.A. . . . . A/T  
ITS Corp. . . . . T  
JNS Electronics, Inc. . . . . F

Kahn Communications, Inc. . . . . A  
LDL Communications, Inc. . . . . T



Learning Industries . . . . . F/T  
LNR Communications, Inc. . . . . A/F/T  
Marcom . . . . . F/T  
Marti Electronics . . . . . F  
McMartin Inc. . . . . A/F  
Modulation Sciences . . . . . F/T  
Moseley Associates, Inc. . . . . A/F  
Motorola Inc. AM Stereo . . . . . A  
Multidyne Electronics . . . . . T  
Nexus Engineering Corp. . . . . T  
QEI Corp. . . . . F  
**Rohde & Schwarz** . . . . . A/F/T  
SCA Data Systems, Inc. . . . . F  
Diel Sistemi Elettronici SRL . . . . . F  
Teko Telecom S.R.L. . . . . F/T  
Telefunken Sendertechnik GmbH . . . . . A/F  
**Television Technology Corp.** . . . . . F/T  
Tepeco Corp. . . . . F  
TFT Inc. . . . . F  
VG Electronics, Ltd. . . . . F

**FILTERS, MICROWAVE, RF**

Alan Dick & Co. Ltd.  
Allen Avionics, Inc.  
AVA Electronics Corp.  
Bird Electronic Corp.  
Broadcast Microwave Services, Inc.  
Coaxial Dynamics  
Comad Communications Ltd.  
**Continental Electronics Corp.**  
DB Elettronica Telecomunicazioni S.p.A.  
Dielectric Communications  
Eagle Wichita  
**EEV**  
Electronics Research Inc.  
ELIT-Elettronica Italiana S.p.A.  
Richard Hirschmann GmbH  
**ITAME, S.A.**  
ITELCO S.p.A.  
ITS Corp.  
J&L Associates  
Loma Scientific  
Matthey Electronics  
**Micro Communications, Inc.**  
Microwave Development Labs, Inc.  
Microwave Filter Co., Inc.  
Microwave Networks Inc.  
Multiplex Technology, Inc.  
**North Hills Electronics, Inc.**  
Nucomm Inc.  
Penstock, Inc.  
Shively Labs Div. of Howell Labs, Inc.  
Spectrum Communications Corp.  
SWR Inc.  
Teko Telecom S.R.L.  
Tepeco Corp.  
TTE, Inc.  
UTE Microwave, Inc.

**HEAT EXCHANGERS**

Includes all transmitter air-handling and cooling products.  
Bird Electronic Corp.  
Dielectric Communications  
Electro Impulse Lab, Inc.  
Harris Allied Broadcast Equipment

**ISOCOUPERS**

Audiolab Electronics, Inc.  
Dielectric Communications  
Kintronic Labs, Inc.  
Marti Electronics  
Moseley Associates, Inc.  
Shively Labs Div. of Howell Labs, Inc.  
UTE Microwave, Inc.

**ITFS, MDS COMPONENTS & ELECTRONICS**

Comwave/Communication Microwave Corp  
Conifer Corp.  
EMCEE Broadcast Products  
ITS Corp.  
J&L Associates  
Loma Scientific  
**Micro Communications, Inc.**  
Microwave Filter Co., Inc.  
Richardson Electronics, Ltd.  
Telesat International, Ltd.

**MOBILE RADIO, CELLULARPHONES**

Utility communications products.  
Astroguide International  
Cellabs  
GE-Marconi Communication Ltd.  
Moseley Associates, Inc.  
Motorola Inc. Land Mobile Products Sector  
OKI Electric Industry Co., Ltd.  
SIRA s.r.l.  
Solid Electronics Labs  
Standard Communications

**MODULATORS, TV**

Advent Communications, Ltd.  
Astroguide International  
Bext Inc.  
Blonder-Tongue Labs, Inc.  
Catel Telecommunications  
Comark Communications.  
DB Elettronica Telecomunicazioni S.p.A.



ELIT-Elettronica Italiana S.p.A.  
FUBA Communication/Hans Kolbe & Co.  
GE-Marconi Communication Ltd.  
Richard Hirschmann GmbH  
ISS Engineering, Inc.  
J&L Associates  
Loma Scientific  
Magnavox CATV Systems, Inc.  
Multiplex Technology, Inc.  
Nexus Engineering Corp.  
Philips TV Test Equipment  
T.R. Pitts Co.  
**Rohde & Schwarz**  
Teko Telecom S.R.L.  
**Television Technology Corp.**

**POWER AMPLIFIERS CAVITIES**

Advent Communications, Ltd.  
Bext Inc.  
Cemlys S.A.  
Comark Communications.  
**Continental Electronics Corp.**  
DB Elettronica Telecomunicazioni S.p.A.  
**EEV**  
EMCEE Broadcast Products  
Frequency Products Inc.  
FUBA Communication/Hans Kolbe & Co.  
GE-Marconi Communication Ltd.  
Harris Allied Broadcast Equipment  
Richard Hirschmann GmbH  
**ITAME, S.A.**  
Loma Scientific  
Marti Electronics  
**MCL, Inc.**  
McMartin Inc.  
Nexus Engineering Corp.  
QEI Corp.  
**Rohde & Schwarz**  
Spectrum Communications Corp.  
Teko Telecom S.R.L.  
Telefunken Sendertechnik GmbH  
**Television Technology Corp.**  
Tepeco Corp.  
TFT Inc.  
Thomson Tubes Electroniques  
Varian Associates

Varian Associates Power Grid & X-Ray Products  
Varian Associates Microwave Equipment Products

**POWER COMBINERS, DIPLEXERS**

Advent Communications, Ltd.  
Blonder-Tongue Labs, Inc.  
Comad Communications Ltd.  
Comark Communications.  
**Continental Electronics Corp.**  
DB Elettronica Telecomunicazioni S.p.A.  
Dielectric Communications  
Eagle Wichita  
EMCEE Broadcast Products  
FUBA Communication/Hans Kolbe & Co.  
GE-Marconi Communication Systems Ltd.  
Harris Allied Broadcast Equipment  
Richard Hirschmann GmbH  
**ITAME, S.A.**  
ITS Corp.  
J&L Associates  
Jampro Antennas Inc.  
Kintronic Labs, Inc.  
LDL Communications, Inc.  
Loral Microwave-Narda  
Lucas Epsco Inc.  
Marti Electronics  
**Micro Communications, Inc.**  
Microwave Filter Co., Inc.  
**North Hills Electronics, Inc.**  
Penstock, Inc.  
Richardson Electronics, Ltd.  
**Rohde & Schwarz**  
Shively Labs Div. of Howell Labs, Inc.  
Teko Telecom S.R.L.  
Telefunken Sendertechnik GmbH  
**Television Technology Corp.**  
Tennaplex Systems Ltd.  
TFT Inc.  
TTE, Inc.  
UTE Microwave, Inc.  
Wide Band Engineering Co., Inc.

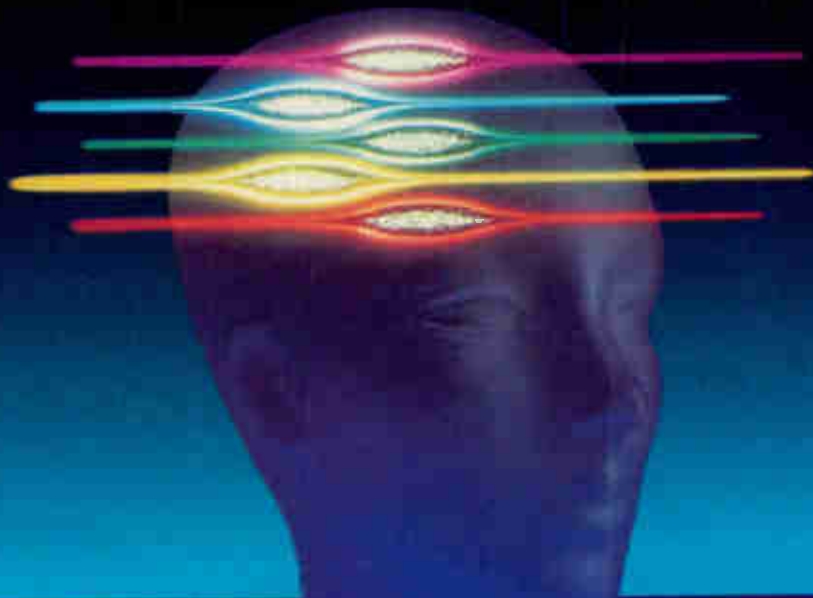
**POWER DIVIDERS**

Andrew Corp.  
**AVCOM of Virginia, Inc.**  
Blonder-Tongue Labs, Inc.  
Comad Communications Ltd.  
Comark Communications.  
DB Elettronica Telecomunicazioni S.p.A.  
Dielectric Communications  
Eagle Wichita  
FUBA Communication/Hans Kolbe & Co.  
Geleco Electronics Ltd.  
GE-Marconi Communication Ltd.  
Harris Allied Broadcast Equipment  
Richard Hirschmann GmbH  
**ITAME, S.A.**  
J&L Associates  
Jampro Antennas Inc.  
JFW Industries  
Kintronic Labs, Inc.  
LDL Communications, Inc.  
Loral Microwave-Narda  
Lucas Epsco Inc.  
Marti Electronics  
**Micro Communications, Inc.**  
MYAT, Inc.  
**North Hills Electronics, Inc.**  
Penstock, Inc.  
T.R. Pitts Co.  
**Rohde & Schwarz**  
Scala Electronic Corp.  
Shively Labs Div. of Howell Labs, Inc.  
SIRA s.r.l.  
SWR Inc.  
**Television Technology Corp.**  
Tennaplex Systems Ltd.  
TFT Inc.

**PRESSURIZATION EQUIPMENT**

Andrew Corp.  
Cablewave Systems  
Comad Communications Ltd.  
Dielectric Communications

# THE NEW TV TRANSMITTER FOR VHF BAND III



## TV Transmitter System 2100

**At the forefront of communications.**

**In its new 10-kW TV Transmitter NT 413 S Rohde & Schwarz presents a fully mature and solid-state system concept for the next generation in broadcasting.**

**Major advantages:**

- high availability of the entire transmitter
- high reliability and long service life
- easy to maintain, modular transmitter architecture
- amplifier units exchangeable without breaks in transmission
- simple and clear operation
- monitoring of quality during ongoing broadcasts

The same architecture, the same amplifier modules and the same power-supply units for all power categories mean rationalized stocking of spares and cost-attractive maintenance.

Our specialists can advise you on all matters of TV transmission and TV testing and measurement. We guarantee optimal performance of a project through to punctual installation, make sure your transmissions start up correctly and securely and offer highly qualified training of operator staff.

**It's never too early to talk to  
Rohde & Schwarz.**



**Circle (12) on Reply Card**

An independent concern, founded in 1933.  
5000 employees, represented in 80 countries.  
Design and turn-key installation of systems  
with software and servicing.  
Calibration, training and documentation.



**ROHDE & SCHWARZ**

W-8000 München 80 Postfach 80 14 68  
Telex 523 703 (rus d) Telefax (089) 41 29 - 21 64  
Tel. internat. + (4989) 41 29 - 0

World Radio History

Electronics Research Inc.  
Environmental Technology, Inc.  
Gabriel Electronics Inc.  
Nucomm Inc.  
RF Technology, Inc.  
Shively Labs Div. of Howell Labs, Inc.  
SIRA s.r.l.



SWR Inc.

**RECEIVERS, AM, FM, SCA, EBS**

Aiphone Intercom Systems  
Avocet Instruments  
Bext Inc.  
Bogen Communications, Inc.  
Catel Telecommunications  
Comad Communications Ltd.  
Croma Research Ltd.  
DB Elettronica Telecomunicazioni S.p.A.  
Delta Electronics Inc.  
ELIT-Elettronica Italiana S.p.A.  
Fairchild Data Corp.  
Gorman-Redlich Mfg. Co.  
Hemec Communications  
Inovonics Inc.  
ISS Engineering, Inc.  
JNS Electronics, Inc.  
Kahn Communications, Inc.  
Marti Electronics  
McMartin Inc.  
Micro Controls, Inc.  
Modulation Sciences  
Moseley Associates, Inc.  
T.R. Pitts Co.  
Reach Electronics, Inc.  
**Rohde & Schwarz**  
SCA Data Systems, Inc.  
Siel Sistemi Elettronici SRL  
Singer Products, Inc.  
Spectrum Communications Corp.  
Swintek Enterprises, Inc.

**RECEIVERS, SATELLITE**

Includes associated LNA, LNC products.  
Advent Communications, Ltd.  
Andrew Corp.  
Antenna Technology



Astroguide International  
**AVCOM of Virginia, Inc.**  
Blonder-Tongue Labs, Inc.  
Fairchild Data Corp.  
FUBA Communication Hans Kolbe & Co.  
GE-Marconi Communication Ltd.  
Hemec Communications  
Hero Communications  
Richard Hirschmann GmbH  
**Intraplex, Inc.**  
ISS Engineering, Inc.  
Kathrein-Werke KG  
LNR Communications, Inc.  
McMartin Inc.  
Microdyne Corp.  
Microwave Solutions Inc.  
Nexus Engineering Corp.  
T.R. Pitts Co.  
**Rohde & Schwarz**  
Standard Communications  
Tennaplex Systems Ltd.  
Vizcom/Satellite Systems  
Wegener Communications Inc.

**REMOTE PICKUP COMPONENTS, ELECTRONICS**

Ace Communications  
Astroguide International  
**Intraplex, Inc.**

**ITAME, S.A.**  
JNS Electronics, Inc.  
Kintronic Labs, Inc.  
LNR Communications, Inc.  
McMartin Inc.  
Moseley Associates, Inc.  
Nucomm Inc.  
RF Technology, Inc.  
Richardson Electronics, Ltd.  
Spectrum Communications Corp.  
TFT Inc.

**SATELLITE T/R COMPONENTS, ELECTRONICS**

Excludes antennas.  
Advent Communications, Ltd.  
Andrew Corp.  
Antenna Technology  
Artel Communications Corp.



Astroguide International  
Corporate Computer Systems  
**Dolby Laboratories, Inc.**  
**EEV**  
Fairchild Data Corp.  
GE-Marconi Communication Ltd.  
Hemec Communications  
Hero Communications  
**Intraplex, Inc.**  
ISS Engineering, Inc.  
JNS Electronics, Inc.  
Kathrein-Werke KG  
Lucas EpSCO Inc.  
**MCL, Inc.**  
McMartin Inc.  
Microdyne Corp.  
Microwave Filter Co., Inc.  
**Ortel Corp.**  
Radiation Systems/SatCom Technologies  
Standard Communications  
Tectan  
3M Sound Products  
Varian Assoc./Microwave Equipment  
Vizcom/Satellite Systems  
Wegener Communications Inc.

**STL COMPONENTS ELECTRONICS**

Excludes antennas (FO Fiber optical STL systems)

American Lightwave Systems, Inc.  
Artel Communications Corp.  
Bext Inc.  
Bi-Directional Microwave  
Broadcast Electronics, Inc.  
Broadcast Microwave Services, Inc.  
Cemlys S.A.  
Corporate Computer Systems  
**Dolby Laboratories, Inc.**  
Elenos  
EMCEE Broadcast Products  
FM Systems, Inc.  
**Intraplex, Inc.**



**ITAME, S.A.**  
JNS Electronics, Inc.  
Leaming Industries  
Marti Electronics  
Microwave Filter Co., Inc.  
Microwave Networks Inc.



Microwave Radio Corp.  
Modulation Sciences  
Moseley Associates, Inc.

Nucomm Inc.  
Orban Associates AKG Acoustics  
QEI Corp.  
RF Technology, Inc.  
T-Tech . . . . .FO  
Tectan  
TFT Inc.  
Wegener Communications Inc.

**SWITCHERS, RF COAXIAL**

ABB Infocom Ltd.  
Bird Electronic Corp.  
Broadcast Electronics, Inc.  
**BURLE INDUSTRIES, INC.**  
Comad Communications Ltd.  
Comark Communications.  
**Continental Electronics Corp.**  
DB Elettronica Telecomunicazioni S.p.A.  
Dielectric Communications  
GE-Marconi Communication Ltd.  
Harris Allied Broadcast Equipment  
J&L Associates  
JFW Industries  
**Kay Elemetrics Corp.**  
Loral Microwave-Narda  
Lucas EpSCO Inc.  
**Micro Communications, Inc.**  
Micro Controls, Inc.  
Monroe Electronics, Inc.  
MYAT, Inc.  
Penstock, Inc.  
T.R. Pitts Co.  
Pro-Bell Ltd.  
Shively Labs Div. of Howell Labs, Inc.  
SIRA s.r.l.  
Tech Labs Inc.  
Telefunken Sendertechnik GmbH  
Tennaplex Systems Ltd.  
TFT Inc.

**TOWER LIGHTING SYSTEMS**

ABB Infocom Ltd.  
Aluma Tower Co. Inc.  
Central Tower Inc.  
Crouse-Hinds Airport Lighting Products  
EG&G Electro-Optics  
Electronics Research Inc.  
Flash Technology  
Flying Fur Industries  
GE-Marconi Communication Ltd.  
Hughey & Phillips Inc.  
Kline Towers  
Microlect Co., Inc.  
Fred A. Nudd Co.  
PiRod Inc.  
Racal Decca Canada Ltd., Insulators Div.  
ROHN  
SSAC Inc.  
Stainless Inc.  
Stellar Communications Inc.  
Tenco Tower Co.  
Trylon Towers  
TWR Lighting, Inc.  
Utility Tower Co.

**TOWERS, ANTENNA SUPPORT, PORTABLE & ACCESSORIES**

S antenna support; P portable; A guys, insulators, hardware  
ABB Infocom Ltd. . . . . S/P A  
Alan Dick & Co. Ltd. . . . . S/P  
Allied Tower Co., Inc. . . . . S/A  
Aluma Tower Co. Inc. . . . . S/P/A  
Andrew Corp. . . . . S/A  
Central Tower Inc. . . . . S/A  
Electronics Research Inc. . . . . S/A  
EMCEE Broadcast Products . . . . . S/A  
Express Tower Co. . . . . S/P/A  
FWT . . . . . S/P/A  
GE-Marconi Communication Ltd. . . . . S/P/A

Ice Crackers, Inc. . . . . A

Kline Towers . . . . . S/A  
LBA Technology, Inc. . . . . A  
LDL Communications, Inc. . . . . S/P/A  
LeBlanc & Royle Telcom Inc. . . . . S  
Lightning Prevention Systems . . . . . A  
Magnum Towers, Inc. . . . . S/A  
Microlect Co., Inc. . . . . S/A  
Fred A. Nudd Co. . . . . S/A  
PiRod Inc. . . . . S/A  
Racal Decca Canada/Insulators . . . . . A  
Rapid Deployment Towers . . . . . S/P/A  
RF Technology, Inc. . . . . P  
ROHN . . . . . S/A  
Stainless Inc. . . . . S/P/A  
Stellar Communications Inc. . . . . S/P/A  
Swager Communications . . . . . S  
Telefunken Sendertechnik GmbH . . . . . A  
Telx Communications, Inc. . . . . S/P/A  
Tenco Tower Co. . . . . S/P/A  
Trylon Towers . . . . . S/P/A  
United Ropeworks (USA) Phillystran . . . . . A  
Utility Tower Co. . . . . S/A  
The Will-Burt Co. . . . . S/P  
Wolf Coach . . . . . P

**TRANSFORMERS, POWER, MODULATION**

ABB Infocom Ltd.  
Computer Power Inc.  
Dahl Co. Inc., Peter  
Telefunken Sendertechnik GmbH

**TRANSLATORS/TRANSPOSERS**

F FM radio; T TV.  
**Acrodyne** . . . . . T  
Advent Communications, Ltd. . . . . F  
Bext Inc. . . . . F  
Cemlys S.A. . . . . F  
Comad Communications Ltd. . . . . F/T  
DB Elettronica Telecomunicazioni . . . . . F/T  
Elenos . . . . . F



ELIT-Elettronica Italiana S.p.A. . . . . F/T  
EMCEE Broadcast Products . . . . . T  
Energy-Onix . . . . . F  
FUBA Communication Hans Kolbe . . . . . F/T  
Hero Communications . . . . . T  
Richard Hirschmann GmbH . . . . . T  
**ITAME, S.A.** . . . . . F  
ITELCO S.p.A. . . . . F/T



ITS Corp. . . . . T  
J&L Associates . . . . . F/T  
LDL Communications, Inc. . . . . T  
Loma Scientific . . . . . T  
Marti Electronics . . . . . F  
Microwave Solutions Inc. . . . . F  
Nexus Engineering Corp. . . . . F/T  
QEI Corp. . . . . F  
Shively Labs Div. of Howell Labs, Inc. . . . . F  
Teko Telecom S.R.L. . . . . F/T  
Telefunken Sendertechnik GmbH . . . . . F



**Television Technology Corp.** . . . . . F/T  
Tepco Corp. . . . . F/T  
TFT Inc. . . . . F  
**Thomson-LGT** . . . . . F/T

**TRANSMISSION LINE, WAVEGUIDE**

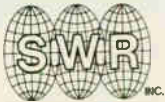
Andrew Corp.  
Cablewave Systems  
Comark Communications.



Dielectric Communications  
EMCEE Broadcast Products  
Gabriel Electronics Inc.  
GE-Marconi Communication Ltd.  
J&L Associates  
Loral Microwave-Narda  
**Micro Communications, Inc.**  
Microflect Co., Inc.  
Microwave Development Labs, Inc.



MYAT, Inc.  
Nucomm Inc.  
RF Technology, Inc.  
Shively Labs Div. of Howell Labs, Inc.  
SIRA s.r.l.



SWR Inc.  
Telefunken Sendertechnik GmbH  
Tenco Tower Co.

**TRANSMITTER REMOTE CONTROL, TELEMETRY**

Includes transmitter logging systems.

ABB Infocom Ltd.  
Advent Communications, Ltd.  
Broadcast Electronics, Inc.  
Burk Technology, Inc.  
**Continental Electronics Corp.**  
DB Elettronica Telecomunicazioni S.p.A.  
Elenos  
Energy-Onix  
**Gentner Electronics Corp.**  
Hallikainen & Friends, Inc.  
Harris Allied Broadcast Equipment  
**ITAME, S.A.**  
ITELCO S.p.A.  
Logica Space & Comm./Broadcast  
Marti Electronics  
Micro Controls, Inc.  
Moseley Associates, Inc.  
RF Industries  
Telefunken Sendertechnik GmbH  
Texar/Gentner Electronics  
TFT Inc.

**TRANSMITTERS, RADIO/TV**

A AM/SW radio; F FM radio; T UHF/VHF TV; L Laser

ABB Infocom Ltd. . . . . A  
**Acrodyne** . . . . . T  
American Laser Systems . . . . . L  
Beaveronics . . . . . F  
Bextl Inc. . . . . F/T  
Broadcast Electronics, Inc. . . . . F  
Broadcast Microwave Services, Inc. . . . . F  
Catal Telecommunications . . . . . A/F/T  
CCA Electronics, Inc. . . . . A/F  
Cemys S.A. . . . . A/F  
Comad Communications Ltd. . . . . F/T  
Comark Communications/Thomson-CSF . . . . . T  
Comwave/Communications Microwave . . . . . T  
**Continental Electronics Corp.** . . . . . A/F  
DB Elettronica Telecomunicazioni S.p.A. . . . . F/T  
Elcom Bauer . . . . . A/F  
Elenos . . . . . F



ELIT-Elettronica Italiana S.p.A. . . . . F/T  
EMCEE Broadcast Products . . . . . T  
Energy-Onix . . . . . A/F  
FUBA Communications/Hans Kolbe . . . . . F/T  
GE-Marconi Communication Ltd. . . . . A/F/T  
GE Support Services/RCA Broadcast . . . . . F/T  
Harris Allied Broadcast Equipment . . . . . A/F/T

Hero Communications . . . . . T  
Richard Hirschmann GmbH . . . . . T



**ITAME, S.A.** . . . . . A/F  
ITELCO S.p.A. . . . . T

**ITS CORPORATION**  
information transmission systems

ITS Corp. . . . . T  
J&L Associates . . . . . A/F/T  
LDL Communications . . . . . T  
Loma Scientific . . . . . T  
LPB Inc. . . . . A  
McMartin Inc. . . . . A/F  
Micro Controls, Inc. . . . . F  
Nautel Maine Inc. . . . . A/F  
Nexus Engineering Corp. . . . . F/T  
Pauza & Co., Ltd . . . . . T  
QEI Corp. . . . . F  
Radio Systems Inc. . . . . A  
RIZ Transmitter Factory . . . . . A/F  
**Rohde & Schwarz** . . . . . A/F/T  
Siel Sistemi Elettronici SRL . . . . . F  
Singer Products, Inc. . . . . A/F  
Spectrum Communications Corp. . . . . F  
Supercircuits . . . . . T  
Swintek Enterprises, Inc. . . . . F  
Teko Telecom S.R.L. . . . . F/T  
Telefunken Sendertechnik GmbH . . . . . A/F/T



**Television Technology Corp.** . . . . . F/T  
TFT Inc. . . . . F  
**Thomson-LGT** . . . . . F/T  
Toshiba Corp. . . . . T

**TUBES, ELECTRON**

R Rectifier, tube, solid-state; P RF power devices, tube, solid-state; K Klystron, TWT, Klystrode, IOT

ABB Infocom Ltd. . . . . R/P  
Advent Communications . . . . . K  
Astroguide International . . . . . K  
**BURLE INDUSTRIES** . . . . . P  
California Tube Lab Inc. . . . . R/K  
Comark Comm./Thomson-CSF . . . . . P/K  
DB Elettronica Telecomunicazioni . . . . . R/P  
Econco . . . . . P/K  
**EEV** . . . . . R/P/K  
Geleco Electronics Ltd. . . . . R/P  
J&L Associates . . . . . R/P/K  
McMartin Inc. . . . . R  
Pauza & Co., Ltd. . . . . P/K  
Philips Components . . . . . R/P/K  
Richardson Electronics, Ltd. . . . . R/P/K  
Thomson Electron Tube & Devices . . . . . P  
Thomson Tubes Electroniques . . . . . P/K  
Varian Associates . . . . . P/K  
Varian Assoc./Power Grid, X-Ray Products P

**VACUUM CONTACTORS**

Geleco Electronics Ltd.  
Kintronics Labs, Inc.  
Richardson Electronics, Ltd.

**Automation & Computer Products**

**BAR CODE EQUIPMENT**

And supporting software.  
Adelaide Works Inc.

BASYS Automation Systems  
Computer Assisted Technologies  
Ensemble Designs  
Evertz Microsystems Ltd.  
Multidyne Electronics, Inc.  
Nesbit Systems Inc.  
Skotel Corp.  
Swintek Enterprises, Inc.  
Xymox Systems

**BUSINESS & STATION AUTOMATION**

Systems and supporting software for B business and S station automation

ABB Infocom Ltd. . . . . S  
AGAP . . . . . S  
Alamar Electronics USA, Inc. . . . . S  
American Broadcast Systems . . . . . S  
Antex Electronics . . . . . S  
Asaca/Shibasoku Corp. of America . . . . . S  
Audio Design . . . . . S  
BASYS . . . . . S  
Broadcast Electronics, Inc. . . . . S  
BTS Broadcast Television Systems . . . . . S  
ChronTrol Corp. . . . . S  
CBSI-Custom Business Systems, Inc. . . . . B  
Columbine Systems, Inc. . . . . B/S  
Computer Concepts Corp. . . . . B/S  
Concept Productions . . . . . S  
Datacount, Inc. . . . . B/S  
DKW Systems . . . . . S  
EDS Portaprompt Ltd. . . . . S  
FloriCal Systems, Inc. . . . . S  
IGM Communications . . . . . S  
Logica Space & Comm. Broadcast . . . . . S  
Leonardo Software . . . . . B  
MacroMedia Design . . . . . B/S  
McCurdy Radio Industries . . . . . S  
Media Computing, Inc. . . . . S  
Modern Media Consulting . . . . . S  
Multidyne Electronics, Inc. . . . . B/S  
Nesbit Systems Inc. . . . . B/S  
**Odetics** . . . . . S  
PKE International . . . . . B/S  
Racom Broadcast Ltd. . . . . B/S  
Radamec EPO Ltd. . . . . S  
Ramko Research . . . . . S  
Richmond Sound Design, Ltd. . . . . S  
Schafer World Communications Corp. . . . . S  
**Schmid Telecom AG** . . . . . S  
**Sony Business & Professional** . . . . . B  
Systemation Corp. . . . . B/S  
Texar/Gentner . . . . . S  
The Management . . . . . B/S  
Time Logic, Inc. . . . . S  
TM Century, Inc. . . . . S  
Utah Scientific, Inc. . . . . S  
Video Data Systems . . . . . S  
Videomedia, Inc. . . . . S  
Vistek Electronics Ltd. . . . . S  
Xymox Systems . . . . . B/S

**COMMERCIAL INSERTION SYSTEMS**

VCR sequencing systems; includes control, switching for video, audio signals for LPTV, CATV, etc.

Alamar Electronics USA, Inc.  
Antex Electronics  
Asaca/Shibasoku Corp. of America  
BASYS Automation Systems  
Channelmatic, Inc.  
DNF Industries  
EMCEE Broadcast Products  
FloriCal Systems, Inc.  
Matco Mfg. & Test Co.  
Monroe Electronics, Inc.  
Nexus Engineering Corp.  
**Odetics Broadcast**  
Panasonic Communications & Systems  
T.R. Pitts Co.  
Solutec Ltd. (H.A.)  
Tech Electronics, Inc.  
Texscan MSI  
Video Data Systems  
Vistek Electronics Ltd.

**COMPUTERS & PERIPHERALS**

Includes PCs, VDT terminals, touch-screen control adaptations; engineering management, maintenance and non-production software.

Adrienne Electronics Corp.  
Advanced Designs Corp.  
AGAP  
Artel Communications Corp.  
Aydin Controls  
B&B Electronics Mfg., Co.  
BASYS Automation Systems  
Columbine Systems, Inc.  
Comprompter, Inc.  
Computer Concepts Corp.  
Computer Power Inc.  
J.E. Cuesta & Co. Inc.  
Dalanco Spry  
DKW Systems  
Dotronix, Inc.

**Full Compass Systems, Ltd.**

Gefen Systems  
Harrison by GLW  
Hewlett-Packard Co.  
JLCooper Electronics  
Lazerus  
Luxor Corp.  
MacroMedia Design  
Media Computing, Inc.  
Micro Express  
Modern Media Consulting  
Modgraph, Inc.  
Multidyne Electronics, Inc.  
PKE International  
Racom Broadcast Ltd.  
Recortec, Inc.  
Richmond Sound Design, Ltd.  
Systemation Corp.  
Tamron Industries Inc.  
Texar/Gentner Electronics  
The Management  
Tripp Lite  
Visionetics International  
Xymox Systems

**CONTROLLERS, SIGNAL ACTIVATED**

Includes tone encoding, decoding equipment.

AGAP  
AMX Corp.  
Astroguide International  
Broadcast Automation, Inc.  
Channelmatic, Inc.  
Computer Concepts Corp.  
GDI  
Leightronix, Inc.  
MacroMedia Design  
Monroe Electronics, Inc.  
**Schmid Telecom AG**  
Solutec Ltd. (H.A.)  
Texar Ltd.  
Video Data Systems  
Videoquip Research Ltd.  
Visionetics International  
Vortex Communications

**ENGINEERING SOFTWARE**

CAD, diagnostics, maintenance  
AGAP  
American Small Business Computers  
Ariel Corp.  
Audio Tekology Inc.  
Autodesk/Multimedia Div.  
BAI Systems, Inc.  
Carvin  
Computer Assisted Technologies  
Delta Electronics Inc.  
Design CAD Inc.  
EDX Engineering, Inc.  
Gotham Audio Corp.  
Jensen Transformers Inc.  
MPB Technologies Inc.  
OrCad  
Renkus-Heinz, Inc.

**Rohde & Schwarz**

David Taylor Software  
Vac Systems Corp.  
Video Design Pro  
Visionetics International

**NEWSROOM AUTOMATION**

Dedicated, PC-based, supporting software packages.

Asaca/Shibasoku Corp. of America  
BASYS Automation Systems  
Columbine Systems, Inc.  
Comprompter, Inc.  
Computer Prompting Corp.  
Corporate Computer Systems  
DKW Systems

**Leitch Inc.**

MacroMedia Design  
Media Computing, Inc.  
MPB Technologies Inc.  
Multidyne Electronics, Inc.  
PKE International  
Ramko Research  
**Sony Business & Professional Group**  
Texar Ltd.  
Vistek Electronics Ltd.  
Wynford Technologies Inc.

**PLAYBACK AUTOMATION**

Audio/radio systems.

AEV  
AGAP  
Alamar Electronics USA, Inc.  
Alpha Audio  
Asaca/Shibasoku Corp. of America  
BASYS Automation Systems  
Broadcast Automation, Inc.  
Broadcast Electronics, Inc.  
Computer Concepts Corp.  
Concept Productions  
Conex Electro Systems  
Corporate Computer Systems  
DKW Systems  
Gefen Systems  
Harrison by GLW  
IGM Communications  
Leonardo Software  
MacroMedia Design  
Matco Mfg. & Test Co.  
PKE International  
Racom Broadcast Ltd.  
Richmond Sound Design, Ltd.  
Sentry Systems  
**Sierra Automated Systems**  
Systemation Corp.  
The Management  
360 Systems  
Time Logic, Inc.  
TM Century, Inc.  
Video Data Systems  
Vistek Electronics Ltd.

**RECORD/PLAYBACK AUTOMATION**

Video/TV systems

Alamar Electronics USA, Inc.  
American Broadcast Systems  
Asaca/Shibasoku Corp. of America  
BASYS Automation Systems  
BTS GmbH  
Dwight Cavendish Co.  
Channelmatic, Inc.  
Cycle-Sat, Inc.  
DKW Systems  
DNF Industries  
FloriCal Systems, Inc.  
Harrison by GLW  
Leightronix, Inc.  
**Leitch Inc.**  
Logica Space & Comm./Broadcast  
Matco Mfg. & Test Co.  
Media Computing, Inc.  
Merlin Engineering Works, Inc.  
MPB Technologies Inc.  
Nexus Engineering Corp.  
**Odetics Broadcast**  
**Panasonic Broadcast Systems Co.**

**Sony Business & Professional Group**

Systemation Corp.  
Tech Electronics, Inc.  
Texscan MSI  
Time Logic, Inc.  
Video Data Systems  
Videoquip Research Ltd.  
Vistek Electronics Ltd.

# Test & Measurement, Maintenance

**ANALYZERS, AUDIO SYSTEM**

includes distortion measurement and automated test systems.

Amber Electro Design  
Ariel Corp.  
Asaca/Shibasoku Corp. of America  
ASC-Tube Traps  
**Audio Precision**  
Audiocontrol Industrial  
Boland Communications  
Boonton Electronics Corp.  
Broadcast Electronics, Inc.  
Brüel & Kjær A/S  
Canford Audio plc  
Consultronics  
Danbridge A/S  
Dorrough Electronics  
Gauss  
Gotham Audio Corp.  
Hewlett-Packard Co.  
Hybrid Arts, Inc.  
Ivive Technologies, Inc.  
Jasoni Electronics  
Klark-Teknik  
**Leader Instruments Corp.**  
MicroAudio, Inc.  
Neutrik USA, Inc.  
Potomac Instruments, Inc.  
RE Broadcast  
ROH Products  
**Rohde & Schwarz**  
**Schmid Telecom AG**  
Sescom, Inc.  
Sound Technology  
Symetrix Inc.  
TC Electronic  
**Tektronix Inc.**  
TFT Inc.  
Titus Technological Labs  
Wandel & Goltermann EMT

**ANALYZERS, RF SPECTRUM & SIDEBAND**

Astroguide International  
**AVCOM of Virginia, Inc.**  
B&K Precision Maxtec International Corp.  
Delta Electronics Inc.  
Hemec Communications  
Hero Communications  
Hewlett-Packard Co.  
Motorola Land Mobile Products Sector  
**Rohde & Schwarz**  
Stanford Research Systems  
**Tektronix Inc.**  
Trilithic, Inc.  
Wandel & Goltermann EMT  
White Instruments Div./C Van R, Inc.

**ANALYZERS, VIDEO SYSTEM**

includes automated test systems.

Boland Communications  
FloriCal Systems, Inc.  
FM Systems, Inc.  
Richard Hirschmann GmbH

**Leitch Inc.**

**PESA America Inc.**  
**Plateau Digital Technology**  
**Rohde & Schwarz**  
System Video  
**Tektronix Inc.**  
Videotek, Inc.

**ANTENNA IMPEDANCE BRIDGES**

Delta Electronics Inc.  
Eagle Wichita  
MFJ Enterprises Inc.  
**Rohde & Schwarz**  
Trilithic, Inc.  
Wide Band Engineering Co., Inc.

**AUDIO GENERATORS**

Stand-alone systems.

Amber Electro Design  
Asaca/Shibasoku Corp. of America  
**Audio Precision**  
Audiocontrol Industrial  
Avitel Electronics Corp.  
B&K Precision Maxtec International Corp.  
Boonton Electronics Corp.  
Brüel & Kjær A/S  
Conex Electro Systems  
Consultronics  
Danbridge A/S  
Delta Electronics Inc.  
Hewlett-Packard Co.  
JNS Electronics, Inc.  
**Leader Instruments Corp.**  
**Leitch Inc.**  
Lyrec Mfg. A/S  
Multidyne Electronics, Inc.  
Neutrik USA, Inc.  
NTP Elektronik A/S  
Potomac Instruments, Inc.  
Pro-Bell Ltd.  
**Rohde & Schwarz**  
**Schmid Telecom AG**  
Stanford Research Systems  
**Tektronix Inc.**  
Vortex Communications

**BENCH POWER SUPPLIES**

B&K Precision Maxtec International Corp.  
Behlman Electronics AstroSystems  
Calex Mfg. Co., Inc.  
Computer Power Inc.  
J.E. Cuesta & Co. Inc.  
Hewlett-Packard Co.  
**Leader Instruments Corp.**  
Multidyne Electronics, Inc.  
Plastic Capacitors, Inc.  
Sorensen Co./Switchcraft  
Stanford Research Systems  
**Tektronix Inc.**

**DEMODULATORS, TV PRECISION**

Asaca/Shibasoku Corp. of America  
Modulation Sciences  
Philips TV Test Equipment  
QSI Systems, Inc.  
**Rohde & Schwarz**  
**Tektronix Inc.**  
Videotek, Inc.

**DETECTORS, NON-IONIZING RADIATION**

Holiday Industries, Inc.  
Loral Microwave-Narda

**DIGITAL DIAGNOSTIC SYSTEMS**

B&B Electronics Mfg., Co.  
Broadcast Electronics, Inc.  
Computer Power Inc.  
**Plateau Digital Technology**  
Telecommunications Techniques Corp.  
Vac Systems Corp.

**FREQUENCY COUNTERS**

B&K Precision Maxtec International Corp.  
Beckman Industrial/Instrumentation Products

Black Star Ltd.  
Coaxial Dynamics  
EIP Microwave, Inc.  
John Fluke Mfg. Co. Inc.  
Hewlett-Packard Co.  
**Leader Instruments Corp.**  
Sescom, Inc.  
Simpson Electric  
Stanford Research Systems  
**Tektronix Inc.**  
Tremetrics Inc. Industrial Instruments

**METERS, AC/POWER PHASE**

Biddle Instruments  
Dranzet Technologies, Inc.  
**Rohde & Schwarz**  
Simpson Electric  
**Tektronix Inc.**

**METERS, AUDIO LEVEL INDICATOR**

Alphaton  
**ATI-Audio Technologies Inc.**  
B&B Systems, Inc.  
Benchmark Media Systems, Inc.  
Beyer Dynamic Inc.  
Boland Communications  
BPI/Porta-Pattern  
Brüel & Kjær A/S  
Dwight Cavendish Co.  
Consultronics  
D&R Electronica b.v.  
D1 International Inc.  
Dorrough Electronics  
Electronic Systems Labs, Inc.  
ESE  
FM Systems, Inc.  
Furman Sound, Inc.  
Hamlet Video International Ltd.  
Inovonics Inc.  
**Leader Instruments Corp.**  
**Logitek Electronic Systems, Inc.**  
McCurdy Radio Industries  
NTP Elektronik A/S  
Radio Systems Inc.  
Scantex Labs Inc.  
Selco Products Co.  
Sescom, Inc.  
Simpson Electric  
Solutec Ltd. (H.A.)  
Symetrix Inc.  
Target Technology  
**Tektronix Inc.**  
Titus Technological Labs  
Videoquip Research Ltd.  
Videotek, Inc.  
Ward-Beck Systems, Ltd.  
Wohler Technologies, Inc.  
World Video Inc.

**METERS, DVMS, DMMs, VOM**

B&K Precision Maxtec International Corp.  
Beckman Industrial/Instrumentation Products  
Black Star Ltd.  
Brüel & Kjær A/S  
J.E. Cuesta & Co. Inc.  
Dranzet Technologies, Inc.  
Fieldpiece Instruments  
John Fluke Mfg. Co. Inc.  
Hewlett-Packard Co.  
**Leader Instruments Corp.**  
Outland Technology Inc.  
**Rohde & Schwarz**  
Simpson Electric  
A.W. Sperry Instruments Inc.  
**Tektronix Inc.**

**METERS, FIELD STRENGTH, RF LEVEL**

R.B. Annis Co.  
Bird Electronic Corp.  
Coaxial Dynamics  
J.E. Cuesta & Co. Inc.  
Holiday Industries, Inc.  
Kathrein-Werke KG  
**Leader Instruments Corp.**  
T.R. Pitts Co.

# GALAXY

## ITAME'S 1 + N FORMULA



**GALAXY GE90 STEREO ENCODER** Because of its digital technology, the GALAXY GE90 stereo encoder provides state-of-the-art performance.



**GALAXY EX20 FM EXCITER** ITAME's experience in exciters, combined with the application of new technologies—such as digital generation of direct frequency—results in the optimum specifications and performance of these units.



**GALAXY RT20 REBROADCAST TRANSMITTER** This unit combines a professional quality synthesized receiver—with excellent sensitivity and low noise level—and an EX20 exciter.



**GALAXY EP100 POWER STAGE**

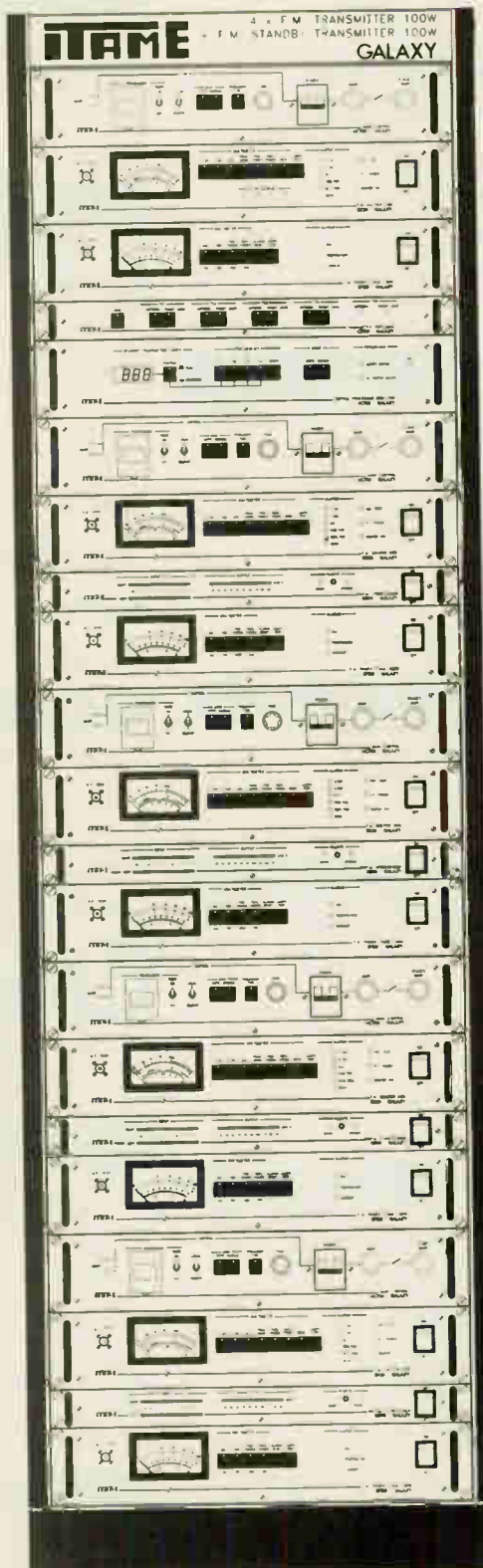


**GALAXY EP500 POWER STAGE**



**GALAXY EP600 POWER STAGE**

The new GALAXY series wide-band power amplifiers are equipped with the latest (MOSFET) technology to assure *reliability, durability and simplicity*, with excellent performance and minimum excitation. They are stand-alone units, fitted with a complete measurement, indication and protection system. Standard equipment includes remote measurement, remote control and remote indication. Because of their broad bandwidth (87.5-108 MHz) they do not require any adjustment in order to operate at any frequency in compliance with CCIR and FCC standards.



### EXAMPLE OF A GALAXY N+1 SYSTEM CONFIGURATION

#### EQUIPMENT:

4 100-W FM transmitters + 1 100-W standby transmitter (could also be 300 or 600 W).

See how we can solve a specific need.

This configuration can carry four simultaneous programs, with one in reserve to be used as needed for any of the active channels.

Each program has a complete transmitter consisting of:

- 300-W power stage
- EX20 exciter
- GE90 stereo encoder
- MC708 control unit

A transmitter consisting of the following equipment acts as the standby unit:

- 300-W power stage
- Four-frequency exciter
- PC702 central processor
- CT709 transmitter switching unit
- NC708 control unit

The GALAXY series is new on the market and is available with a system of options:

- Summing networks
- Control units
- Switching units
- N+1 exciters, etc.

*This example can cover any program, power and backup contingency.*

## Because stations change...

Circle (14) on Reply Card



c. Campezo s.n. Pol. Ind. Las Mercedes  
28022 MADRID, SPAIN  
Tel: (34-1) 747 74 44 Fax: (34-1) 747 75 07  
Telex: 28257 ITAME

Potomac Instruments, Inc.  
**Rohde & Schwarz**  
 Simpson Electric  
 Trilithic, Inc.

**METERS, PHOTOGRAPHIC LIGHT**

Includes monitor color balance measurement, adjustment systems.

Birns & Sawyer Inc.  
 Dorough Electronics  
 Minolta Corp. Industrial Meter Div.  
 Philips TV Test Equipment

**METERS, RF POWER**

Bird Electronic Corp.  
 Boonton Electronics Corp.  
 Coaxial Dynamics  
 J.E. Cuesta & Co. Inc.  
 Dranetz Technologies, Inc.  
 Hewlett-Packard Co.  
 Loral Microwave-Narda  
 MFJ Enterprises Inc.  
**Rohde & Schwarz**  
 Simpson Electric

**MODULATION MONITORS**

AM, FM radio, TV aural  
**Belar Electronics Lab, Inc.**  
 Boonton Electronics Corp.  
 Broadcast Electronics, Inc.  
 Delta Electronics Inc.  
 FM Systems, Inc.  
 Harris Allied Broadcast Equipment  
 Hewlett-Packard Co.  
 Inovonics Inc.  
**ITAME, S.A.**  
 JNS Electronics, Inc.  
 Kahn Communications, Inc.  
 Marcom  
 Modulation Sciences  
 Motorola Inc. AM Stereo  
 QEI Corp.  
**Rohde & Schwarz**  
**Tektronix Inc.**  
 TFT Inc.  
 VG Electronics Ltd.

**OSCILLOSCOPES, ACCESSORIES**

American Laser Systems  
 B&K Precision Maxtec International Corp.  
 Beckman Industrial Instrumentation Products  
 Black Star Ltd.  
 Dranetz Technologies, Inc.  
 John Fluke Mfg. Co. Inc.  
 Hewlett-Packard Co.  
 Hitachi Denshi America, Ltd.  
**Leader Instruments Corp.**  
**Rohde & Schwarz**  
 S.A.V.  
 Sescom, Inc.  
 Sperry Instruments Inc., A. W.  
**Tektronix Inc.**  
 Test Probes, Inc.  
 Vortex Communications

**RECORDER TEST SYSTEMS**

Excludes general categories of distortion analyzer, audio generator, level, noise measurement equipment; includes tension and alignment products; T tension alignment gauges

Amber Electro Design  
 R.B. Annis Co.  
 Asaca/Shibasaku Corp. of America  
**Audio Precision**  
 Brüel & Kjær Instruments, Inc.  
 Gauss  
 Hybrid Arts, Inc.  
**Rohde & Schwarz**  
 Tentel

**RF GENERATORS**

Stand-alone; excludes products designed used as part of a transmitter.  
 Boonton Electronics Corp.

John Fluke Mfg. Co. Inc.  
 Hewlett-Packard Co.  
 JNS Electronics, Inc.  
**Kay Elemetrics Corp.**  
**Leader Instruments Corp.**  
**MCL, Inc.**  
 Potomac Instruments, Inc.  
**Rohde & Schwarz**  
 Stanford Research Systems  
 Trilithic, Inc.

**RF LOAD RESISTORS & DUMMY LOADS**

Altronic Research Inc.  
 AVA Electronics Corp.  
 Bird Electronic Corp.  
 Coaxial Dynamics  
 Dielectric Communications  
 Electro Impulse Lab, Inc.  
 GE-Marconi Communication Ltd.  
 Harris Allied Broadcast Equipment  
**ITAME, S.A.**  
 JFW Industries  
 Kintronic Labs, Inc.  
 Loral Microwave-Narda  
 MFJ Enterprises Inc.  
 Penstock, Inc.  
**Rohde & Schwarz**  
 UTE Microwave, Inc.  
 Wide Band Engineering Co., Inc.

**SC/H PHASE MEASUREMENT & DISPLAYS**

excludes waveform vector monitors with SC/H phase measurement capability.

Alphaton  
 BPI/Porta-Pattern  
 Hamlet Video International Ltd.  
 Icon Electronics Corp.  
**Leitch Inc.**  
**Plateau Digital Technology**  
**Rohde & Schwarz**  
 Sigma Electronics, Inc.  
 System Video  
 Vortex Communications

**TIME DOMAIN REFLECTOMETERS**

Beckman Industrial Instrumentation Products  
 Biddle Instruments  
 Delta Electronics Inc.  
 Riser-Bond Instruments  
 Siecor Corp.  
**Tektronix Inc.**

**VECTORSOPES**

Electronic Visuals Ltd.  
 James Grunder & Associates  
 Hamlet Video International Ltd.  
 Hitachi Denshi America, Ltd.  
**Leader Instruments Corp.**  
 Magni Systems, Inc.  
 Philips TV Test Equipment  
**Plateau Digital Technology**  
 S.A.V.  
 Snell & Wilcox  
 System Video  
**Tektronix Inc.**  
 Videotek, Inc.

**VIDEO GENERATORS**

Pattern, blackburst, color bar; includes programmable systems.  
 B&K Precision Maxtec International Corp.  
 Black Star Ltd.  
 Boland Communications  
 BPI/Porta-Pattern  
 Brabury International  
 Colorado Video Inc.  
 Ensemble Designs  
 ESE  
 John Fluke Mfg. Co. Inc.  
**FOR.A Corp. of America**  
 Horita Co.  
 Icon Electronics Corp.  
**Leader Instruments Corp.**  
**Leitch Inc.**

Magni Systems, Inc.  
 Multidyne Electronics, Inc.  
 Optical Electronics  
**PESA America Inc.**  
 Philips TV Test Equipment  
 QSI Systems, Inc.  
**Rohde & Schwarz**  
 Sigma Electronics, Inc.  
 System Video  
**Tektronix Inc.**  
 Video Accessory Corp.  
 Videotek, Inc.  
 Vortex Communications

**VSWR INDICATORS, DETECTORS**

Bird Electronic Corp.  
 Electronics Research Inc.  
 Loral Microwave-Narda  
 MFJ Enterprises Inc.  
**Rohde & Schwarz**  
 Shively Labs Div. of Howell Labs, Inc.  
 Wide Band Engineering Co., Inc.

**WAVEFORM MONITORS**

Electronic Visuals Ltd.  
 James Grunder & Associates  
 Hamlet Video International Ltd.  
 Hewlett-Packard Co.  
 Hitachi Denshi America, Ltd.  
**Leader Instruments Corp.**  
 Magni Systems, Inc.  
 Philips TV Test Equipment  
**Plateau Digital Technology**  
 S.A.V.  
 Snell & Wilcox  
 System Video  
**Tektronix Inc.**  
 Videotek, Inc.

**Ancillary & Support Products**

**ACOUSTIC MATERIALS**

Acoustic Systems  
**Acoustical Solutions**  
**Alpha Audio Acoustics**  
 ASC-Tube Traps  
 AZ-USA, Inc.  
 Canford Audio plc  
 Industrial Acoustics Co.  
 Lakeside Associates Inc.  
 Ram Broadcast Systems



RPG Diffusor Systems, Inc.  
 Sonex-Source  
 Systems Development Group  
 3M Sound Products

**ATTENUATORS, FIXED, IMPEDANCE MATCHING**

Allen Avionics, Inc.  
 AVA Electronics Corp.  
 Bird Electronic Corp.  
 Danbridge A/S  
 Har-Ken Specialties  
 JFW Industries  
 Kintronic Labs, Inc.  
 Matthey Electronics  
 Penstock, Inc.  
 Russco Electronics Mfg. Inc.  
 Shallco, Inc.  
 Tech Labs Inc.  
 Trilithic, Inc.  
 Wide Band Engineering Co., Inc.

**BATTERIES**

Chargers, analyzers, reconditioners  
 Alexander Batteries



Anton Bauer, Inc.  
 Birns & Sawyer Inc.  
 Christie Electric Corp.  
 Cine 60, Inc.  
 Computer Power Inc.  
 J.E. Cuesta & Co. Inc.  
 Dynamote Corp.  
 Energex Systems Corp.  
 Frezzolini Electronics, Inc.  
 G&M Power Products, Inc.  
 Gray Supply Co.  
 HM Electronics  
 Indus-Tool  
 Lamp Technology Inc.  
 Motorola Inc. Land Mobile Products Sector  
 PAG Ltd.  
 Periphex Inc.  
 PERROTT Engineering Labs Inc.  
 T.R. Pitts Co.  
 Pro Battery Co. Inc.  
 Professional Sound Corp.  
 Reliance Comm/Tec  
 Synergistic Batteries Inc.  
 Tungstone Batteries Inc.  
 VDO-PAK  
 Whirlwind

**BLOWERS FANS**

Ventilation products; includes facilities air-conditioning systems.  
 Amco Engineering Co.  
 Cabron Systems Inc.  
 J.E. Cuesta & Co. Inc.  
 Emcor Products Crenlo, Inc.  
 Ergo Industries  
 General Devices Co., Inc.  
 Winsted Corp.

**CAPACITORS, HV**

ABB Infocom Ltd.  
**EEV**  
 Motor Capacitors, Inc.  
 Plastic Capacitors, Inc.  
 Surcom Associates, Inc.

**CARTS, A/V EQUIPMENT UTILITY**

Advance Products Co.  
 Apollo Audio Visual/Lighting  
 Birns & Sawyer Inc.  
 Bretford Mfg., Inc.  
 Canford Audio plc  
 Cine 60, Inc.  
 Ergo Industries  
 Ferno Salesmaker Ferno-Washington, Inc.  
 Luxor Corp.  
 Nalpak Video Sales Inc.  
 Neumade Products Corp.  
 Peerless Sales Co.  
 Professional Sound Corp.  
 Research Technology International  
 Tek Media Supply Co.  
 3M Professional A/V & Specialty Products  
 3M Sound Products  
 Winsted Corp.

**CASES, EQUIPMENT TRANSPORT**

Aarmor Case Co.  
 Anvi Cases (Subsidiary of Zero Corp.)  
 Broadcast Marketing International  
 Calzone Case Co.  
 Canford Audio plc  
 Cine 60, Inc.  
 EDAK  
 Hardigg Cases  
 Island Cases  
 K&H Products Ltd.-Porta Brace  
 Karl Heitz, Inc.  
 Keystone Metal Products, Inc.  
 Lowel-Light Mfg. Inc.  
 MicroFone  
 Nalpak Video Sales Inc



**He is manageable, easy to catch, simple to cut-out  
and can be quickly put into place without costing an arm and a leg**

Picturebox is the most powerful, versatile and cost-effective still store on the market.

A single station can handle thousands of images with fast, efficient picture management and complete on-air control.

What's more, it can frame grab, produce floating graphics and expand to meet any requirements. It is the definitive system for a new age of stills presentation.

Go on, catch one today.

**PICTUREBOX**



Quantel Inc. 85 Old Kings Highway North, Darien, CT 06820

Circle (15) on Reply Card

World Radio History

Neumade Products Corp.  
O'Connor Engineering  
Ram Broadcast Systems  
Reliance Plastics & Packaging Div.  
Sachtler Corp. of America  
Star Case Mfg. Co., Inc.  
Telepak San Diego  
Thermodyne International  
Tiffen Mfg. Corp.  
Viking Cases

**CHEMICALS**

Cleaning, conditioning treatment products.  
CAIG Labs, Inc.  
DW Electrochemicals Ltd.  
Geneva Group of Companies, Inc.  
Lipsner-Smith Co.  
Mitchell Co. Inc., E.C.  
ORA Electronics  
Ram Broadcast Systems  
Research Technology International  
Tayo Industries  
Tek Media Supply Co.  
3M Sound Products

**CLOCKS**

Master, synchronized studio clocks, timers.  
BAI Systems, Inc.  
Beaveronics, Inc.  
BPI/Porta-Pattern  
Broadcast Automation, Inc.  
Canford Audio plc  
ChronTrol Corp.  
CRL Systems-Circuit Research Labs, Inc.  
DYMA Engineering, Inc.  
EELA Audio  
ESE  
Evertz Microsystems Ltd.  
**Leitch Inc.**  
MacroMedia Design  
maney\_logic  
QSI Systems, Inc.  
Radio Systems Inc.  
Ram Broadcast Systems  
Richmond Sound Design, Ltd.  
Seem Audio A/S  
Time Service Systems Inc.  
TOA Electronics, Inc.  
Torpey Controls & Eng. Ltd.  
Vortex Communications  
Ward-Beck Systems, Ltd.  
World Video Inc.

**COAXIAL CABLE**

RF, video; excludes transmission line products rated greater than 1kW.  
Alpha Wire Corp.  
Andrew Corp.  
Arcor Broadcast Products  
Astroguide International  
AVA Electronics Corp.  
Bi-Tronics, Inc.  
C.A.E.  
**Canare Cable, Inc.**  
Canford Audio plc  
Chester Audio & Video Cable/Alcatel  
Clark Wire & Cable  
Comark Communications.  
Connectronics Corp.  
**Cooper Industries/Benden**  
DYMA Engineering, Inc.  
Gabriel Electronics Inc.  
Hero Communications  
Magnavox CATV Systems, Inc.  
Marshall Electronics  
**Mohawk Wire & Cable Corp.**  
MTC/Mycomp Technologies Corp.  
Nemal Electronics International  
T.R. Pitts Co.  
Shively Labs Div. of Howell Labs, Inc.  
Tenco Tower Co.  
Trompeter Electronics, Inc.  
Western Electronic Products  
Wireworks Corp.

**COMPONENTS, ELECTRONIC**

Resistors capacitors inductors  
solid-state devices panel indicators.  
Allen Avionics, Inc.  
Alpha Wire Corp.  
Altronic Research Inc.  
AT&T Microelectronics  
C.A.E.  
Calex Mfg. Co., Inc.  
Comark Communications.  
Computer Power Inc.  
**EEV**  
Gennum Corp.  
Kintronic Labs, Inc.  
Lamp Technology Inc.  
Ledtronics, Inc.  
McMartin Inc.  
Motor Capacitors, Inc.  
Norlake Mfg. Co.  
ORA Electronics  
Penstock, Inc.  
T.R. Pitts Co.  
Richardson Electronics, Ltd.  
Sescom, Inc.  
Target Technology  
**Thomson Broadcast**

**CONNECTORS**

Audio, video, RF, fiber optic  
Alpha Wire Corp.  
AMP  
Andrew Corp.  
Arcor Broadcast Products  
AT&T Microelectronics  
AVA Electronics Corp.  
B&B Electronics Mfg., Co.  
Beyer Dynamic Inc.  
Bi-Tronics, Inc.  
Bird Electronic Corp.  
Blonder-Tongue Labs, Inc.  
C.A.E.  
**Canare Cable, Inc.**  
Canford Audio plc  
Chromatic Technologies  
Comark Communications.  
Connectronics Corp.  
**Cooper Industries/Benden**  
Hero Communications  
ITT Cannon, Canada  
Kings Electronics Co., Inc.  
Lemo USA  
Marshall Electronics  
Nemal Electronics International  
Neutrik USA, Inc.  
OFTI  
ORA Electronics  
Penstock, Inc.  
T.R. Pitts Co.  
Pomona Electronics/ITT  
Reliance Comm/Tec  
RF Industries  
Shively Labs Div. of Howell Labs, Inc.  
Siecor Corp.  
SIRA s.r.l.  
Superior Electric Co.  
Switchcraft Inc.  
Target Technology  
Tenco Tower Co.  
3M Sound Products  
Trompeter Electronics, Inc.  
Union Connector Co., Inc.  
Veam/Litton Systems, Inc.  
Whirlwind  
Wireworks Corp.

**CRYSTAL REFERENCES  
FREQUENCY**

McMartin Inc.  
Motorola Inc. Land Mobile Products Sector  
**Sennhelsler Electronic Corp.**

**FIBER-OPTICEQUIPMENT**

Cable and terminal equipment, laser transmission products and FO STL systems.



**ADC Telecommunications, Inc.**  
American Lightwave Systems, Inc.  
AMP  
Arcor Broadcast Products  
Artel Communications Corp.  
Astroguide International  
AT&T Microelectronics  
Bec Technologies, Inc.  
**BURLE INDUSTRIES, INC.**  
C-COR/COMLUX, Inc  
Catel Telecommunications  
Chromatic Technologies  
**Cooper Industries/Benden**  
DYNAIR Electronics, Inc.  
Fotec, Inc.  
Gotham Audio Corp.  
Grass Valley Group  
Innovision Optics  
Integrated Switching Systems  
**Intralex, Inc.**  
Kathrein-Werke KG  
LNR Communications, Inc.  
Lone Wolf  
Magnavox CATV Systems, Inc.  
**Mohawk Wire & Cable Corp.**  
Nexus Engineering Corp.  
nVision, Inc.  
OFTI  
ORA Electronics  
Orchard Communications Inc.  
**Ortel Corp.**  
T.R. Pitts Co.  
RF Technology, Inc.  
Selco Products Co.  
Siecor Corp.



T-Tech  
3M Professional A/V & Specialty Products  
Veam/Litton Systems, Inc.

**FILM CLEANING, INSPECTION,  
PROCESSING EQUIPMENT**

Birns & Sawyer Inc.  
Lipsner-Smith Co.  
Neumade Products Corp.  
Research Technology International  
Steenbeck, Inc.  
Tamron Industries Inc.  
Tek Media Supply Co.

**FILTERS, VIDEO HUM-REDUCTION**

Allen Avionics, Inc.  
**Audio-Video Engineering**  
BAL  
Beaveronics, Inc.  
Broadcast Video Systems, Ltd.  
Deerfield Laboratory  
Matthey Electronics  
**North Hills Electronics, Inc.**  
Shintron Co., Inc.  
Vortex Communications

**HARDWARE EQUIPMENT  
MOUNTING**

Atlas/Soundolier  
BGW Systems, Inc.  
Black Audio Devices  
Bretford Mfg., Inc.  
Buhl Optical Co.  
Canford Audio plc  
Catamount Mfg. Inc.  
Croma Research Ltd.  
J.E. Cuesta & Co. Inc.  
Emcor Products Crenlo, Inc.  
Ergo Industries  
FSR, Inc.

Furneo S.p.A.  
General Devices Co., Inc.  
GKM Mfg. Corp.  
**Jem-Fab Corp.**  
JNS Electronics, Inc.  
Keystone Metal Products, Inc.  
Lenbar Electronics Corp.  
Lowel-Light Mfg. Inc.  
Matthews Studio Equipment, Inc.  
Newton Instrument Co., Inc.  
Fred A. Nudd Co.  
Peerless Sales Co.  
Pivotelli/USA  
PKE International  
Seam-Teach  
Utility Tower Co.  
Vortex Communications  
Winsted Corp.  
**Zero Stantron Cabinets**

**LABELS, ADHESIVE-BACKED**

Cart, cassette ID, cabling, panel  
Canford Audio plc  
Catamount Mfg. Inc.  
Patch Bay Designation  
3M Professional A/V & Specialty Products  
3M Sound Products  
Winsted Corp.

**LIGHTS, STUDIO ON-AIR WARNING**

Brabury International  
Canford Audio plc  
Fidelipac Corp.  
Frezzolini Electronics, Inc.  
Henry Engineering  
Koto Luminous Corp.  
Philips Lighting  
PKE International  
Titus Technological Labs  
Vantage Lighting

**PATCH PANELS, ACCESSORIES,  
CABLES**



**ADC Telecommunications, Inc.**  
AMP  
Arcor Broadcast Products  
**Audio Accessories, Inc.**  
Avitel Electronics Corp.  
B&B Electronics Mfg., Co.  
BFE AG  
BGW Systems, Inc.  
Bi-Tronics, Inc.  
Brabury International  
C.A.E.



**Canare Cable, Inc.**  
Canford Audio plc  
Connectronics Corp.  
**Cooper Industries/Benden**  
J.E. Cuesta & Co. Inc.  
D&R Electronica b.v.  
Dielectric Communications  
Ergo Industries  
Farrtronics  
Fougerolle Video  
Furman Sound, Inc.  
Har-Ken Specialties  
ITI Electronics, Inc.  
**Jem-Fab Corp.**  
Kings Electronics Co., Inc.  
Kintronic Labs, Inc.  
Lenbar Electronics Corp.  
Lumitrol, Ltd.  
Marshall Electronics  
Nemal Electronics International  
Newton Instrument Co., Inc.  
OEI Electronics Systems, Inc.  
ORA Electronics  
Packaged Lighting Systems, Inc.  
Patch Bay Designation

Penny & Giles, Inc.  
Philip Drake Electronics  
Pomona Electronics/ITT  
Ram Broadcast Systems  
Seam-Tech  
Seem Audio A/S  
Shively Labs Div. of Howell Labs, Inc.  
Siecor Corp.  
SIRA s.r.l.  
Switchcraft Inc.  
TASCAM  
Texar/Gentner Electronics  
Trompeter Electronics, Inc.  
Union Connector Co., Inc.  
Videoquip Research Ltd.  
Ward-Beck Systems, Ltd.  
Whirlwind  
Wireworks Corp.

Nexus Engineering Corp.  
Northern Technologies, Inc.



**PolyPhaser Corp.**  
Power Integrity Corp.  
Schafer World Communications Corp.  
Sine Control International Corp.  
Sola  
Spectrum Communications Corp.  
Staco Energy Products  
Superior Electric Co.  
**Television Technology Corp.**  
Transtector Systems Inc.  
Tripp Lite

CAIG Labs, Inc.  
Geneva Group of Companies, Inc.  
Tayo Industries

**Wheatstone Corp.**

**TAPE CLEANERS, EVALUATORS, CONDITIONERS**

Accurate Sound Corp.  
Data Security, Inc.  
Geneva Group of Companies, Inc.  
ORA Electronics  
Recortec, Inc.  
Research Technology International  
Sony Magnetic Products Co.  
Tek Media Supply Co.  
Wide Range Electronics Corp.

**TAPE HEAD DEGAUSSERS**

Conveyor & non-moving types  
Ampex Corp.  
R.B. Annis Co.  
Audiolab Electronics, Inc.  
Canford Audio plc  
Data Security, Inc.  
Garner Industries  
Geneva Group of Companies, Inc.  
Graff Electronic Machines Ltd.  
Ram Broadcast Systems  
Sanix Corp.  
Sonifex Ltd.  
Videomagnetics  
Weircliffe International Ltd.  
Wide Range Electronics Corp.

**TOOLS, KITS**

AMP  
Black Audio Devices  
**Canare Cable, Inc.**  
Canford Audio plc  
Contact East Inc.  
Jensen Tools Inc.  
Nalpak Video Sales Inc.  
Pace Inc.  
Paladin Corp.  
RIZ Transmitter Factory  
Siecor Corp.  
Solder Absorbing Technology Inc.  
Techni-Tool Inc.  
Western Electronic Products  
Brian R. White Co., Inc.  
Wide Range Electronics Corp.

**VEHICLES, PRODUCTION/ENG/SNV**

Advent Communications, Ltd.  
AF Associates  
BAF Communications Corp.  
Cycle-Sat, Inc.  
Fougerolle Video  
Fumeo S.p.A.  
Harris Allied Broadcast Equipment  
Landy Associates, Inc.  
Microdyne Corp.  
Mobile-Cam Products  
RIZ Transmitter Factory  
Roscor Corp.  
Shook Electronics USA, Inc.  
Telesat International, Ltd.  
Television Engineering Corp.  
Western Electronic Products  
Wolf Coach, Inc.

**VOLTAGE REGULATORS**

High-power systems transmitter operation.  
Atlas Energy Systems  
Computer Power Inc.  
J.E. Cuesta & Co. Inc.  
Hipotronics Inc. Power Products Div.  
Northern Technologies, Inc.  
RIZ Transmitter Factory  
Sola  
Superior Electric Co.

**Services**

**ANTENNA, TOWER INSTALLATION, MAINTENANCE**

ABB Infocom Ltd.  
Alan Dick & Co. Ltd.

**RECORDER ELECTRONICS, MOTORS**

Inovonics Inc.  
**Television Technology Corp.**

**REELS CABLE**

Arcor Broadcast Products  
C.A.E.  
**Canare Cable, Inc.**  
Canford Audio plc  
Chester Audio & Video Cable/Alcatel  
Communications Specialties Inc.  
Connectronics Corp.  
Fumeo S.p.A.  
Keith Monks Sound Systems  
Mobile-Cam Products  
T.R. Pitts Co.  
Rapid Deployment Towers  
Roll-A-Reel Co. Inc.  
Seam-Tech  
Wireworks Corp.

**SHIELDING, RFI/EMI**

ABB Infocom Ltd.  
Alpha Wire Corp.  
Arcor Broadcast Products  
Chester Audio & Video Cable/Alcatel  
Current Technology Inc.  
**EEV**  
Emcor Products Crenlo, Inc.  
General Devices Co., Inc.  
Industrial Acoustics Co  
LBA Technology, Inc.  
3M Sound Products  
Tripp Lite  
Western Electronic Products  
**Zero Stantron Cabinets**

**STATIC SUPPRESSORS, ENVIRONMENTAL CONTROLS**

Computer Power Inc.  
Cortana Corp.  
Indus-Tool  
Lightning Prevention Systems  
Solder Absorbing Technology Inc.  
3M Electrical Specialties Div.

**STORAGE SYSTEMS**

Including racks and shelves for videocassettes, cartridges, CDs, etc.  
Advance Products Co.  
Canford Audio plc  
J.E. Cuesta & Co. Inc.  
Ergo Industries  
Fidelipac Corp.  
Fumeo S.p.A.  
Geneva Group of Companies, Inc.  
Kintronic Labs, Inc.  
Lake Cabinet Systems  
Neumade Products Corp.  
Plastic Reel Corp. of America  
Research Technology International  
Ruslang Corp.  
Sonifex Ltd.  
Star Case Mfg. Co., Inc.  
Storeel Corp.  
Tek Media Supply Co.  
The Express Group  
3M Sound Products  
Wide Range Electronics Corp.  
Winsted Corp.

**STUDIO SCENERY, DRAPERIES, SETS**

Arrakis Systems  
Broadcast Services/EME  
Canford Audio plc  
Da-Lite Screen Co., Inc.  
Hoffend & Sons, Inc.  
Lake Cabinet Systems  
Lumitrol, Ltd.  
The Express Group

**RACKS, EQUIPMENT ENCLOSURE**

Amco Engineering Co.  
Andrew Corp.  
Arcor Broadcast Products  
Arrakis Systems  
Atlas/Soundolier  
BFE AG  
BGW Systems, Inc.  
Black Audio Devices  
Broadcast Automation, Inc.  
Cabtron Systems Inc.  
Calzone Case Co.  
Canford Audio plc  
**Continental Electronics Corp.**  
Croma Research Ltd.  
J.E. Cuesta & Co. Inc.  
D&R Electronica b.v.  
EDAK

Emcor Products Crenlo, Inc.  
Ergo Industries  
Fumeo S.p.A.  
General Devices Co., Inc.  
GKM Mfg. Corp.  
Hardigg Cases  
Harris Allied Broadcast Equipment  
Hero Communications  
**Jem-Fab Corp.**  
JNS Electronics, Inc.  
Keystone Metal Products, Inc.  
Kintronic Labs, Inc.  
Lake Cabinet Systems  
Luxor Corp.  
Mobile-Cam Products  
Modular Audio Products  
Neumade Products Corp.  
Newton Instrument Co., Inc.  
Nexus Engineering Corp.  
Packaged Lighting Systems, Inc.  
T.R. Pitts Co.  
PKE International  
Ram Broadcast Systems  
Recortec, Inc.  
Research Technology International

**Rohde & Schwarz**  
Ruslang Corp.  
Siecor Corp.  
Skaggs Telecommunications Service, Inc.  
Spectrum Communications Corp.  
Star Case Mfg. Co., Inc.  
The Express Group  
Thermodyne International  
3M Sound Products  
Union Connector Co., Inc.  
**Wheatstone Corp.**  
Winsted Corp.  
**Zero Stantron Cabinets**

**RECORD CARE PRODUCTS**

Audiolab Electronics, Inc.  
Geneva Group of Companies, Inc.  
Keith Monks Sound Systems  
TASCAM  
Tayo Industries

**RECORDER CARE, RECORDING ACCESSORIES**

Includes head-cleaning products.

**PHASE CONVERTERS, 1-to-3φ**

ABB Infocom Ltd.  
Compute Power Inc.  
J.E. Cuesta & Co. Inc.  
Dielectric Communications  
International Computer Power

**POWER GENERATORS, STANDBY**

Motor-generator solar power inverters, UPS.  
ABB Infocom Ltd.  
Alpha Technologies  
Atlas Energy Systems  
Behlman Electronics/Astrosystems  
Best Power Technology, Inc.

**COMPUTER POWER INC.**

Computer Power Inc.  
J.E. Cuesta & Co. Inc.  
Dynamote Corp.  
Exeltech, Inc.  
FWT  
Indus-Tool  
Instrumentation & Control Systems, Inc.  
International Computer Power  
Kalgio Electronics  
LorTec Power Systems  
Neumade Products Corp.  
Nexus Engineering Corp.  
Northern Technologies, Inc.  
PERROTT Engineering Labs Inc.  
Reliance Comm/Tec  
Schafer World Communications Corp.  
Sola  
SSAC Inc.  
Staco Energy Products  
Superior Electric Co.  
Teledyne Energy Systems  
Tripp Lite

**POWER LINE CONDITIONERS**

Includes surge suppression, lightning protection products; grounding products.  
ABB Infocom Ltd.  
Alpha Technologies  
Atlas Energy Systems  
Best Power Technology, Inc.

**COMPUTER POWER INC.**

Computer Power Inc.  
Control Concepts Corp.  
J.E. Cuesta & Co. Inc.  
Current Technology Inc.  
Furman Sound, Inc.  
Indus-Tool  
International Computer Power  
Kalgio Electronics  
Lightning Eliminators & Consultants, Inc.  
Lightning Prevention Systems  
Lyncole XIT Grounding  
MCG Electronics, Inc.

Alpha Tower Design, Inc.  
Andrew Corp.  
Antenna Technology  
John H. Battison & Assoc., Consulting Eng.  
Broadcast Communications  
DSI Communications, Inc.  
DYMA Engineering, Inc.  
Electronics Research Inc.  
EMCEE Broadcast Products  
Express Tower Co.  
FWT  
Gabriel Electronics Inc.  
J&L Associates  
Kline Towers  
La Cie D'Electronique Normex Ltee  
LDL Communications, Inc.  
LeBlanc & Royle Telcom Inc.  
Marcom  
Multiphase Consulting  
Fred A. Nudd Co.  
**Rohde & Schwarz**  
SIRA s.r.l.  
SOFRATEV  
Southern Illinois Antennas  
Stainless Inc.  
Stellar Communications Inc.



SWR Inc.  
Teletech, Inc.  
Tenco Tower Co.



Tower Network Services  
Trylon Towers  
Utility Tower Co.

**CONSULTING, DESIGN**

Facilities, system and custom equipment designs

ABB Infocom Ltd.  
**AEQ- Aplicaciones Electronicas Quasar**  
AF Associates  
AIR Corp.  
Alpha Tower Design, Inc.  
Eric Neil Angevine P.E.  
Antenna Technology  
ASC-Tube Traps  
AVEC  
B&B Systems, Inc.  
BAI Systems, Inc.  
Baranti Group  
BASYS Automation Systems  
John H. Battison & Assoc., Consulting Eng.  
Franklyn R. Beemish & Co.  
Lawrence Behr Associates Inc.  
BFE AG  
Broadcast Communications  
Broadcast Equipment Sales & Eng.  
Broadcast Systems Design  
BTS GmbH  
Richard W. Burden Associates  
**CEL Electronics**  
D.A.T.A. Business Publishing  
John J. Davis & Assoc., Consulting Eng.  
DeSantis Associates  
DKW Systems  
DSI Communications, Inc.  
DYMA Engineering, Inc.  
East Coast Video Systems  
EDX Engineering, Inc.  
Electronics Research Inc.  
EMCEE Broadcast Products  
EMS-Electronic Maintenance Services  
Ergo Industries  
Evans Assoc. Consulting Telecom, Eng.  
Fougerolle Video  
**Full Compass Systems, Ltd.**  
Funke & Associates  
GEE Broadcast Systems Ltd.  
Gendra International, Inc.  
Harris Allied Broadcast Equipment

Harrison Systems Ltd.  
HB Centennial  
Hemec Communications  
HN Engineering Inc.  
Integral Systems Group  
**Jem-Fab Corp.**  
Key Systems International, Inc.  
Kintronic Labs, Inc.  
Knudson-Benson Associates Inc.  
Ron Krob Technical Consultant  
Lakeside Associates Inc.  
Landy Associates, Inc.  
LDL Communications, Inc.  
Logica Space & Comm./Broadcast  
Lumitrol, Ltd.  
Magnavox CATV Systems, Inc.  
Marcom  
D. L. Markley & Assoc. Inc., Consulting Eng.  
MBI Broadcast Systems Ltd.  
Kenneth R. Meades  
Media Touch Systems, Inc.  
**Micro Communications, Inc.**  
Jay Mitchell Associates  
Modern Media Consulting  
Lawrence L. Morton Associates  
Moseley Associates, Inc.  
Multi Electronic Services Ltd.  
Multiphase Consulting  
Nesbit Systems Inc.  
Nissen Group Inc.  
Old Dominion Broadcast Eng. Service  
Pacific Recorders & Eng. Corp.  
Philip Drake Electronics  
PKE International  
Pro Video & Film Equipment Group  
Radiotechniques Engineering Corp.  
A. D. Ring  
RMS  
ROH Products  
Roscor Corp.  
Rosner TV Systems, Inc.



RPG Difusor Systems, Inc.  
RPS Communications  
Seem Audio A.S.  
Shook Electronics USA, Inc.  
Smith & Powstenko  
George R. Snell Associates,  
SOFRATEV  
Somich Engineering  
**Sony Business & Professional Group**  
Southern Illinois Antennas  
Standard Frequency Measuring Service  
Star Case Mfg. Co., Inc.



Synergistic Technologies, Inc.  
Systems Development Group  
David Taylor Software  
Teletech, Inc.  
**Television Technology Corp.**  
Theta Scientific  
Tiffen Mfg. Corp.  
Vac Systems Corp.  
VDO Ltd.  
Video Images-Chicago  
Video Masters Inc. (VMI)  
Vir James Consulting Engineers  
Vizcom Satellite Systems  
Washington Information Group

**EDITING POST PRODUCTION FACILITIES**

Associated Images Ltd.  
Audio Plus Video Int'l/International Post  
CEDAR Audio Ltd.  
Center Video Industrial Co. Inc.  
Complex Inc.  
Cycle-Sat, Inc.  
Ediflex Systems

Gendra International, Inc.  
HDTV Holland BV  
High Fidelity  
Image Video Teleproductions, Inc.  
M2 Design  
Media Concepts, Inc.  
METROPOST  
MPB Technologies Inc.  
Pro Video & Film Equipment Group  
Prosonus  
Skaggs Telecommunications Service, Inc.  
Steenbeck, Inc.  
Tayo Industries  
3M Optical Recording  
Video Central  
Video Dub, Inc.  
VSC Post Production, Inc.

**EQUIPMENT REBUILDING**

Reconditioning, customizing  
ABB Infocom Ltd.  
AIR Corp.  
Atlas Energy Systems  
Baranti Group  
Broadcast Automation, Inc.  
Broadcast Equipment Sales & Engineering  
California Tube Lab Inc.  
Center Video Industrial Co. Inc.  
EMS-Electronic Maintenance Services  
Freeland Products, Inc.  
**Full Compass Systems, Ltd.**  
Funke & Associates  
GE Support Services/ RCA Broadcast  
Gendra International, Inc.  
Hall Electronics  
Harris Allied Broadcast Equipment  
Harrison Systems Ltd.  
Kintronic Labs, Inc.  
Landy Associates, Inc.  
McMartin Inc.  
Multi Electronic Services Ltd.  
Old Dominion Broadcast Eng. Service  
PERROTT Engineering Labs Inc.  
Pro Video & Film Equipment Group  
Schafer World Communications Corp.  
Sprague Magnetics, Inc.



Synergistic Technologies, Inc.  
Texscan MSI



Tower Network Services  
Vac Systems Corp.

**EQUIPMENT RENTAL, LEASING BROKERS**

Altronic Research Inc.  
Atlas Energy Systems  
BCS, Inc.  
BDL/Autoscript Ltd.  
BERC-Broadcast Equipment Rental Co.  
Broadcast Equipment Sales & Engineering  
BTS GmbH  
Center Video Industrial Co. Inc.  
**Continental Electronics Corp.**  
Cycle-Sat, Inc.  
Egripment USA Inc.  
Film Video Equipment Service Co.  
**Full Compass Systems, Ltd.**  
Funke & Associates  
GE Projection Display Products  
Gendra International, Inc.  
Harris Allied Broadcast Equipment  
High Fidelity  
Image Video Teleproductions, Inc.  
Landmark Financial Group  
LTM Corp. of America  
Marcom  
Mathews Studio Equipment, Inc.

Maze Broadcast, Inc.  
Media Concepts, Inc.  
Multiphase Consulting  
Musco Mobile Lighting, Ltd.  
Old Dominion Broadcast Eng. Service  
Panther Corp. of America  
Paufa & Co., Ltd.  
PERROTT Engineering Labs Inc.  
Pro Video & Film Equipment Group  
Roscor Corp.  
Schafer World Communications Corp.  
Siecior Corp.  
Solid Electronics Labs  
**Sony Business & Professional Group**  
Steenbeck, Inc.  
System Associates  
The Toy Specialists  
Video Central  
Video Images-Chicago  
Video Rentals, Inc.  
Vision Quest

**FILM TO TAPE TRANSFER**

Audio Plus Video Int'l/International Post  
Center Video Industrial Co. Inc.  
Media Concepts, Inc.  
Skaggs Telecommunications Service, Inc.  
Video Dub, Inc.  
VSC Post Production, Inc.

**FREQUENCY MEASUREMENT COORDINATION**

John H. Battison & Assoc., Consulting Eng.  
Broadcast Signal Lab  
HN Engineering Inc.  
Johnson Measurement Service  
McQuatters Freq. Measurement Service  
Lawrence L. Morton Associates  
Old Dominion Broadcast Eng. Service  
PKE International  
SOFRATEV  
Standard Frequency Measuring Service  
Teletech, Inc.  
Theta Scientific  
Ziehl Electronic Service

**HEAD REFURBISHING, RELAPPING**

Aulen Associates, Inc.  
CMC Technology Datatape Inc.  
GEE Broadcast Systems Ltd.  
Hall Electronics  
International Electro-Magnetics  
JRF Magnetic Sciences Inc.  
Northern Magnetics, Inc.  
Oktel, LP  
Saki Magnetics Inc.  
Sprague Magnetics, Inc.  
Videomagnetics

**INSTRUMENT CALIBRATION**

R. B. Annis Co.  
Brüel & Kjaer Instruments, Inc.  
Pro Video & Film Equipment Group  
**Rohde & Schwarz**

**LENS REPAIR**

Birns & Sawyer Inc.  
Canon USA Inc. Broadcast Equipment Div.  
Century Precision Optics  
**Jem-Fab Corp.**  
Pro Video & Film Equipment Group

**PRODUCTION MUSIC, EFFECTS LIBRARIES, IDs**

Associated Production Music  
Manhattan Production Music  
Music Director Programming Service  
Prosonus  
Signature Music Library  
Skaggs Telecommunications Service, Inc.  
SoperSound Music Library  
Sound Ideas  
Tayo Industries  
TM Century, Inc.  
Valentino, Inc.



# Acrodyne...the best of all worlds.

## UHF TV Transmitters

### Solid State Technology

The proof is in! Since 1989, Acrodyne has been delivering affordable solid state 1 kW UHF TV transmitters—**no tubes, no tuning, no downtime.**

- Redundant power supplies
- Built-in diagnostics
- Modular construction
- Frequency agile designs

### Advanced Tetrode Technology

Our product line includes the world's only single tetrode 25 kW UHF TV transmitter. Acrodyne's advanced systems are demonstrating exceptional field reliability—**the only new UHF transmitter development which meets and routinely exceeds expected tube life at full rated power.**

- Ultra high plant efficiency
- Solid state drivers
- Inherent linearity minimizes precorrection
- Low cost tube replacement
- Parallel systems available



Tomorrow's digital TV transmitter company

# ACRODYNE

Acrodyne Industries, Inc.  
516 Township Line Road  
Blue Bell, PA 19422  
800-523-2596  
or (215) 542-7000  
FAX: (215) 540-5837

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Circle (16) on Reply Card

**Now Available  
30kW  
10% aural output**

**RF SYSTEM MAINTENANCE**

AM, FM, TV, microwave.  
 ABB Infocom Ltd.  
 Advent Communications, Ltd.  
 Antenna Technology  
 John H. Battison & Assoc., Consulting Eng.  
 Broadcast Equipment Sales & Engineering  
 DSI Communications, Inc.  
 Electronics Research Inc.  
 EMCEE Broadcast Products  
 Frequency Products Inc.  
 Funke & Associates  
 Gabriel Electronics Inc.  
 GE Support Services/ RCA Broadcast  
 Harris Allied Broadcast Equipment

Harrison Systems Ltd.  
 HN Engineering Inc.  
 Ron Krob Technical Consultant  
 LDL Communications, Inc.  
 Marcom  
 McMartin Inc.  
**Micro Communications, Inc.**  
 Lawrence L. Morton Associates  
 Motorola Inc. Land Mobile Products Sector  
 Multiphase Consulting  
 Fred A. Nudd Corp.  
 Old Dominion Broadcast Eng. Service  
**Rohde & Schwarz**  
 SIRA s.r.l.  
 Southern Illinois Antennas

Stainless Inc



SWR Inc  
 Teletech Inc  
 Theta Scientific



Tower Network Services

Utility Tower Co

**SATELLITE TIME BROKERS**

Program distribution, FO Fiber opt. distribution  
 Atlantic Satellite Communications, Inc.  
 BAF Communications Corp.  
 Cycle-Sat. Inc.  
 GE American Communications  
 Interactive Satellite  
 ISS Engineering, Inc.  
 NPR Satellite Services  
 Skaggs Telecommunications Service, Inc.  
 VVYX NVN .FO  
 Waterfront Communications Corp.

**WIRING CABLING**

Arcor Broadcast Products  
 Bi-Tronics, Inc.  
 C.A.E.  
**Canare Cable, Inc.**  
 Canford Audio plc  
 Chester Audio & Video Cable Alcatel  
 J.E. Cuesta & Co. Inc.  
**Full Compass Systems, Ltd.**  
 GEE Broadcast Systems Ltd.  
**Jem-Fab Corp.**  
 La Cie D'Electronique Normex Ltee  
 Lakeside Associates Inc.  
 Landy Associates, Inc.  
 Lemo USA  
 Lenbar Electronics Corp.  
 Multiphase Consulting  
 Fred A. Nudd Corp.  
 Old Dominion Broadcast Eng. Service  
 Siecior Corp.  
 SOFRATEV  
 Teletech, Inc.  
 Theta Scientific  
 3M Professional A/V & Specialty Products  
 3M Sound Products  
 Western Electronic Products



**The Fast-Track Video Analyzer**  
 Model UAF

**Measures 25 Key Video Signal Parameters In Just 640 Milliseconds**

You won't find another video analyzer that can match the speed of the UAF. With its advanced parallel measurement capability, the UAF can analyze 25 parameters of NTC-7 or FCC video test signals ... *in real time* ... with an accuracy of 0.1% for standard measurements, 0.01% for difference or reference measurements.

You can make all your equipment adjustments and checks more accurately and easily with the UAF ... measurement results for all parameters always reflect *real* conditions. Competitive products may have measurement cycles as long as 20 seconds - ample time for measured parameters to change and invalidate test results before the measurement cycle has been completed.

Operating flexibility is yet another convenient feature of the UAF - it can be operated manually, automatically using a convenient plug-in memory card, or remotely via an IEEE 488 bus. You can store measurement values on the memory card or output test results to a printer or plotter. You can even use the UAF as a bus controller for any IEEE 488 bus-addressable instruments on the bus.

High speed, outstanding accuracy, and versatility ... distinctive features of the UAF designed to make your job much easier!



**ROHDE & SCHWARZ**

Rohde & Schwarz, Inc., 4425 Nicole Drive  
 Lanham, MD 20706 ■ Tel: (301) 459-8800

In Canada: Rohde & Schwarz Canada, Inc. 555 March Road Kanata Ontario K2K 2M5 ■ Tel: (800) 667-9841  
 Outside North America: Rohde & Schwarz Headquarters, Muhldorfstr. 15 W-8000 Munchen 80 Germany ■ Tel: (089) 41-29 0

The information contained in this directory is taken from the responses to questionnaires sent to all companies on our mailing list as of June 1991. If a specific manufacturer does not appear in this directory, either the name was not on the mailing list with current address information, or no questionnaire was returned. To have a company name included on the mailing list for future issues and other special editorial projects, please contact the Directory Editor or Editor, Special Projects, **Broadcast Engineering Equipment Reference Manual**, PO Box 12901, Overland Park, KS 66282-2901.

Circle (46) on Reply Card



# NOW SHIPPING

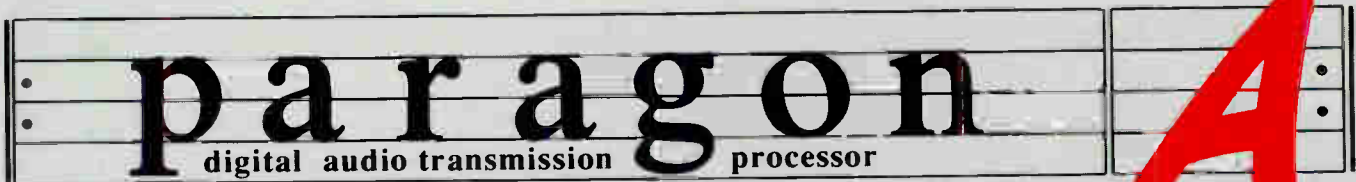
**par•a•gon** \ ' par-e-, gän, -gen \ n

**1:** a fully digital transmission processor for all broadcast environments.

**2: Featuring:**

No clipper, meaning no clipping artifacts;

4-band compressor and 4-band limiter; 10-band graphic EQ; 9" VGA touch-screen equipped video monitor; factory-loaded sound library; on-air A/B comparison. *User installable options* will include a AES/EBU digital I/O and Stereo Generator.



**A U D I O  
ANIMATION  
INCORPORATED**

6632 Central Avenue Pike ■ Knoxville, Tennessee 37912 ■ (615) 689-2500

Euro-Distributor Info: JWM (M) Ltd., P.O. Box 115, Swindon, Wiltshire, SN2 1DA, England  
Phone: (Int. 44) 637 877170 ■ Fax: (Int. 44) 637 850495

Circle (17) on Reply Card

World Radio History

# At Ampex, we engineer so you can create.

298 metal particle formulation enables the use of higher carrier frequencies for greater reproducible bandwidth and improved signal-to-noise ratio for bright, sharp pictures even after multiple generations.

Identification tabs allow machine to sense tape type and adjust for thickness, hub diameter, and record current when using both Betacam and Betacam SP.

Hold-down spring with precision-ground ends helps center spool properly. One-piece cap design holds spool securely in place and protects against dislodging.

Solid, precision stainless-steel pins and low-friction rollers for smooth guiding and improved tape handling.

Brake system securely locks reel in place when not in use to prevent tape cinching.

198 high-energy cobalt-modified oxide formulation delivers excellent RF output, chrominance, and luminance for crisp colors.

Spool-hub bearing button mounts to cassette shell rather than window for greater stability during spool rotation, minimizing edge damage and improving tape handling.

Reinforced sidewall for increased structural reliability of shell even under rugged handling conditions.

High-impact anti-stat plastic housing for maximum tape protection and minimum debris-induced dropouts.

Conductive carbon backcoat formulation incorporates a tough binder system to deliver durability, static dissipation, and a smooth surface for low dropouts and reliable handling.

We are as committed to the engineering of great videotape as you are to the creation of great video.

That's why we developed Ampex 198/298 Master Broadcast Videocassettes for all your Betacam



SP applications. And why we developed it with the same unrelenting passion for detail that you bring to your job.

From the tape to the plastic to the packaging, 198 Betacam and 298 Betacam SP reflect our commitment to this growing format...and to your growing needs.

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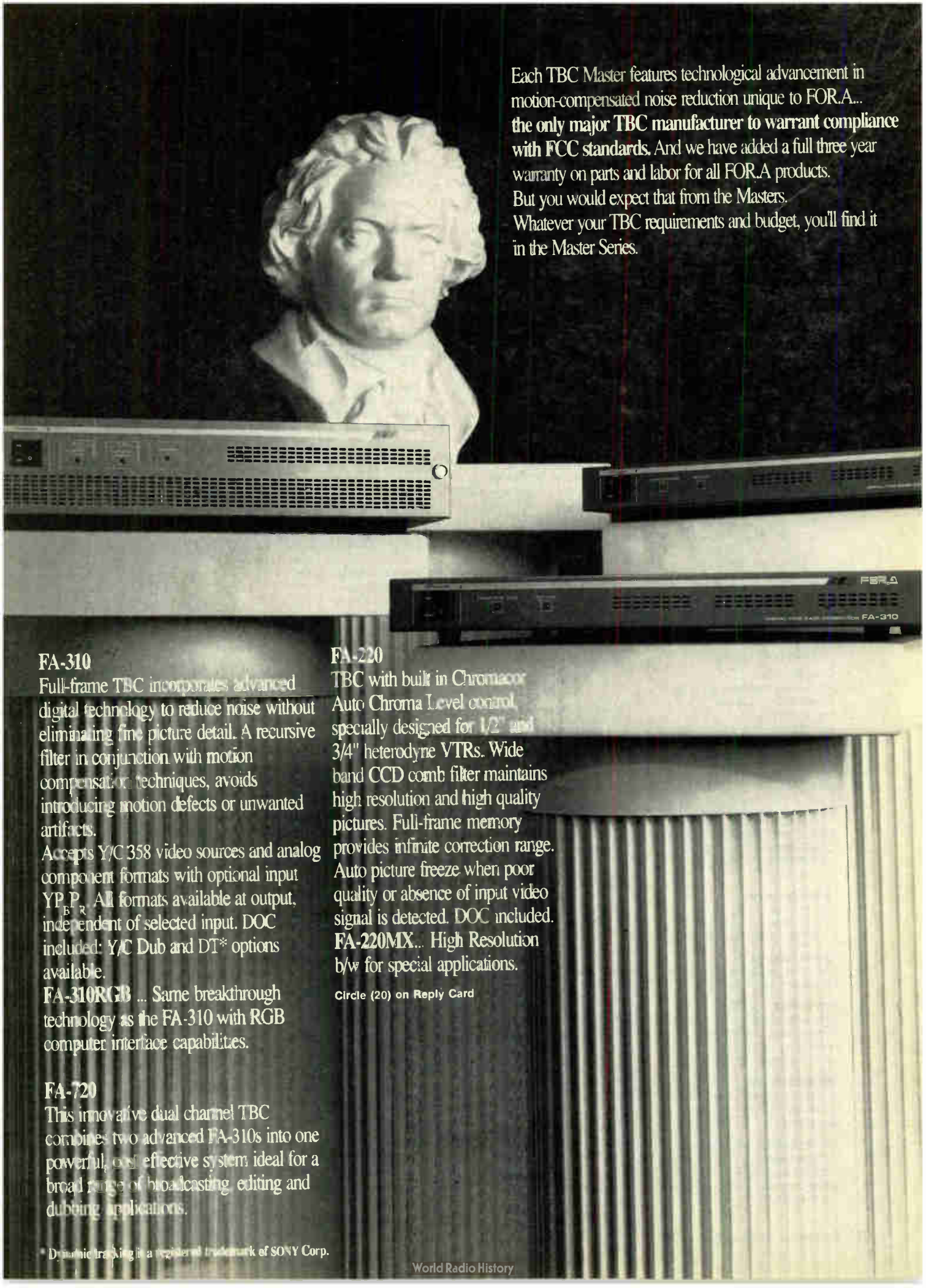
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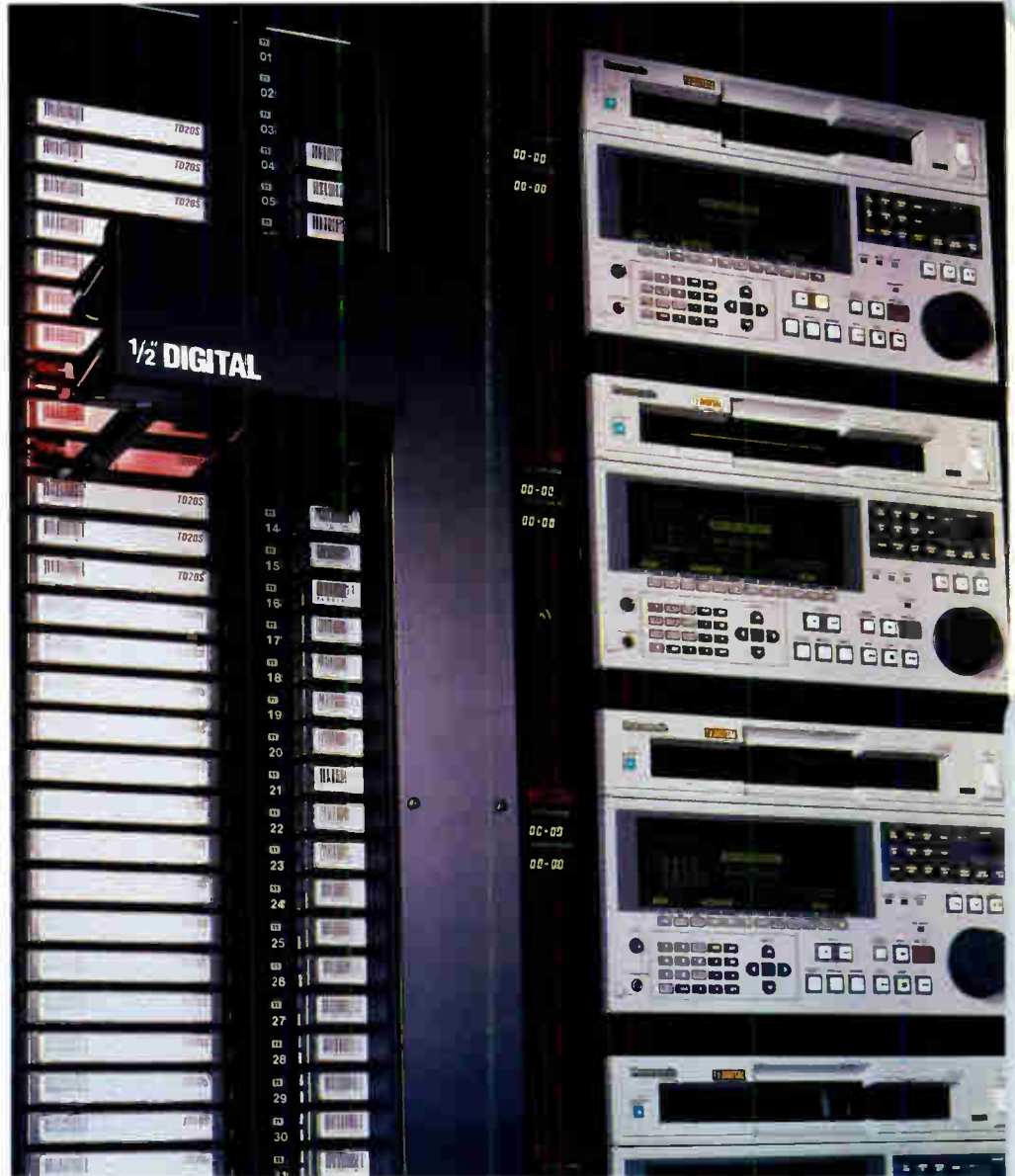
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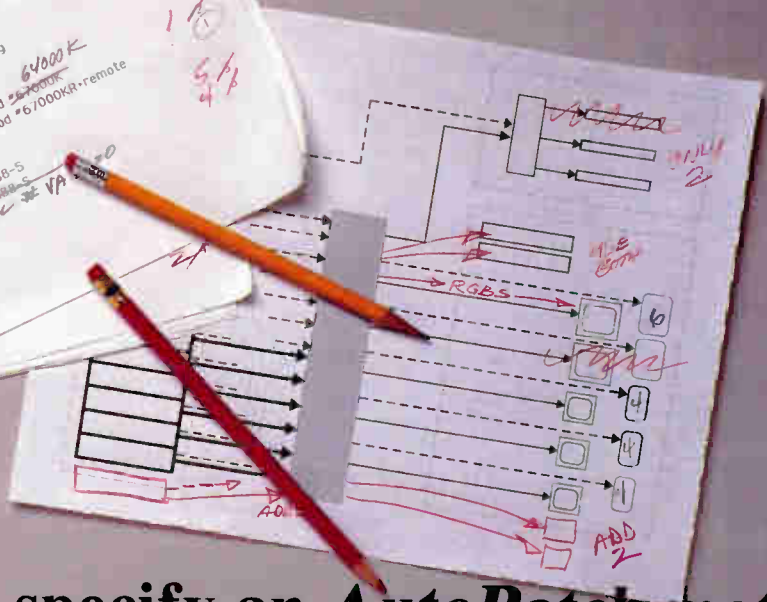
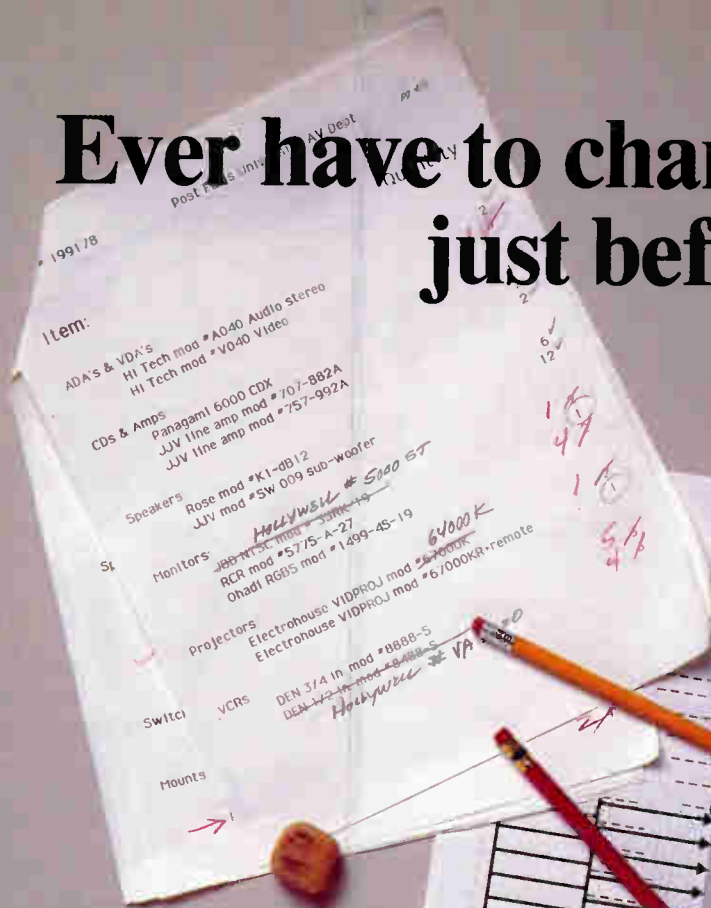
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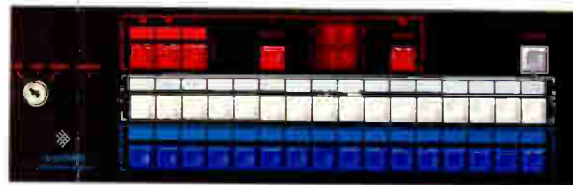


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# Video Products

## Color Television Cameras

Manufacturer	Amplex			BTS			Hitachi Denshi	
	Model	CVC-50 (-5)	CVC-7(-70)	KCH 1000 <sup>1</sup>	LDK 9	LDK 90 (900)	LDK 91 <sup>2</sup> (910)	SK-F2 (-F3) <sup>3</sup>
Composite output	Yes	Yes	Any HDTV	Yes N P	N P S (N P)	Yes N P	Yes	Yes
RGB output	Yes (No)	No	Yes	Yes	Yes	Yes	Yes	Yes
Y/R-Y R-Y output	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
S-VHS Y-C output	No	No	No	No	No	No	Option	No
Direct VCR cable	Yes	Yes	No	...	Yes (...)	Yes	Yes	No
Cable: coax/triax/FO	-50 only	C/T/FO	Triax	Triax	...(Triax)	Triax	C/T	Triax
Multicore cable	-50 only	Yes	No	Yes	No (Yes)	Yes	Yes	Yes
Docking VCR	Betacam	Yes	No	No	Yes (No)	Yes	Yes	No
Intercom audio	-50 only	Yes	Yes	Yes	Yes	Yes	...	Yes
Program audio	Yes	Yes	2-ch	Yes	Yes	Yes	Yes	Yes
Return video circuit	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lens correction memory	No	No	Yes	Yes	...	...	...	...
Color balance memories	Yes	Yes	Scenes	Yes	Yes	Yes	32 scenes	Yes
ND, color filters	4C-2N	4C-2N	4-position	8-position	(4-position)	(4-position)	2N-2C	4N-5C
For ENG EFP Studio OB	ENG EFP	ENG EFP	HDTV	Studio	E & (F/S)	E & (F S)	ENG EFP	OB
Pickup size/type	FIT CCD	2/3" IT (FIT)	30mm PbO	3 FT 1/2" CCD	3 FT CCD 1/2"	2/3" CCD 1/2"	2/3" IT (FIT)	2/3" IT (FIT)
CCD array size/type	510x492	768x493	or 24mm SAT	806x504	610x492 (2/3")	806x504	400k pixel	400k pixel
Standard sensitivity	2000 f/5.6	2000; 5.6	800; 4 PbO	2000; 4.0	1750; 4.0	1750; 4.0 (2000)	2000; 5.6	2000; f/5.6
Max sensitivity lux; f/ +dB	15; 1.4; +18	15; 1.4; +18	70; 2; +9	32; 1.4; 18	27(54); 1.4; 12	13(15); 1.4; +18	15; 1.4; +18	17; 1.; +18
S/N ratio	60dB (58)	62dB NTSC	...	62dB	58dB	62dB	60dB (62dB)	62dB
Limiting resolution	550 TVL	700 lines	1200 lines	>700	>650 lines	>700 lines	650 (700)	700
Electronic shutter speeds	7 on -50	6 to 1/2000S	No	Yes	2	2	6 to 1/2000	6
Registration error %	0.05%	0.005%	0.02%	0.05%	0.05%	0.05%	0.05% all zones	<0.1%
Highlight compensation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Color correction matrix	Option	Option	Yes	Yes	... (Yes)	... (Yes)	Option	Yes
Camera control unit	Option	Option	Yes	Yes	Yes	Yes	Option	Yes
Multi-camera panel	...	...	Yes	Yes	... (Yes)	... (Yes)	Option	Yes
Operating power	10.5-17V	10.5-17V	350W	0W	11W (110W)	11W (170W)	10.5-17V 14W	110VA
Camera head weight lbs	7.5 lb	7.5 lb	72.6	46.2	7.5 (< 40)	7.5 (< 40)	7.5 lb	55 lb
Reader Service No	301	302	303	304	305	306	307	308

<sup>1</sup> Software adjustable to all current HDTV proposals. <sup>2</sup> LDK-391 Camcorder Betacam SP format; +24dB gain opt. <sup>3</sup> -F3S uses high sensitivity FIT CCD. <sup>4</sup> -300S high sensitivity FIT; -350S 450k pixel

Manufacturer	Hitachi Denshi				Ikegami			
	Model	SK-F700/710	SK-F750(-760) <sup>5</sup>	Z-One-A	EC-1125	HC-200/230/240 <sup>6</sup>	HK-323	HK-327
Composite output	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y/R-Y R-Y output	Option	Option	Yes	Y/C <sub>N</sub> /C <sub>W</sub>	Yes	No	Yes	Yes
S-VHS Y-C output	Option	...	Yes	No	Yes	No	No	Option
Direct VCR cable	Yes	...	Yes	No	Yes	No	No	No
Cable: coax/triax/FO	Triax	Yes	...	No	No	C/T/FO	C/T	C/T/FO
Multicore cable	Yes	Yes	Yes	2-core	Yes	Yes	Yes	Yes
Docking VCR	No	No	Yes	No	Yes	No	No	No
Intercom audio	Yes	Yes	Yes	•	Yes	Yes	Yes	Yes
Program audio	Yes	Yes	Yes	•	Yes	Yes	Yes	Yes
Return video circuit	Yes	Yes	...	•	Yes	Yes	Yes	Yes
Lens correction memory	...	...	...	•	No	Four	...	No
Color balance memories	32 data files	32 scenes	Yes	Yes	2	One	Yes	Yes
ND, color filters	4N-3C	4N-4C	1N-3C	3C-3N	3C 1N	4C-4N (3C-3N)	4C 4N	4N 4C
For ENG EFP Studio OB	OB S	Studio EFP	ENG EFP	E, S	E, F, S	Studio EFP	Studio/EFP	Studio
Pickup size/type	2/3" FIT CCD	2/3" FIT CCD	3 2/3" CCD	PbO 1 1/4"	IL/IL FIT 1/2"	1" PbO DG	30mm M-S PbO	IT 2/3"
CCD array size/type	400k pixel	450k pixel	754x485	HDTV	250k/360k/400k	...	...	400k pix
Standard sensitivity	2000; 5.6	2000; 5.6	2000; 5.6	2000; 5.6	2000; 5.4/5.5	2000; 5.6	1500; 5.6	2000; 5.6
Max sensitivity lux; f/ +dB	15; 1.4; +21	15; 1.4; +18	23; 1.7; +18	...	20/24/20; 1.4; 18	12	94; 1.4; 0dB	125; 1.4; 0dB
S/N ratio	60dB/N; 57dB/P	62dB	60dB	60dB	58/60/60	59	59dB	62dB
Limiting resolution	700 TVL	800 TVL	750	800	570/600/700	700	800;	700H 400V
Electronic shutter speeds	None	6 to 1/2000	5 to 1/2000	No	3/3/6	No	No	Variable
Registration error %	0.05% all zones	0.05% all zones	0.05%	<0.03 <0.045	0.05%	0.05/1/2	0.05%	0.05%
Highlight compensation	Yes	Yes	Yes	•	Yes	Yes	Yes	Yes
Color correction matrix	Yes	Yes	No	...	No	Yes	Yes	Yes
Camera control unit	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Multi-camera panel	Yes	Yes	No	...	No	Yes	Yes	Yes
Operating power	300VA	300VA	12Vdc 11W	230VA	12V 11.5W	230VA	360VA	130VA
Camera head weight lbs	66	66	7.7 (9.2)	33	7.1/5.3/5.3	57	79.2	55
Reader Service No	309	310	311	312	313	314	315	316

<sup>5</sup> -600/-610 use 400k pixel IT CCDs. <sup>6</sup> Variations based on CCD types. <sup>7</sup> Optical axis of prism adjusts to center lens on CCDs.

Manufacturer	Ikegami						JVC Company	
Model	HK-355 (355P) <sup>8</sup>	HL-1125 (HC-2000)	HL-55A <sup>9</sup> (-53)	HL-57 (-V57) <sup>10</sup>	HL-7M Owl <sup>11</sup>	LK-33	GY-X1 TCAU	KY-17U
Composite output	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Y/R-Y/R-Y output	Opt	Y/P <sub>B</sub> /P <sub>R</sub>	Yes	Yes	Yes	...	No	Yes
S-VHS/Y-C output	No	No	No	No	...	...	Yes	Yes
Direct VCR cable	Opt	No	Yes	Yes	Yes	No	No	Yes
Cable: coax/triax/FO	C/T FO	Yes (No)	Coax/triax	C/T	C/T	...	Coax	...
Multicore cable	Yes	2-core	Yes	Yes	Yes	Yes	No	26-core
Docking VCR	No (Yes)	No	Yes	Yes	Yes	No	S-VHS-C	Adapter
Intercom audio	Yes	...	Yes	Yes	...	No	...	Yes
Program audio	Yes	...	Yes	Yes	Yes	No	Yes	Yes
Return video circuit	Yes	Yes	Yes	Yes	Yes	•	No	Yes
Lens correction memory	Yes	...	No	...	No	•	IC Card memory	No
Color balance memories	Yes	Yes	2	2	2	2	...	...
ND, color filters	4C-4N (3C-3N)	3C-1N	2N-4C	2N-4C	1N-3C	2C-1N	1N-3C	1N-3C
For ENG EFP Studio OB	Stu EFP OB	Portable	E F S	E, F, S	Low light	EFP 3D	ENG/EFP	ENG EFP
Pickup size/type	FIT CCD 2/3"	Harpicon 2/3"	FIT (IT) 2/3"	FIT 2/3"	FIT 2/3"	FIT 1/2"	1/2" IL CCD	1/2" IT CCD
CCD array size/type	450k (400k)	...	400k pix	400k pix	400k pix	400k	330k pixel Microlens	360k pixels
Standard sensitivity	2000; 5.6	200. 4(1000, 2.8)	2000; 6.2	2000; 6.2	150; 5.6	2000; 5.0	2000 f/5	2000 f/4
Max sensitivity lux; f/ +dB	125; 1.4; 12	...	13; 1.4; +24	3; 1.4; 30	0.02; ...; +18	25; 1.4; 18	20; 1.4; +18	32; 1.4; +18
S/N ratio	62dB	45dB	62dB	62dB	5dB	60dB	59dB	59dB
Limiting resolution	800 (700) 400V	800	700H 400V	750H/400V	30H	700	600	640 Lum
Electronic shutter speeds	Variable	No	6	6	5	6	4	3
Registration error %	0.02% (0.03)	0.05/0.1	0.05%	0.05%	±0.5%	0.05%	0.05%	0.05%
Highlight compensation	Yes	...	Yes	Yes	Yes	Yes	...	...
Color correction matrix	Yes	...	Yes	Yes	Yes	No	...	No
Camera control unit	Yes	... (Yes)	Yes	Yes	Yes	...	No	No
Multi-camera panel	Yes	... (Yes)	Yes	Yes	...	...	No	No
Operating power	130VA (26W)	110-220V	11-16V	11-16V; 16.5W	12V 15W	12V; 29W	12Vdc 25W	12Vdc 15W
Camera head weight lbs	55 (13.2)	14.3 (14)	6.	6.	9	9.4	11 lb	6 lb
Reader Service No	317	318	319	320	321	322	323	324

<sup>8</sup> 355P portable. <sup>9</sup> HL-55/-V55 camcorders with Betacam SP recorder. <sup>10</sup> 10-bit digital processing. <sup>11</sup> Proximity Image Intensifier/Micro-Channel Plate

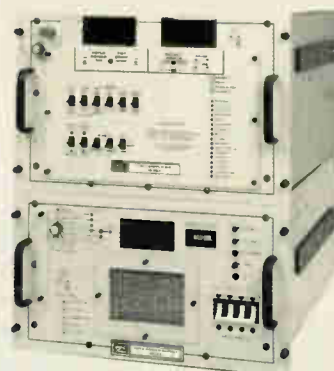
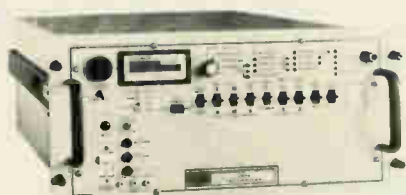
Manufacturer	JVC Company		Panasonic Broadcast			Panasonic CSC		Sony
Model	KY-25U	KY-35U	AK 400	AK 450	AQ-20 (-10)	WV-F250	WV-F300 (-F200)	BVP-370 (270)
Composite output	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	...	CCU
Y/R-Y/R-Y output	Yes	Yes	Yes	Yes	Yes	Yes	...	CCU
S-VHS/Y-C output	Yes	Yes	No	No	No	Yes	Yes	No
Direct VCR cable	Yes	Yes	Option	Option	Yes	Yes	Yes	Option
Cable: coax/triax/FO	Coax	...	Coax/triax	Coax/triax	C/T/FO	Coax	Coax	Triax
Multicore cable	Yes	Yes	Yes	Yes	Yes	Yes	32-pin	...
Docking VCR	Adapter	Adapter	AU 400	AU 400	AU 400	Yes	Option	No
Intercom audio	Yes	Yes	...	...	...	Yes	Yes	Yes
Program audio	Yes	Yes	Yes	Yes	Yes	Yes	Yes	370
Return video circuit	Yes	...	Yes	...	[Digital	Yes	Yes	Yes
Lens correction memory	No	No	...	...	signal	...	No	Yes
Color balance memories	...	...	...	...	...	2	2	...
ND, color filters	1N-3C	2N-4C	3N 4C	3N 4C	4N-4C (2N-2C)	3C:1ND	3C:1N	4N 3C
Application ENG EFP Studio OB	ENG/EFP	Studio, remote	E F S C	E F S C	E F S C	E/M/S	E/M/S	S F
Pickup size/type	3 2/5" IT CCD	2/3" IT CCD	FIT 2/3"	FIT 2/3"	FIT 2/3"	3 FIT CCD 1/2"	3 IT CCD 1/2"	FIT (IT) 2/3"
CCD array size/type	380k pixels	768x482	574x494	838x485	768x499 (574x)	768x495	711x458 (510x492)	380k
Standard sensitivity	2000; 5.6	2000 f/7	2000; 5.6	2000; 5.6	2000; 5.6	2000 f/4	2000 f/5.6	2000; 5.6
Max sensitivity lux; f/ +dB	23; 1.7; +18	16 f/1.7 +18	20; 1.6; +18	20; 1.6; +18	20; 1.6; +18	30; 1.4; +18	2; 1.7; +18	15; 1.4; +18
S/N ratio	60dB	62dB	60dB	60dB	60dB	60dB	60dB (56dB)	62dB
Limiting resolution	700	700	650	800	750 (630)	700	700 (600)	700
Electronic shutter speeds	3 to 1/1000	5	4	5	6	6	3 (...)	6
Registration error %	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Highlight compensation	...	...	Yes	Yes	Yes	Yes	Yes	Yes
Color correction matrix	No	Matrix mask	Yes	Yes	Yes	Mask	...	Option
Camera control unit	No	No	Yes	Yes	Yes	...	No	Yes
Multi-camera panel	No	No	...	...	...	No	No	Option
Operating power	12Vdc 1W	12Vdc 15W	10.5 17V	10.5 17V	12V	12V AC adaptor	12V	120V 350W
Camera head weight lbs	6.6	5 lb	7.5	7.5	6.5	5.5 lbs	7.7 lbs	44
Reader Service No	325	326	327	328	329	330	331	332



# 12



## Reasons To Specify MCL C-Band, Ku-Band and DBS High Power TWT Amplifier Systems.



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  - 3** Commonality in design and operation provides module interchangeability, and minimizes maintenance and repair downtime.
  - 4** Designed to operate under extreme environmental conditions, and in unattended remote areas.
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  - 9** Amplifier Performance Readout/Control.
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Manufacturer	Sony			Thomson Broadcast			
	Model	BVP-701S <sup>12</sup>	DXC-537	TTV 1250 Proscan <sup>3</sup>	Proscan Light <sup>13</sup>	TTV1542	TTV1645 Sportcam
Composite output	Yes	Yes	No	No	Yes	Yes	Yes
RGB output	Yes	CCU	Yes	Yes	Yes	Yes	Yes
Y-R-Y R-Y output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
S-VHS Y-C output	No	Yes	No	No	No	No	...
Direct VCR cable	Yes	Yes	Tnax	...	No	...	Yes
Cable: coax/triax/FO	Triax	...	No	...	Triax	T	Triax
Multicore cable	Yes	Yes	200m	200m	Yes	No	26-core
Docking VCR	Yes	Adapler	No	No	No	No	Beta SP
Intercom audio	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Program audio	Yes	Yes	...	Yes	Yes	Yes	Yes
Return video circuit	...	...	Yes	Yes	Yes	Yes	Yes
Lens correction memory	No	No	Yes	Yes	Yes	...	...
Color balance memories	...	...	...	...	...	...	10
ND, color filters	2N 4C	2N 2C	6 pos.	6-pos./Effects	4N:4 effects	4 pos	4 pos
For ENG EFP Studio OB	E F	ENG:EFP	HDTV(1)	HDTV	S F	S F	E F S
Pickup size type	3 FIT 2/3"	CCD IT 2/3"	PbO or SAT 2/3"	SAT 2/3"	2/3" IT (FIT)	IT 2/3"	2/3" IT (FIT)
CCD array size/type	768x494	380k HyperHad	...	...	768 (754) pix/line	440k	768 (838) pix/line
Standard sensitivity	2000: 8.0	2000: 8.0	2200: 4.3 S	2200 I/4	1000: 4	1250: 4	1000 I/4(5.6)
Max sensitivity lux; f/ +dB	7.5; 1.4 +18	7.5; 1.4; +18	50: 1.4; +12	70: 1.4; +12	15; 1.4; +1dB	10; 1.4; +21	14; 1.4; +21
S/N ratio	62dB	62dB	43dB/47dB	43dB/47dB	61dB	62dB	62dB
Limiting resolution	700	700	... 20% 20MHz	40% Gr 13.7MHz	700, 60%	700 TVL	700
Electronic shutter speeds	6	5	No	No	1/60-1/2000	5	1/60-1/2000
Registration error %	0.05%	0.05%	0.05%; 0.1%	0.05%; 0.1%	0.05%; 0.1%	<0.05%	0.05%
Hilight compensation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Color correction matrix	Yes	No	Option	Option	Yes	Opt	Option
Camera control unit	Option	Option	Option	Option	Yes	Yes	Option
Multi-camera panel	Option	No	Option	Option	Yes	Opt	Option
Operating power	12Vdc 13W	12Vdc 9.2W	110/220V	110/220V 150W	110-220Vac	110-220V	16.5W
Camera head weight lbs	7.5	7.65 lb	2kg	5.5kg	2kg	26.5kg	3.5kg
Reader Service No	333	334	335	336	337	338	339

<sup>12</sup> T7/-70 have removable optical heads; HyperHad CCDs for low light-level operation. <sup>13</sup> 1250:50, 1050:60interlaced; 625:50,525:60 progressive. <sup>14</sup> ST IT; STX IT microlens; SF FIT; SFX FIT microlens.

## TV Camera Zoom Lens Systems

Code letters for applications, E indicates ENG, F indicates EFP, O indicates Outside Broadcasting and S indicates Studio.

### Zoom Lens Systems, 1/2"

Manufacturer	Angenieux				Canon USA		
	Model	14x6	14x7	15x5 <sup>2</sup>	20x7 <sup>3</sup>	PH14a×6.6B IRS	PH20×Super
Application	E/F/O	E F O	S,F,O	S,F,O	E F	E F	Studio
Zoom range (mm)	6-84	7-98	5-75	7-140	6.6-92.4	6-120	6-120
Aperture (W-T)	1.4-1.6	1.4-1.6	1.4-1.7	1.2	1.4-1.55	1.4-1.5	1.4-1.5
MOD distance	31"	31"	19.5"	0"	31.5"	23.6"	23.6"
MOD area (HxV)	61×46mm	52×39	35.4×46.8	110×83	712×534	813×610	813×610
H angle (W-T)	58-4.5	52-4'	68.5-5	51.5-2.75'	51.7-4'	56.1'-3.06'	56.1'-3.06'
Back focus (mm)	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Extender(s)	2x	0.64x <sup>1</sup>	2x; 0.8	2x	2x	2x	2x
Macro focus	Yes	to 0" MOD	...	to 0" MOD	Yes	(at 3.74" MOD)	(at 3.74" MOD)
Diascope	No	No	...	3-lamp	No	No	No
Operating wt	4.2 lbs	3.1 lbs	23 lbs	39 lbs	2.87 lbs	35.2 lbs	35.2 lbs
Reader Service No	341	342	343	344	345	346	346

<sup>1</sup> Also wide-angle, tele, retrozoom models. <sup>2</sup> 15x6.5 - 6.5-97.5mm f/1.6-2.3 for 2/3" format. <sup>3</sup> Optional integral shutter; other extenders: 1.2x, 1.4x, 1.6x, 1.8x.

Manufacturer	Canon USA		Fujinon			Schneider	
	Model	PH55×Super	S14×6.4ERM <sup>4</sup>	S18×6.4ERM/ERD	S24×8.8ERD	S8.5×4.2ERM/ERD	TV59 Apo-Varon
Application	EFP	E/F	E/F	E/F	E/F	E/F	E/F
Zoom range (mm)	7-385	6.4-90	6.4-115	8.8-211	4.2-36	6.5-91 (HM14x)	6.5-91 (HM14x)
Aperture (W-T)	1.4-2.2	1.4-1.5	1.4-1.7	1.5-2.1	1.4-1.5	1.4-3	1.4-3
MOD distance	7.2'	29.1"	0.9m	1.8m	11"	31.5"	31.5"
MOD area (HxV)	178.8×134.1	75.1×56.3	876×657.1	1231.8×923.9mm	46.9×35.1	53×40	53×40
H angle (W-T)	49.1-0.95'	53-4'	53-08'-3-11'	39-58'-10-44'	74-10'	53-4'	53-4'
Back focus (mm)	Adjustable	...	...	...	...	35.5	35.5
Aperture (F,B)	...	...	...	...	...	70.5-30.5	70.5-30.5
Extender(s)	2x; 2.6x	2x	1.7x	2x	1.7x	2x	2x
Macro focus	at 15.7" MOD	Yes	Yes	Yes	Yes	Yes	Yes
Diascope	No	Yes	...	...	Yes	...	...
Operating wt	39 lbs	2.81 lbs	4 lbs	4 lbs	4 lbs	3.95 lbs	3.95 lbs
Reader Service No	347	348	349	350	351	352	352

<sup>4</sup> Similar lens for 2/3" is A14x8.5ERM/ERD. RM/RD versions do not include extender.

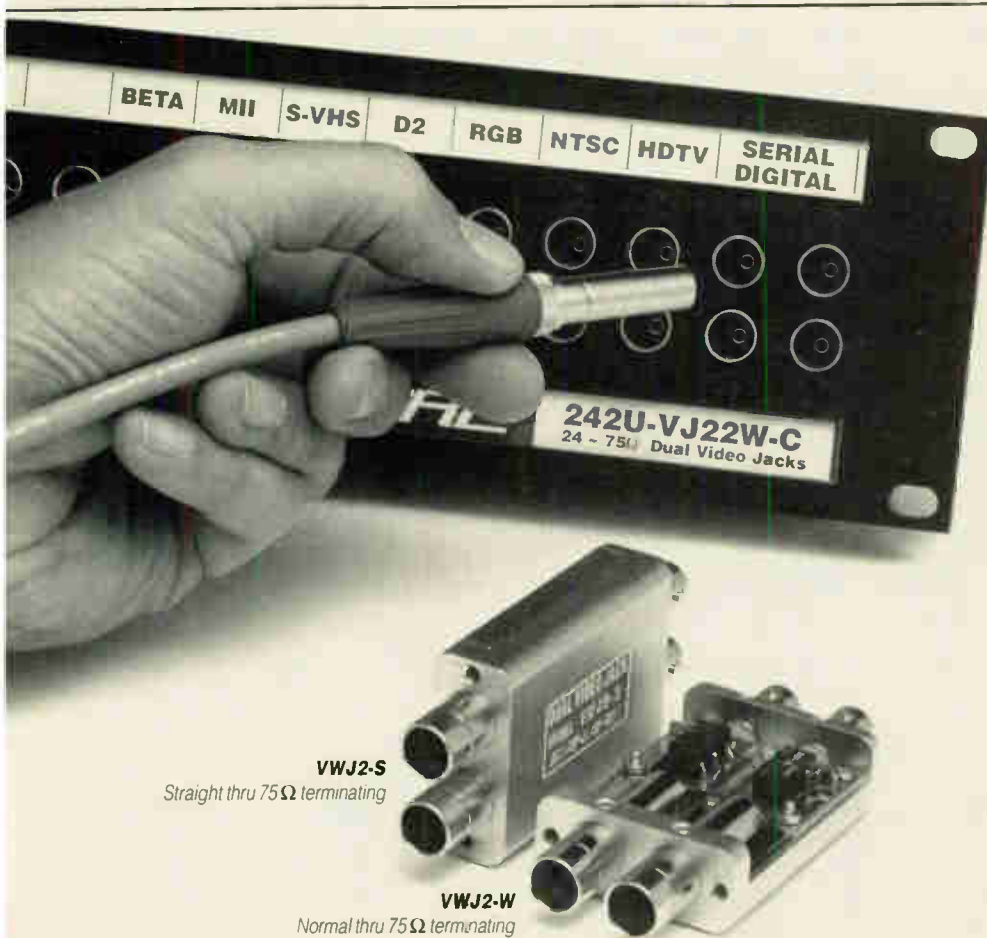
## Zoom Lens Systems, 2/3"

Manufacturer	Angenieux					Canon USA			
Model	14x8	14x9	15x6.5	20x8.5 <sup>5</sup>	40x9.5	J13x9BIRS-IIA	J14x8.5BIRS	J15x9.5B IRS	J18x8.5B IRS
Application	EFO	EFO	Studio OB	SFO	SFO	E/F	ENG,EFP	E/F	E/F
Zoom range (mm)	8-112	9-126	6.5-97.5	8.5-170	9.5-380	9-117	8.5-119	9.5-143	8.5-153
Aperture (W-T)	1.6-2	1.6-2	1.6-2.3	1.3	1.3-2.1	1.6-1.9	1.7-2.0	1.8-2.1	1.7-2.3
MOD distance	31"	31"	0.5m	0"	0"	29.1"	31.5"	34.6"	35"
MOD area (HxV)	61x46	52x39	35.4x46.8	121.9x91.7	55x41.5 <sup>7</sup>	...	755x566	86.2x64.7	86.2x64.6
H angle (W-T)	58 -4.5	52 -4	68.5 -5	55 -3	49.75 -1.33	52.1 -4.3	54.7 -4.24	49.7 -3.5	54.7 -3.3
Back focus (mm)	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Var	Man adj	Adjustable	Adjustable
Aperture (F,B)	...	...	...	...	...	72.6:31.7	...	...	82.8
Extender(s)	2x; 0.6x	2x; 0.8x <sup>5</sup>	2x	2x	2.15x; 2.7x	2x	2x	2x	2x
Macro focus	to 0" MOD	to 0" MOD	...	to 0" MOD	to 0" MOD	Yes	Yes	Yes	Yes
Diascope	No	No	No	3-lamp	3-lamp	Option	No	No	Option
Operating wt	3.9 lbs	3.1 lb <sup>6</sup>	23 lbs	39 lbs	43 lbs	2.84 lbs	2.82 lbs	3.5 lbs	3.5 lbs
Reader Service No	353	354	355	356	357	358	359	360	361

<sup>5</sup> Wide angle attachment; 1.55x tele adapter option. <sup>6</sup> Optional integral shutter; other extenders include: 1.2x, 1.4x, 1.6x, 1.8x. <sup>7</sup> Based on MOD of 8.2";  $\mu$ P control system.

Manufacturer	Canon USA				Fujinon					
Model	J20xSuper	J50xSuper	J55xSuper	A14x8.5ERM <sup>8</sup>	A15x8ESM <sup>9</sup>	A16x9.5ERM <sup>10</sup>	A20x7ESM <sup>11</sup>	A34x20.5ESM	A44x9.5ESM <sup>12</sup>	
Application	Studio	EFP	EFP	E/F	EFP	E/F	EFP	EFP	EFP	
Zoom range (mm)	7.5-150	9.5-475	9-500	8.5-119	8-120	9.5-152	7-140	20.5-700	9.5-420	
Aperture (W-T)	1.5-1.9	1.4-2.7	1.4-2.8	1.7-2.0	1.5-1.7	1.8-2.2	1.4-1.6	2.4-3.5	1.4-2.5	
MOD distance	21.8"	24"	8.2'	31.5"	27.5"	37.4"	29.5"	16.4'	7.2'	
MOD area (HxV)	89x67	180x135cm	190x143	777x583	915x686	817x613	1166x874	2000x1500	1863x1397	
H angle (W-T)	61.9 -3.3	49.7 -1.1	52.1 -1	54 -4	57 -4	49 -3	64 -3	24 -0.7	49 -1	
Back focus (mm)	Adjustable	Var; man adj	...	...	...	...	...	...	...	
Extender(s)	2x; 1.5x	2x	2x; 1.5x	2x	2x	2x	2x	2x	2x	
Macro focus	Yes	...	No	Yes	No	Yes	No	No	No	
Diascope	Option	Option	Option	Yes	Yes	Yes	Yes	Yes	Yes	
Operating wt	35.2 lbs	37.5 lbs	37.5 lbs	2.8 lbs	28.6 lbs	3.2 lbs	33 lbs	42.9 lbs	31.9 lbs	
Reader Service No	362	363	364	365	366	367	368	369	370	

<sup>8</sup> Similar unit for 1/2" is S14x6.4ERM/ERD. <sup>9</sup> Similar unit for 1/2" is S15x6ESM. <sup>10</sup> Similar unit for 1/2" is S16x7ERM/RM. <sup>11</sup> Similar unit for 1/2" is S20x5.4ESM <sup>12</sup> Similar unit for 1/2" is S44x7.3ESM.



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Manufacturer	Fujinon	Hase				Schneider		Schwem	Tamron
Model	A55-9.5ESM <sup>13</sup>	S13×9B	S15×8.5B	S19×8B	S9×5.5B	TV56 Apo-Varon	TV80	Gyrozoom FP-1	466H (14×9B)
Application	EFP	E/F	E/F	E/F	E/F	E/F	O/S	E/F/O/S	ENG
Zoom range (mm)	9.5-525	9-117	8.5-127.5	8-152	5.5-49.5	9-126 (HM14x)	8.5-150	60-300	9-126
Aperture (W-T)	1.4-2.9	1.7-2.0	1.7-2.2	1.7-2.2	1.7-1.9	1.7-2.1	1.4-2	6.2	1.6-1.9
MOD distance	< 1'	31.5"	31.5"	35.4"	0.3m	31.5"	27.5"	10'	39.37"
MOD area (HxV)	2028×1521	72.2×54.2	76.4×57.5	89.3×67.4	60×45	54×41	53×40	...	...
H angle (W-T)	49°-0.97'	52.1°-4.3'	54.7°-4.0'	57.6°-3.3'	77.3°-10.2'	52°-4'	55.5°-3.4'	8.38°-1.68°	52°6'-4'
Back focus (mm)	...	Adjustable	Adjustable	Adjustable	Adjustable	42.5-47.6	42.4	...	38.98
Aperture (F,B)	...	...	...	...	...	72-29.5	133-33	...	76.5-24.8
Extender(s)	2x	2x	2x	2x	1.7	2x; W.A.	2x	...	None
Macro focus	No	Yes	Yes	Yes	Yes	...	No	No	Yes
Diascope	Yes	No	No	No	No	No	...	No	...
Operating wt	36.9 lbs	2.42 lbs	2.75 lbs	2.75 lbs	4.25 lbs	3.96 lbs	33 lbs	7.4 lbs	3.33 lbs
Reader Service No	371	372	373	374	375	376	377	378	379

<sup>13</sup> Similar unit for 1/2" is S55x7.3ESM.

## Zoom Lens Systems, 1"

Manufacturer	Angenieux		Canon USA			Fujinon		
Model	15×12 <sup>14</sup>	40×14	PV14×12.5BIE	PV40×13.5BIE	PV50×13.5BIE	HR11×11SD	HR14×12.5ES	HR22×18ES
Application	HDTV	S/F/O	Studio	EFP	EFP	HDTV	HDTV	HDTV
Zoom range (mm)	12-180	14-560	12.5-175	13.5-540	13.5-675	11-121	12.5-175	18-400
Aperture (W-T)	1.5-1.8	1.9-3	1.6	1.7-2.8	2.0-3.7	1.8-2.0	1.6-1.7	1.8-2.7
MOD distance	0"	0"	27.5"	8.2'	8.2'	3.9'	4.6'	18'
MOD area (HxV)	60×34.5	55×41.5	960×125	211×158	213×160	1179×663	1058.6×595.5	3644×2050
H angle (W-T)	60.25°-4.5'	49.75°-1.33'	54.2°-4.3'	50.7°-1.4'	50.7°-1.1'	64°-6'	58°-4'	42°-2'
Back focus (mm)	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	...	...	...
Extender(s)	1.4x; 2x	2.15x; 2.7x	2x; 1.5x	2x; 1.5x	2x	...	2x	2x
Macro focus	...	to 0" MOD	...	...	at 19.7" MOD	No	No	No
Diascope	3-lamp	3-lamp	Option	Option	Option	Option	Option	Yes
Operating wt	54 lbs	43 lbs	51 lbs	68 lbs	46 lbs	18.7 lbs	45.1 lbs	57.2 lbs
Reader Service No	380	381	382	383	384	385	386	387

<sup>14</sup> Similar unit is 6x10 10-60mm zoom; f/1.5 with 16" MOD.

Manufacturer	Hase				Hikon			
Model	HR6×12.5SD	R17×12.5ESM	R20×10.5ESM	R34×29.5ESM	R44×13.5ESM	R10×12AED-HD2	R5.5×12.5AD-HD	
Zoom range (mm)	12.5-75	12.5-215	10.5-210	29.5-1000	13.5-600	12-120	12.5-70	
Aperture (W-T)	1.5	1.6-2.0	1.6-2.1	3.5-5.0	1.8-3.0	1.8-2.2	1.5	
MOD distance	3.9'	29.5"	29.5"	18.7'	8.2'	51.6"	1.21m	
MOD area (HxV)	1013×570	987×174	1168×876	2021×1516	2181×1636	...	...	
H angle (W-T)	58°-10'	54°-3'	62°-3'	24°-0.6'	50°-1'	60°19'-6°39'	58.3°-11.4'	
Extender(s)	...	2x; 1.5x	2x; 1.5x	2x	2x	2x	No	
Macro focus	No	No	No	No	No	Yes	Yes	
Diascope	Option	Yes	Yes	Yes	Yes	...	...	
Operating wt	15 lbs	42.9 lbs	45.1 lbs	45.1 lbs	55 lbs	16.5 lbs	20 lbs	
Reader Service No	388	389	390	391	392	393	394	

## Zoom Lens Systems, 1 1/4"

Manufacturer	Angenieux	Canon USA			Fujinon			
Model	15×16	P14×16.5BIE	P18×15BIE	P40×18BIE	HP5×16SD	P17×16.5ESM	P20×14ESM	P44×18ESM
Application	HDTV	Studio	F/S	Field	HDTV	F/S/O Special	F/S/O Special	F/S/O Special
Zoom range (mm)	16-240	16.5-235	15-270	18-720	16-80	16.5-280	14-280	18-800
Aperture (W-T)	2-2.4	2.1	2.1-2.7	2.3-3.7	1.4	2.1-2.7	2.1-2.8	2.4-4.0
MOD distance	0"	27.6"	23.6"	8.2'	3.9'	29.5"	29.5"	8.2'
MOD area (HxV)	60×34.5	965×724	922×692	211×158	1055×594	1000×750mm	1171×878	2181×1636
H angle (W-T)	60.25°-4.5'	54.8°-4.2'	60.4°-3.7'	50.7'	60°-13'	54°-3'	62°-3'	50°-1'
Back focus (mm)	Adjustable	Adjustable	Adjustable	Adjustable	...	...	...	...
Extender(s)	1.4x; 2x	2x; 1.5x	2x; 1.5x	2x; 1.5x	2x; 1.5x	2x; 1.5x	2x; 1.5x	2x; 1.5x
Diascope	3-lamp	Option	Option	Option	Yes	Yes	Yes	Yes
Operating wt	54 lbs	51 lbs	59 lbs	68 lbs	31.9 lbs	42.9 lbs	45.1 lbs	55 lbs
Reader Service No	395	396	397	398	399	400	401	402

## Video Monitors

Manufacturer	ASACA/ShibaSoku					
Model	CM 23/43 <sup>1</sup>	CM201/141(202/142) <sup>2</sup>	CM30A6/65B6	CM321H/361H	CM99A	CMM 20-11(U)
Beam feedback CRT	...	Yes	Yes	Yes	...	...
Aperture correction	Yes	Yes	No	No	Yes	Yes
X-Y display output	No	No	RGB only	RGB only	No	Opt
Underscan/overscan	Yes	Yes	Under	Under	Yes	Yes
# composite inputs	3	1	None	None	2	3



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Circle (29) on Reply Card

Manufacturer	ASACA/ShibaSoku					
	CM 23/43 <sup>1</sup>	CM201/141(202 142) <sup>2</sup>	CM30A6/65B6	CM321H/361H	CM99A	CMM 20-11(U)
Model	CM 23/43 <sup>1</sup>	CM201/141(202 142) <sup>2</sup>	CM30A6/65B6	CM321H/361H	CM99A	CMM 20-11(U)
RGB inputs	Yes	Yes	2	2	Yes	Opt
S-VHS inputs	Yes	Y/C	No	No	No	Opt
Y/C <sub>a</sub> C <sub>b</sub> inputs	No	Yes	2	2	No	Opt
Audio amp/speaker	No	No	No	No	Yes	No
Application	Grade 2	Video	HDTV	HDTV	Grade 2	Grade 1
CRT diagonal (in.)	21 (15)	20 (14)	30 (26)	32 (36)	9	20 (14 26)
CRT type	In-line dot	In-line dot	Delta/shadow mask	Delta/shadow mask	In-line dot	Delta gun/dot
Dot/stripe pitch (mm)	0.39	0.4/ .31	0.37 (.34)	0.34 (.5)	0.3	0.44
Resolution at center	550TVL	600TVL	525NS/1150/1050	525NS/1125/1050	400TVL	600TVL
Luminance bandwidth	7MHz	7MHz	±3 30MHz	±3 30MHz	7MHz	7MHz
Chrominance bandwidth	0.5MHz	0.6MHz	±3 30MHz	±3 30MHz	0.5MHz	to 4.4MHz
Demodulation axes	R-Y/B-Y	I&Q	[16:9 & 4:3	[16:9 & 4:3	No	I/Q
Decoder filter	Comb & notch	Comb & notch	[aspect ratios	[aspect ratios	Comb & notch	Comb & notch
Standards	NTSC/PAL	202/142	Autoselection	Autoselection	NTSC/PAL	N/P/S/multi
µP auto-setup	...	No	Yes	Yes	No	No
Reader Service No	403	404	405	406	407	408

<sup>1</sup> Flat square CRT also available in 14" rack-mount CM44. <sup>2</sup> CM 202/142 may include multiple decoders with auto standard selection.

Manufacturer	Barco			Electronic Visuals	Hitachi Denshi	Ikegami
	AVM series <sup>3</sup>	CVS 2037 2051	CVS series <sup>4</sup>			
Model	AVM series <sup>3</sup>	CVS 2037 2051	CVS series <sup>4</sup>	EV6351B <sup>5</sup>	CM-150 (-210)	15 series <sup>6</sup>
Beam feedback CRT	Yes	Yes	Yes	Yes	Yes	Yes
Aperture correction	Yes	Yes	Yes	...	...	Yes
X-Y display output	...	No	No	No	No	Yes
Underscan/overscan	Yes	Yes	Yes	Yes	Yes	Yes
# composite inputs	3	3	2	Yes	3	3
RGB inputs	Yes	Yes	Yes	Yes	Yes	Yes
S-VHS inputs	No	No	No	Yes	Yes	No
Y/C <sub>a</sub> C <sub>b</sub> inputs	Yes	Opt	Opt	Yes	...	Option
Audio amp/speaker	Amp	-ASP opt	ASP opt	No	No	No
Application	Grade 1	Grade 1	Grade 1	Video	Video	Video
CRT diagonal (in.)	10-28	14 (20)	14 (20)	20	15 (21)	14, 20
CRT type	In-line slot	In-line dot	In-line dot	In-line dot	Dark-Tint	In-line dot
Dot/stripe pitch (mm)	0.31	0.31	0.31	0.43 (0.47)	0.57	0.31 (0.43)
Resolution at center	>500 15"	900TVL	900TVL	...	450 (500)	700
Luminance bandwidth	6MHz	6MHz	6MHz	8MHz	...	to 10MHz
Chrominance bandwidth	0.6MHz	0.6MHz	0.6MHz	...	...	0.6MHz
Demodulation axes	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	U/V	R-Y/B-Y	R-Y/B-Y
Decoder filter	Comb filter	Comb & notch	Comb & notch	Notch	Notch (NTSC)	Adaptive comb
Standards	NTSC	N/P/S	N/P/S	PAL	NTSC/PAL	NTSC
µP auto-setup	Option	Standard feature	Yes; setup opt	No	No	Yes
Reader Service No	409	410	411	412	413	414

<sup>3</sup> Available with MMRC, SRC multiple, single monitor remote controller; full control of 48 monitors from one remote panel; on-screen menu and digital controls; interfaces for PAL, NTSC, PAL, D1, D2. <sup>4</sup> Multiple input cards allow added input capability including quad input, NTSC-4.43, PAL-M/N; D-1/D-2, CCIR 601 digital. <sup>5</sup> EV6351 Grade II; -B model Grade I; switchable aspect ratio shows 4:3 or 16:9 pictures. <sup>6</sup> TM14-15RH; TM20-15RH

Manufacturer	Ikegami			JVC Company		
	16 series <sup>7</sup>	19 series <sup>8</sup>	20 series <sup>9</sup>	TM20-30RH	TM-1400SU <sup>11</sup>	VM-R190SU <sup>12</sup>
Model	16 series <sup>7</sup>	19 series <sup>8</sup>	20 series <sup>9</sup>	TM20-30RH	TM-1400SU <sup>11</sup>	VM-R190SU <sup>12</sup>
Beam feedback CRT	Yes	Yes	Yes	Yes	Yes	Yes
Aperture correction	Yes	Yes	Yes	Yes	...	Yes
X-Y display output	No	Yes	Y/B-Y/R-Y opt	Y/R-Y/B-Y opt	No	No
Underscan/overscan	Under	Under	Under/over	Under/Over	Under	Yes
# composite inputs	Yes	Yes	3	3-input	2	2
RGB inputs	Yes	Yes	Yes	Yes	No	Yes
S-VHS inputs	Yes	No	(D-1/D-2 opt)	Yes	Yes	Yes
Y/C <sub>a</sub> C <sub>b</sub> inputs	No	Yes	Yes	Yes	No	Yes
Audio amp/speaker	No	No	No	No	Yes	No
Application	Video	Video	Video	Video	Video/data	Video/data
CRT diagonal (in.)	10, 14, 20	10, 14, 20	14 (20)	20	14 Full Square	19
CRT type	In-line slot	In-line dot	Shadow mask/dot	Shadow mask/dot	In-line dot	In-line dot
Dot/stripe pitch (mm)	0.41 (0.55)	0.31 (0.43)	0.31 (0.43)	0.28	0.499 stripe	0.4
Resolution at center	500	700	700	900	450	600
Luminance bandwidth	to 7MHz	60-10MHz	50-7MHz	to 7MHz	...	...
Chrominance bandwidth	to 3.58MHz	0.6MHz	3.58MHz	to 10MHz/RGB	...	...
Demodulation axes	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	I/Q	R-Y/B-Y	R-Y/B-Y
Decoder filter	Comb & notch	Comb & notch	Comb & notch	Notch & Comb <sup>10</sup>	Comb	Comb
Standards	NTSC	NTSC	Multistandard	Multistandard	NTSC/Y/C358	NTSC/component
µP auto-setup	No	No	Digital control	Opt w probe	No	No
Reader Service No	415	416	417	418	419	420

<sup>7</sup> TM10-16R; TM14-16R; TM20-16R <sup>8</sup> TM10-19RH; TM14-19RH; TM20-19RH <sup>9</sup> TM14-20RH; TM20-20RH <sup>10</sup> Adaptive comb filter option by Faroudja Laboratories. <sup>11</sup> TM-200SU 20", TM-91SU 9" have similar features and specifications. <sup>12</sup> VM-R140SU 14" unit with similar characteristics and specifications.



Manufacturer	Melford Electronics	Mitsubishi Electric			Panasonic PCSC		
		AM-3501R <sup>3</sup>	SMR-2601R	AT-H series <sup>4</sup>	BT-HI-DI-M <sup>5</sup>	BT-S series <sup>6</sup>	
Model	DU5-20C						
Beam feedback CRT	Yes	...	...	Yes	Yes	Yes	
Distortion correction	...	Yes	Yes	10dB	Yes	Yes	
Video display output	[EBU phosphors	No	No	No	No	No	
Underscan/overscan	Overscan	Yes	Yes	Yes	Yes	Yes	
Composite inputs	2	3	3	3	2	2	
RGB inputs	Yes	Yes	Yes	Yes	Yes	Yes	
Hi-Fi inputs	No	Yes	Yes	Yes	Yes	BT-S901Y	
Hi-CB inputs	No	No	No	Yes	Yes	No	
Audio amp/speaker	No	Yes	Yes	No	Yes	Yes	
Application	Video; Data	Data; Mon/Rcvr	Data; Mon/Rcvr	Video	Video	Video	
Beam diagonal (in.)	20	35	26"	13; 19	13; 19	19/13 9/7	
Beam type	In-line dot	In-line dot	In-line dot	In-line dot	In-line dot	3-beam/OLF gun	
Beam stripe pitch (mm)	0.4; 0.31	0.92 centers	...	0.31; 0.44	0.31	0.31; 0.44	
Resolution at center	5.5MHz pattern	630 TVL max	...	650	750; 550	230-350	
Minimum bandwidth	to 10MHz	8MHz	...	>7	>8	>7	
Chrominance bandwidth	...	...	...	0.6/0.3	...	0.6	
Modulation axes	UV	...	...	I/Q	PrPb	I/Q	
Color filter	Notch	...	...	Both	Both	Both	
Standards	PAL; NTSC	NTSC	NTSC	N/P/S	NTSC	N/P/S	
Auto-setup	No	...	...	Option	No	No	
Dealer Service No	421	422	423	424	425	426	

AM-2751A 27", AM-3151A 31" have similar characteristics. <sup>14</sup> AT-H1900; AT-H1300; may use multiple decoders. <sup>15</sup> CompuFocus CRT with overlapping field lens gun; BT-H1350 w/C-phosphor, 4-std auto selection; BT-H1350 C-phosphor BT-D1920 19" w/.55mm dot pitch; BT-M1310 13" w/.39mm pitch. <sup>16</sup> CompuFocus CRT with overlapping field lens gun on 13"/19" models; BT-S1900, BT-S1300N, BT-S901Y, BT-S701/702 703N

Manufacturer	FESA					
	BM-4400 series	BVM-1310 (-15)	BVM-1910 (-15)	BVM-1912 (-1312)	BVM-8021/9021	PVM-2030/2530 <sup>17</sup>
Model						
Beam feedback CRT	Yes	Yes	Yes	Yes	...	Yes
Distortion correction	±6dB	6dB	6dB	Yes	Yes	...
Video display output	No	Yes	Yes	Yes	No	No
Underscan/overscan	Yes	Yes	Yes	Yes	Yes	No
Composite inputs	2	Yes	Yes	2	2	Yes



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Circle (36) on Reply Card

Manufacturer	PESA			Sony		
Model	BM-4400 series	BVM-1310 (-15)	BVM-1910 (-15)	BVM-1912 (-1312)	BVM-8021/9021	PVM-2030/2530 <sup>17</sup>
RGB inputs	Yes	Yes	Yes	Yes	No	PC
S-VHS inputs	Yes	No	No	[4:2:2 opt	No	Yes
Y.CaCb inputs	Yes	Yes	Yes	Yes	No	No
Audio amp speaker	No	No	No	No	0.8W	Yes
Application	Video	Video data	Video data	Grade I	graphics	Grade II
CRT diagonal (in.)	14: 20	13"	19	19" (13")	8"	21 (27)
CRT type	Dot mask	Trinitron	Trinitron	Trinitron	Trinitron	Trinitron
Dot stripe pitch (mm)	0.31, 0.44	0.25	0.3 (0.4)	0.30mm	0.25	0.55 (0.73)
Resolution at center	>600, >700	700 (600)	900 (600)	900 TVL	400	560
Luminance bandwidth	6MHz	8MHz (6) NTSC	8MHz (6) NTSC	10MHz	5.5MHz	6MHz NTSC
Chrominance bandwidth	...	10MHz (6) RGB	10MHz (6) RGB	1.5MHz	...	10MHz RGB
Demodulation axes	UV	R-Y B-Y	R-Y B-Y	R-Y B-Y	R-Y B-Y	R-Y B-Y
Decoder filter	Both	Comb & notch	Comb & notch	Comb filter	NTSC (PAL SECAM)	Comb
Standards	NTSC or PAL	per decoder	per decoder	per decoder	Comb-filter	NTSC
Multiscan capability	No	No	No	No	No	...
µP auto-setup	Option	BKM-2053 adapter	BKM-2056 adapter	Standard	No	No
Reader Service No	427	428	429	430	431	432

<sup>17</sup> PVM-3230 32"; PVM-4300 43"; PVM-1910 19".

Manufacturer	Sony	Videotek				Vistek Electronics
Model	PVM-5310 (3x)	AVM-13sv (-19s)	RM-8 (-8PR) <sup>18</sup>	Studio 13	VM-13 PRO	GM7100(7200) <sup>19</sup>
Beam feedback CRT	Yes	No	No	No	No	...
Aperture correction	[Sized for	Yes	No	No	No	No
X-Y display output	[3-across mounting	No	No	No	No	No
Underscan overscan	No	Under	Opt	Yes	Yes	Yes (Opt)
# composite inputs	Yes	2	2	3	3	A/B
RGB inputs	No	No	No	No	No	Yes
S-VHS inputs	No	-13vs	No	No	No	...
Y.CaCb inputs	No	No	No	No	No	No
Audio amp speaker	No	Yes	Yes	Yes	No	No
Application	V	Grade 2	Mon Rcvr	Grade 2	Grade II	Gr 1 (2)
CRT diagonal (in.)	5"	13 (19)	8	10	13	14/20 (6.5/10)
CRT type	Trinitron	In-line slot	Trinitron	In-line Slot	Trinitron Plus	Dot mask
Dot stripe pitch (mm)	...	...	...	...	0.25mm	0.39 0.44
Resolution at center	220	450 (380)	260TVL	380 TVL	260TVL	...
Luminance bandwidth	...	4.2MHz	3MHz	3MHz	3.2MHz	6MHz
Chrominance bandwidth	...	1MHz	1MHz	1MHz	1.5MHz	...
Demodulation axes	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y B-Y	R-Y B-Y	U-V
Decoder filter	...	Comb filter	Notch	Comb, notch	Notch	Comb filter
Standards	NTSC	NTSC	NTSC	NTSC	NTSC	PAL
µP auto-setup	No	No	No	No	No	No
Reader Service No	433	434	435	436	437	438

<sup>18</sup> RM-8 is a portable unit; both operate from ac or 12Vdc; 68 channel tuner. <sup>19</sup> GM7200 available for NTSC-358.4.43, PAL or SECAM.

## Time Base Correctors/Synchronizers

Manufacturer	ALTA Group	Amplex Corporation		BTS	CEL Electronics	Digital Processing Systems		
Model	Cygnus (-5.5)	TBC-7	ZEUS	DSY7	P164-38 (-18)	DPS-220	DPS-265	DPS-270
Function TBC Synchronizer	Both	TBC	TBC	Synchronizer	Both	Both	Both	TBC
Standard NTSC PAL SECAM comp	NTSC	NTSC PAL	N: P-M: S	CCIR 601	N:P:S	NTSC	NTSC	NTSC
Format conversions	(5.5 only)	No	No	No	Yes	No	Yes	Yes
Sampling frequency	14.318	4xFsc	14.318	13.5MHz	13.5	4xFsc	4xFsc	4xFsc
Bits sample	8-bit	8-bit	9-bit	8-9 10-bit	8-bit	8-bit	8-bit	8-bit
Correction window	1 field	28-line	60 lines	1 frame	5-field PAL	Infinite	Infinite	16 lines
Video bandwidth	290 lines (5.5)	4.2 N/5.5 P	±0.2dB 5MHz	...	5.5MHz	-3/+0.5 to 6MHz	-3/0.5dB 6MHz	-3 0.25dB 5.5
S/N ratio	>55dB (>56dB)	>56dB	>58dB	[Unit is	56dB	>58dB	58dB	58dB
Diff phase/gain	<3°/3% (<2°/2%)	<2%, <2%	<2° <2%	[digital	...	<2°/ <2%	<2°/ <2%	<2°/ <2%
Residual error	...	±2.5ns color	±10ns mono	[device	...	<15ns	±15ns	±15ns
Advanced sync output	No	Yes	Yes	...	Yes	Yes	No	Yes
Coherent subcarrier out	No	Yes	Yes	AF delay ctl	...	Yes	No	Yes
Composite I/O	Yes	Yes	Yes	With options	Yes	Yes	Yes	Yes
Component I/O	(Y/C 3.58)	No	D-2 ZeusPort	4:2:2 digital	YUV-YC CCIR-601/656	No	Color-under	Y-C
Heterodyne operation	...	Yes	Yes	No	...	Yes	Yes	Yes
Dropout compensation	...	Digital	Yes	[Auto selects	Yes	Opt	...	No
For servo capstan	...	Yes	Yes	[525/625 line	...	...	...	...
Supports dynamic tracking	Yes	Yes	Yes	[standard ref.	Yes	No	No	...
Noise reduction	No	...	Yes	[to input sync.	...	...	...	Chroma
Image enhancement mode	Yes (No)	No	...	[Variable	...	...	...	...
Video effects	Yes	No	No	[delay.	-38 only	No	(VITS insert)	No
Freeze frame, field	Yes [4x1 xtch	No	Yes	Yes	Yes [4x1 xtch	Yes	Yes	...
Reader Service No	441	442	443	444	445	446	447	448

Manufacturer	Digital Processing Systems			Digital Vision		For-A			Grunder/Feral
	DPS-295 <sup>1</sup>	DPS-375	DVFS 1000	FA 720	FA-220	FA-310	UDP-1000	C-100 <sup>2</sup>	
Model	TBC	Both	Both	Dual TBC	TBC	TBC	TBC	Both	
Standard: NTSC/PAL/SECAM	NTSC	PAL	N, P, comp	NTSC	NTSC	NTSC	...	NTSC/PAL	
Format conversions	Yes	Yes	Yes	Yes	No	Transcode opt	Yes	Yes	
Sampling frequency	4xF <sub>sc</sub>	13.5	4xF <sub>sc</sub>	13.5	13.5 4:1:1	14.318	4xF <sub>sc</sub>	13.5MHz	
Bits/sample	8-bit	8-bit	10-bit	8-bit	8-bit	8-bit	8-bit	8-bit/4:2:2	
Interpolation window	Infinite	Infinite	...	Full frame	Full frame	1-frame	1-frame	1 frame	
Video bandwidth	>3/4 25.6MHz	0.5dB 5MHz Y/C	[Spec per	5MHz	5MHz	4.2MHz	±0.3 5MHz	5.5MHz	
SN ratio	58dB	58dB	[CCIR 601	56dB	56dB	58dB	58dB	58dB	
Off phase/gain	<2°/2%	<1°/1%	...	2°/2%	2°/2%	2°/2%	2°/2%	2°/2%	
Residual error	<15ns	±15ns	...	±15ns	15ns	±15ns	±2.5ns	...	
Advanced sync output	Yes	Yes	...	...	Yes	Yes	Yes	...	
Inherent subcarrier out	Yes	No	...	...	No	Yes	Yes	...	
Composite I/O	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Component I/O	Yes	Y/C; YCrCb	RGB YCrCb D1	Y/C; YCrCb ...	Y/C RGB YCrCb	Y/C; YCrCb; D1	Y/C	...	
Stereo operation	...	...	...	...	Yes	Yes	...	...	
Output compensation	AUTODOC-3D	No	...	Yes	...	Yes	Yes	...	
Linear servo capstan	...	...	...	...	Yes	Yes	Yes	...	
Supports dynamic tracking	No	...	...	...	No	Option	Yes	No	
Noise reduction	...	...	...	9dB 3-step	Luma/Chroma	9dB 3-step	2-stage	No	
Freeze enhancement mode	...	...	Yes	...	[ACC/Chromacor	[Auto Chroma	Yes	No	
Freeze effects	Yes	Yes	No	No	[Color correction	[Level Ctrl	No	No	
Freeze frame, field	Yes	Yes	...	Automatic	Automatic	Yes	Yes	Yes	
Reader Service No	449	450	451	452	453	454	455	456	

<sup>1</sup>NTSC/Y-C/Dub input; Y/R-Y/B-Y out. <sup>2</sup>C-100N NTSC; C-100P PAL; S-100A automatic selection from input signal.

Manufacturer	Hotronic				I-DEN			Leitch Video
	AE61/-B/-S	AF71	AF75	AH91	IVT-7	IVT-9 Plus <sup>3</sup>	TBCard (Plus)	
Model	TBC	Both	Both	Both	Both	TBC	TBC	Synchronizer
Standard: NTSC/PAL/SECAM/comp	NTSC	NTSC	NTSC	NTSC	NTSC	NTSC	NTSC	NTSC D2
Format conversions	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Sampling frequency	4xF <sub>sc</sub>	4xF <sub>sc</sub>	4xF <sub>sc</sub>	14.3MHz, 8-bit	13.5MHz	13.5MHz	13.5MHz	14.3MHz
Bits/sample	8-bit	8-bit	8-bit	8-bit	8-bit	8-bit	8-bit	10-bit
Interpolation window	16-line	2 frame	1 frame	1 frame	1 frame	1 frame	1 frame	Infinite
Video bandwidth	4.2 (-B 2.5)	4.2	4.2 (400 lines)	5.5MHz	5.5MHz	5.5MHz	5.5MHz	4.5MHz
SN ratio	58dB	58dB	58dB	58dB	58dB	58dB	56dB	>70dB
Off phase/gain	<2°/2%	<1.5°/1.5%	<2°/2%	1, 1%	2°/2%	2°/2%	2°/2%	<1°/1.25%
Residual error	±10ns	±20ns	±10ns	10ns C, 1 L	...	±15ns 2°	...	<10ns
Advanced sync output	Yes	Yes	Yes	Yes	No	Yes	No	...
Inherent subcarrier out	Yes	Yes	Yes	Yes	No	Yes	No	...
Composite I/O	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NTSC, D2
Component I/O	Y/C	No	Y/C	Y/C	Y/C	YCrCb; Y/C	Y/C; YCrCb	...
Stereo operation	Yes	Yes	Yes	Yes	...	...	...	...
Output compensation	Option	Yes	Yes	Yes	Yes	Yes	...	...
Supports dynamic tracking	...	...	...	No	No	Yes	No	...
Noise reduction	3dB chroma	3dB chroma	3dB chroma	Chrominance	No	No	No	No
Freeze frame, field	No	Yes	Yes	Yes A/V xch	Yes	Yes	No	On signal failure
Reader Service No	457	458	459	460	461	462	463	464

IVT-9S(M) offers similar characteristics. For PAL or Secam, use IVT-9S, (P).

Manufacturer	Microtime				Nova Systems			
	FS10 (FS8)	Tx3 FIT	Tx4.2 Component	Tx6	#700 (#800)	502 EFP-TBC	920SP 950 (900)	NOVASync <sup>c</sup>
Model	Both	TBC	TBC	TBC component	TBC (Both)	TBC	Both	Both
Standard: NTSC/PAL/SECAM/comp	NTSC; PAL	NTSC/PAL	N/P	NTSC; PAL-B	NTSC	NTSC	NTSC (& PAL)	NTSC
Format conversions	No	Yes	Yes	Yes	No	No	#950	(Sync2 2F)
Sampling frequency	4xF <sub>sc</sub>	14.3MHz	14.3MHz	13.5	14.3MHz	14.3	13.5	14.3
Bits/sample	10-bit (8-bit)	8-bit	8-bit	4:2:2, 8-bit	8-bit	8-bit	8-bit/4:2:2	8-bit
Interpolation window	Inf (4-fid opt)	1 frame	1 frame	1-frame	32-line (frame)	6-line	1 field	1 frame
Video bandwidth	5.5MHz	5.2MHz	5.2MHz SVHS	5.5 MHz	5.5MHz #710	5.5MHz	to 5.5MHz	>3.5MHz
SN ratio	>60dB	58dB	58dB NTSC	58dB NTSC	>58dB	>58dB	>58dB	>58dB
Off phase/gain	1°/1% (2°/2%)	2°, 2%	2°, 2%	2°/2%	<2°/2%	<2°/2%	<2°/2%	2°/2%
Residual error	...	2° C, 15ns L	<15ns Y	<15ns	±10ns	±10ns	±10ns	±10ns Y
Advanced sync output	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inherent subcarrier out	No	Yes	Yes	No	Yes	Yes	No	Yes
Composite I/O	Yes	NTSC, PAL	NTSC, PAL	Yes	NTSC	Output	Yes	NTSC
Component I/O	D2	YUV, Y-C, YCrCb	Y-C YCrCb	Y/C	Y-C	...	Y/C; YCrCb out	Y-C
Stereo operation	Opt	No	Yes	...	Yes	...	...	Yes
Output compensation	...	Hetero component	Yes	Yes	Yes	No	Yes (No)	Yes

Manufacturer	Microtime				Nova Systems			
Model	FS10 (FS8)	Tx3 FIT	Tx4.2 Component	Tx6	#700 (#800)	502 EFP-TBC	920SP/950 (900)	NOVASync <sup>4</sup>
For servo capstan	...	or non-servo	or non-servo	Yes	Yes	Yes	Yes	Yes
Supports dynamic tracking	No	Vari-Trak	Vari-Trak	Yes	No	No	No	No
Noise reduction	No	Lum./Chr.	Option	...	No	[Portable	3dB chroma	No
Video effects	No	Option	Option	...	No	[unit for	Yes	No
Freeze frame, field	Yes	Yes	Yes	Yes	Yes	[field use	4x1 switcher	NOVASync F/2F
Reader Service No	465	466	467	468	469	470	471	472

<sup>4</sup>NOVASync-F synchronizers; NOVASync 2-/2F sync/TBCs.

Manufacturer	Panasonic CSC		Prime Image				Festpar	Videotek
Model	TBC-200 Plus	6.5P (6500 <sup>5</sup> )	7.5MHz (700 <sup>6</sup> )	Excel 6.5 (600)	HR600 (800) <sup>6</sup>	Model 50 (25)	110-S <sup>9</sup>	VDP8400 (8000) <sup>10</sup>
Function TBC/Synchronizer	TBC	Both	TBC	Both	Both	Both	Synchronizer	Synchronizer
Standard NTSC/PAL/SECAM/comp	NTSC	PAL	NTSC	NTSC	NTSC	NTSC	NTSC	NTSC
Format conversions	Yes	Yes	Yes	Not 605/650.	Yes	(50S/25S)	No	No
Sampling frequency	14.318	...	...	...	...	...	14.314	14.318
Bits sample	8-bit	8-bit	8-bit	8-bit Y&C	8-bit	8-bit	10-bit	8-bit
Correction window	16 line	16 lines	16 lines	16-line	1 frame	1 frame	Infinite	1-frame
Video bandwidth	6MHz DUB	6.5MHz	7.5MHz	6.5MHz	7.5MHz	4.2MHz	to 4.2MHz	-3dB 5MHz
S/N ratio	>57dB	58dB	58dB	58dB	58dB	58dB	60dB	>58dB
Diff phase gain	2°/2%	1.5°/1.5%	1.5°/1.5%	1.5°/1.5%	1.5°/1.5%	1.5°/1.5%	1°/1%	2°/2%
Residual error	±15ns	±15ns	±15nsec	±15nsec	±15nsec	±15ns	20ns max	...
Advanced sync output	Yes	Yes	Yes	Yes	Not required	No	No	No
Coherent subcarrier out	No	Yes	Yes	Option	Yes	No	No	No
Composite I/O	Yes	...	Yes	Yes	Yes	Yes	NTSC	Yes
Component I/O	Y/C YCrCb	Y/C YUV	Y/C; YCrCb	Y/C; YCrCb	Y/C; YCrCb	Y/C; YCrCb	(50S/25S)	None
Heterodyne operation	...	Yes	Yes	Yes	Yes	No	w/TBC opt	...
Dropout compensation	...	Yes	Yes	Yes	Yes	Yes	...	...
For servo capstan	...	...	...	...	...	...	...	...
Supports dynamic tracking	...	Yes	Yes	Yes	Yes	No	No	...
Noise reduction	Chroma	20dB	to 20dB	20dB	No	No	No	No
Video effects	No	Not 6500	Not 700	Yes	Some models	No	No	No
Freeze frame, field	...	No	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	473	474	475	476	477	478	479	480

<sup>5</sup> TBC 6500, 6501; TBC/Sync 6510, 6511. <sup>6</sup> TBC 705/750 composite I/O only; others include components. 700/701/705 TBC; 710/711/750 synchronizer. <sup>7</sup> 605, 650 composite I/O only. <sup>8</sup> 801 TBC, #800 with effects; 810 TBC synchronizer; 810 limited effects. <sup>9</sup> Link to AS-18 audio delay to resynchronize audio delayed through transmission or processing. VS-211 video synchronizer for PAL standard; 10-bit sampling. <sup>10</sup> 2-frame freeze memory for 1-frame freeze, while 2nd channel operates normal with synchronized output.

## Routing Switchers, Audio/Video/Data

Manufacturer	360 Systems	Alpha Image	ASACA	Auditronics	AutoPatch	Barco	BTS Broadcast Television Systems		
Model	AM-16	Alpha 264S	ASW-88S	1900 IFB	4Y-140DM(8Y-)	BVRS/BARS	BSB-3000	BSX-350A-V	DRS 7
Audio/Video/Data	Audio	Serial digital	V/A	Audio	V/A Data	V/A	Audio	V/A	Digital video
Basic crosspoint matrix	8x8 16x16	16x16	8x8	16x8	4x4 (8x8)	16x16	4x4	10x10	8x4
Typical system size	16x16x4	64x64	8x8	48x24	32x128 (64x256)	32x32	...	10x10-V 20x-A	8x8 8x12/8x16
Audio response ±dB Hz-kHz	-3 to 50k	...	±0.5 30-18k	±0.5 20-20k	±0.1 20-30k	±0.1 20-20k	±0.1 20-20k	±0.1 20-20k	[This system
Harmonic distortion	<0.008%	[Mix of D1, D2	<0.5%	<0.01%	<0.002%	<0.02%	<0.002%	<0.007%	[for CCIR
S/N ratio	105dB	[for serial	>72dB	91dBu	120dB	...	95dB	85dB	[601 4:2:2
Audio crosstalk (worst)	88dB 1kHz	[component or	<-80dB	-86dBu 1kHz	<-95dB	-100dB	<-95dB 20kHz	<-90dB	[digital video
Video response	...	[composite	-0.5/3 8MHz	...	to 50MHz	to 40MHz	...	to 20MHz	[signals in
Diff phase/gain	...	[digital	<1%/<1	...	<0.05°/0.1%	<0.1°/<0.1%	...	<0.1%	[8-9 10-bit
Chroma Luma delay	...	[signal	...	...	1° 4.43MHz	...	...	<±1°	[sampling;
Video S/N ratio	...	[distribution	>45dB	...	80dB	...	...	>75dB	[system auto-
Video crosstalk (worst)	...	[via coax.	<-50dB	...	<-78dB 10MHz	50dB 5MHz	...	-60dB	[selection of
Multilevel audio control	Yes	...	2-channel	...	Yes	Possible	...	Possible	[525 and 625.
For component video	...	Digital only	No	...	Yes	Possible	...	Possible	Digital
Reader Service No	481	482	483	484	485	486	487	488	489

Manufacturer	BTS		Datatek			Di-Tech			
Model	TAS TVS-2000	BVS-350C	D-2400	D-2000	5865A 5864V	5616/5618	5216	5860 series	5217 Wideband
Audio/Video/Data	V/A	Component vid	V/A	V/A	V 2A	V/A	Video D1/D2	5861V 5862A	Video
Basic crosspoint matrix	10x10	10x1x3	160x20	50x25	32x24	16x8/16x16	16x16	64x32	16x16
Typical system size	250x150	3x20x1	40x20x4	50x50; 250x500	64x32	16x32 audio	64x16	256x256	HDTV video
Audio response ±dB Hz-kHz	±0.1 20-20k	...	±0.05 20-20k	±0.1 20-20k	±0.1 20-20k	±0.5 20-100k	[Digital; 75±	±0.5 20-100k	...
Harmonic distortion	<0.007%	...	<0.005%	0.05%	<0.05%	<0.25%	[input/output	<0.1%	...
S/N ratio	85dB	...	116dB	105dB	>70dB	>70dB	[at 0.8Vp-p;	>70dB	...
Audio crosstalk (worst)	<-90dB	...	-82dB 20kHz	-85dB 20kHz	<-75dB	<-80dB 20-1k	[data rates	<-80dB	...
Video response	to 20MHz	±0.7 30MHz	-3/0.5 60MHz	0.25 to 10MHz	-1/0 20MHz	-1/0 20MHz	[to 270Mbit/s	-1.5/0 20MHz	±0.25 50MHz
Diff phase/gain	<0.1°/<0.1%	<0.1°/<0.1%	0.05°/0.05%	0.15° 0.15%	<0.25°/<0.25%	<0.25° 0.25%	[D1, D2, & DX	<0.25°/0.25%	<0.2°/<0.2%
Chroma Luma delay	< ±1°	±1.5°	±0.75°	5ns	<1°	<1°dB	...	<1°	...
Video S/N ratio	>75dB	>75dB	75dB	...	>70dB	>70dB	[Matrix can be	>70dB	>60dB
Video crosstalk (worst)	-60dB 3.58	-40dB 30MHz	<-63dB 5MHz	...	<-60dB 4.5MHz	<-60dB 4.5MHz	[expanded.	<-60dB 4.5M	<-40dB 100MHz
Multilevel audio control	Yes	Yes	Yes	Yes	...	Yes	...	4-lvl brkaway	...
For component video	Possible	Yes	Yes	...	No	Possible	...	...	...
Reader Service No	490	491	492	493	494	495	496	497	498

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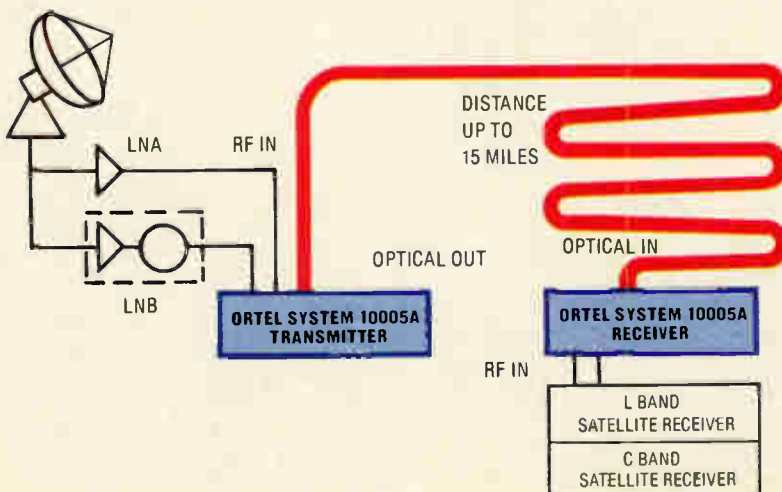
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Manufacturer	DYNAIR Corporation				Grass Valley Group			Harrison <sup>GLW</sup>	HEDCO
	Model	DYNA MITE	DYNASTY WB	DYNASTY 100	DYNASTY	Horizon DHX-532	20-TEN TEN-20	Horizon systems	ARS-9
Audio/Video/Data	V/A 40MHz	V/A (70MHz)	Video/digital	V/A 30(40)MHz	Video/digital	V/A	V/A	Audio	V/A
Basic crosspoint matrix	10x10	10x10	10x10	10x10	8x8	20x10/10x20	8x16	64x32	16x4/16x8
Typical system size	30x10 A/V	100x30	50x100	100x100 (x50) video	32x32	20x20-10x40	128x128	256x256	16x16-64x64
Audio response ±dB Hz-kHz	±0.2 30-20k	±0.1 20-20k	...	±0.1 20-20k	[Conforms to	±0.1 20-20k	±0.1 20-20k	>20kHz	-0.05 20-100k
Harmonic distortion	0.1%	0.1%	...	0.1%	[SMPTE RP125	0.05%	<0.05%	...	<0.02%
S/N ratio	75dB	75dB	...	75dB	[CCIR 601/F	120dB	>100dB	...	-80dB
Audio crosstalk (worst)	80dB	<-80dB	...	56dB	[EBU 3246-E	80dB	<-80dB	...	>86dB
Video response	-3dB 40MHz	-3/1.5 70MHz	±2 to 100MHz	±0.3 20MHz	[standards	±0.5 10MHz	0.015 8MHz	[21.5dB	-3dB >32MHz
Diff phase gain	0.05°/0.05%	0.2°/0.15%	0.25°/0.25%	0.05°/0.05%	...	0.2°/0.1%	<0.1°/0.1%	[headroom	<0.3°/0.2%
Chroma Luma delay	1° 5MHz	1°	...	1° 5MHz	[DHX88;	>±1°	±1°	[above a	<±2ns
Video S/N ratio	30dB RMS	55dB 70MHz	55dB 100MHz	80dB < 1Vp-p	[DHX1616	>75dB	>75dB	[+4dB level	>70dB 10MHz
Video crosstalk (worst)	<-50dB 5MHz	<-25dB 70MHz	-25dB 100MHz	<-60dB 5MHz	[DHX3216	-50dB 10MHz	-60dB	...	-60dB 4.43MHz
Multilevel audio control	Yes	Yes	...	Yes	...	Yes	Yes	Possible	Yes
For video components	Yes	Yes	Yes	Yes	Digital	Yes	Yes	...	Yes
Reader Service No	499	500	501	502	503	504	505	506	507

<sup>1</sup> HX-16 16x16; HX-32 8x16/16x16/24x16/32x16; HX-48 to 48x48; HX-64 to 64x64. <sup>2</sup> HD-16x16D for RS-422/-423 data

Manufacturer	Image Video		Integrated Switching Systems	International Tapetronics	Microvideo	NTP Elektronik	nVision	Omicron Video		
	Model	9540 (9541)	Model 9600	Pathfinder	Audio Switcher	RS422 matrix	Type 612	NV3512A	Model 554-XX/YY	Model 558
Audio Video/Data	Video (audio)	Video/audio	D-1/D-2 HDTV	Audio only	RS-422 data	Audio	Audio/Data	Video	Video	D1/D2 data
Basic crosspoint matrix	20x10	20x10/40x20	8x8	16x16	12x6	16x8/64x8	8x32	5x2	5x4	
Typical system size	40x20	320x320	100x100	64x48 mono	32x32	96x192	2500x2500	20x20	10x8	
Audio response ±dB Hz-kHz	(-0.25 20-20k)	-0.25 20-20k	[System uses	±0.1 20-20k	[Buffer I/O	±0.01 40-20k	...	...	[per CCIR 601	
Harmonic distortion	<0.02 +18))	<0.02%	[various I/O	0.01%	[meet relevant	<0.01% 22dBu	[Digital audio/	...	[TEC2346E,	
S/N ratio	>96dB	>96dB	[modules to	95dB	[SMPTE, EBU	<-93dBu rms	[data using	...	[SMPTE 125(X)	
Audio crosstalk (worst)	>75dB	>75dB	[convert between	<-95dB	[EIA spec	>100dB	[50Mbits coax	...	[specifications;	
Video response	-1dB 30MHz	-1 30MHz	[coax or fiber	...	[10Mbaud data	...	[for FO, 10Mbits	0.25/-3 35MHz	[permits analog	
Diff phase gain	0.1°, 0.1%	<0.1°, <0.1%	[distribution	...	[rates; for	...	[on bal. I/O	<0.25°/0.25%	[audio, video,	
Chroma Luma delay	<10nsec	<10ns	[system; 1.3GHz	...	[reallocation	...	...	...	[HDTV, tally	
Video S/N ratio	>70dB	70dB	[GaAs device	...	[of edit ctl	...	...	>65dB	[bit-parallel.	
Video crosstalk (worst)	>65dB	>65dB	[switches 800	...	[lines to multi	...	...	>60dB 3.58	...	
Multilevel audio control	2-channel	2-channel	[to 1500nm	Yes	[VTRs,	3-level	Yes	4-level video	Yes	
For video components	...	...	...	No	...	...	...	RGB/S	Digital analog	
Reader Service No	508	509	510	511	512	513	514	515	516	

Manufacturer	PESA			Pro-Bel		Siemens	Sierra Automated Systems	Sierra Video Systems		
	Model	System 5	Series H <sup>3</sup>	AX switcher	Prodigy series	HD series	Crossmatic D	SAS32000	Series 16 <sup>4</sup>	Series 32
Audio Video/Data	A/V	A/V	Audio	V A(TC) D	V(A)	Audio	Audio	Audio	V/A	Video/audio
Basic crosspoint matrix	8x8	128x32	20x10	8x4	16x16	32x32	32x16 stereo	64x32	16x4	32x8
Typical system size	48x96	128x128	40x10, 20x20	24x24	256x256 (x128)	32x96	64x32	16x8/16x16	32x8 to 32x32	
Audio response ±dB Hz-kHz	dB to 20k	±0.15dB to 20k	±0.25 20-20k	±0.25 20-20k	[Digital audio	<0.4 40-15k	±0.25 20-20k	±3 150kHz	...	
Harmonic distortion	<0.1%	<0.1%	<0.15	<0.1%	[at 44.1/48kHz	<0.1	<0.05%	0.1%	...	
S/N ratio	73dBm	92dB	>65dB	>96dB	[sampling rates	>70dB	>86dB 20kHz	>100dB	...	
Audio crosstalk (worst)	<-90dB	<-88dB	<-65dB	<-100dB	[w/mixed rates	>100dB	<-70dB	<-80dB 1kHz	...	
Video response	-1.5 to 20MHz	-1.5 to 20MHz	...	<3dB to 30MHz	[Serial digital	...	...	-3dB 30MHz	to 100MHz	
Diff phase gain	0.1°/0.1%	0.1°/0.1%	...	<0.2°/0.15%	[video for NRZI	...	...	0.25°/0.25%	...	
Chroma Luma delay	<-62ns	±10ns	...	<5ns	[standards from	...	...	...	...	
Video S/N ratio	73dB	73dB	...	<78dB luma	[140-300Mbit/s	...	...	60dB	...	
Video crosstalk (worst)	-62dB 4.43MHz	-62dB 4.43MHz	...	-60dB 4.43MHz	...	...	...	-50dB 3.58MHz	...	
Multilevel audio control	Yes	Yes	...	2nd level	...	Yes	...	Yes	Yes	
For video components	Yes	Yes	...	Yes	D1, D2	...	...	Y-C/RGB/YC <sub>R</sub> C <sub>B</sub>	Yes	
Reader Service No	517	518	519	520	521	522	523	524	525	

<sup>3</sup> Series H also available in 256x32; 32x32. <sup>4</sup> Series 8 offers 8x8 matrix with similar characteristics; System 16x4/16x8 video or 16x8 with four audio channels; model 61 8x8 may include one to three levels of video with stereo.

Manufacturer	Sony	Thomson	Utah Scientific				Vistek
	Model	DVS-V/DVS-A <sup>5</sup>	TTV5790 <sup>6</sup>	AVS-1B series <sup>7</sup>	DVS-1	DVS-2/32	AVS-2
Audio Video Data	A/V/Data	Video/digital	V A	Video/digital	Serial digital	V/A	A/V/Dig Vid <sup>8</sup>
Basic crosspoint matrix	16x16	30x15, 32x16	10x10	4x16	32x32	10x10	16x8, 16x16
Typical system size	512x512	30x30, 32x32	320x (150x10)	32x16	...	320x320	64x64
Audio response ±dB Hz-kHz	[Digital	[Conforms to	±0.05 30-20k	[10-bit arch.	[for D1 270Mb/s	±0.05 30-20k	±0.25 20-20k
Harmonic distortion	[A/V router	[EBU 3247 &	0.05%	[conforms to	[D2 143Mb/s NTSC	0.05%	<0.1%

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Circle (13) on Reply Card

World Radio History

Manufacturer	Sony	Thomson	Utah Scientific				Vistek
Model	DVS-V/DVS-A <sup>5</sup>	TTV5790 <sup>6</sup>	AVS-1B series <sup>7</sup>	DVS-1	DVS-2/32	AVS-2	ARRAY
S/N ratio	[based on	[CCIR 656 rec.	85dB	[SMPTE RP125	[D2 177Mb/s PAL	85dB	-90dBm Hum+noise
Audio crosstalk (worst)	[AES/EBU I/O	[for digital	-90dB to 20k	[EBU 3246E	[jitter time at	-90dB to 20k	-90dB
Video response	[format;	[video; for	±0.5 20MHz	[for digital	[<10% of the	±0.5dB 30MHz	-3dB 30MHz
Diff phase gain	[Video for	[signals to	0.05°/0.05%	[video signals	[bit time	±0.05°/0.05%	0.1°/0.1%
Chroma Luma delay	[D1 or NTSC	[270 Mb/s	±0.75°	[Switch allows	...	±5ns	...
Video S/N ratio	[and PAL D2	[data rate	80dB	[use as 8-bit	...	80dB	...
Video crosstalk (worst)	[formats.	[serial data	-60dB 4.43MHz	[9-, 10-bit	...	-60dB 4.43MHz	-60dB 4.43MHz
Multilevel audio control	...	[stream.	Yes	[per input.	...	8-level	Yes
For video components	Yes	Digital	Possible	...	...	Possible	Possible
Reader Service No	526	527	528	529	530	531	532

<sup>5</sup> Models for 16x16, 32x32, 64x64 available. <sup>6</sup> TTV 5791 offers similar characteristics with basic 64x64 matrix, expanding to 256x256. <sup>7</sup> -1BB bandwidth 60MHz; -1WB bandwidth 100MHz for video with response of ±2dB. <sup>8</sup> Meets requirements for CCIR-656 8-/10-bit digital video in D1, D2 formats; available in 8x8 minimum matrix for digital video use.

## Video Production & Master Control Switchers

Manufacturer	Abekas Video Systems		Alpha Image	ALTA Group		Amplex Corporation	
Model	A82 Digital	A84 Digital Post	Alpha 500	Pegasus	Pyxis 5.5	Century series	Vista Component
Control application	Post production	Post production	Production	Production	Production	Production	Production
Standard	Composite D-2	CCIR 601 D-1	D1 component dig.	NTSC	NTSC	NTSC/PAL	RGB/YPbPr
# inputs	32 video or key	12 <sup>2</sup>	16	8 Y/C or encoded	4 Y/C or encoded	16 or 32	10 or 18
Integral matte source	Yes	Yes	Yes	3 generators	Yes	per keyer	5 generators
Key sources	Any input <sup>1</sup>	12 ext 12 int	Yes	10-input	Yes	2 ext 10/18 int	2 ext 10/18 int
Chroma keyers	8 RGB	8 RGB	Yes	RGB option	...	3 per ME <sup>4</sup>	3 RGB/Y/ISO <sup>4</sup>
Downstream keyer	No	No	...	[2 linear keys	No	w/UNIKEY	w/UNIKEY
Switching buses	...	...	3	3	2	4 prime, 5 aux	12
# switcher M/E amps	4 Multilayer	8 layer capability	1	1	1	2 or 3 multilevel	1.5
# pattern generators	2	3	20 basic	27 patterns	10 transitions	164 patterns/ME	32 patterns
Wipe effects	Rot/S-E/Adj edge	Rot/S-E/Adj edge	...	hard/soft	Yes	H-E, S-E, Rot.	Hard, soft edge
Spotlight effects	...	...	...	No	No	Yes	Yes
Border effects	Yes	Yes	...	Matte/outlines	Yes	Opt	4 types
Shadow effects	Yes	Yes	...	Yes	No	Opt	Yes
Programmable routines	Yes	Yes	[Configures in	Yes/learn mode	Yes	SuperSTAR Mem.	24 routines
Memory backup battery	Yes	Yes	[layers	...	[Dual TBC	No	Yes+VistaDisk
Diagnostic software	Yes	Yes	...	...	[channels	Yes	Yes
Digital effects port	Yes	Yes	Yes	to Editor	Integral effects	for Int. ADO	Digi-Loop <sup>5</sup>
Automation port	From edit control	From edit control	...	No	GPI/serial	GPSI, PIPS	GPSI, PIPS
Input timing adjustment	...	...	...	<1.5'	...	...	...
Path length, deviation	...	...	...	...	[>450-line	1'	1.5'
Crosstalk at subcarrier	...	Not applicable	...	<-54dB	[resolution	>55dB	>50dB
Link to rack electronics	1 digital line	1 digital line	[up to 4 separate	15-conductor	...	Multicore cable	Multicore cable
Audio preview function	No	No	[layers plus	No audio	[4-input	[Option for A/V	Option
Audio metering	No	No	[background;	N.A.	[stereo	[in association	Option
Audio level control	No	No	[memory for	N.A.	[audio follow	[with M/E or	Option
Audio mixer interface	No	No	[full switcher	N.A.	[mixer	[the DSK unit;	Option
Edit control interface	Yes	Yes	[setup per layer	RS-488	Yes	[editor manual	Option
Reader Service No	533	534	535	536	537	538	539

<sup>1</sup> Adaptive Sub-Pixel Intelligent Keying; framestores associated with each keyer. <sup>2</sup> Frame store associated with each input and all 12 key inputs; Adaptive Sub-Pixel Intelligent Keying. <sup>3</sup> 3 SpectraKey. <sup>4</sup> All keyers capable of linear, RGB luminance, external and encoded modes; SpectraKey processing. <sup>5</sup> SE models may include integrated ADO-100 or -2000 digital effects.

Manufacturer	Ampex	AVS (Vatek)	BTS	ECHOLab Inc			Feral Industries
Model	Vista Composite	Integra <sup>8</sup>	MCS-2000	DV-5	DV-7 <sup>10</sup>	SE-6	6119 (6119YC)
Control application	Production	Production	Master control	Production	Production	Production	Production
Standard	NTSC/PAL	PAL/CCIR 601	NTSC, PAL	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC
# inputs	10 or 18	8 external <sup>9</sup>	to 250	10	6	10	6 (6 Y-C)
Integral matte source	5 generators	2 generators	4 generators	3 generators	3 generators	3 generators	Yes
Key sources	2 ext 10/18 int	4 external	Ext/Int	4 ext/10 int	3 ext/1 int	5 ext 20 int	Int/ext
Chroma keyers	3 RGB/Y/ISO <sup>6</sup>	...	Luminance only	RGB/Composite	RGB opt	RGB/Comp opts	...
Downstream keyer	w/UNIKEY	Per setup	Yes	Y	Yes	Yes	Yes
Switching buses	12	Multiple	3	3 primary	3 primary	4 primary 1 aux	3
# switcher M/E amps	1.5	to 4 key levels	...	1½	1	2½	1
# pattern generators	32 patterns	13-patterns	None	1½/39 patterns	1; 10 patterns	2½ patterns	12 wipes
Wipe effects	Hard, soft edge	Yes	No	Rotary/adj edge	Soft-edge	Adjustable edge	Var edge
Spotlight effects	Yes	...	No	Yes	No	Yes	No
Border effects	4 types	Yes	Yes	Yes	Yes	Yes	...
Shadow effects	Yes	Yes	Yes	Opt	No	Option	No
Programmable routines	24 routines	Yes	Yes	1 std/5 opt	No	10/297 keyframes	...
Memory backup battery	Yes+VistaDisk	...	Yes	Yes	...	...	No



Manufacturer	Ampex	AVS (Vatek)	BTS	ECHOLab Inc			Feral Industries
Model	Vista Composite	Integra <sup>8</sup>	MCS-2000	DV-5	DV-7 <sup>10</sup>	SE-6	6119 (6119YC)
Diagnostic software	Yes	...	Yes	Yes	Yes	No	No
Digital effects port	Digi-Loop <sup>7</sup>	Integral 3-D	No	Yes	No	No	No
Automation port	GPSI, PIPS	RS-422	Yes	No	No	No	Serial
Input timing adjustment	...	...	...	±0.001ms	±0.001ms	±0.001ms	...
Path length, deviation	1.5'	...	±1'	1'	1'	1'	...
Crosstalk at subcarrier	>55dB	...	<-60dB	-52dB	-51dB	-51dB	>50dB
Link to rack electronics	Multicore cable	24-pin D	...	2 coaxial	Single digital line	Multicore cable	...
Audio preview function	Option	[4:2:2:4 image	Yes	No	No	No	No
Audio metering	Option	[store permits	Yes	No	No	No	No
Audio level control	Option	[recursive	Yes	No	No	No	No
Audio mixer interface	Option	[effects	...	No	No	No	No
Edit control interface	Option	Yes	No	GPI Opt	Opt	No	Option
Reader Service No	540	541	542	543	544	545	546

<sup>6</sup> 3 SpectraKey. <sup>7</sup> SE models may include integrated ADO-100 or -2000 digital effects. <sup>8</sup> Available in US from Vatek. <sup>9</sup> 1-6 composite, YCrCb or Y-C; 7-8 also for RGB. <sup>10</sup> DV-7C permits intermixed component and composite signals.

Manufacturer	Grass Valley Group						
Model	CVM-600	PVM-525	110/CV <sup>12</sup>	200 Composite	200-2CV	KADENZA	MASTER 21
Control application	Production	Production	Production Post	Production, post	Production, post	Production	Master control
Standard	NTSC RGB R-Y/B-Y	NTSC	RGB or YUV	NTSC PAL	YCrCbYUV	NTSC PAL <sup>14</sup>	NTSC PAL
# inputs	12 component <sup>11</sup>	6	10	20	20	32 maximum	16 V stereo audio
Integral matte source	2 generators	2 generators	3 generators	9 generators	9 generators	...	1 Int generator
Key sources	4 ext 2 int	4 ext 2 int	2 ext 8 int	6 ext 20 int	16 ext	20 int	32 maximum
Chroma keyers	CCK-500C Exkey	CCK-500 Exkey	1 RGB optional	to 8 optional	...	Options	1 RGB opt
Downstream keyer	Yes	2-input	DSK-101	Standard	Yes	Yes	Yes
Switching buses	2 prime	4	3 prime	8 prime 4 aux	8 prime 4 aux	10-channel	2 prime
# switcher M/E amps	1	1	1	1 or 2	2 M/Es	...	1 opt
# pattern generators	1 w/24 patterns	1 w/24 patterns	1 gen/10 patterns	2 gen 56 patterns <sup>13</sup>	2 gen 56 patterns	2 w 44 patterns	1 w/10 patterns
Wipe effects	Soft-edge Adj edge	Adj edge	Soft edge/adj edge	Rot/S-E Adj Edge	Rot S-E Adj Edge	Rot S-E/Adj-Edge	SE Adj E
Spotlight effects	No	No	Yes	Standard	Yes	Yes	Option
Border effects	Yes	...	Yes	...	...	...	...

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Circle (37) on Reply Card

Manufacturer	For-A			Grass Valley Group			
	CVM-600	PVM-525	110/CV <sup>12</sup>	200 Composite	200-2CV	KADENZA	MASTER 21
Shadow effects	Yes	Yes	Yes	Yes	Yes	Yes	Option
Programmable routines	FMX-500 Extrol	FXM-500 Extrol	E-MEM memory	E-MEM system	E-MEM 30 event	Yes	Event Stacker
Memory backup battery	No	No	Yes	Yes	Yes	Yes	Yes
Diagnostic software	No	No	Yes	Yes	Yes	Yes	Yes
Digital effects port	No	...	to DPM-100	...	No	Kaleidoscope	Opt/GVG DPM-100
Automation port	RS-422	GPI, serial	Serial editor	Serial editor opt	Serial editor opt	Editor option	RS-422
Input timing adjustment	...	...	Unspecified	...	...	...	...
Path length, deviation	...	...	Unspecified	1.5	Not applicable	...	100ns length
Crosstalk at subcarrier	...	-60dB	≤-54dB DC-5MHz	≤-54dB	<-56dB DC-4MHz	...	56dB
Link to rack electronics	...	Multicore	1-line digital	1-cable 2-port serial	1-line digital	...	Multicore cable
Audio preview function	Option	[Audio	Option	No	No	No	Yes
Audio metering	Option	[functions	Option	No	No	No	Yes
Audio level control	Option	[with AFV-500	Option	No	No	No	Yes
Audio mixer interface	Option	[editing	to AMX-170S mixer	No	No	Option	No
Edit control interface	Option	[audio mixer.	Option	Option	Option	Option	No
Reader Service No	547	548	549	550	551	552	553

<sup>11</sup> CVM-400 component mixer is 8-source, 6-input system. <sup>12</sup> 110 composite; 110CV component. <sup>13</sup> Programmable ((20+4)x16)+32. <sup>14</sup> Supports RGB, YUV SMPTE, YUV Betacam, CCIR 601/656 digital.

Manufacturer	Grass Valley Group		JVC Professional Products			Panasonic C&S	Polar Video
	Model 300 2A 2B	Model 3000	KM-1600U	KM-2500U <sup>16</sup>	KM-D600U <sup>16</sup>	EGP-7	PVM-1 (PVM-2)
Control application	Production	Production	Production	Production	Production	Production	Production
Standard	NTSC	PAL	NTSC	S-VHS Y-C	NTSC	S-VHS Y-C	NTSC
# inputs	24/16 <sup>15</sup>	to 64	4	8	4	6 Y-C or encoded	4 (U-matic S-VHS)
Integral matte source	5 generators	Yes	1 generator	2 gen w/DSK	1 generator	3 generators	Yes
Key sources	6/31 Ext 18/26 Int	per input+	Ext/Int	Ext/Int	Ext/Int	6	Int/Ext
Chroma keyers	6 RGB, 14/22 Comps	Yes	RGB	RGB	RGB	Option	Yes
Downstream keyer	Yes	Dual	Yes	Yes	Yes	Yes	...
Switching buses	9 prime/5 aux	...	2, flip/flop	3 prime 1 aux	2, flip/flop	3	3
# switcher M/E amps	2	2 4-layer	...	...	...	1	1
# pattern generators	2 w/44 patterns	Dual	6 patterns	13 patterns	6 patterns	28 patterns	1 w/8
Wipe effects	Rot/S-E Adj-Edge	User definable	Soft wipes	S-E	Adj.	Soft wipes	Yes
Spotlight effects	Yes	...	No	No	No	...	No
Border effects	Yes	Yes	No	Yes	No	...	No
Shadow effects	Yes	Yes	No	No	No	...	No
Programmable routines	20 per M/E	E-MEM	No	No	No	Panel setup	No
Memory backup battery	Yes	Yes	...	No	...	...	No
Diagnostic software	Yes	Yes	No	No	No	...	No
Digital effects port	Yes	Yes	No	...	Int. dig. effects	No	No
Automation port	Editor option	[Inputs from	...	GPI	[Integrated	Editor only	GPI
Input timing adjustment	...	[analog and	...	...	[dual TBC	...	...
Path length, deviation	±1.5	[serial or	...	...	[facilities	...	...
Crosstalk at subcarrier	-54dB	[parallel	...	...	[for editing	-50dB	...
Link to rack electronics	Multicore cables	[digital	...	1-line digital	[production	Coax	...
Audio preview function	No	...	No	No	No	Yes	No
Audio metering	No	...	No	No	No	VU L/R	No
Audio level control	No	...	No	No	No	Yes	No
Audio mixer interface	Option	...	No	No	No	No	No
Edit control interface	Option	...	No	GPI opt.	No	RS-422	PSI-I serial
Reader Service No	554	555	556	557	558	559	560

<sup>15</sup> Model 300-3A 24-input system, 300-3B 16-input; Model 300 units includes 3 M/Es. Inputs from analog and ser/pal digital; Finline key processor, Lamina image layering. <sup>16</sup> KM-1200U 4-input switcher with similar characteristics.

Manufacturer	Prime Image	Ross Video Ltd		Sony	Thomson		
	CleanCut/EFX	Model 210A 216A	Model 416 (424)	BVS 8000 (8000C)	IMPULS	Synonym	TTV5645
Control application	Production	Production	Production	Production	Production	Dig. production	Production
Standard	NTSC	NTSC	PAL	NTSC/PAL	D-2 (D01)	4:2:2 digital	D-1
# inputs	4 (S-VHS Opt)	8/14	16 (24)	24	16	24 D-1 component	16
Integral matte source	...	3 generators	6	4 generators	Yes	Yes	9 backgrounds
Key sources	None	3-Ext, 8/14-Int	6-E	14-I	24	Int/Ext	10 inputs
Chroma keyers	None	RGB & composite	4-RGB/1-composite	1 RGB	Yes	Yes	3
Downstream keyer	None	Yes	Option	Yes	...	Multilevel	...
Switching buses	2	3 prime	6 prime, aux avail	4 prime 4 aux	5 prime	7+	8 + 6 aux
# switcher M/E amps	1	1	2 multilevel keys	2 w/2 keyers each	Multiple	Multiple	2
Wipe effects	...	...	S-E, Adj E	Various	...	Yes	...
Spotlight effects	No	...	No	...	...	Yes	...

Manufacturer	Prime Image	Ross Video Ltd		Sony	Thomson		
Model	CleanCut/EFX	Model 210A/216A	Model 416 (424)	BVS 8000 (8000C)	IMPULS	Synonym	TTV5645
Border effects	No	Yes	Yes	Yes	Yes	Yes	Yes
# pattern generators	4 wipes	1 w/53 patterns	2 w/64 patterns	1 w/18 patterns	Multiple digital	4 gen	4 generators
Shadow effects	No	No	No	Yes	Yes	Possible	Yes
Programmable routines	No	No	(40 event 424)	Yes	Yes	with MEMBOX	Yes
Memory backup battery	[Unit	Yes	Yes	No	Yes	[270Mbit/s	Yes
Diagnostic software	[includes	Yes	Yes	...	Yes	[data stream	Yes
Digital effects port	[basic	Yes	Yes	Link to DME-5000	Yes	Yes	Yes
Automation port	[production	RS-422 option	RS-422 opt	Yes	Yes	RS-422	Yes
Input timing adjustment	[effects	No	...	...	Automatic	...	...
Path length, deviation	...	±1	±1	<1.5	...	...	...
Crosstalk at subcarrier	...	-53dB	-53dB	...	...	[Keyers use	...
Link to rack electronics	N.A.	Dig 1-line	Dig 1-line	Digital/RS-422	...	[autophasing	...
Audio preview function	[4 AFV	No	No	No	No	[over 15 to	No
Audio metering	[switcher	No	No	No	No	[40µs	No
Audio level control	No	No	No	No	No	...	No
Audio mixer interface	No	No	No	No	No	...	No
Edit control interface	No	Option	Option	Yes	Yes	RS-422	Yes
Reader Service No	561	562	563	564	565	566	567

Manufacturer	Utah Scientific		VGV		Videotek	Vistek Electronics	
Model	MC-500 series <sup>17</sup>	PVS2-224 <sup>19</sup>	D2500 (D3200)	DX120 (DX300)	Prodigy <sup>23</sup>	ARENA	VISION (PAL)
Control application	Master	Production	Production	Production	Production	Production	Production
Standard	NTSC PAL	NTSC	D2, D3, Analog	Digital NTSC/PAL	NTSC	PAL	NTSC
# inputs	30 A/V + 8A	24	10 to 20 <sup>19</sup>	10 (23) <sup>22</sup>	8	13	10 per CCIR 656 <sup>24</sup>
Integral matte source	1 generator	1 generator	8+2 <sup>20</sup>	Yes	1 generator	6 generators	Yes
Key sources	3 ext, 1 int	12-inx6 keyers	10 ext 20 int	15 (10)	3 ext 8 int	4 ext 13 int	Analog or digital
Chroma keyers	None	Analog	RGB, R-Y/B-Y	Optional	RGB Opt	1 RGB	Yes
Downstream keyer	None	Analog	...	Yes	Yes	Yes	...
Switching buses	2 prime/1 aux	3 prime/2 aux	5 prime 4 aux	8 (11)	3 pnme	4 prime/1 aux	3
# switcher M/E amps	1	2	3, multilevel keys	(3 multilevel)	1 ME	3	1
# pattern generators	1 w/4 patterns	1 w/42 patterns	6 w/100 patterns	20 (...)	24 pat/programmable	2 gen w/89	1 generator
Wipe effects	Soft-edge	Full feature	Rot S-E Adj E	Yes	Soft-edge/adj edge	Rot. S-E, Adj-Edge	16 rotary+
Spotlight effects	No	Yes	Yes	...	Yes	Yes	Possible
Border effects	Yes	Soft/hard	Option	Options	Yes	Yes	Yes
Shadow effects	Yes	Yes	Option <sup>21</sup>	Options	No	Yes	Yes
Programmable routines	Opt 99 routines	250 event	EZMEM than 100	EZMem system	100 routines	Yes	Yes
Memory backup battery	Yes	Yes	Yes	...	Yes	Yes	Yes
Diagnostic software	Yes	...	Yes	...	Yes	No	Yes
Digital effects port	No	No	Yes	Option	Option	Yes	Options
Automation port	for TAS	AMES system	RS-422	RS-422, GPI	Option	RS-422	Option
Input timing adjustment	...	...	...	...	...	...	Synchronizer
Path length, deviation	±1	1.5'	3200ns	...	<0.5	440ns	...
Crosstalk at subcarrier	-60dB	-55dB	...	...	<-60dB	-50dB	...
Link to rack electronics	Multicore	Multicore	1-line digital	1-line digital	...	1-line digital	...
Audio preview function	Yes	...	No	No	Yes	No	No
Audio metering	LED	No	No	No	No	No	No
Audio level control	Yes	No	No	No	No	No	No
Audio mixer interface	8x3 matrix	No	No	No	No	No	No
Edit control interface	No	8 GPI in	Option	Option	Yes	Yes	Option
Reader Service No	568	569	570	571	572	573	574

<sup>17</sup> MC-501C, M502B; 30-210 V/A + 8 A only inputs; SAP; Dynabus interface. <sup>18</sup> AMES (Automated Memory Effects System); PVS2-112 12-input system with 4 keyers. <sup>19</sup> D3200 includes 20-input phantom analog package; digital inputs are 8-10 bit parallel or serial. <sup>20</sup> Eight complex function generators with two paint-type generators. <sup>21</sup> Includes flying the entire screen. <sup>22</sup> 8-to-10-bit inputs for DX300; both systems use 16 32-bit internal processing. <sup>23</sup> Prodigy/P PAL composite; Prodigy C 525/60 analog component; Prodigy C/P 625/50 analog component. <sup>24</sup> Accepts analog and digital component video signals.

## Standards Converters

Manufacturer	AVS				CEL Electronics		
Model	ADAC	EOS	ISIS	P156-2	P165 PLUS	P165 TETRA <sup>1</sup>	P165-22 STANDI
Supports NTSC 3.58 I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O
Supports NTSC 4.43 I/O	I/O	I/O	I/O	Opt	I/O	I/O	I/O
Supports PAL CCIR I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O
Supports PAL-M I/O	& N Opt	and N	& N opt	Opt	Output	I/O	...
Supports SECAM I/O	Option	I/O	Option	Input	I/O	I/O	Opt out
Supports Y/C, S-VHS I/O	No	I/O	Option	...	I/O	I/O	I/O
Supports Y/C <sub>B</sub> I/O	Yes	Yes	Option	Input	I/O	I/O	I/O
Supports RGB I/O	Yes	...	Option	...	...	No	...
Supports CCIR 601	Option	No	Option	No	Yes	Opt	Yes
Supports D-2	No	No	No	No	...	...	No

Manufacturer	AVS				CFL Electronics		
	ADAC	EOS	ISIS	P156-2	P165 PLUS	P165 TETRA <sup>1</sup>	P165-22 STANDI
Model	ADAC	EOS	ISIS	P156-2	P165 PLUS	P165 TETRA <sup>1</sup>	P165-22 STANDI
Luminance bandwidth MHz	13.5MHz	13.5	13.5MHz	12.9	13.5	13.5	13.5
Chrominance bandwidth	6.75MHz	6.75	6.75MHz	4.3	6.75	6.75	6.75
Quantizing scheme LC	8-bit	8-bit	8-bit	7-bit	8-bit	8-bit	8-bit
Input S/N minimum	>55dB	>50dB	...	53dB	>56dB	>56dB	>56dB
Resolution B/W	5.5MHz	4.5MHz NTSC	3.58MHz	3.5MHz	4.2MHz NTSC	4.2MHz	3.5MHz PAL
Timebase correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Synchronizer	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame freeze	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Field freeze	4-field	Yes	Yes	1 or 2	Yes	Yes	...
Image enhancement	Yes	Yes	Yes	...	Y & chroma	Chroma	Yes
Noise reduction Y/C	9dB	Yes	17dB/21dB	...	Yes	Yes	9dB Y/3dB C
Composite encoder	Yes	Yes	Yes	No	Yes	Yes	Yes
Enhanced NTSC/PAL	Yes	Yes	Yes	...	...	...	...
Format conversion	Yes	Yes	Yes	No	Yes	Yes	Yes
Scan conversion	No	No	No	No	No	Opt	Opt
Auto input selection	Yes	Yes	Yes	Yes	Yes	...	...
Color correction	Yes	Yes	Yes	Gain; phase	Yes	Yes	Yes
Programmable	No	4-preset	No	No	Rmt Clt	RS-423	RS-423
Gamma correction	No	No	No	No	...	...	...
Color balance	Yes	Yes	Yes	No	...	...	...
Time code control	No	No	No	No	No	No	No
Scene detection	No	No	No	No	No	No	No
Proc-amp adjustment	Full	Full	Full	Yes	Yes	Yes	Yes
Reader Service No	575	576	578	579	580	581	582

<sup>1</sup> -50 full system; 4 options upgrade to full system.

Manufacturer	I-DEN	OKI Electric	Quantel	Snell & Wilcox			
				Alchemist	Atlantis series	Atlas series	HD 2020 (2010) <sup>2</sup>
Model	IP-500 (-450)	LT2000TSC	Satin 601	Alchemist	Atlantis series	Atlas series	HD 2020 (2010) <sup>2</sup>
Supports NTSC 3.58 I/O	Yes	I/O	Yes	Yes	Yes	I/O	Yes
Supports NTSC 4.43 I/O	No	In	Yes	Yes	Yes	(3600)	Yes
Supports PAL CCIR I/O	Yes	I/O	Yes	Yes	Yes	I/O	Yes
Supports PAL-M I/O	Yes	I/O	Yes	Yes	Yes	(3600)	...
Supports SECAM I/O	Yes	I/O	Yes	Yes	Yes	I/O	...
Supports Y/C, S-VHS I/O	Yes	I/O	...	Yes	Yes	No	...
Supports Y/C <sub>1</sub> , C <sub>2</sub> I/O	Yes	Opt	Yes	YUV	YUV	No	YUV out
Supports RGB I/O	Yes	Opt	Yes	Yes	Yes	No	RGB out
Supports CCIR 601	No	Yes	Yes	Yes	...	No	CCIR 656
Supports D-2	No	...	...	Yes	...	No	...
Downconversion from HDTV	No	No	...	...	...	No	1250/50, 1125/60
Luminance bandwidth MHz	5.5	13.5	...	<+0.5 7.57MHz	±1 3.3MHz NTSC	-3dB 3.5MHz	5.5MHz
Chrominance bandwidth	3.58	6.75	...	<1 2.75MHz	...	...	...
Quantizing scheme LC	8-bit 4:2:2	8-bit	...	10-bit 13.5/6.75	...	...	10-bit 4:2:2
Input S/N minimum	DOC	(>25dB)	...	...	56dB	56dB	>50dB
Resolution B/W	...	420L H/330L V	...	...	...	...	...
Timebase correction	Yes	Yes	Yes	Yes	Yes	Yes	...
Synchronizer	Yes	Yes	...	Yes	Yes	Yes	Yes
Frame freeze	Yes	Yes	...	Yes	Yes	...	Yes
Field freeze	Yes	Yes	...	Yes	Yes	...	Yes
Image enhancement	-500 only	H & V	Yes	H/V	H/V	(3600)	Yes
Noise reduction Y/C	-500 only	Yes	Yes	Yes	Yes	(3600)	Yes
Composite encoder	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced NTSC/PAL	...	...	...	Yes	...	...	[16:9
Format conversion	Yes	...	Yes	Yes	No	No	[16:12 aspect
Scan conversion	No	No	...	No	No	No	[ratios out
Auto input selection	No	Yes	...	Yes	Yes	No	...
Color correction	ACC circuit	Yes	...	Yes	Yes	(3600)	...
Programmable	No	Remote	Yes	Yes	No	No	No
Gamma correction	No	...	...	...	...	...	...
Color balance	No	No	...	Yes	Yes	...	...
Time code control	No	No	...	No	No	...	...
Scene detection	No	No	...	No	No	No	...
Proc-amp adjustment	Full	Full	Yes	Yes	Yes	Full	Partial
Reader Service No	583	584	585	586	587	588	589

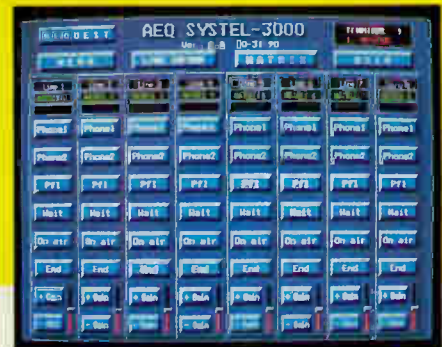
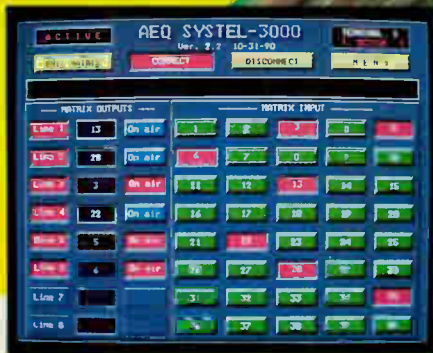
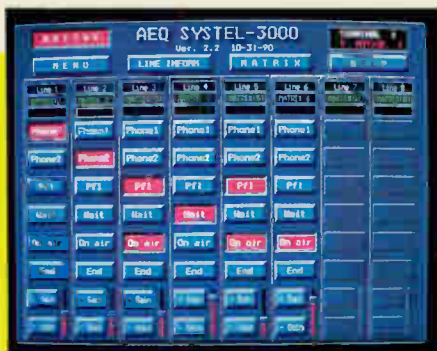
<sup>2</sup> -2010 output 625/50, RGB, YUV and CCIR 656.

In all categories of this Specifications Comparison section, the manufacturers may offer additional models, one of which may be ideally suited to your requirements. For information on other products, contact the manufacturers.

# SYSTEM - 3000

## DIGITAL MULTI-HYBRID TELEPHONE SYSTEM

- Digital signal processed hybrid system.
- Microprocessor controlled via standard RS-232 or RS-422 interface.
- Up to eight telephone lines in full multiplex communication, by way of the internal MIX-MINUS buss structure.
- No preliminary adjustment or line measurement is required; simply connect it and work!
- Easy to use: the control module can be either a small dedicated console or a standard PC or compatible.
- Line functions and controls are independent for each input module; the technician's job is made easier than ever, even in the software version.
- The switching section handles up to eight telephones, plus the control telephone and the studio telephone.
- Each input module includes:
  - Superb 60dB sidetone rejection.
  - 128 step digital adaptive filter.
  - 24 bit coefficients.
  - 16 bit sigma-delta A/D converters.
  - Switched-capacitor antialiasing filter, with 80dB rejection.
  - Line inputs safety protected against line transients and discharges, according to CCITT regulations.
- Some of the functions included on the digital processed section are:
  - Digital AGC included in the self-adaptive filter.
  - Doubletalk detection, without influence in the adaptive procedure.
  - Noise reduction procedure, using a white noise generator applied in the digital domain.
  - Noise free line switching, using stand-by signal timing.
    - Supervisory function of line status, with detection of dialing tones and signalling (busy line, disconnection, etc.)



THE *Digital* SPECIALIST ON *Analog* TELEPHONE LINES

 aeq

APLICACIONES ELECTRONICAS QUASAR, S A

CENTRAL OFFICE: P.I.Leganés, c/Key Pastor, 36 - 28914 LEGANES, MADRID, (SPAIN). Tel. 011-34-1-686 13 00 - Fax: 011-34-1-686 44 92

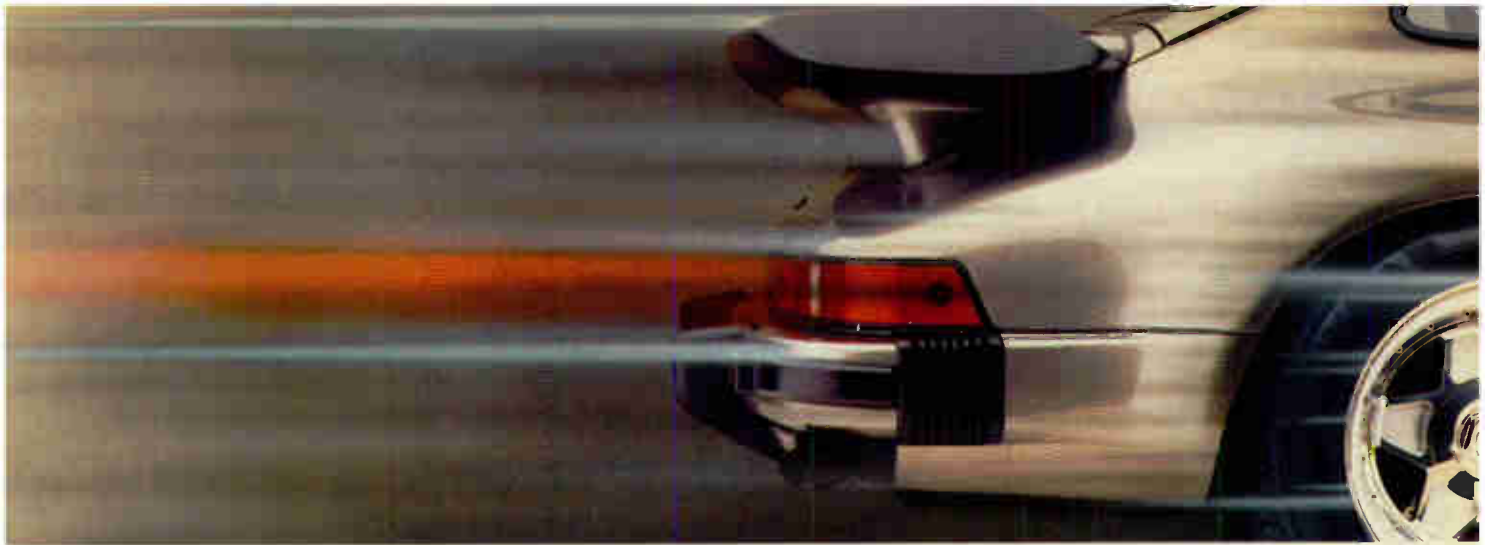
Circle (28) on Reply Card  
WorldRadioHistory

Manufacturer	Snell & Wilcox		Video International		Video Int'l/Grunder		Vistek Electronics
	ME8800	ME9900 series	DTC 3504	DTC 3604	DTC 1504	DTC 2604	
Model	I/O	I/O	I/O	I/O	I/O	I/O	Yes
Supports NTSC 3.58 I/O	I/O	I/O	Yes	I/O	I/O	I/O	Yes
Supports PAL CCIR I/O	I/O	I/O	Yes	I/O	I/O	I/O	Yes
Supports PAL-M I/O	8800	(9930)	& -N	I/O	I/O3	I/O & -N	Yes
Supports SECAM I/O	I/O	(I/O 9930)	Yes	I/O	I/O	I/O	Yes
Supports Y C, S-VHS I/O	Yes	(9910 DUB)	Yes	I/O	I/O	I/O	No
Supports YC <sub>R</sub> C <sub>B</sub> I/O	Yes	(9930)	Yes	I/O	I/O	I/O	Yes
Supports RGB I/O	No	(9930)	Yes	I/O	...	Option	Yes
Supports CCIR 601	No	No	D1	D1	...	No	Yes
Supports D-2	...	...	No	No	...	No	No
Downconversion from HDTV	No	No	No	No	No	No	Yes
Luminance bandwidth MHz	3.3MHz	3.3MHz	13.5	13.5	...	13.5	13.5
Chrominance bandwidth	...	...	6.75	6.75	...	6.75	6.75
Quantizing scheme L/C	8-bit	8-bit	8-bit	8-bit	8-bit/4:2:2	8-bit/4:2:2	8-bit
Input S/N minimum	56dB	56dB	60dB	60dB wtd	60dB	60dB wtd	...
Resolution B/W	...	4-field motion	>5.5	>5.5	...	>5.5	5.5MHz
Resolution V	...	processing	...	...	...	...	...
Timebase correcton	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Synchronizer	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame freeze	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Field freeze	Yes	Yes	1 or 2	4-field	Yes	4-field	Yes
Image enhancement	Yes	Yes	Yes	H/V	Yes	H/V	...
Noise reduction Y/C	Yes	Yes	Yes	15dB	15dB	15dB	Yes
Composite encoder	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced NTSC PAL	...	...	Opt Comb	...	...	...	...
Format conversion	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scan conversion	No	No	No	No	No	No	No
Auto input selection	Yes	Yes	Yes	Yes	No	Yes	Yes
Color correction	Yes	Yes	Yes	Yes	Level only	Yes	Yes
Programmable	Yes	Yes	No	No	No	No	No
Gamma correction	...	...	No	...	No	...	No
Color balance	Yes	Yes	Yes	Yes	No	Yes	No
Time code control	...	...	No	No	No	No	No
Scene detection	No	No	No	No	No	No	No
Proc-amp adjustment	Full	Full	Full	Full	Yes	Full	Full
Reader Service No	590	591	592	593	594	595	596

## Video Processing Systems

Products in this group serve various signal processing functions, including video color correction, encoding & decoding, format conversions & translations, image enhancement, line doubling and noise reduction.

Manufacturer	Accom		ALTA Group	AVS	Broadcast Video Systems				BTS
	D-Bridge 122 <sup>1</sup>	DIE-125 <sup>2</sup> D	Celeris	SIGMA	#734/#735	#740/750	D100 (D101)	EN300/350/450	CNR7
Processing function	Encoder	Enhancer	Format converter	Noise reduction	Translator	Component translator	Decoder	Encoders	Noise reduction
Supports NTSC	Yes	Yes	Yes	Yes	[#743 for	[#740 RGB to	Yes	Yes	Yes
Supports PAL	Yes	...	No	Yes	[RGBS to	[YCrCb	(D101)	EN300	Yes
Supports SECAM	No	No	No	No	[YCrCb	No	No	No	...
Format conversion	Yes	Yes	Yes	Yes	[#735 for	Yes	Yes	350, 450	Yes
Supports Y/C 3.58	No	No	Yes	Yes	[YCrCb	[#750 RGB from	Yes	350, 450	Yes
Supports Y/C 688	No	No	Yes	...	to RGBS	[YCrCb	...	No	Yes
Supports RGB	Yes	Yes	No	Yes	Yes	Yes	Out	Yes	Yes
Supports YC <sub>R</sub> C <sub>B</sub>	Yes	Yes	No	Yes	Yes	Yes	Out	350, 450	Yes
Supports CCIR 601/D1	Yes	Yes	No	Processing	No	No	No	No	...
Supports D2	Yes	No	No	...	No	No	No	No	...
H enhancement	No	Yes	No	...	No	No	Video EQ	No	Yes
V enhancement	No	Yes	No	...	No	No	No	No	Yes
Noise reduction	No	Yes	No	3-16dB	No	No	No	No	Yes
Color correction	Yes	No	L/C delay	3-16dB	Yes	No	No	No	Yes
Contrast correction	Yes	No	No	...	Yes	No	No	No	Yes
Sync regeneration	Yes	Yes	Yes	TBC function	Yes	Yes	No	350, 450	TBC
Proc amp control	Yes	No	No	...	Partial	Yes	Partial	No	Yes
Programmable	Yes	Yes	No	...	No	No	Memories	No	...
Time code control	No	No	No	No	No	No	No	No	No
RS-232/-422 control	Yes	Yes	No	No	No	No	RS-422	No	...
Composite encoder	Yes	No	Yes	Yes	No	No	...	Yes	Yes
Enhanced NTSC encoder	Yes	No	No	...	No	No	...	No	...



# Test Drive a TETRA

You won't believe the new P165 TETRA from CEL BROADCAST (USA).

This is not your parents standards converter.

The TETRA is fully bi-directional so you can get to or from NTSC, or PAL, or SECAM and back again faster than anything else in its class. TETRA also has the power of full bandwidth in 8-bit 4:2:2 and seats more standard features than converters twice the price.

In the open studio TETRA is smooth as glass with four-field, four-to-eight line adaptive motion interpolation. Even a test

## The new P165 TETRA



FOUR FIELD INTERPOLATION

# TETRA

MOTION ADAPTIVE DSP

CEL BROADCAST (USA)  
US OFFICE: TEL: 800-325-CEL1

pattern generator is included for those tough-to-handle output curves.

We build the TETRA for the engineer, but we didn't forget the budget. You won't be able to tell its only \$28,995.00.

You'll love what we do for you, TETRA.

Circle (32) on Reply Card



The Art of Image Control

CEL Broadcast (USA) • 4550 W. 109th Street, Suite 140, Overland Park, Kansas 66211 • Tel: 800-325-2351 Fax: 913-345-2771

Manufacturer	Accom		ALTA Group	AVS	Broadcast Video Systems				BTS
Model	D-Bridge 122 <sup>1</sup>	DIE-125 <sup>2</sup> D	Celeris	SIGMA	#734 #735	#740 750	D100 (D101)	EN300/350/450	CNR7
Video bandwidth	to 5.75MHz	to 5.75MHz	-3dB 6MHz	3.3MHz	...	10MHz	to 5MHz	5/5.5/6MHz	-3, +0.5dB 4MHz
Video S/N ratio	65dB	54dB	56dB	...	...	46dB	...	45.45/60dB	...
Envelop delay	5ns	5ns	Adjustable	...	...	4ns Δ	<20ns	±15/15/10ns	Adjustable
∠φ/G	0.2°, 0.2%	0°, 0%	...	...	...	...	...	...	...
Reader Service No	601	602	603	604	605	606	607	608	609

<sup>1</sup> D-Bridge 221 is companion decoder unit. <sup>2</sup> Designed for reduction of noise and grain in film-to-tape transfer operations.

Manufacturer	BTS	CEL Electronics	Central Dynamics	Digital Vision	Faroudja Laboratories			For-A	Grass Valley Group
Model	DNR7 <sup>3</sup>	P171	STAGE ★1 E- NTSC	DVCC1000	CTE-2	LD-1	VHP-N/P	CT-600	EMPHASYS #11
Processing function	Noise reduction	Encoder	Encoder	Color correction	Encoder	Line doubler	Enhancer	Format conversion	Encoder
Supports NTSC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports PAL	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes
Supports SECAM	Yes	No	No	No	No	No	Yes	...	No
Format conversion	Yes	...	Yes	No	Yes	Yes	No	No	No
Supports Y C 3.58	No	No	Yes	No	Yes	No	No	Yes	No
Supports Y C 688	No	No	...	No	No	No	No	Yes	No
Supports RGB	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Supports YC <sub>R</sub> C <sub>B</sub>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Supports CCIR 601/D1	Yes	Yes	Yes	Yes	No	No	No	No	No
Supports D2	No	No	Yes	No	No	No	No	Yes	10-bit
H enhancement	...	[Through	Yes	Yes	Yes	Yes	Yes	No	Hi freq boost
V enhancement	...	]artifact	Yes	Yes	Yes	Yes	Yes	No	...
Noise reduction	C/L	[reduction	No	...	No	Yes	No	No	Artifacts <sup>4</sup>
Color correction	Yes	No	No	Yes	No	No	No	No	No
Contrast correction	...L	No	No	Possible	No	Yes	Yes	No	No
Sync regeneration	per CCIR	No	Yes	TBC function	Yes	Yes	No	Yes	Yes
Proc amp control	Yes	No	No	Partial	Yes	No	No	Yes	Yes
Programmable	...	No	Yes	w/IBM-PC	No	No	No	No	...
Time code control	...	No	No	LTC/VITC	No	No	No	No	No
RS-232/-422 control	...	Yes	Yes	...	No	No	No	No	No
Composite encoder	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
Enhanced NTSC encoder	...	Improved	Yes	...	Yes	No	No	...	Yes
Video bandwidth	per CCIR	to 5MHz	5.5MHz	[10-bit	6MHz	9MHz	4.2MHz	5MHz	5.75MHz
Video S/N ratio	...	...	>60dB	[4:2:2	>60dB	...	>60dB	>60dB	>65dB
Envelop delay	...	...	<10ns	[processing	<25ns	...	<20ns	...	...
∠φ/G	...	...	...	...	1°, 1%	...	2.5°, 2.5%	1°, 1%	...
Reader Service No	610	611	612	613	614	615	616	617	618

<sup>3</sup> Integration into various production configurations with CD7 encoder, DC7 decoder; D-1. <sup>4</sup> 2-D, Lo/Hi, vertical and diagonal filtering modes for removal of cross luminance and cross color artifacts.

Manufacturer	I-DEN	Intelvideo	Laird	Leitch Video	Magni Systems		Microvideo	Philips	
Model	IVS-3 (-4/-5)	IV-6 (IV-4)	IV-7 (IV-8) <sup>5</sup>	1032 (1032Y/C)	VGE-3210N	125AD (125DA)	4004/4005	CCIR656	PM 5638
Processing function	Translator	Encoder (decoder)	Decoder (en- coder)	Encoder	Signal encoder	Transcoding	Encoder	Coder (decoder)	Encoder
Supports NTSC	No	Yes	Yes	Yes	Yes	...	4004	Yes	5638M
Supports PAL	{-3 RGB to	No	No	No	No	...	4005	Yes	5638G/N/P
Supports SECAM	[Y <sub>R</sub> C <sub>B</sub>	No	No	No	No	...	No	No	No
Format conversion	[-4 Y <sub>R</sub> C <sub>B</sub>		Opt	No	No	Yes	from Amiga 2000	No	No
Supports Y C 3.58	[to RGB	(IV-4)	(Out opt)	Yes	No	...	...	No	No
Supports Y C 688	No		...	S-VHS	No	...	S-VHS	No	No
Supports RGB	Yes	(Yes)	Yes	Yes	No	Yes	Yes	Yes	Yes
Supports YC <sub>R</sub> C <sub>B</sub>	Yes	(Yes)	Yes	...	No	Yes	No	Yes	Yes
Supports CCIR 601/D1	No	No	No	No	No	[RP125	No	Yes	No
Supports D2	No	(Option)	No	No	No	[EBU 3246	No	Yes	No
For dubbing	...	Yes	Yes	...	No	...	No	...	Yes
For production	5.5MHz	Yes	Yes	...	4.5MHz	...	No	...	Yes
For on-air	...	Yes	Yes	...	...	...	No	...	Yes
H enhancement	N.A.	(Yes)	IV-3	...	8- or 10-bit	No	No	No	No
V enhancement	58dB	Yes	IV-3	...	No	No	No	No	No
Noise reduction	[-5 converts	Artifacts	See Note <sup>5</sup>	...	No	No	No	No	No
Color correction	[CTDM, CTCM	No	No	...	Yes	No	No	No	No
Contrast correction	[component to	No	No	...	Yes	No	No	No	No
Sync regeneration	[Y <sub>R</sub> C <sub>B</sub>	No	No	RS-170	Yes	No	RS-170 genlock	No	Yes
Proc amp control	No	No	No	Partial	Yes	No	Yes	[codes analog	...



Manufacturer	I-DEN	Intelvideo		Laird	Leitch Video	Magni Systems		Microvideo	Philips
Model	IVS-3 (-4/-5)	IV-6 (IV-4)	IV-7 (IV-8) <sup>5</sup>	1032 (1032Y/C)	VGE-3210N	125AD (125DA)	4004/4005	CCIR656	PM 5638
Programmable	No	No	No	No	No	No	via PC	[components to	No
Time code control	No	No	No	No	No	No	...	[serial digital	No
RS-232/-422 control	No	No	No	No	No	Yes	via PC	[decodes	Simple remote
Composite encoder	No	IV-6	Yes	Yes	No	No	Yes	[parallel	Yes
Enhanced NTSC encoder	No	Yes	(IV-3 encoder)	...	No	10-bit	...	[digital into	No
Video bandwidth	...	to 6.5MHz	>15MHz; >10MHz	5MHz (8MHz)	±0.1dB 5MHz	±0.3 5.5MHz	>34dB 4.2MHz	[analog	to 8MHz
Video S/N ratio	Yes	...	...	56dB (72dB)	>60dB	>60dB	...	[components	75dB
Envelop delay	...	±25ns Y to C	±25ns Y to C	...	...	...	...	...	<20ns
∂φ/G	...	2/2%	2/2% (1/1%)	...	<0.2', 0.5%	...	±1', 1%	...	<0.15;<0.2%
Reader Service No	619	620	621	622	623	624	625	626	627

<sup>5</sup> IV-3 encoder uses digital color modulation for enhanced NTSC using Intelcomp for greater detail. <sup>6</sup> Optional digital delay comb filter.

Manufacturer	Vistek Electronics								
	Sierra Video Systems	Sony	Thomson						
Model	Delta Series	BVX-D10	COLORADO	205N <sup>7</sup> (204N)	600JN <sup>8</sup>	ACC200	V1010 series	V4000 series	V4130 series
Processing function	Format conversion	Format translation	Color correction	Encoder	Color corrector	Color correction	Format conversion	Transcoder	Encoders
Supports NTSC	No	Yes	No	Yes	Yes	No	...	Yes to PAL-M	3.58/4.43
Supports PAL	No	Yes	No	No	No	No	YUV	I, G, B, N	No
Supports SECAM	No	No	No	No	No	No	No	Yes	No
Format conversion	Yes	Yes	No	No	No	Yes	Yes	No	No
Supports Y/C 3.56	No	...	No	No	No	No	No	No	No
Supports Y/C 688	No	...	No	No	No	No	No	No	No
Supports RGB	Yes	Digital	Digital	Yes	Yes	Yes	Yes	Yes	Yes/YUV
Supports YCrCb	Yes	Digital	No	Yes	Yes	Yes	Yes	No	Yes
Supports CCIR 601/D1	No	Yes	Yes	No	No	No	No	No	No
Supports D2	No	Yes	No	No	No	No	No	No	No
H enhancement	No	No	No	Yes	No	...	No	...	...
V enhancement	No	No	No	No	No	...	No	...	58dB
Noise reduction	No	No	...	No	Yes	...	No	[4021 PAL	[encoding and
Color correction	No	[Gamma, gain	Yes	No	Yes	...	No	[4022 NTSC	[re-encoding of
Contrast correction	No	[Setup of RGB	...	No	Yes	...	No	[decoder units	[original or
Sync regeneration	No	No	No	Yes (No)	No	...	[Models for	[ for conversion	[decoded RGB
Proc amp control	No	Yes	Yes	Yes (No)	No	...	[conversion	[between NTSC	[or YCrCb
Programmable	No	No	Yes	No	No	...	[among RGB, signals and	[to composite	
Time code control	No	No	Yes	No	Yes	...	[RGS, and	[PAL-M or from	[output
RS-232/-422 control	No	RS-422 comm.	Yes	No	No	...	[YCrCb	[PAL-I/B/G/N	...
Composite encoder	No	...	No	Yes	No	...	No	[to SECAM	Yes
Enhanced NTSC encoder	No	No	No	No	No	...	No	No	...
Video bandwidth	20MHz	13.5MHz Y	per CCIR 601	6MHz	5 MHz	6MHz	<0.1 5.5MHz	±1 5.5MHz	±0.2 5.5MHz
Video S/N ratio	60dB	...	per CCIR	60dB	65dB	60dB	>66dB	...	>64dB
Envelop delay	5ns	...	...	1100ns	450ns	30ns	...	<20ns	<10ns
∂φ/G	...	...	...	0.5	0.5%	...	...	...	...
Reader Service No	628	629	630	631	632	633	634	635	636

<sup>7</sup> Model 205N provides genlock feature. <sup>8</sup> 600JN is similar unit providing color correction for component video.

## Time Code Equipment

Manufacturer	Adrienne Electronics					Cipher Digital			
	Adams-Smith	AEC-BOX series	PC-LTC (-VITC)	CDI-1000/-1200	CDI-1400	CDI-4800 Shadow II	CDI-4815 PhantomII <sup>3</sup>	CDI-750	
Model	System 2600								
Portable unit	No	...	PC card	No	No	No	No	No	
Internal reference	Yes	...	Yes (...)	No	Yes	Yes	Yes	Yes	
Reader function	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	
Generator function	Yes	No	Yes	No	Yes	No	No	Yes	
Character generator function	Yes	...	No	No	No	No	No	Yes	
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Supports color framing	Yes	Yes	Yes	N.A.	Yes	...	...	Yes	
Supports jam sync	Yes	...	...	N.A.	Yes	No	No	Yes	
Supports 3:2 film pull-down	Yes	...	...	No	...	...	...	No	
Supports LTC	I/O	Box-1/-2/-20	Yes	I/O	I/O	Input	Input	I/O	
Supports VITC	I/O	Box-10/-20	(Yes)	-1000 translator	No	No	No	No	
Editor interface	Yes	RS-232/-422	RS-323/-422 opt	Yes	No	Yes	Yes	Yes	
Character keyer	Yes	...	...	Yes	Yes	No	No	Yes	
Keyed window display	Adj	...	...	Yes	Adj	No	No	Adj	

Manufacturer	Adams-Smith	Adrienne Electronics			Cipher Digital			
Model	System 2600	AEC-BOX series	PC-LTC (-VITC)	CDI-1000/-1200	CDI-1400	CDI-4800 Shadow II	CDI-4815 PhantomII <sup>3</sup>	CDI-750
Time code entry	Yes	...	Yes	No	Yes	No	No	Yes
Time code comparisons	Yes	Not Box-1	Yes	[Control track	No	Yes	Yes	Yes
User bit entry	Yes	...	Yes	[TACH input	Yes	No	No	Yes
Synchronizer function	Yes	No	No	No	[24-frame	Yes <sup>2</sup>	Yes	No
TC UB display	LED	...	No	LED	LED	...	...	LED
TC UB display size	Various	...	No	...	...	...	...	0.7"
Reading speed range	1-100x	1/10-80 <sup>1</sup>	1/30x-80x -1, +3x	(1/30-50x -1200)	Generates at 2x	1/30-50x	1/30-50x	1/30-80x
LTC output signal	1Vp-p	...	Yes (VITC)	-1000 only	+4dBm 600Ω	...	...	+4dBm 600Ω
Power requirement	110/220Vac	115Vac	From PC	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac
Reader Service No	637	638	639	640	641	642	643	644

<sup>1</sup> Box-1 to 2.2x; Box -10 -1x to +3x range. <sup>2</sup> To synchronize and control one master and one slave. <sup>3</sup> Interface for one transport; for standard parallel interface, VO-5800/5850, third jack for future types.

Manufacturer	Denecke	ESE				Evertz Microsystems		
Model	TC-1 (Syncox)	ES452	ES453	ES456 <sup>4</sup>	ES461	ES488	4015 <sup>5</sup>	7200e <sup>2,6</sup>
Portable unit	Yes	No	No	No	No	No	No	No
Internal reference	Yes	No	No	No	Yes	Yes	Yes	No
Reader function	TC-1	Yes	Yes	Yes	No	Yes	No	Yes
Generator function	Syncox	...	No	No	Yes	Yes	Yes	No
Character generator function	...	Yes	No	No	No	Yes	Yes	No
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	...	No	No	No	Yes	Yes	Yes	Yes
Supports jam sync	Yes	No	No	No	Yes	Yes	No	No
Supports 3:2 film pull-down	...	No	No	No	No	No	Yes	No
Supports LTC	Yes	In	In	In	I/O	I/O	Opt	In (VITC Input)
Editor interface	Opt	No	Yes	No	No	No	No	Yes
Character keyer	No	Yes	No	No	No	Yes	Yes	No
Keyed window display	No	Multiline	No	No	No	Adj	...	No
Time code entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
User bit entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Synchronizer function	No	No	No	No	No	No	No	Yes
TC UB display	TC-1 LED	Video	LED	LED	LED	LED	LED	...
TC UB display size	...	5% of screen	0.56"	0.56"	0.56"	0.56"	0.75"	...
Reading speed range	1/30-50x	1x	1x	1/30-30x	...	1/30-30x	...	0-70x
LTC output signal	1V 10kΩ	...	...	...	1V 0dBm 75Ω	1V 0dBm 75Ω	-20/12dBm	...
Power requirement	ac/dc	110Vac	110Vac	110Vac	110Vac	110Vac	110/220Vac	12Vdc
Reader Service No	645	646	647	648	649	650	651	652

<sup>4</sup> ES 455 includes window dubber feature. <sup>5</sup> Film footage, <sup>6</sup> Intelligent interface encoder

Manufacturer	Evertz	Fast Forward Video		For-A	Gray Engineering Laboratories			
Model	EV-Bloc <sup>7</sup>	F30	P1 (F22)	TGR-2000	DR-107B	DT-104FC	DTR-313 series	DT-213/VID-225
Portable unit	No	No	P1	No	No	No	No	No
Internal reference	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes
Reader function	611	Yes	Yes	Yes	Yes	Slave	Yes	Yes
Generator function	612	Yes	Yes	Yes	No	Yes	Yes	Yes
Character generator function	613	Yes	F22 <sup>8</sup>	Yes	Yes	...	Yes	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	No	Yes	...	Yes	Yes	Yes
Supports jam sync	Yes	Yes	Yes	Yes	N.A.	Yes	...	Yes
Supports 3:2 film pull-down	...	No	No	No	Yes	Yes	Yes	Yes
Supports LTC	I/O and VITC	I/O	I/O	I/O	Yes	Yes	Yes and VITC	I/O and VITC
Editor interface	Yes	Yes	No	Yes	Yes	Yes	Remote	Yes
Character keyer	613	Yes	F22	Yes	Yes	No	Yes	Yes
Keyed window display	Yes	Yes	No (Adj)	Adj	Yes	No	Yes	Adj
Time code entry	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Time code comparisons	...	No	No	No	...	...	...	Yes
User bit entry	Yes	Yes	(F22)	Yes	No	Yes	Yes	Yes
Synchronizer function	No	No	No	...	No	Yes	...	No
TC UB display	LED	LED	LCD (LED)	LED	No	LED	LED	LED
TC UB display size	0.75"	0.55"	...(0.55")	Adj.	No	...	...	0.6"
Reading speed range	0-70x	1/30-15x	1x (1/30-15x)	1/30-80x	1/100-100x	...	...	1/10-100x
LTC output signal	+6dBm	0.5-8V	0dBm (0.5-8V)	2.2Vp-p	Reconstituted	+8dBm	+8dBm	+8dBm 600Ω adj
Power requirement	110/220Vac	110/220Vac	12Vdc (110Vac)	110Vac	110Vac	110Vac	110Vac	100/220Vac
Reader Service No	653	654	655	656	657	658	659	660

<sup>7</sup> Modular system of building blocks to perform required functions. <sup>8</sup> P2 includes character inserter.

Manufacturer	Horita	OpTex	Skotel				Sony	Telcom
Model	TG-50 TRG-50 <sup>9</sup>	AVTC-20	TCG-313 (FTK)	TCG-333	TCG-80N-FT	TCT-412 (421)	BVG series (BVG-100)	PC 600
Portable unit	Yes	Yes	No	No	No	No	Yes	PC card <sup>11</sup>
Internal reference	No	Yes	Yes	Yes	No	[LTC-VITC and (VITC-LTC)]	Yes	...
Reader function	TRG-50	Yes	Yes	Yes	Yes	[translators	BVG-1600	Yes
Generator function	Yes	Yes	Yes	Yes	Yes	Yes	BVG-1500	No
Character generator function	Yes	-20VI	Yes	Yes	Yes	No	Yes	via PC
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	...	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	No	...	Yes	Yes	Yes	Yes	Yes	...
Supports jam sync	Yes	Yes	Yes	Yes	Yes	Yes	Yes	...
Supports 3:2 film pull-down	No	...	No	Yes	No	No	...	Yes
Supports LTC	I/O	Yes	I/O	I/O	I/O	In (Out)	Yes	Yes
Supports VITC	with VLT-50	...	No	I/O	Output	Out (In)	Yes	...
Editor interface	No	No	No	...	No	[LTC sampled	Yes	...
Character keyer	Yes	...	Yes	Yes	Yes	[at frame rate	Yes	Yes
Keyed window display	WG-50	...	Adj	Adj	Adj	[for non-play	Yes	No
Time code entry	Yes	Yes	Yes	Yes	Yes	[speed use. Yes	Yes	...
Time code comparisons	No	No	No	Yes	No	[may duplicate	...	...
User bit entry	Yes	Yes	Yes	Yes	Yes	[address or skip	Yes	Yes
Synchronizer function	No	No	No	No	No	[in sequence.	No	No
TC UB display	...	LED	LED	Variable	LED	LED	LED	PC CRT
TC UB display size	...	...	0.6"	Variable	0.3"	0.56"	...	...
Reading speed range	1/30-10x	...	1/30-80x	Still ±50X	0.9-1.1x	1/30-80x	...	1/30-70x
LTC output signal	1V/-6dBm 2kΩ	3dB 1kΩ	0.5-5V 100Ω	0.5-4.5Vpp	0.5-5V 100Ω	0.5-5V 100Ω	to 8dBm	...
Power requirement	110Vac 9-12Vdc	12Vdc	ac/dc	110Vac	ac/dc	ac/dc	110ac (9dc)	From PC
Reader Service No	661	662	663	664	665	666	667	668

<sup>9</sup> TRG-50PC for IBM/compatibles w/PC-LOG, TC-TOOLKIT software; RS-232 serial communication; RLT-50 Hi8 to LTC translations; WG-50 window dub inserter. <sup>10</sup> supports KEYCODE data. <sup>11</sup> TC-LOG, EDL, BUF600, PC600 DRV software; Executive Producer software from Imagine Products.

Manufacturer	Telcom Research				Time Line	United Media	
Model	T 102	T5010	T911 processor <sup>13</sup>	TCR 680	Lynx TC module	Model 505	515 TCR CG
Portable unit	Desktop	No	No	Yes	No	Yes	Yes
Internal reference	Yes	Yes	Yes	...	Yes	Yes	Yes
Reader function	Yes	Yes	Yes	Yes	Yes	Yes	No
Generator function	Yes	Yes	Yes	No	Yes	Yes	Yes
Character generator function	Yes	Yes	Yes	Yes	No	Yes	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	Yes	...	No	Yes	Yes
Supports jam sync	Yes	Yes	Yes	...	Yes	Yes	Yes
Supports 3:2 film pull-down	No	No	Yes	No	Film module	Yes	Yes
Supports LTC	I/O	I/O	Yes	Input	I/O	I/O	I/O
Supports VITC	No	No	Yes	No	Yes	Yes	Yes
Editor interface	via PC	No	Yes	No	Yes	Yes	Yes
Character keyer	EFP <sup>12</sup>	Yes	Yes	Yes	No	Yes	Yes
Keyed window display	...	Adj	Yes	Adj	No	Multiline Adj	Multiline Adj
Time code entry	via PC	Yes	Yes	...	Yes	Yes	Yes
Time code comparisons	...	No	Yes	...	No	Yes	Yes
User bit entry	Yes	Yes	Yes	...	Yes	No	No
Synchronizer function	No	No	No	...	Yes	No	No
TC UB display	EFP PC CRT	LED	LED	Video	LED	LED	LED
TC UB display size	...	0.8"	0.8"	...	0.3"	4"	4"
Reading speed range	1/10-8x	1/30-8x	...	1/50-8x	1/2-60x	1/20-50x	1/20-50x
LTC output signal	11dBm 600Ω	11dBm 600Ω	11dBm 600Ω	...	-1dBm 200Ω adj	0.5-4Vp-p	0.5-4Vp-p
Power requirement	117Vac	110 220Vac	110 220Vac	8-16Vdc	110 220Vac	110 220Vac	110 220Vac
Reader Service No	669	670	671	672	673	674	675

<sup>12</sup> EFP Electronic Front Panel display on EGA, VGA, 8514A video adapter and CRT; TC-LOG, EDL software packages. <sup>13</sup> Includes MIDI MTC output and translations from LTC VITC to MTC.

## Editing Control Systems

Manufacturer	Abekas Video	ALTA Group	Ampex	Amtel Systems	Axial Corp.	BTS	Calaway Editing	
Model	A34 Solo	Pyxis (E)	ACE 25	E-Pix	Axial	BBE-910 <sup>6</sup>	CD-400	CE-210 (110)
Suggested for	On-line	On-line	On, Off-line	Off-line	On-line	On-off-line	On-line	On-line
Editing type	Linear	A/B roll	Linear	Non-linear	Either	...	...	...
Transports controlled R/P	2-R, 4-P	1R 2P	1R, 3P	8 R, 8 P	48 devices	1R, 3P	13 VTRs	8 (4)
Videodisc interface	No	...	No	Yes	Yes	No	...	...
Control type	Centralized	...	80286 PC	Distributed	Proprietary	PC	Central 8-bit	80386 DOS

Manufacturer	Abekas Video	ALTA Group	Ampex	Amtel Systems	Axial Corp.	BTS	Calaway Editing	
Model	A34 Solo <sup>1</sup>	Pyxis (E)	ACE 25 <sup>4</sup>	E-Pix	Axial	BBE-910 <sup>6</sup>	CD-400	CE-210 (110) <sup>7</sup>
# events (internal storage)	512	None	1000	2000	...	128	9999-line	3000 (1980)
External event storage	FD	[Dual-channel]	FD dual 3.5"	Floppy disk	MO disk	None	FD	FD
Edit decision list	Yes	[TBC facility]	Yes	Yes	Yes	Yes	TurboTrace+	TurboTrace+
Edit data display	CRT	[(E) includes]	CRT	CRT	CRT	CRT	CRT	CRT
Printer interface	3.5" disk on PC	[Synchronizers]	RS-232 ser/par	Centronics parallel	36-pin	None	Yes	Yes
Command entry via	Keyboard	Control panel	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard
Deck motion control via	KB, Joystick <sup>2</sup>	None	Keyboard, Knob	Joystick	Trackball	Keyboard, knob	Knob	keys
Assemble edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Insert edit	Yes	...	Yes	Yes	Yes	Yes	Yes	...
Split A-V edits	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
A-B sync roll	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Animation mode	No	[Includes audio]	No	Yes	Yes	...	Yes	Possible
Integral TC reader	No	[& video mix]	No	No	...	Yes	...	...
Integral TC generator	No	[capability]	No	No	...	No	...	...
Time reference support for	LTC VITC Ctl-Trk	None	LTC VITC CtlTrk	LTC VITC	LTC	Ctl-Trk	LTC VITC CtlTrk Sync	...
Color framing	Yes	...	Yes	Yes	Yes	NTSC, PAL	NTSC/PAL	NTSC & PAL
Editing accuracy	1 TC ±2 CtlTrk <sup>3</sup>	...	0 TC ±1 CtlTrk	±0 TC	...	TC	±0 TC, ±2 CTL	...
Interfaces available	AF mixer, Video EFX system	GPI triggers	AF Vd Xtch Multi-ATR, Ser/Par interface <sup>5</sup>	AF mix, VD xtch, Multi ATR, Titler	RS422/232-GPI	Switcher, mixer, VTR, GPI equipment	V/A mixers, A/V mixers, TBC	VTRs, Prvw xtchr
Control protocol	RS-422, GPI	...	RS-232	RS-422	GPI	Ethernet	RS-422	RS-422, ESbus, GPI
Reader Service No	677	678	679	680	681	682	683	684

<sup>1</sup> Combines editing control with 8-input A/V switcher, 2-D digital effects, 3 TBCs, flying bus, luma and DSK keying. <sup>2</sup> Or thumb wheel control. <sup>3</sup> Accuracy dependent upon VTRs used in the system. <sup>4</sup> ACE-200 (20 GPIs, 16 devices), ACE 10 (4 GPI, 2P/1R VTRs), ACE Micro (4 GPIs, 4VTRs) have characteristics similar to the ACE 25 system. <sup>5</sup> ACE-MIF, digital effects system on GPI. <sup>6</sup> BBE-600, scaled down version with fewer VTRs and reduced effects type control. <sup>7</sup> Related systems include CE-25 cutsonly, CE-75 A/B roll with 999-line EDL.

Manufacturer	Cipher Digital	CV Technologies	Ediflex Systems	EMC Editing Machines	FCM-A	Grass Valley Group		JVC Professional Products	
Model	CDI-5000 Softouch II	Edit Master	Ediflex II <sup>8</sup>	EMC <sup>9</sup>	EC-740	VPE-141	VPE-151	RM G850U	RM G86U
Suggested for	On-line	On-line	...	Off-line	On-line	On, Off	On-line	Off-line	Off-line
Editing type	Linear	Linear	Non-linear	Non-linear	Linear	Linear	Linear	Linear	Linear
Transports controlled R P	4-R, 4-P	1R 4P	1/2" options	Opt configs	1R, 2P	1-R, 6-P	1-R, 6-P	1-R, 2-P	1-R, 1-P
Videodisc interface	No	...	WO MO disk	Option	...	No	...	No	No
Control $\mu$ type	Multiple	80286, 68000	Proprietary	PC	...	...	...	...	...
# events (internal storage)	16	900	...	...	1-event	2,000	16,000	1 event	1 event
External event storage	3.5" FD	Floppy disk	Floppy disk	FD	None	FD, papertape	FD, papertape	None	None
Edit decision list	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
Edit data display	CRT	CRT	CRT	RGB CRT	LED displays	CRT	CRT	LED display	LED display
Printer interface	RS-232, parallel	via PC	...	RS-232	None	RS-232	RS-232	...	...
Command entry via	Keyboard	Keyboard	GUI/pointer	Keyboard	Keyboard	KB	Keyboard	Keyboard	Keyboard
Deck motion control via	Keyboard	Keyboard	GUI/pointer	Keyboard	Knob	KB	Keyboard	Knobs	Knobs
Assemble edit	...	Yes	Yes	Option	Yes	Yes	Yes	Yes	Yes
Insert edit	[Audio editor]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Split A V edits	[stores setup]	4-ch audio	Yes	Yes	Yes	Yes	Yes	No	No
A B sync roll	[w/edit list]	Yes	...	...	Yes	Yes	Yes	No	No
Animation mode	[Interface to 4]	...	Yes	No	...	Option	Yes	No	No
Integral TC reader	[Shadow II and]	Yes	KEYCODE data	No	...	No	No	No	No
Integral TC generator	[CDI-750 G/R]	Yes	...	No	...	No	No	No	No
Time reference support for	LTC	VITC/LTC	LTC	LTC	...	L/V/CT	L/V/CT	LTC CtlTrk	CtlTrk
Color framing	...	...	...	Yes	...	Yes	Yes	N	N
Editing accuracy	0.01 Frame/TC	...	...	...	±2	±0 TC, ±1 CT	±0 TC, ±1 CT	0 TC ±2 CtlTrk	±2 CtlTrk
Interfaces available	...	Various	...	...	Various	AF Mixer, Video Prod Switcher, Still Store Multitrack-ATR, Titler, Digital Effects	...	...	...
Control protocol	RS-232, GPI	...	...	...	GPI, RS-422	RS-422	RS-422	RS-422	Other
Reader Service No	685	686	687	688	689	690	691	692	693

<sup>8</sup> Provides optional hybrid disk/tape systems; Optiflex uses rewritable MO media exclusively. <sup>9</sup> EMC<sup>1</sup> hard-disk based; EMC<sup>2</sup> MO optical disks for source material; EMC-PC is editing software only for PCs/compatibles.

Manufacturer	NEC America	OLE Partnership	Paltex			Panasonic PCSC		QUANTEL	Sony
Model	VUES	Lightworks	Abner-II	Europa (Plus) <sup>1</sup>	ECS-85	AG-A770	AG-A800	Harry Suite	BVE-600 (BVE-910)
Suggested for	On-line	Off-line	On-, Off-line	On-, Off-line	On-line	...	On-line	Either	On (& Off) line
Editing type	...	Random	Linear	Linear	Linear	2-machine	A/B roll	Random	Non-linear
Transports controlled R P	...	5 VTRs	1 R, 2 P	8 to 16 decks	1P 1P (opt)	1R, 1P	1R 2P	[RGB/YUV]	1-R/2-P, 1-R/3-P
Videodisc interface	...	...	No	Option	...	No	No	[composite]	No
Control $\mu$ type	Macintosh IIx	...	Centralized	Multiple	Proprietary	Proprietary	Proprietary	[CCIR 601]	Centralized

Manufacturer	NEC America	OLE Partnership	Paltex			Panasonic PCSC		QUANTEL	Sony
Model	VUES	Lightworks	Abner-II	Europa (Plus)	ECS-85	AG-A770	AG-A800	Harry Suite	BVE-600 (BVE-910)
# events (internal storage)	...	...	50	3100-event	1000 line	128-event	128-event	[I/O support.	... (998)
External event storage	...	FD	Floppy disk	Floppy disk	Floppy disk	via PC/RS-232	PC/RS-232	...	Floppy disk
Edit decision list	Yes	Yes	50-event	7000 lines	Yes	...	...	...	No (Yes)
Edit data display	Macintosh CRT	CRT1	CRT	E-Screen CRT	CRT	TC on LEDs	TC on LEDs	CRT menus	LED (CRT)
Printer interface	via Macintosh	...	...	RS-232	...	No	No	...	RS-232
Command entry via	Keyboard	Kybrd	console	Keyboard	Keyboard	Keyboard	Keyboard	Keybiard	Keyboard
Deck motion control via	Keyboard	Console	Shuttle knobs	Shuttle knobs	Shuttle joystick	Shuttle knobs	Shuttle knob	Yes	Keyboard
Assemble edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	[For editing of	No (Yes)
Insert edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	[short segments	Yes
Split A V edits	...	Yes	Yes	Yes	Yes	Yes	Yes	[in memory;	Yes
A B sync roll	...	Yes	Yes	Yes	A/B upgrade	No	Yes	[CRT display	No (Yes)
Animation mode	Single frame	Yes	Yes	Yes	...	...	...	[of video and	No (Yes)
Integral TC reader	[per VSR-11	...	Yes	Yes	SID interface	No	No	[commands;	No (Opt)
Integral TC generator	[Solid-state	...	No	No	SID interface	No	No	[may link to	No (Opt)
Time reference support for	[recorder with	LTC/VITC	LTC CtlTrk VITC	LTC CtlTrk VITC	LTC/VITC/cttrk	LTC, CntTrk	LTC	[Paintbox	LTC VITC Ctl-Trk
Color framing	[34s memory	...	No	No	Yes	...	...	[Mirage, Encore	Yes (opt)
Editing accuracy	[expandable to	...	±0 TC, ±1 Ctl-Trk <sup>10</sup>	±0 TC, ±1 Ctl-Trk	...	...	...	[effects.	0 TC, ±2 CtlTrk
Interfaces available	[136s.	...	GPI	AF/VD/TELC Still Stores, ATRs, CG, EFX	Numerous	Integral switching	AG-SW800/-RM800	...	AF mix, Video switcher, (ATRs Effects)
Control protocol	RS-422	...	RS-422 GPI Parallel	RS-422 GPI Parallel	RS-422/-232	...	AG-IA81/-IA82	...	RS-422, GPI
Reader Service No	694	695	696	697	698	699	700	701	702

<sup>10</sup>Abner-VITC supports VITC time code; "Park & Perform" marking feature. Upgradable to 6 machine system. <sup>11</sup>Europa permits 4 of 8 VTRs rolled per event; Europa plus 6 for 6 of 12; Europa plus 8 for 8 of 16.

Manufacturer	Sony	United Media			Videomedia			
Model	BVE-9100	MultiTasking	UMI 400 series <sup>12</sup>	UMI 500 (600)	Mickey	Micron, Super-Micron	V-LAN	VLC-32
Suggested for	On & Off line	On, Off-line	On, Off-line	On/Off line	On, Off-line	On/Off line	On/Off line	On/Off line
Editing type	Non-linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Transports controlled R P	2-R/12-P1	3; 2-6; 2-9	2, 3, 4 total	4 (6) total	R/P	R/P	to 31 devices	2-16 transports
Videodisc interface	Option	Yes	Yes	...	Option	Option	Option	Option
Control $\mu$ type	Central, Distribute	Multi distributed	Multi distrib	MC68000	Distributed <sup>13</sup>	Distributed <sup>13</sup>	Distributed <sup>13</sup>	Distributed <sup>13</sup>
# events (internal storage)	1000	2000, 3000	250	1000 (2000)	400	250	...	500
External event storage	Floppy disk	Floppy disk	Floppy disk	3.5 Floppy disk	FD	FD	FD/HD	Floppy disk
Edit decision list	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT	CRT	CRT	CRT
Printer interface	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232	RS-232
Command entry via	Keyboard	Keyboard	Keyboard joystick	Keyboard	Keyboard, Mouse	Keyboard	Keyboard	Keyboard
Deck motion control via	Keyboard	Keyboard	Keyboard	Joystick	Mouse	Keyboard	Keyboard	Keyboard
Assemble edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Insert edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Split A V edits	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
A B sync roll	Yes	Yes	Yes	Yes	Yes	(SuperMicron)	Yes	Yes
Animation mode	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Integral TC reader	Option	Yes	Yes	...	Option	Option	Optional	Option
Integral TC generator	Option	Yes	Yes	Yes	No	No	Optional	No
Time reference support for	LTC VITC CtlTrk	LTC VITC CtlTrk Tmr	LTC VITC CtlTrk	LTC VITC CtlTrk	LTC/VITC/CtlTrk	LTC/VITC/CtlTrk	LTC/VITC/CtlTrk	LTC/VITC/CtlTrk
Color framing	Yes (Opt)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Editing accuracy	0 TC, ±2 CtlTrk	±0 TC ±2 CtlTrk	±0 TC, ±2 CtlTrk	±0 TC	...	...	...	...
Interfaces available	AF mixer, Video switcher, ATRs, Effects	AF mix Video switcher, ATRs	AF mix, Vid tch	Various	V-LAN units	V-LAN control network units <sup>13</sup>		
Control protocol	RS-422, GPI	RS-232/-422/GPI	RS-232/-422/GPI	RS-232/422, GPI	RS-232/-422/GPI	RS-232/-422/GPI	RS-232/-422/GPI	RS-232/-422/GPI
Reader Service No	703	704	705	706	707	708	709	710

<sup>12</sup> UMI420 2-VTR, UMI430 3-VTR, UMI440 4-VTR, UMI450 3-VTR w/switcher ctrl. <sup>14</sup> 1 VLX modules tie controlled devices to V-LAN network.

In most cases, manufacturers offer additional products in most of the categories of equipment featured in these specification comparison charts. We suggest you contact the manufacturers for information on these other models. These tables make no attempt to include every product from every manufacturer. They are based on information provided from the manufacturers in response to a questionnaire mailed in June 1991.

# Video Recorders

Because the technical parameters of the various recording formats have been relatively standardized, the choice becomes a matter of operational features and preferences. The following tables indicate the types of recorder units and their model numbers. We invite you to request information from the manufacturers to learn more about their features before you make your selections for purchases.

Manufacturer	Betacam SP				M-II	S-VHS			
	Ampex	BTS	Ikegami	Sony	Thomson	Panasonic	Hitachi	JVC	Panasonic
Camcorder	CVR-300A, -400	LDK391	HL-V55	BVS-300A, -400	TTV3505				
Docking VCR	CVR-5			PVV-1		AU-410, 410S			AG-7450
Portable VCR	CVR-35, -50	BCB-35, -50		BVW-50	TTV-3535	AU-500, -520, -530, 550	VL-S100		AG-7400
Field player	CVR-22	BCB-22			TTV-3522				
Studio player	CVR-60, -65	BCB-60, -65, -2600		PVW-2600, BVW-65	TTV-3560, -65	AU-A63		BR-605U	AG-7650, -7150
Studio recorder	CVR-70, -75, -D75 <sup>1</sup> , -85P <sup>2</sup>	BCB-70, -75, -D75 <sup>1</sup> , -2800		PVW-2800, BVW-70, -75, D75 <sup>1</sup>	TTV-3570, -75	AU-65, -665		BR-S611U, S811U, -S822U	AG-7750, -7350
Reader Service No.	711	712	713	714	715	716	717	718	719

<sup>1</sup> -D75 Betacam SP system with component digital serial interface capabilities. <sup>2</sup> Digital audio with DAP-85 processor.

Manufacturer	D-1 Digital Component		D-2 Digital Composite			D-X	C	
	BTS	Sony	Ampex	BTS	Hitachi	Sony	Panasonic	Ampex
Portable recorder				DCR-2		DVR-2	AJD-310	
Studio recorder	DCR-100	DVR-2100	VPR-200, -250 <sup>1</sup> , VPR-300, -350 <sup>1</sup>	DCR-10, -18 <sup>2</sup> , DCR-20, -28 <sup>2</sup>	VL-D500	DVR-20, -28 <sup>2</sup> , DVR-10 <sup>2</sup>	AJD-350	VPR-3, VPR-6, VPR-80
	720	721	722	723	724	725	726	727

<sup>1</sup> VPR-200, -250 designed for short and medium length cassettes; VPR-300, -350 also accept long cassettes. <sup>2</sup> -10, -20 units support short and medium length cassettes; -18, -28 also support long cassettes.

# Videocassette Automation Systems

Dedicated automation systems, not machine sequencer systems.

Manufacturer	Ampex	ASACA	Odetics	Panasonic Broadcast	Sony
Model	ACR-225 <sup>1</sup>	ACL-6000C	TCS-2000 <sup>2</sup>	M.A.R.C. systems	BVC-1000S LMS <sup>4</sup>
Video format	D-2	Betacam SP, M-II	Various	M-II, D-X	Beta cam SP, D-2
# record transports	3-4 & external	1	6 & external	1 or 2	4; 6 max
# playback transports	3-4 & external	4,5	6 & external	5	4; 6 max
Multiple outputs	4 simultaneous	...	Multiple	Multiple	2
Editing features	Full feature	...	Per transport	Per transport	Per transport
Control protocol	RS-232/-422	RS-422	RS-422, Ethemet, ESBUS	RS-422	RS-422
Record delayed play	Opt.	...	Yes	Yes	Option
Cassette ID	Barcode	Barcode	Barcode, TC/UB	Barcode, TC/UB	Barcode, TC/UB
Time code reader	LTC	Per transport	LTC	Yes	LTC/VITC
Time code generator	LTC	Per transport	LTC	...	LTC/VITC
Storage capability	256 32-min	600	280	107, expandable	1036 for D-2
Shortest segment	7 sec w/4	15s cycle	12 sec	10-15 sec	10s
Reader Service No.	728	729	730	731	732

<sup>1</sup> Multievent per cassette system, AutoResolve software previews playlist, recognizes and corrects playlist conflicts. <sup>2</sup> Handles D-2, Betacam/SP, M-II systems, including PAL capability; capacity extendable with expansion units; maximum of 1,495 cassettes in D-2 format. <sup>3</sup> Expansion units permit from 472 to 1,176 cassettes; external VTRs may be used. <sup>4</sup> BVC-10 system has 40-cassette storage with 4 BVW-95 VTRs; three external transports may be supported; several sizes available based on small, medium and large size cassettes.

Many of the companies included in these specification comparisons have additional products, one of which might be ideal for your application. We suggest that you contact the manufacturers to learn more about other applicable models and systems.

The information included in this **Equipment Reference Manual** was derived from manufacturers' specification sheets; every effort has been made to assure accuracy in the tables. If a value was not given for a product or an interpretation would be required, an indication "N.A." or an ellipsis (...) is shown.

**Manufacturers:** If your company is not included in the directory portion of this publication, either your company's name was not on our mailing list, or the questionnaire, mailed in June 1991, was not returned.

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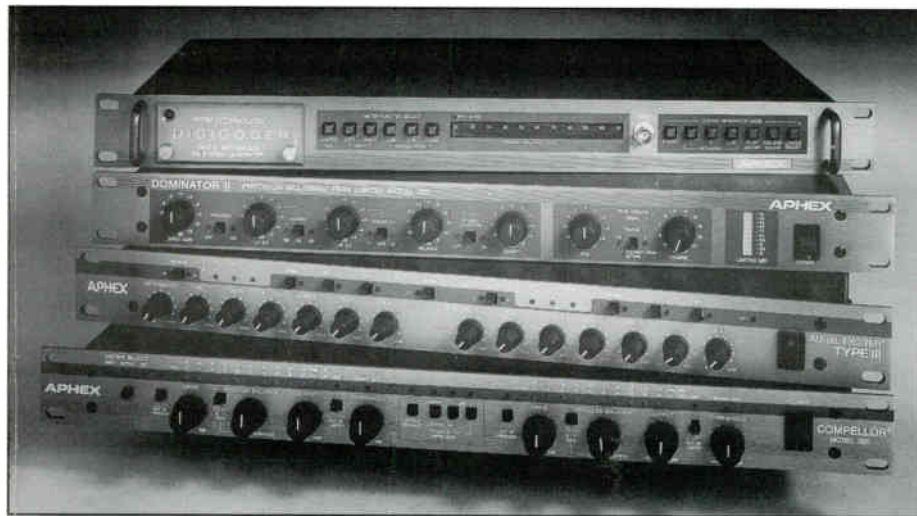
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BENELUX—Trans-European Music NV; CANADA—Gould Marketing;  
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GERMANY—AKG Acoustics; GREECE—Omikron S.A.;  
HONG KONG—Ace Co. Ltd.; INDONESIA—David Sutedja & Assoc.;  
ISRAEL—Sontronics; ITALY—Audio Equipment sri; JAPAN—Otaritec;  
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Systems, Ltd.; NORWAY—Audiotron S/A; SINGAPORE—Auvi Private Ltd.;  
SPAIN—Neotechnica S.A.E.; SOUTH AFRICA—Tru-Fi Electronics;  
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# Audio Products

## On-air Audio Mixers

Manufacturer	AMEK Systems & Controls	Arrakis Systems	ATI/Audio Technologies	Autogram		Broadcast Audio Corp.
Model	BC III	15,000 (12000)	Vanguard BC8 (12)	Pacemaker 1032	R/TV-20 <sup>1</sup>	Series VI
Modular system	Yes	Yes	Yes	No	No	Yes
Automation port	Option	No	Opt	...	Option	Yes
Digital control	No	No (...)	Yes	No	Option	No
Mono mix output	Yes	Yes	Yes	Yes	Yes	Yes
Solid-state bus switching	...	Yes	Yes	Yes	Yes	Yes
VCA gain control	Option	Yes	Yes	Yes	Yes	No
Pan pots	Yes	...	Yes	...	No	Option
Machine starts/stops	Yes	Yes	Option	Per mix position	Yes	Yes
Talkback circuitry	Yes	Yes	No	...	...	Yes
Speaker muting	Yes	...	Yes	Yes	Yes	Yes
Tone oscillator	Yes	...	No	No	No	Opt
Patch points	Yes	Yes	No	No	No	Yes
# of inputs (total)	12 (20/28)	8/18/28(56)	16-32	32	34	24 (72)
# of mixing buses	10 + 4	3 (6)	4	3	3	2 (4)
Fader type	Slider	P&G slider	Rot or slider	VCA sliders	Slider	Slider
Meter type	VU/PPM	VU/PPM	VU/PPM	VU	VU	VU/LED peak
Input connection $\Omega$	A/T 1.2k/20k	AB	A 20k	B/Unb 150-20k	150-20k $\Omega$	A/TB 150/20k
Input range	+26dBu	$\pm$ 20dB	-60/4dBu	-65/+10dBm	-65/+10dBm	-60/10dBv
Output connection $\Omega$	A/T >50	AB	A 400 $\Omega$	B/Unb 600 $\Omega$	B/Unb 600 $\Omega$	TB 150 $\Omega$
Output level max	26dBu	27dB	24dBm	+24dBm	+24dBm	28dBm
AF response $\pm$ dB Hz-kHz	-1 20-20k	$\pm$ 0.5 20-20k	$\pm$ 0.25 20-20k	$\pm$ 0.1 20-20k	$\pm$ 0.1 20-20k	$\pm$ 0.5 20-20k
THD % $\pm$ dB Hz	0.02	0.006 (0.01)	0.15	<0.05%	<0.05%	0.007
S/N Mic EIN/Line dB	-128/81	-126/85(75)	-124/95	>90dB	-118dBm	80dB
Crosstalk (worst case)	<-90	<-75dB 20kHz	-74dB 10k	...	...	-80dB 15k
Reader Service No	801	802	803	804	805	806

<sup>1</sup> Remote control for all channels.

Manufacturer	Broadcast Electronics		EELA Audio	Hallikainen	Harrison by GLW	
Model	250A (350) <sup>2</sup>	AirTrak 90	S-240 (-90/-50)	TVA series	AIR 790	AP-100
Modular system	No	Yes	Yes (Yes/No)	No	Yes	Yes
Automation port	No	Limited	Yes (Opt/No)	No	VSI editor port	...
Digital control	No	No	No	No	Yes	Yes
Mono mix output	Opt	Yes	Opt	Yes	Yes	Yes
Solid-state bus switching	No (Yes)	Yes	Yes	...	Yes	Yes
VCA gain control	No	Yes	Yes	No	Yes	DCA
Pan pots	No	No	Yes	No	Yes	No
Machine starts/stops	No	Yes	Yes	No	Yes	Yes
Talkback circuitry	Yes	Yes	Yes	No	Yes	...
Speaker muting	Yes	Yes	Yes	No	Yes	Yes
Tone oscillator	No	...	Opt	No	Yes	...
Patch points	No	No	Opt	No	Yes	Yes
# of inputs (total)	20 (22)	2x position	28 (17/4)	36 +x6	12-28	24 typical
# of mixing buses	2	2	20 (8/2)	2 mono	6	3
Fader type	Rotary (Slider)	Slider	P&G slider	Rotary	P&G slider	P&G slider
Meter type	VU	VU	VU/PPM/LED Peak	VU	VU & LED	VU
Input connection $\Omega$	AB	1.5k/10k $\Omega$	AB 1.5k/12k	Bal 150/15k	AB 1.2k	...
Input range	-65/20dBv	-60/8dB	-70/22dB	-58dB mic	-28, -52dB	...
Output connection $\Omega$	TB 600 $\Omega$	Bal <100 $\Omega$	TB <60 $\Omega$ (50 $\Omega$ )	Bal 600	AB, 40 $\Omega$ source	...
Output level max	18dBm	+29dB	20 (6/12)dB	+22dBm	+24dBm max	...
AF response $\pm$ dB Hz-kHz	-1 30-20k	-0.25 20-20k	-1 20-20k	$\pm$ 1 20-20k	...	...
THD % $\pm$ dB/Hz	0.5 (0.075)	<0.05%	<0.03	<0.25%	...	...
S/N Mic EIN/Line dB	-120/68	>90dB	85dB	74dB	...	...
Crosstalk (worst case)	...	>80db	<-70dB 20-20k	-82dB	...	...
Reader Service No	807	808	809	810	811	812

<sup>2</sup> Also 150 series with 5 and 8 mix positions.

Manufacturer	ITAME	Logitek	LPB Inc		MBI Broadcast Systems	Pacific Recorders & Eng.
Model	Sierra 13S	TR2 (Mariner) <sup>3</sup>	CITATION II	SIGNATURE III	Series 16	Radiomixer
Modular system	Yes	Yes	Yes	Yes	Yes	Yes
Automation port	Yes	No	No	No	Rmt Ctl	No
Mono mix output	Yes	Yes	Yes	Opt	Yes	Opt
Solid-state bus switching	Yes	No (Yes)	No	No	No	...
VCA gain control	Yes	No (Yes)	No	No	Opt	Yes

Manufacturer	ITAME	Logitek	LPB Inc		MBI Broadcast Systems	Pacific Recorders & Eng.
Model	Sierra 13S	TR2 (Mariner <sup>3</sup> )	CITATION II	SIGNATURE III	Series 16	Radiomixer
Pan pots	No	No	No	No	Yes	Yes
Machine starts/stops	No	Yes	Yes	Yes	Yes	Yes
Talkback circuitry	Yes	...	No	No	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	No	No	No	No	Yes	No
Patch points	No	...	No	No	Yes	Yes
# of inputs (total)	16	36	30, 3ch	18-36	22-46	12/20/28
# of mixing buses	8	2 (2ST+1)	2	2	6	3
Fader type	Slider	Slider	Slider	Rotary	Slider	Slider
Meter type	VU/PPM	VU	VU	VU	VU/PPM	Sifam R32 VU
Input connection $\Omega$	TB	AB 10k $\Omega$	TB 150/600 $\Omega$	TB 150/600 $\Omega$	Bal	AB >30k $\Omega$
Input range	-30/20dB	-60/23dBu	-65, -10dBm	-65, +10dBm	...	-70/+9Bu
Output connection $\Omega$	TB	AB 60 $\Omega$	TB 600 $\Omega$	TB 600 $\Omega$	Bal 600 $\Omega$	AB 80 $\Omega$ source
Output level max	15dB	+23dBu	+22dBm	22dBm	+26dBu	+26dBm
AF response $\pm$ dB Hz-kHz	0.1 30-20k	$\pm$ 0.25 20-20k	1.0dB 20-20k	10 20-20k	$\pm$ 0.25 40-20k	-0.7 20-20k
THD % $\pm$ dB/Hz	0.1	0.006%	0.04% 22dBm	0.05	<0.1%	<0.01
S/N Mic EIN/Line dB	75dB	90dB	>75dB	75dB	>80dB	-128/88
Crosstalk (worst case)	80dB 400Hz	...	Below noise	-61dB 1kHz	<-75dB	-80dB 1kHz
Reader Service No	813	814	815	816	817	818

<sup>3</sup> Unit designed with waterproof packaging.

Manufacturer	Pacific Recorders & Eng.	PKE International		Radio Systems	Sonosax	Sony
Model	Stereo mixer	CSC-1	MC-200	RS-6 (12/18)	SX-V	MXP-2900
Modular system	Yes	Yes	Yes	No	Yes	Yes
Automation port	No	...	No	No	Opt	Opt
Digital control	No	No	No	Yes	Opt	No
Mono mix output	No	Yes	...	Yes	Yes	...
Solid-state bus switching	Yes	Yes	Yes	Yes	No	Yes
VCA gain control	No	Yes	...	Yes	Option	...
Pan pots	Yes	Yes	No	No	Yes	Yes
Machine starts/stops	Yes	Yes	Yes	Yes	Option	Yes
Talkback circuitry	Yes	Yes	Yes	Yes	Option	Yes
Speaker muting	Yes	Yes	Yes	Yes	No	Yes
Tone oscillator	Yes	Yes	No	No	Yes	Yes
Patch points	Yes	No	...	Yes	Yes	Yes
# of inputs (total)	16	Custom	8, 12, 16	12-36	10	2x positions
# of mixing buses	1	2ST/2Mix-minus	Main, Aux	3	3	3
Fader type	Rotary	Slider	Slider	Slider	Slider	Slider
Meter type	VU	LED	LED VU	VU; LED Peak	VU; LED peak	LED
Input connection $\Omega$	AB (40k)	Bal 150/10k $\Omega$	...	A 10k	AB 10k $\Omega$	TB 1.2k/10k $\Omega$
Input range	-10/8dBv	Mic/line	-60dBm mic	-60/10dBm	-85/6dBu	-62/24dBs
Output connection $\Omega$	AB 80 $\Omega$	Bal 600 $\Omega$	...	AB 100 $\Omega$	AB 50 $\Omega$	TB <100 $\Omega$
Output level max	24dBm	...	+16dBm	22dBm	24dBu	+24dB
AF response $\pm$ dB Hz-kHz	-0.7 20-20k	20-20k	0.5 40-20k	$\pm$ 0.25 20-20k	$\pm$ 0.5 30-20k	-1.5 20-20k
THD % $\pm$ dB/Hz	<0.01	...	0.15%	0.02	0.01	0.1%
S/N Mic EIN/Line dB	-126/88	...	75dB	-124/88	-129.2dBm	-122/85
Crosstalk (worst case)	-70dB 1kHz	...	...	<-75dB 20kHz	80dB 20k	69dB 16kHz
Reader Service No	819	820	821	822	823	824

Manufacturer	Soundcraft	Studer	Wheatstone Corporation		
Model	SAC 200	Studer 970	A-32 A-30	A-500	SP-40 series <sup>4</sup>
Modular system	Yes	Yes	Yes	Yes	Yes
Automation port	Yes	...	No	No	No
Mono mix output	Yes	Yes	Yes	Yes	Yes
Solid-state bus switching	No	Yes	No	No	No
VCA gain control	Yes	...	No	Option	No
Pan pots	Yes	Yes	No	Yes	Yes
Machine starts/stops	Yes	Yes	Yes	Yes	Yes
Talkback circuitry	Yes	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes
Tone oscillator	Yes	Yes	No	Yes	Opt
Patch points	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	32-48	18/exp x9's	2/position	3/position	2/position
# of mixing buses	3	Pgm, Aux	2	3	2+mono
Fader type	Slider	Slider	Slider	Slider	Slider
Meter type	VU/PPM	VU/Peak LED	VU	SIFAM VU	VU
Input connection $\Omega$	A 1k/10k	A/T >1.6k/10k	...	A/BR; Xfmr	AB 150/50k $\Omega$
Input range	-80/30dBu	-60/21dBu	28dBu max	Mic/line	+26dBu max

Manufacturer	Furman Sound	MBI Systems	Seem Audio A/S	Shure Brothers	Sonosax	
Model	MM-4AB (MM-8AB)	Series 12	SEEPOR <sup>1</sup>	FP410 IntelliMix	SX-PR series	SX-S6 (8/10)
Modular system	Yes	No	Yes	No	Yes	Yes
Mono mix output	Yes	Yes	Yes	Mono only	No	Yes
VCA gain control	No	Yes	No	Yes	No	No
Pan pots	Yes	No	Yes	No	Yes	Yes
Machine starts.stops	No	Yes	Option	No	No	Opt
Tone oscillator	No	No	Yes	1kHz	Yes	Yes
# of inputs (total)	4M/1S (11)	12	8	4	2 to 6	6/8/10
# of mixing buses	3	3	1 ST + 4	1	2	3
Fader type	Rotary	Opt pack	Slider	Rotary	Rotary	Slider
Meter type	(LED)	VU/PPM	LED	LED VU/Pk	VU/LED peak	VU/LED peak
EQ types	...	None	2-band	No	...	Swept
Input connection $\Omega$	A (600 $\Omega$ )	T/AB 1k/10k $\Omega$	AB 8k $\Omega$	TB 900/66k $\Omega$	A >10k	A 10k
Input range	-75/18dBV (-60.18)	Mic/line	Mic, line	Mic/line	-98/6dBu	-85/6dBu
Output connection $\Omega$	A (200 $\Omega$ )	TB 75 $\Omega$	<40 $\Omega$ source	TB 100 $\Omega$ line	A <50 $\Omega$	A/T <50 $\Omega$
Output level max	23dBV (21)	22dBu	+20dBu	+19dBm	21dBu	24dBu
AF response $\pm$ dB Hz-kHz	-3/0 20-20k	0/-1 20-20k	-0.7dB 30-20k	-5/2 25-20k	$\pm$ 0.5 30-20k	$\pm$ 0.5 30-20k
THD	0.02%	0.5%	<0.1%	<0.5%	0.01%	0.01%
S/N Mic EIN/line dB	-126/-118dBV	>78dB	-125dBu	-128.5dB EIN	-129.6	-129.2
Crosstalk (worst case)	-40dB 20kHz	<-62dB	>90dB	...	80dB	-80dB 20kHz
Weight (portable) lb	6 lbs	...	...	5 lbs	4.88 lbs	14.8lbs
Power source (portable)	115/230Vac	110-240Vac	AC or DC	Vac/18Vdc	3Vdc	9-15Vdc
Reader Service No	843	844	845	846	847	848

<sup>4</sup> Optional remote control.

Manufacturer	Sony	Soundcraft	SQN Electronics	Studer		
Model	MX-P61VU/PK	MXP-210 (290)	Spirit	SQN-4S Ser II <sup>5</sup>	961/962	C279 Compact
Modular system	Yes	No	Yes	No	Yes	No
Mono mix output	...	L or R	Yes	Yes	Yes	No
VCA gain control	No	(-290)	No	No	...	Yes
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts.stops	No	No	...	No	Yes	Opt
Tone oscillator	Yes	Yes	Yes	Yes	Yes	Option

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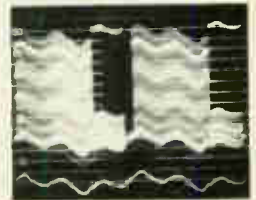
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Circle (42) on Reply Card

Manufacturer	Sony		Soundcraft	SQN Electronics	Studer	
Model	MX-P61VU/PK	MXP-210 (290)	Spirit	SQN-4S Ser II <sup>5</sup>	961/962	C279 Compact
# of inputs (total)	17	9	16-48	4	18	12
# of mixing buses	3	L/R	3	Stereo pair	6	4
Fader type	Slider	Slider	Slider	Rotary	Slider	Slider
Meter type	VU PPM	LED	LED	TB meter	VU or PPM	LED w/peak
EQ types	3-band	3-band	3-band	...	Yes	Swept
Input connection $\Omega$	Bal/Unbal	Bal 6k/47k $\Omega$	>2k/10k $\Omega$	XLR-3	1.6k/10k	1.2k/47k
Input range	Mic/line	-60 24dBs	...	-20, 0dB	-69/21dBu	-66/10dBv
Output connection $\Omega$	Bal/Unbal	Bal 600 $\Omega$ /10k $\Omega$	75 $\Omega$	Bal/Unbal	<40 $\Omega$	<50 $\Omega$ / $<$ 1k $\Omega$
Output level max	...	15dBs	+21dBu	18dBm 600 $\Omega$	24dBm	24dBv
AF response $\pm$ dB Hz-kHz	$\pm$ 0.5 30-20k	-1.5/ 5 20-20k	22-22kHz	-1, 0 30-20k	-1/0.5 4.5-45k	$\pm$ 1 20-20k
THD	...	<0.3%	<0.006%	...	<0.03%	<0.03%
S/N Mic EIN/line dB	...	-126@80dB	-129dBu EIN	3dB A wtd	< 125/>95	-125/>86
Crosstalk (worst case)	...	<-70dB	>85dB	<80dB 1kHz	<-90dB	...
Weight (portable) lb	...	16.5 lb	...	2.2kg	55-75 lbs	24.2 lbs
Power source (portable)	110/220Vac	24W ac	110Vac	8 AA cells	110/220Vac	100-240Vac
Reader Service No	849	850	851	852	853	854

<sup>5</sup> SQN-3M mono; M-S stereo matrix.

Manufacturer	Studer	TASCAM			Vortex Communications
Model	Studer A779	M-106	M06 ST	M208 (M216/M224)	PFM-312
Modular system	No	No	No	No	No
Mono mix output	...	No	No	No	Mono only
Telephone hybrid	No	No	No	No	No
VCA gain control	Yes	No	No	No	...
Pan pots	Yes	Yes	Yes	Yes	No
Machine starts.stops	Yes	No	No	No	No
Talkback circuitry	Yes	...	No	No	No
Speaker muting	...	...	No	No	No
Tone oscillator	No	No	No	No	1kHz
# of inputs (total)	6	6	6	8 (16/24)	3
# of mixing buses	2	4	No	4	1 mono
Fader type	Slider	Slider	Slider	Slider	Rotary
Solo type	AFL/PFL	...	No	PF	...
Meter type	LED peak	VU	VU	VU/Peak LED	LED bargraph
EQ types	Swept	Swept	Swept	Swept	None
Input connection $\Omega$	A/T >47k	UB 100k	UB 100k	A 2.8k/22k	1k/6k
Input range	-66/10dBv	-70/4dBV	-70/4dBV	-70/24dBV	-14/+22dBm
Output connection $\Omega$	A/T <50 $\Omega$	UB 100 $\Omega$	UBb 220 $\Omega$	100 $\Omega$	50
Output level max	24dBv	18dBV	0dBu	20dBV	+16 to 600 $\Omega$
AF response $\pm$ dB Hz-kHz	$\pm$ 1 20-20k	-2/1dB 20-20k	-2,1 20-20k	-2,1 20-25k	$\pm$ 1 20-20k
THD	0.03%	0.01%	0.025%	0.025%	<0.02%
S/N Mic EIN/line dB	-65/86	70dB	51dB (78dB)	83dB	...
Crosstalk (worst case)	...	<-60dB	<-60dB	<-60dB	...
Weight (portable) lb	24.2 lbs	15.4 lbs	5.73 lbs	18.75 lbs	2 lbs
Power source (portable)	110/220Vac	110/220Vac	110/220Vac	110/220Vac	2x9Vdc
Reader Service No	855	856	857	858	859

## Studio/Production Audio Mixers

Manufacturer	AMS/Siemens		Broadcast Audio	Broadcast Electronics	For-A	Fostex	Graham-Patten Systems	
Model	Logic 1	Logic 2	Series IV <sup>1</sup>	Mix Trak-90	AFV-500	1240 (2440)	Model 812	D/ESAM 800
Modular system	Yes	Yes	Yes	Yes	Yes	No	Yes	[Digital edit
Cue amp	...	...	Yes	Yes	Yes	No	Yes	[suite mixer
Automation port	...	Yes	Yes	Yes	Yes	No	Option	To editor
Digital control	Yes	Yes	No	Yes	Yes	No	No	Yes
Digital processing	Yes	Yes	No	No	No	No	No	Yes
Mono mix output	Yes	Yes	Yes	Opt	Yes	No	...	...
Solid-state bus switching	[Integrates	Yes	Yes	No	...	No	No	Yes
VCA gain control	[with	Yes	No	Yes	...	No	No	Yes
Compressor.limiter	[AudioFile	Yes	No	No	No	No	No	No
Pan pots	[PLUS	Yes	Opt	Yes	Yes	Yes	Yes	No
Machine starts.stops	[digital	Yes	Yes	Opt	...	No	...	...
Talkback circuitry	[recorder	...	Yes	Opt	...	No	No	No
Speaker muting	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Tone oscillator	...	...	Opt	No	Yes	No	...	Yes
Patch points	Yes	Yes	Yes	Yes	Opt	No	Yes	Yes
# of inputs (total)	28+16	112	18-48	24-48	8	24 (48)	12	to 16

Manufacturer	AMS/Siemens		Broadcast Audio	Broadcast Electronics	For-A	Fostex		Graham-Patten Systems
	Logic 1	Logic 2	Series IV <sup>1</sup>	Mix Trak-90	AFV-500	1240 (2440)	Model 812	D/ESAM 800
Model	Logic 1	Logic 2	Series IV <sup>1</sup>	Mix Trak-90	AFV-500	1240 (2440)	Model 812	D/ESAM 800
# of mixing positions	14 or 28	28	6-16	12-24	8	12 (48)	20	12
# of direct outputs	16 to AudioFile	Multiple	3-7	3	2	12-24	12	...
# of mixing buses	Multiple	Multiple	2-4	6	2	4	3	4 channels
# of groups.subgroups	2	Various	User defined	...	...	4	8	...
# of sends.returns	Multiple	Multiple	2R/Defined sends	...	...	4	3 returns	...
Fader type	Slider	Slider	Slider	Slider	...	Slider	Slider	Slider
Solo type	PFL	PFL	PF	...	...	IP	In-place	...
Meter type	Bargraph	Bargraph	VU, peak LEDs	VU, PPM, LED pk	VU	LED peak	PPM	Bargraph
EQ types	4-band	4-band	Swept	Parametric	...	Parametric	3-band	Digital parametric
Filters	Adjustable	Adjustable	...	HP, LP	...	...	...	No
Input connection $\Omega$	[Analog or	[Specifications	AB/TB 150/20kW	AB >10k $\Omega$	A 600 $\Omega$	A 7k $\Omega$	B 600/20k Unb 20k	...
Input range	[digital	[per AES/EBU	-60, 10dBm	-65, 13dBu	-12, 24dB	-70, 15dBV	-70/+15dBV	...
Output connection $\Omega$	[inputs and	[I/O analog or	TB 150 $\Omega$	A <100 $\Omega$	...	...	for 10k $\Omega$ load	...
Output level max	[outputs	[digital with	28dBm	26dBu	0, 24dB	15dBV	_15dBV	...
AF response $\pm$ dB Hz-kHz	[with A/D	[20-bit cards	$\pm$ 0.5 20-20k	-0.25 20-20k	...	$\pm$ 1 20-20k	-2/1 20-20k	...
THD	[D/A converters	[Direct link	0.007% +28dBm	0.05% 0dBu 20-20k	0.15% +20dB 15kHz	0.05% 1Hz	0.05%	...
S/N Mic EIN/line dB	[meets AES/EBU	[to AudioFile	80dB	-128dBm/90dB	>90dB	52dB (48dB)	-125dBV EIN	...
Crosstalk (worst case)	[specifications	...	-80dB 1.5kHz +8dBm	<-80dB 20-20k 0dB	$\hat{a}$ -20dB 30Hz	-65dB 1kHz	65dB 1kHz	...
Reader Service No	861	862	863	864	865	866	867	868

<sup>1</sup> Usable in on-air applications.

Manufacturer	Graham-Patten Systems	Grass Valley Group	Harrison by GLW		MBI Broadcast Systems	Neve/Siemens		Neve Orion
	ESAM series <sup>2</sup>	AMX-170S <sup>3</sup>	PRO 790	TV-3 (TV-4)	Series 20	44 series	66 series	2000 series
Model	ESAM series <sup>2</sup>	AMX-170S <sup>3</sup>	PRO 790	TV-3 (TV-4)	Series 20	44 series	66 series	2000 series
Modular system	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Cue amp	No	No	...	Yes	Yes	...	Yes	...
Automation port	To editor	Yes	VSI editor port	Yes	Rmt Ctl	Options	Yes	ReMeM
Digital control	Yes	Yes	Yes	Yes	No	...	Yes	Yes
Digital processing	...	No	...	No	No	No	No	No

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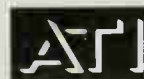
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Circle (38) on Reply Card

Manufacturer	Graham-Patten Systems	Grass Valley Group	Harrison by GLW		MBI Broadcast Systems	Neve/Siemens		Neve Orion
Model	ESAM series <sup>2</sup>	AMX-170S <sup>3</sup>	PRO 790	TV-3 (TV-4)	Series 20	44 series	66 series	2000 series
Mono mix output	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Solid-state bus switching	Yes	Yes	Yes	Yes	No	...	Yes	Yes
VCA gain control	...	Yes	Yes	Yes	DBX VCA	...	Yes	Yes
Compressor.limiter	No	No	...	...	Voice-over	Yes	Option	No
Pan pots	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts.stops	...	No	Yes	Yes	Yes	Yes	Yes	Yes
Talkback circuitry	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Speaker muting	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	No	Yes	Yes	Yes	Yes	Yes	...	5-tone
Patch points	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	12-16	8, 16	12-28	36-60 (16-60)	8/16/24/32/40	—	24, 36, 48	48
# of mixing positions	12-16	1	20-36	36-60	8/16/24/32/40	20+4+2	24, 36, 48	16
# of direct outputs	12-46	...	to 8-track	24, 48	Opt per input	Yes	per input	Yes
# of mixing buses	2	4	6	2 ST 4 Mono	3	2+	Main, Aux	4 (or 2+2)
# of groups.subgroups	...	2	4 groups	8 groups	...	4 option	4-8	8/2
# of sends.returns	...	4	2	4	...	...	Multiple	Var. config.
Fader type	Slider	Slider	P&G slider	P&G slider	Slider	Slider	Flying Fader	Slider
Solo type	...	...	PFL, In-place	AFL/PFL/APFL	...	...	Yes	Yes
Meter type	VU analog	VU, PPM, LED pk	VU & LED	VU & 40-seg LED	VU/PPM bargraph	LED bargraph	Var. opts.	LED peak VU
EQ types	Programmable	Fixed freq	3-band	3-band	3-band	3-band	4-band	7-band
Filters	No	LP, HP	LP, HP	HP, LP	LP/HP	HPFx3	...	HP, LP
Input connection Ω	Opt TB >20kΩ	A Hi-Z	AB 1.2k	AB	Bal 1k/20kΩ	Bal	1k/10kΩ	Bal
Input range	...	-40, 8dBu	-28, -52dB	+4dB	...	...	-70/+20dB	...
Output connection Ω	3.2 20kΩ	A 60Ω	AB, 40Ω source	AB	Bal 50Ω	Bal	600Ω TB <30Ω	Bal
Output level max	+8dBu max nom.	20dBm	+24dBm max	+4 dB nom	+22dBu	...	25.5dBu max	...
AF response ±dB Hz-kHz	±0.5 20-20k	-0.3 20-20k	...	...	±0.25 40-20k	...	±0.5dB 20-20k	...
THD	<0.1% 16dBu	0.03% 4dB 20-20k	...	...	<0.1%	...	<0.2%	...
S/N Mic EIN/line dB	dB	89dB	...	...	-128/-80dB	...	-125dB EIN	...
Crosstalk (worst case)	<-82dB 15kHz	-75dB/20kHz/4dB	...	...	<-75dB	...	...	...
Reader Service No	869	870	871	872	873	874	875	876

<sup>2</sup> Editing suite mixer system. <sup>3</sup> Also on-air; 2000E for post production.

Manufacturer	Pacific Recorders & Engineering		Philip Drake	Solid State Logic		Sonosax	Sony
Model	Production mixer	STX	PD2000 series	SL 5000M ser <sup>4</sup>	SL 6000G ser <sup>4</sup>	SX-T <sup>4</sup>	MXP-2000
Modular system	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cue amp	Yes	Yes	...	Yes	Yes	Yes	Yes
Automation port	No	No	Yes	Yes	Yes	Opt	via editor
Digital control	No	No	Yes	Yes	Yes	Opt	Yes
Digital processing	No	No	...	No	No	No	No
Mono mix output	Yes	Opt	Yes	Yes	Yes	Opt	Yes
Solid-state bus switching	...	Yes	Yes	Yes	No	Yes	No
VCA gain control	Yes	No	Yes	Yes	Yes	Opt	Yes
Compressor.limiter	No	Option	...	Yes	Yes	Opt	Yes
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts.stops	Yes	Yes	...	Opt	Opt	Yes	Yes
Talkback circuitry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	No	Yes	Yes	Yes	Yes	Yes	Yes
Patch points	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	28	156-252	48+8aux	to 96	24 to 96	10-32	16-36
# of mixing positions	28	26-42	48	1 to 3	One	...	16-36
# of direct outputs	8	...	per input	1 per channel	Option	8-16	16-36
# of mixing buses	3	15	12+	32	6	8-16	4+2
# of groups.subgroups	...	...	12	Variable	1-32/1-32	8	4+2-G, 4R
# of sends.returns	2/2	12/1	8 send	8 S# of channels	6 S# R	2	4S, 4R
Fader type	Slider	Slider	Slider	Slider	Slider	...	Slider
Solo type	Cue	...	AFL, PFL	PF, AF, IP	PF, AF, IP	PF, AF, IP	PF, AF
Meter type	Sifam R32 VU	VU, PPM	VU	VU/PPM, LCD	VU PPM, Plasma	VU	LED peak
EQ types	3-band	...	4-band	Parametric	Parametric	Swept	Swept
Filters	...	HP/LP	HP, LP	HP, LP	HP, LP options	HP	HP
Input connection Ω	AB >30kΩ	AB 40kΩ	...	T. AB 10kW	TB/AB 1k/10kW	...	A/TB 10kΩ
Input range	-70/+9Bu	-15/10dBv	...	-80, +16dBu	-80, +24dBu	-85, +6dBu	+27dBm max
Output connection Ω	AB 80Ω source	AB 30Ω	...	AB 30Ω	AB 75Ω	AB/TB	A/TB 50Ω
Output level max	+26dBm	28dBm	...	+28dBu	+29dBu	+24dBu	+25dBm
AF response ±dB Hz-kHz	-0.7 20-20k	-0.9 20-20k	...	±0.5dB 20-20k	±0.5dB 20-20k	±0.5 20-20k	±0.5dB 30-20k
THD	<0.01	<0.1	...	0.08% 24dBu 1kHz	0.02% +8dBu 1kHz	0.01% 6dBu 20-20k	0.05% 20dB 1kHz
S/N Mic EIN/line dB	-128/88	-127/88	...	-125 dBm	-127.5dBm	-129.2dBm	-126dBm EIN
Crosstalk (worst case)	-80dB 1kHz	-80dB 1kHz	...	-80dB/15kHz/+4dB	-70dB.1kHz/+4dB	-80dB/20k/0dB	60dB 15kHz
Reader Service No	877	878	879	881	882	883	884

<sup>4</sup> May be configured for on-air operation.

Manufacturer	Sony	Delta 200	Soundcraft Delta AVE	Sapphire	ERIC series	Soundtracs Pic IL4832 (3632)	Quartz series	Studer 900 series <sup>6</sup>
Model	VSP-8000	Delta 200	Delta AVE	Sapphire	ERIC series	IL4832 (3632)	Quartz series	900 series <sup>6</sup>
Modular system	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automation port	from editor	...	to editor	Yes	No <sup>5</sup>	No	Auto muting	Yes
Digital control	48, 44.1 or	No	No	No	Yes	No	Yes	Yes
Digital processing	44.056kHz	No	No	No	No	No	No	No
Solid-state bus switching	32-bit sampling	No	No	No	Yes	No	Yes	Yes
VCA gain control	...	Yes	Yes	Yes	No	No	No	Yes
Compressor limiter	Yes	Yes	Yes	Yes	No	No	No	Yes
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts/stops	...	Yes	Yes	Yes	Yes	No	Yes	Yes
Talkback circuitry	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speaker muting	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Patch points	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	16 or 32 dig	8-96	8-96	64	32-48	48 (36)	32-48	28
# of mixing positions	16 or 32	8/16/24/32	8/16/24	32	...	...	...	41
# of direct outputs	...	per mix pos.	per mix pos.	2-32 track	32-48	48 (36)	32-48	24
# of mixing buses	4 out dig	1 pr + 6	1 pr + 6	1 pr	8-24	32	8-24	24
# of groups/subgroups	...	4 subgroups	4 subgroups	8 groups	8-24	32 In line	8-24	8
# of sends/returns	...	2	4	6	8	8 S	8	Various config.
Fader type	Slider	Slider	Slider	Slider	Slider	Slider	Slider	Slider
Solo type	...	PFL	PFL	...	PF, AF, IP	PF, AF, IP	PF, AF, IP	PF, AF
Meter type	201-seg plasma	LED bar	LED bar	Bargraph VU	LED peak	LED Peak	LED peak	VU
EQ types	4-band	4-band	4-band	4-band	Parametric	Parametric	4-band	Parametric
Filters	HP/LP	HP/LP	HP/LP	HP/LP	Swept HP	HP	Swept HP	HF roll-off
Input connection $\Omega$	XLR-3-31	A 2k/10k	A 2k/10k	A 2k/15k	AB 710k $\Omega$	AB	AB 2k $\Omega$ /10k $\Omega$	T/A $\delta$ 1.6k/ $\delta$ 10kW
Input range	Per AES/EBU	-80 30dBu	-80/30dBu	-80/30dBu	-60, +10dB	-60, +10dB	-60, +10dB	-70, +20dBu
Output connection $\Omega$	XLR-3-32	AB 75 $\Omega$	AB 75 $\Omega$	AB 600 $\Omega$	AB <75 $\Omega$	AB	AB ...	TB <50 $\Omega$
Output level max	...	27dBu	27dBu	27dBu	+24dBV	+26dBV	+26dBu	+24dBm
AF response $\pm$ dB Hz-kHz	-1, +0.5 20-20k	-0.5 20-20k	-0.5 20-20k	-0.9 20-20k	-2, 0dB 20-20k	-2, 0dB 20-20k	...	-1, +0.5 30-20k
THD	...	0.003%	0.003%	0.005	0.008% 0dB 1kHz	0.008% 0dB 1kHz	<0.02% 0dB	<0.1%
S/N Mic EIN/line dB	...	-127.5/93dB	-127.5/93dB	-127.5dBm	-127.5dBm	-127dBm	-127.5dBm/81dB	-125dBm/>100dB
Crosstalk (worst case)	...	80dB max gain	80dB max gain	85dB 10kHz	-82dB 1kHz/0dB	-82dB/1kHz/0dB	<-85dB	<-85dB
Reader Service No	885	886	887	888	889	890	891	892

<sup>5</sup> ERIC III moving faders. <sup>6</sup> Also custom configurations.

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Circle (47) on Reply Card

Manufacturer	Studer		TASCAM		Trident Audio	Wheatstone Corporation	
Model	990 series	Model 963	M-3500	M600 (M700)	Vector 432	SP-5	SP-6
Modular system	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cue amp	Yes	Yes	Yes	No	Opt	No	No
Automation port	Option	No	...	Yes	Yes	No	No
Digital control	Yes	No	No	No	No	No	No
Mono mix output	Yes	Yes	Yes	No	Opt	Opt	Opt
Solid-state bus switching	Yes	...	No	No	Yes	No	No
VCA gain control	Yes	...	...	No	Opt	No	No
Compressor.limiter	...	Yes	No	No	Yes	No	No
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts.stops	Yes	Yes	No	No	Yes	No	No
Talkback circuitry	...	Yes	Yes	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	No	Yes	Opt	Opt
Tone oscillator	...	Yes	Yes	Yes	Yes	Yes	Yes
Patch points	Yes	Yes	...	Yes	Yes	Yes	Yes
# of inputs (total)	80	24-60	24, 32	162 (40)	40-4	2/input	2/input
# of mixing positions	per config	24-60	24, 32	32	1-4	16-32	16-32
# of direct outputs	1/channel	56	...	32	40-64	Per mix position	Per mix position
# of mixing buses	4+8+4	2 mstr, 4 aux	Program	16	4-8	1 stereo/1 mono	1 stereo/1 mono
# of groups.subgroups	8	4 or 8	8 groups	16 (32)	32 G/32 S	8M/4S	8M/4S
# of sends.returns	2/channel	Various config.	6 send/4 ret	4/6 (8/8)	8 S/8 R	4/4	4/4
Fader type	Slider	Slider	Slider	Slider	Slider	Slider	Slider
Solo type	PFL	AF	IP/PFL	PF, AF, IP	PF AF IP	PF	PF
Meter type	...	VU, bar graph	Bargraph	VU, LED peak	VU, PPM, Pk LEDs	VU	VU
EQ types	4-band	3-band	4-band	Swept	Parametric, swept	3-band	3-band
Filters	LF, HF	HP	HP	...(HP, LP)	HP, LP	HP	HP
Input connection $\Omega$	T/A $\delta 1.6k/\delta 10kW$	TB $>5k\Omega$	Bal 2.2k/16k $\Omega$	AB 2k/100kW	AB/TB $>10kW$	AB 10k-20k $\Omega$	AB 10k-20k $\Omega$
Input range	-70,+20dBu	-70,+21dBu	-67,+4dBm	-68,+8dBm	-20,+70dB dBu	Mic, line	Mic, line
Output connection $\Omega$	TB $\delta 50\Omega$	TB $<50\Omega$	Bal 75 $\Omega$	AB 100 $\Omega$	AB/TB 600 $\Omega$	AB 600 $\Omega$	AB 600 $\Omega$
Output level max	+24dBm	+24dBm	+25dBm	+28dBm	+28dBm	+28dBu	+28dBu
AF response $\pm$ dB Hz-kHz	-1,+0.5 30-20k	-1,-0.5 4.5-40k	-1.5,+0.5 20-20k	$\pm$ 1dB 20-20k	$\pm$ 0.5dB 10-50k	-0.2 20-20k	-0.5 10-30k
THD	$\hat{a}$ 0.1%	0.03%	$<$ 0.018%	0.015% 1kHz	0.03%	0.004	0.005
S/N Mic EIN/line dB	-125dBm/ $>$ 100dB	$\hat{a}$ -125dBu/ $\hat{a}$ 95dB	-130dBm/85dB	88dB unwt'd	-128dBm/+70dB	-129dBm/-90dBu	-129dBm/90dB
Crosstalk (worst case)	$<$ -85dB	$>$ 90dB	$<$ 59dB	$<$ -60dB 1kHz	$<$ -80dB 0dB	-75dB 1kHz	-100dB
Reader Service No	893	894	895	896	897	898	899

## CD Players

Manufacturer	Barco EMT		Denon America			Harris Allied Broadcast	Panasonic Pro Audio
Model	EMT 980	EMT 981	DN-7700R	DN-950FA <sup>2</sup>	DN-970FA <sup>2</sup>	Audiometrics CD10 <sup>2</sup>	SL-4300
Configuration	Single player	Single	Record/Play <sup>1</sup>	Single player	Single player	Single player	Single
Player trays	...	...	1	1	1	1	1
Programmable events #	None	4-event	None	None	None	Pending EOM	20-event
Output connection $\Omega$	Balanced	Balanced	for 600 $\Omega$ load	Balanced	for 600 $\Omega$ load	AB 40 $\Omega$ source	Unb
Output level	+6dB	+6dB	-4/+22dB	+4dB	-5/+18dB	+24dBm	-10dBu
Digital output kHz	No	Yes 44.1kHz	AES/EBU on XLR	No	AES/EBU on XLR	...	No
Digital resolution	16-bit	16-bit	16-bit	16-bit	16-bit	...	16-bit
Oversampling (factor)	x2	x4	x8	x4	x8	...	x4
AF response $\pm$ dB, Hz-kHz	$\pm$ 0.5 20-19.8k	$\pm$ 0.2dB 40-20k	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	$\pm$ 1 20-20k	$\pm$ 0.5 2Hz-20kHz
Distortion	0.03%	0.04%	$<$ 0.008%	$<$ 0.01%	$<$ 0.008%	$<$ 1%	0.003%
Dynamic range	90dB	98dB	$>$ 90dB	92dB A wtd	$>$ 90dB	...	94dB
Crosstalk (worst case)	-60dB	$<$ -75dB	$>$ 90dB	...	$>$ 90dB	...	...
S/N	+94dB RMS	+105dB RMS	$>$ 92dB	92dB	$>$ 92dB	...	96dB
Access time (worst)	4s	3.5s	...	3s	...	$<$ 200ms	...
Reader Service No	901	902	903	904	905	906	907

<sup>1</sup> 63 min per disc; analog and digital inputs and outputs; discs per Orange Book. <sup>2</sup> Emulates tape cartridge machine.

Manufacturer	Panasonic Pro Audio	Sony	Studer			TASCAM	
Model	SL-4700	CDP-2700 <sup>3</sup>	D740 CD/CDR <sup>3</sup>	A727	A730	CD 401/501	CD 701
Configuration	6-disc cap.	Single player	Record/Play	Single	Single	Single player	Single player
Player trays	1	3" or 5"	1	1	1	8 or 12mm	8 or 12mm
Programmable events #	36 event	24 event	...	No <sup>4</sup>	3-event <sup>4</sup>	via Rmt Ctl	RC-701 unit
Output connection $\Omega$	Unbal	XLR or Phone	Bal/UB 600 $\Omega$ load	Bal/UB $<$ 50 $\Omega$	Bal/UB $<$ 50 $\Omega$	Bal XLR	Bal XLR
Output level	-10dB	+15dBs max	24dBm max	+15dBm	15dBm	+4dBm	+18dBm max
Digital output, kHz	No	AES/EBU XLR/Phono	Yes	Yes	Yes	Yes	Yes



Manufacturer	Panasonic	Sony		Studer		TASCAM	
Model	SL-4700	CDP-2700 <sup>3</sup>	D740 CD/CDR <sup>3</sup>	A727	A730	CD 401/501	CD 701
Digital resolution	16-bit	18-bit	16-bit	16-bit	16-bit	16-bits	16-bit
Oversampling (factor)	x4	8x	x4	x4	x4	18-bit x4	16-bit 4x
AF response $\pm$ dB, Hz-kHz	$\pm$ 0.5 2Hz-20kHz	$\pm$ 0.5 20-20k	$\pm$ 0.2 20-20k	$\pm$ 0.1 20-20k	$\pm$ 0.1 20-20k	$\pm$ 3 5-20k	-1 20-20k
Distortion	0.003%	<0.04%	<0.008%	0.006%	<0.006%	0.008%	0.008%
Dynamic range	94dB	...	...	>100dB	>100dB	96dB	...
Crosstalk (worst case)	...	100dB	>90dB	<-90dB	<-90dB	92dB	90dB
SN	96dB	>110dB	...	>100dB	>100dB	96dB	96dB
Access time (worst)	...	...	...	<3s	<3s	<2sec	2s
Reader Service No	908	909	910	911	912	913	914

<sup>3</sup>  $\pm$ 12.7% variation in speed; features interface for start/stop control from audio mixer fader. <sup>4</sup> Analog line and XLR, Cinch or optical digital inputs and outputs. <sup>5</sup> A729 CDS series controller may be used with 4 A727 or A730 units for multiple event program.

## Shotgun Microphones

Manufacturer	AKG Acoustics			AMS Industries	Audio-Technica		
Model	C 460B/ULS/61	C 568 EB	CK 62 DF-ULS	SoundField	AT4071	AT4073	AT815a
AF response Hz-kHz	20-20k	20-20k	20-20k	...	30-20k	30-20k	40-20k
Polar pattern(s)	Cardioid	HC/directional	Omni	Variable <sup>1</sup>	Lobar	Nar. dir.	Narrow directional
Output impedance	$\leq$ 120 $\Omega$	$\leq$ 600 $\Omega$	$\leq$ 120 $\Omega$	...	250 B	250 $\Omega$	600 $\Omega$
Output level (mV/Pa)	8mV/Pa	11mV/Pa	8mV/Pa	...	62mV	52mV/Pa -25.7dBm	9mV/Pa -44.5dBm
Maximum SPL dB; % dist	...	128dB 0.5%	...	140dB 0.5%	127dB	129dB 1% dist	120dB 3% dist
Output noise	15dB	18dB DIN 45412-A	15dB	20dB/pattern spec	12dB A-wtd	16dB	18dB
SN ratio	79dB	76dB	79dB	...	...	>75dB	>70dB
Mic capsule type	Electret	Electret	Electret	...	Capacitor	Ext pol cap	Fixed-charge cond.
Stereo design	No	No	No	M/S or L/R	No	No	No
Power source	C460B preamp	9-45Vdc	C460B preamp	48Vdc or ac	12-48V	12-48Vdc	1.5Vdc AA-cell
Filters	...	...	...	Bass rolloff	...	High-pass	High-pass
Weight	4.2gm	6.2gm	4.2gm	...	5.8 oz	4.2oz	9.2oz
Reader Service No	915	916	917	918	919	920	921

<sup>1</sup> Patterns from omni through cardioid to Figure-eight.

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World Radio History

Manufacturer	Audio-Technica		beyerdynamic			Electro-Voice	
Model	AT835	AT877	MC 736-PV	MC 737-PV	MCE 86 S	DL42 <sup>2</sup>	RE45N/D <sup>3</sup>
AF response Hz-kHz	40-20k	60-14k	40-20k	40-20k	50-18k	50-12k	150-15k
Polar pattern(s)	Narrow directional	Unidirectional	Cardioid lobe	HC/lobe	HC/lobe	HC	Card.-line
Output impedance	600Ω	350 B	150Ω	150Ω	190Ω	150Ω	600Ω
Output level (mV/Pa)	9mV/Pa -45.5dBm	10mV	25mV/Pa	25mV/Pa -30dBV	4.2mV/Pa -47dBm	-50dB	5mV/Pa 1kHz
Maximum SPL dB; % dist.	115dB 3% dist	120dB	128dB	122dB	138dB 0.7% dist	...	...
Output noise	17dB	...	4.5μVS	4.5μVS	3.8μVS	-125dBm hum	-130dBm hum
S/N ratio	>70dB	>70dB	74dB	74dB	61dB	...	...
Mic capsule type	Fixed-charge cap.	Condenser	RF condenser	RF condenser	Electret	Dynamic	Dynamic
Stereo design	No	No	No	No	No	...	No
Power source	1.5Vdc	AA cell	1.5V	12Vdc	12-48Vdc	8-48Vdc	Not required
Filters	High-pass	...	Bass rolloff	Bass rolloff	...	...	...
Weight	7.5 oz	>6 oz	4 oz	7 oz	2.5 oz	13 oz	7.5 oz
Reader Service No	922	923	924	925	926	927	928

<sup>2</sup>Windscreen, case, coiled cord, handle. <sup>3</sup>Shock mount, case, handle, clamp, attenuator.

Manufacturer	Georg Neumann		Sennheiser Electronics			Shure Brothers
Model	KMR8 1i (KMR82i) <sup>4</sup>	RSM190i MS-stereo <sup>5</sup>	MKH 416 P48 <sup>6</sup>	MKH 70 P48	MKH 816- P48 <sup>7</sup>	SM89
AF response Hz-kHz	40-18k (40-20k)	40-18k	40-20k	±2 70-20k	40-20k	60-20k
Polar pattern(s)	HC	HC/Fig-8	Sup card./lobe	Sup card. lobe	Ultra dir/lobe	HC; LOBAR
Output impedance	150Ω	50Ω	10Ω	150Ω bal	10Ω	100Ω source
Output level (mV/Pa)	18mV/Pa (21mV/Pa)	23mV/Pa	1.25	40mV/Pa	1.2V	2.2mV/Pa -53dBV
Maximum SPL dB; % dist.	>128dB	134mV/Pa	128dB	124dB	124dB	127dB 0.5% dist
Output noise	...	...	17dB	10dBA/DIN 45500	15Ba	16dB A wtd
S/N ratio	82dB	78dB M/72dB S	>77dBa	...	>78dBa	79dB
Mic capsule type	...	...	RF condenser	RF condenser	RF condenser	Electret
Stereo design	No	Yes	No	No	No	No
Power source	48Vdc±4V	48Vdc±4V	48V	48Vdc	48Vdc/8	11-52Vdc
Filters	...	...	...	High boost	Low cut	Highpass
Weight	145 g	300 g	6.25 oz	6.5 oz	13.4 oz	6.9oz
Reader Service No	929	930	931	932	933	934

<sup>4</sup>Windscreen, case mounting accessories. <sup>5</sup>MTX 190i matrix amplifier <sup>6</sup>MKH 416 TU3 12Vdc. <sup>7</sup>MKH8166 TU3 12Vdc

## Wireless Microphone Systems

Manufacturer	Audio-Technica US		beyerdynamic		Comprehensive Video Supply	Comtek	
Model	ATW1031	ATW1032	SDM 170/NE 170	TS 170/NE 170	HighBand 1500	MR-180/M-72	MR-182/M-182
RF spectrum	169-216 MHz	169-216 MHz	169.5-202.3MHz	169.5-202.3MHz	203-215MHz	169-216MHz	169-216MHz
Modulation control	Compression	Compression	...	...	...	Compression	Compression
Companding function	2:1	2:1	Low noise	Low noise	Yes	2:1	2:1 companding
System AF response	±1 40-16k	±1 40-16k	-3 30-18k	-3 30-18k	±3 25-20k	±2 50-15k	±2 80-15k
System S/N ratio	95dB	95dB	102dBA	102dBA	...	95dB	95dB
System distortion	0.5%	0.5%	0.5%	0.5%	<0.3%	0.05%	0.5%
Transmitter Model:	ATW-T31 UniPak	ATW-T32	SDM-170	TS-170	HBT-1500	M-72	M-182
Transmitter packaging	Pocket unit	Handheld	Handheld	Pocket unit	Body pack	Pocket	Handheld
RF output	30mW	30mW	50mW	50mW	50mW	35mW	50mW
FM deviation	±15kHz	±15kHz	±15kHz	±15kHz	±16kHz	±30kHz	±30kHz
Microphone support	AT831b/ATM73a <sup>1</sup>	ATW-T32-HE <sup>3</sup>	DM 186.04 head	Electret <sup>4</sup>	Lavalier/mini XLR	Elect Dynam Rib	Electret
Auxiliary line input	Yes	Yes	No	No	...	Possible	No
Power requirement	9Vdc	9Vdc	9Vdc alk.	9Vdc	9V alk.	9Vdc	3-AA
Operating weight	3.2	3.2	160g	160g	...	4	11
Receiver Model:	ATW-R10	ATW-R10	NE 170	NE 170	HBR-1500	MR-180	MR-182 <sup>5</sup>
RF sensitivity	1μV 60dB quieting	1μV 60dB quieting	0.5μV 20dB quieting	0.5μV 20dB quieting	Adjustable	1μV 45dB quieting	1μV 45dB quieting
Spurious rejection	60dB	60dB	>60dB	>60dB	60dB	80dB	>90dB
Antenna types	Whip furnished	Whip furnished	Dual whips	Dual whips	Software	Whip dipole, multi-element accsy	Whip dpl multiel acc
Diversity reception	Yes	Yes	Yes	Yes	N.A.	No	No
Multichannel	No	No	No	No	No	No	No
AF output level	-8dBV Unbal <sup>2</sup>	-8dBV Unbal <sup>2</sup>	-20/+6dBm	-20/+6dBm	600Ω Unb	+9dBm	+10dBm
Power requirement	120ac/12-18dc	120ac/12-18dc	15Vdc	15Vdc	9V alk.	6-12dc 50hr	ac/dc V 8W
Metered parameters	AF/RF	AF/RF	AF/RF	AF/RF	...	AFV	AF/RF/V
Metering types	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs
Reader Service No	935	936	937	938	939	940	941

<sup>1</sup>Or AT803b, AT857AMLa, ATM35, AT851a. <sup>2</sup>-20dB balanced. <sup>3</sup>Or ATW-T32-C condenser type capsule. <sup>4</sup>Suitable for various mic units; phantom power. <sup>5</sup>MRC-82 Camera Companion receiver attaches to camera, connects to camera audio channel.

Manufacturer	HM Electronics		Lectronsonics			Micron Audio Products	
Model	515 (525)	System 55 (50)	PRO-STD-T(-L)	PRO-4-Mini	PRO-DIV-L(-T)	CTR 501 IH	MDR530-SH
RF spectrum	169-216MHz	169-216MHz	150-216MHz	150-216MHz	150-216MHz	169-216MHz	170-216MHz
Modulation control	Compression	Compression	Compression	Compression	Compression	Limiting	Limiting
Companding function	Dynamic expansion	Dynamic expansion	2:1	2:1	2:1	CNS type	CNS type
System AF response	±3 100-15k	±3 100-15k	±1 50-15k	±1 50-15k	50-15k	±2 50-15k	±2 50-15k
System S/N ratio	NRX II	NRX II	96dB A wtd	96dB A wtd	96dB A wtd	>115dB	>115dB
System distortion	1%	1%	0.7%	0.7%	0.7%	<0.3% THD	<0.3% THD
Transmitter Model:	TX550 (555)	TX555 (TX550)	T185 (M185)	M185/H185	M185 (T185)	TX-501 (503)	TX-513/-516
Transmitter packaging	Body-Pac (HH)	Body-pac	Handheld (Pocket)	Handheld/plugon	Pocket (HH)	Pocket (HH)	[513 operates on
RF output	>50mW	>50mW	50mW	50mW	50mW	50mW	[3 of 6 freq in
FM deviation	15kHz max	15kHz max	±15kHz	±15kHz	±15kHz	±15kHz	[1.2MHz range.
Microphone support	1.5-5kΩ (dynamic)	Dynamic	SM58 (Electret <sup>6</sup> )	Electret or dynamic	Electret (& dynamic)	Electret, dyn.	...
Auxiliary line input	...	No	No (Yes)	...	Yes (No)	Yes	
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc
Operating weight	4.7	10	13.2 (5.3)	...	5.3 (13.2)	8.5 (11)	8.5
Receiver Model:	RX522	RX520	R185	CR185/CDM4	DR185	MR-510 (110) <sup>8</sup>	MDR-530 <sup>9</sup>
RF sensitivity, quieting	1μV 30dB	1μV 30dB	0.5μV 20dB	0.6μV 20dB	0.5μV 20dB	> 5μV >100dB S/N	2μV 60dB
Spurious rejection	>50dB	>60dB	>100dB	>100dB	>100dB	>80dB	>80dB
Antenna types	Whip BNC	Whip BNC	Whip furnished <sup>7</sup>	Whip furnished	Whip furnished	Whip furnished	Whips furnished
Diversity reception	No	Yes	No	No	Yes	No	Yes
Multichannel	No	No	No	4-channel	No	No	No
AF output level	-4dBV	-4dBV	-18dBm	-65,0dBm	-65,0dBm	-65,0dBm	-53dBV/0dBV
Power requirement	120ac/12-16dc	120ac/12-16dc	12dc/120ac	9-16dc/120ac	12dc/120ac	12-30dc	12-18dc/Vac
Metered parameters	Vdc/RF	Vdc/RF/AF	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc
Metering types	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs
Reader Service No	942	943	944	945	946	947	948

<sup>6</sup>M185 also supports dynamic mic units. <sup>7</sup>Dipole antenna available as an added accessory. <sup>8</sup>Model 110 without noise suppression. SR-120/SR-520 are similar receivers, mounting on and can be powered from the camera. <sup>9</sup>MDR-550 mobile diversity receiver offers similar characteristics in portable, compact dc-powered package.

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Circle (50) on Reply Card

Manufacturer	Micron Audio	Samson Technologies			Sennheiser Electronics		
Model	MDS-2	Broadcast STD	Concert TD	MR-1 system	UHF 1B (1H)	UHF 2B (2H)	VHF 1B-90 (1H)1
RF spectrum	150-216MHz	174-199MHz	174-199MHz	174.46-199.6MHz	450-960MHz	450-960MHz	174-216MHz
Modulation control	Limiting	...	...	...	Compress (limit)	Compress (limit)	Compress (limit)
Companding function	CNS type	NRS dbx I/II	NRS dbx I/II	NRS dbx II	Hi-Dyn	Hi-Dyn	Hi-Dyn
System AF response	±2 50-15k	±3 30-18k	±3dB 30-18k	±3dB 60-12k	±3 40(70)-20k	±3 40(70)-20k	±3 40(70)-20k
System S/N ratio	115dB	>115dB	>100dB	95dB IHF	94dB	94dB	+92dB A wtd (94)
System distortion	<0.3% THD	<0.5% 400Hz	<0.5% 1kHz	...	<2%	<2%	<2%
Transmitter Model:	TX-501 (503) <sup>10</sup>	BH-3 (BT-3)	CH-2 (CT-2)	SH-2 (ST-2(L))	SK-2012-TV (SKM 4031)	SK-2012-TV (SKM 4031)	SK-2012-90 (4031-90)
Transmitter packaging	Pocket (HH)	Handheld (Belt)	Handheld (Belt)	Handheld (Belt)	Pocket (handheld)	Pocket (handheld)	Pocket (handheld)
RF output	50mW	50mW	50mW	50mW	20mW	20mW	30mW
FM deviation	±15kHz	±15kHz	±15kHz	±15kHz	±40kHz	±40kHz	±40kHz nom.
Microphone support	Elec	dyn (AKG)	Various <sup>12</sup>	Various <sup>13</sup>	Various <sup>14</sup>	Electret MKE-2/-40	MKE-2/-40
Auxiliary line input	Yes (No)	No	No	No	No	No	No
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc[6-8 hr]	4.5V 3-AAA cells	4.5V 3-AAA cells	4.5Vdc 3-AAA
Operating weight	8.5 (11)	...	13 (4.2)	7.8 oz (5.1)	7 oz (9 oz)	7 oz (9 oz)	7 oz (9 oz)
Receiver Model:	MDR-540 (-4) <sup>11</sup>	BR-3	CR-2	MR-1 Micro	EK-2012-TV <sup>15</sup>	EM 2003-TV	EK-2012-90 <sup>16</sup>
RF sensitivity, quieting	2μV 60dB	15μV 60dB S/N	15dB/μV 60dB S/N	15-45dBu	<20μV 40dB	<10μV 40dB	<20μV 40dB
Spurious rejection	>80dB	60dB ±60Hz	60dB ±60Hz	60dB ±60kHz	>70dB	>80dB	>70dB
Antenna types	Dipole	Dual whips	Dual whips	7" Flex whip	Whip furnished	Whip furnished	Whip furnished
Diversity reception	Yes	Yes	Yes	No	No	Yes	No
Multichannel	Yes	10	1 of 10	1 of 10	Option	Yes	No
AF output level	0dB line	Bal/unbal 8dBm	Bal/unbal 8dBm	Bal/unbal 0dBv	-26/+6dBm	-28/+12dBm	-26,+26dBm
Power requirement	10-22dc 120ac	110/220ac	110/220Vac	9V	4.5Vdc 3-AAA cells	12-24Vdc 117Vac	4.5Vdc
Metered parameters	AF/RF/Vdc	Vdc RF A-B Ch AF	Vdc RF A/B	Vdc	RF	None	AF/RF
Metering types	LEDs	LEDs	LEDs	LEDs	...	LEDs	...
Reader Service No	949	950	951	952	953	954	955

<sup>10</sup>TX100 series does not use CNS noise suppression. <sup>11</sup>4 model does not include noise suppression; multiple element accessory available. <sup>12</sup>Various mic possibilities include: AKG, Audio-Technica, E-V, Sennheiser, Shure, Sony. <sup>13</sup>Various mic include AKG, Audio-Technica, E-V, Sennheiser, Shure, Sony. <sup>14</sup>Supports various mics from all major manufacturers in dynamic and condenser types. <sup>15</sup>Camera mounted receiver. <sup>16</sup>VHF camera mount receiver. Model WM1 wireless mixer may be used; 4 of 5 channels include wireless receivers with Hi/Lo EQ, 70Hz cutoff, prefader listen features.

Manufacturer	Sennheiser	Shure Brothers		Sony	Swintek	Vega Mark IV	
Model	VHF 2B-90(2H-90)	LS14 839 <sup>18</sup>	LS23	UHF systems	MK50A Hi-fi-S <sup>22</sup>	Pro Plus	VX-20 systems
RF spectrum	174-216MHz	169-216MHz	169-216MHz	400 (900)MHz	49-470MHz	150-216MHz	150-174/174-216
Modulation control	Compress (limit)	Companding	Companding	Limit/compress	Limit/compression	...	Compression
Companding function	Hi-Dyn	Yes	Yes	Switchable <sup>19</sup>	Yes	Dynex III	DYNEX III
System AF response	±0.3 40-20kHz	±2 50-15k	±2 50-15k	±1.5dB 75-15k	±3dB	60Hz-20kHz	40-15kHz
System S/N ratio	+92dB A wtd	...	<13dB SPL	57dB linear A-wtd	80dB	110dB	>100dB
System distortion	<2%	0.3%	0.3%	0.3% linear	1%	<0.2%	<0.5%
Transmitter Model:	SK 2012-90 (SKM-4031)	L11	L2	WRT-28L (H)	MK50A Hifi	77/DIII (T-81)	T-25/-28/-29
Transmitter packaging	Pocket (handheld)	Pocket	Handheld	Pocket	Pocket	Body (handheld)	Bodypack/Handheld
RF output	30mW	50mW	50mW	6mW (30mW) <sup>20</sup>	50mW	50mW	50mW
FM deviation	±40kHz nom.	±15kHz	±15kHz	±2.4kHz <sup>21</sup>	±20kHz	...	±15kHz
Microphone support	MKE-2/-40	Electret 839W	58; 96	Elec Dyn ECM-77BC	Electret; dynamic	Various <sup>23</sup>	Electret/...
Auxiliary line input	No	No	No	No	Yes	No	No
Power requirement	4.5Vdc 3-AAA	9Vdc	9Vdc	3Vdc	9Vdc	9V alk	9V MN1604
Operating weight	7 oz (9 oz)	5.5oz	10.4 oz max	4.6 oz	5 oz	7 (9-13.5)	5/9/10Oz
Receiver Model:	EM-2003-90 <sup>17</sup>	L4 MARCAD	L3	WRR-28/37	QDC Hi-Fi	R-42A	R-27
RF sensitivity, quieting	<10μV 40dB	0.45μV 12dB	0.35μV 12dB	10dBμV mute level	1μV 12dB	1.3μV 50dB SNR	<1.3μV 50dB S/N
Spurious rejection	>100dB	75dB	75dB	>70dB	80dB	...	75dB
Antenna types	Whip	ground plane	Whip furnished (2)	Whip furnished (2)	Whip	Whip	Dual whips
Diversity reception	Yes	Yes	No	WRR-37	O	Yes	No
Multichannel	No	No	No	Yes	O	No	No
AF output level	-28/+12dBm	0dBm	-2dBv	-58dBs 600Ω	56dBm,+10dBm	Line level	-45/+1dBm
Power requirement	117Vac	12-18Vdc	12-18Vdc	3/10-17Vdc	9Vdc	ac/dc	9V alk.
Metered parameters	AF/RF	AF/RF/V/Div	AF/RF/V	AF/RF	AF/RF/V	A/B; RF/AF	RF, AF, DC
Metering types	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	meter
Reader Service No	956	957	958	959	960	961	962

<sup>17</sup>EM-2003-90 offers diversity reception; EK-2012-90 is a camera mount receiver. <sup>18</sup>Various other systems available combining L11 transmitter with other microphone instruments. <sup>19</sup>Linear or companded; >60dB SNR w/companding; 0.7% distortion w/companding. <sup>20</sup>WP-27 amplifier gives 500mW. <sup>21</sup>Per 1kHz linear mode; ±9.4kHz/1kHz, companded. <sup>22</sup>Video camera system. <sup>23</sup>T-series includes elements such as E-V N/D757, Shure SM-58, SM-85, SM-87.

# Telephone Audio Bandwidth Extenders

Manufacturer	Comrex Corporation				Gentner Electronics			
Model	2XP/2XR	3XP/3XR	LX-T LX-R	PLXmicro/THX	EFT-1000A <sup>1</sup>	EFT-100 <sup>1</sup>	EFT-3100	EFT-900A <sup>1</sup>
System type	2-line	3-line	1-line	1-line duplex	1-line	1-line	3-line duplex	1-line
Offset line 1 Hz	250	250	250	250	250	250	320	250
Offset line 2 Hz	2k	2k	...	...	...	...	2.82k	...
Offset line 3 Hz	...	2k	...	...	...	...	5.32k	...
Translation error	±0.02Hz	±0.02Hz	±0.02Hz	±0.02Hz	±0Hz	±0Hz	±0Hz	±0Hz
Processing analog/digital	Analog	Analog	Analog	Analog	Digital	Digital	Digital	Digital
AF response dB Hz	0.5 50-5k	0.5 50-10k	0.5 50-5k	0.5 50-5k	0.5 50-3.5k	0.5 50-3k	0.5 50-7k	0.5 50-3.5k
Compression/expansion	...	Auto lvl ctl	Yes	...	Yes	Yes	No	Yes
System transmitter	2XP	3XP	LX-T	PLX micro	EFT-1000A	EFT-100	EFT-3100	EFT-900A
Packaging	Portable	Portable	Rack/Table	Portable	Portable	Rack/Table	Rack/Table	Portable
AF input impedance	600Ω	600Ω	600Ω	150Ω/10kΩ	600 Ω	>10kΩ	150/600Ω	150/600Ω
AF input level dBm	+4	+4	-20; +8	-60; +0	-55; 0	-10; 0	10	-55; 0
Mic input	...	...	...	Bal	Bal	...	Bal	Bal
Line input	Bal	Bal	Yes	Bal	Bal	Bal	Bal	Bal
Output connection	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Ext hybrid	Xfmr bal	Xfmr bal
Output impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
Output level	-9dBm	-9	-9	-9dBm	-15	-2	-10	0
Power requirement	120/240Vac	120/240Vac	120Vac	120Vac; ±15Vdc	117/234Vac; dc	117/234Vac	117/234Vac	117/234Vac; dc
System receiver	2XR	3XR	LX-R	TH-X	EFT-1000A	EFT-100	EFT-3100	EFT-900A
Packaging	Rack mount	Rack mount	Rack/Table	Rack-mount	Portable	Rack/Table	Rack/Table	Portable
Power requirement	...	120/240Vac	...	...	117/234Vac	117/234Vac	117/234Vac	117/234Vac
Telco connection	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Ext hybrid	Xfmr bal	Xfmr bal
Telco input level	-40; +8	-40; +8	-40; +8	-40; +8	-30; +17	-20; 0	0	-35; +4
Telco impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
AF output connection	Act bal	Act bal	Act bal	Act bal	Act bal	Act bal	Act bal	Act bal
AF output impedance	600Ω	...	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
AF output level dBm	0	0	0	0dBm	0	-10; 0	10	-60; 0
Reader Service No.	963	964	965	966	967	968	969	970

<sup>1</sup> Transceiver units; one required at each end of link.

Q203-6

## AUDIO/VIDEO PRODUCTION & PACKAGING SUPPLIES



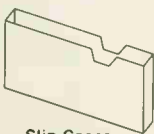
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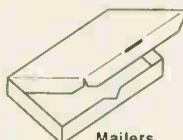
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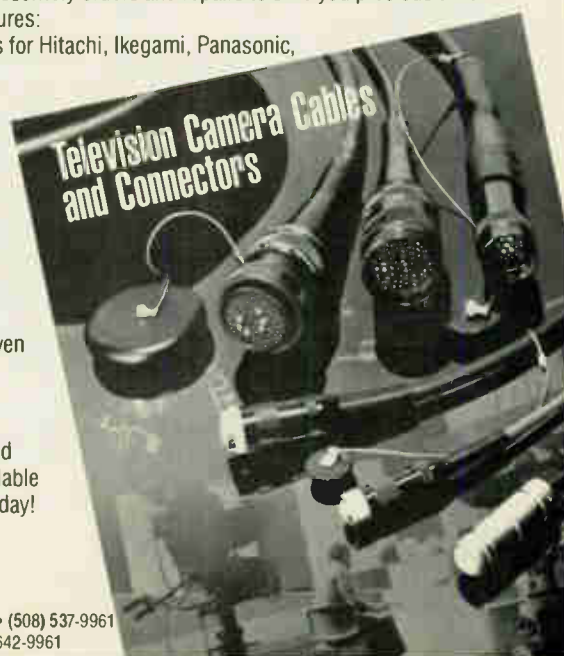
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Circle (52) on Reply Card

# Audio Test Systems

Manufacturer	Amalgamated Wireless Australasia	Amber Electro Design			ASACA ShibaSoku		Audio Precision		Hewlett-Packard
Model	F242A	# 3501	# 5500 <sup>2</sup>	# 7000 <sup>3</sup>	AD60A	AM51A	Portable One	System One	HP 8903E
Auto level set	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
μP-control	...	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automation bus port	No	No	Yes	GPI/RS-232	GP-IB	GP-IB	Yes	Yes	HP-IB
Audio recorder tests	No	Yes	Yes	Wow/flutter	CD spec	...	No	Yes	Non-specific
Transmit-receive unit	No	Yes	Yes	No	No	No	Yes	Yes	No
Portable unit	...	Yes	Yes	No	No	No	Yes	No	No
AF range (fundamentals)	20-20kHz	10-100k	10-100k	8.5Hz->500kHz	10-120kHz	10-100kHz	10-100kHz	10-200kHz	20Hz-100kHz
Range (on harmonics)	10-100kHz	10-300k	10-500k	...	...	to 330kHz	...	10Hz->500kHz	1-Hz-500kHz
Input level range	-30/+30dBm	-30/+40dBm	-30/+40dBm	-100/+40dBV	1mV-100Vrms	-26.8/+42.2dBm	-800μV	<21μV, -90dBu	50mV-300V
Input impedance	600Ω	100kΩ	100kΩ	100kΩ	200kΩ/100kΩ	200kΩ/100kΩ	100kΩ	100kΩ	100kΩ
Input connection	Bal/Unbal	AB/AU	AB/AU	B/Unbal	2-ch Bal/unb	Bal/unb	Bal/Unbal	Bal/Unbal	B/Unb
Fundamental rejection	...	>100dB	>100dB	>120dB <sup>4</sup>	>115dB	>85dB	...	...	...
THD minimum, accuracy	<0.005%, ±0.5	0.0008%, ±1%	0.001%, ±1%	-30dBV, ±2dB	<-110dB	-120dB	0.0025%, ±1dB	0.001%, ±0.5dB	-80dB, ±2dB
IMD measurements per	N.A.	SMPTE <sup>1</sup>	SMPTE <sup>1</sup>	SMPTE 4:1	...	70kHz/7kHz	SMPTE <sup>5</sup>	SMPTE <sup>5</sup>	...
IMD minimum, accuracy	N.A.	0.003%, ±2%	0.001%, ±1%	<0.003%	...	0.001-100%	0.0025%, ±1dB	0.0018%, ±1dB	...
AC voltage range	-110/+32dBm	<3μ-100V	10μ-100V	Yes	30μV-100V	0.1μV-100Vrms	<10mV-140V	300μV-160V	0.3mV-300V
Audio noise range	<2.5μV	<1μ-100V	<1μ-100V	to <-112dBm	...	-100dB/+40dB	...	75μ-160Vrms	0-99.99dB
Signal generator range	Model G232	<-60 +28dBm	<-80/+30dBm	Yes	No	Yes	10Hz-120kHz	10Hz-204kHz	Yes
Generator output	B/Unb	TB/TU	TB/TU	B/Unbal Act	...	Bal/unb	Bal/Unbal Xfmr	Bal/Unbal Xfmr	600Ω or 50Ω
Frequency counter range	No	10Hz->500kHz	to 500kHz	Yes	Yes	to 500kHz	10-200kHz	10Hz->500kHz	Yes
Meters/display	Vrms/dBm meter	Mechanical	LED	Windows 3.0	Dual analog	LCD display	LCD panel	CRT	7-seg LED
Reader Service No	971	972	973	974	975	976	977	978	979

<sup>1</sup>Also per DIN 45045 & CCIF specifications. <sup>2</sup>AudioCheck software package allows control from PC for automated measurement system. <sup>3</sup>System based on IBM/compatible with Windows 3.0 operating system. <sup>4</sup>Rejection > 120dB or 10dB below highest harmonic. <sup>5</sup>IMD also per DIN 45045/45043; measurements also per CCIR IEC 2683 IHF A202.

Manufacturer	Neutrik		Rohde & Schwarz		Schmid Telecomm.	Sound Technology		Tektronix	
Model	A1 System	TT402A	SUN-2	UPA series	SZ 346/316 <sup>6</sup>	1510A <sup>7</sup>	3200B/3100B <sup>8</sup>	AA5001	AA501
Auto level set	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
μP-control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automation bus port	RS-232	-488/-232	Yes	Yes	RS-232	Opt	Yes	Yes	No
Audio recorder tests	Possible	Possible	Yes	Yes	Possible	Yes	Yes	No	No
Transmit-receive units	No	No	Yes	No	X-316/R-346	Yes	Yes	No	No
Portable unit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
AF range (fundamentals)	20Hz-40kHz	19Hz-21kHz	10-100kHz	10-100k	30Hz-20kHz	20-40kHz	1-102.39kHz	10-100kHz	
Range (on harmonics)	to 130kHz	to 200kHz	...	300k	...	315Hz-1kHz	10Hz-300kHz	to 300kHz	
Input level range	10mV-200V	30μV-100V	-84/+32dB	12mV min	-44/+21dBm	100μV-40V	10mV-100V	60mV-200V 100kΩ	
Input impedance	100kΩ	2 100kΩ	1MΩ	1M 20k/600Ω	600/10kΩ	100kΩ	100kΩ	100kΩ	100kΩ
Input connection	Act bal	Bal A/B	B/Unb	B/Unb	2 bal	AB	...	AB	AB
Fundamental rejection	...	...	>65dB	...	...	...	...	10dB <sup>9</sup>	10dB <sup>9</sup>
THD minimum, accuracy	0.0025%	<0.01%, ±1.5%	0.06%, ±0.1dB	0.0001%, ±2dB	>0.1%	0.05%, 5%	0.001%, 10%	0.0025%, ±10%	
IMD measurements per	...	Options	per DIN 45405	...	Opt SMPTE	...	SMPTE	CCIF/DIN/SMPTE	
IMD minimum, accuracy	...	...	...	N.A.	...	...	0.002%, 1.0%	0.0018%, ±10%	
AC voltage range	10μV-200V	30μV-100V	-84/+32dBm	10μV-300V unb	-70/+21dBm	300μV-40V	30μV-100V	-108/+48dBm ±2% fs	
Audio noise range	-111dBu res.al	<-106dB min	Yes	<3μV	-70dBm	-92/-10dBV	<4μV	-108dBm	-108dBm
Signal generator range	Yes	Yes	SUN-2 S	Opt 10-100k	Yes	-80,+30dBm	-90/+30dBm	10-100k 28dBm	10-100k 28dBm
Generator output	<0.2Ω bal	Bal	B/Unb	Bal	unbal	Bal<5/600Ω	AB	AB	28dBm Bal
Frequency counter range	...	Yes	...	8-250k	...	20Hz-40kHz	10Hz-500kHz	No	No
Meters-display	LCD	LCD	Multi-LED	VU	LED displays	LCD displays	LEDs	CRT	LED
Reader Service No	980	981	982	983	984	985	986	987	988

<sup>6</sup> SIAT "Short Interval Audio Testing" is a signal generator and receiver for operation of wired or radio links; complete set of measurements made within 5-sec interval. <sup>7</sup> Audio signal and recording test system; measures 2nd, 3rd harmonics separately. <sup>8</sup> Two unit package for programmable transmission path tests; transmission package is 3100B programmable generator with LED metering display. <sup>9</sup> Value noted below specified residual THD & noise or actual THD, whichever is greater.

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# RF/Test & Measurement

## AM Broadcast Transmitters

Manufacturer	Continental Electronics				Energy-Onix	Harris Broadcast	
	315-R1	316F-1	419G <sup>1</sup>	420C		AM-10K <sup>2</sup>	DX-100 <sup>3</sup>
Model	315-R1	316F-1	419G <sup>1</sup>	420C	AM-10K <sup>2</sup>	DX-100 <sup>3</sup>	DX-50 <sup>4</sup>
Band of service	Broadcast	Broadcast	Shortwave/SSB	Shortwave SSB	Broadcast/SW	Broadcast	Broadcast
RF output	5kW	10kW	250kW/300kW	500kW	11kW	100kW	60kW
RF output connection	1 1/8"	1 1/8"	50Ω/75Ω/300Ω bal	50Ω/75Ω/300Ω bal	...	6 1/8" 50Ω	3 1/8" 50Ω
Carrier stability	± 5Hz	± 5Hz	±1×10 <sup>-6</sup> Hz	±1×10 <sup>-6</sup> Hz	±10Hz	± 2Hz typical	± 2Hz typical
Carrier shift	2%	<2% 100% mod	<5%	<5%	2% max	<1%	<1%
Modulation maximum	125%	125%	100%	100%	125%	130%	145% 50kW
Audio input connection	Act bal	Act bal	Active 600Ω	10kΩ	Active 600Ω	10kΩ	600Ω bal
Audio response (dB Hz)	±1 20-7.5k	1.5 10-15k	±1 50-7.5k	±1 50-7.5k	±1 20-7.5k	-0.9/0.1 30-10k	-0.9/0.1 30-10k
Audio distortion	< 2% 100%	< 3% 100% 50-10k	< 3% to 98% mod	< 3% to 98%	< 2.5%	≤1% 95% mod	≤1% 95% mod
AM noise figure	< -60dB unwt'd	< -60dB unwt'd	< -55dB residual	< -55dB unwt'd	-60dB	65dB	65dB
IPA driver stage	Solid-state	Solid-state	...	...	Solid-state	Solid-state	Solid-state
Final amplifier	3CX3000F7	4CX15000A	Multiple source	Multiple source	2 3CX2500F3	MOSFET	MOSFET
Modulator final	3CX3000F7	Solid-state	SS modulator	SS modulator	2 3CX2500F3	AM digital	AM digital
Input AC power	208-250Vac 3φ	208/230Vac 3φ	4.160-13kV 3φ	4.160-13kV 3φ	208-380Vac	220Vac 3φ	220Vac 3φ
Power consumption	12.8kVA	28.4kW	640kW 95% mod	1075kVA 95% mod	30kW 100% mod	117kW	59kW
Power factor (System Efficiency)	0.95 (>55%)	0.93 (53%)	>0.95 (70%)	>0.95 (70%)	...	0.98 (86%)	0.98 (85%)
Stereo capable	Yes	Yes	No	No	...	Yes	Yes
Fault logic	Relay	Relay	μP system	μP system	Solid-state	Solid-state	Solid-state
Floor space used	35×34" sep. PS	67×26"	400×72", sep. PS	42m <sup>2</sup> sep. PS	52×37"	...	120×33"
Reader Service No	1301	1302	1303	1304	1305	1306	1307

<sup>1</sup>Model 418D-2 at 100kW. <sup>2</sup>AM-5K5.5kW; AM-2-5K/3K 3-3.5kW. <sup>3</sup>DX300 300kW; DX500 500kW; DX750 750kW configurations; digital modulation. <sup>4</sup>DX10 11kW; DX25U 27.5kW; DX100 110kW; 3 pre-set power levels; lower power units combine for higher levels.

Manufacturer	Harris Broadcast		ITAME	LPB Inc	GE-Marconi Communications		
	Gates 5A <sup>5</sup>	SX-5A <sup>6</sup>	TAURO S 10 <sup>7</sup>	AM-100P <sup>8</sup>	B6034 <sup>9</sup>	B6040	B6126 (6127)
Model	Gates 5A <sup>5</sup>	SX-5A <sup>6</sup>	TAURO S 10 <sup>7</sup>	AM-100P <sup>8</sup>	B6034 <sup>9</sup>	B6040	B6126 (6127)
Band of service	Broadcast	Broadcast	Broadcast	LP Broadcast	Broadcast	Broadcast	Shortwave
RF output	5.6kW	5.6kW	10kW	100W	50kW	5W/10kW	300kW (500kW)
RF output connection	7/8"	7/8" 50Ω	1 1/8"	SO-239 UHF 50Ω	50Ω/300Ω	50Ω unb	50Ω/300Ω
Carrier stability	±2Hz	±10Hz PLL	±5Hz	±10Hz	<1 ppm/yr	±10Hz	<1 ppm/yr
Carrier shift	<1% 100%	<2% 100%	<3%	<2%	<2.5%	<5%	<2.5%
Modulation maximum	130% peak	125%	125% PDM	+125%	125%	100%	100%
Audio input connection	600Ω bal	600Ω bal	Bal 600Ω	600Ω	Bal 600Ω	Bal 600Ω	Bal 600Ω
Audio response (dB Hz)	±0.5 20-10k	-1.5/5 20-12.5k	±1 20-10k	±1.0 20-15k	±1 50-6k	±1 50-6k	±1 50-6k
Audio distortion	<1.3% 95% mod	<1% 95%	<2% 99%	<2%	95% mod	4% 90% mod	3% 90% mod
AM noise figure	>60dB	>60dB	60dB	-55dB	<-56dB	-55dB	<-56dB
IPA driver stage	FET	Solid-state	Tube-type	Solid-state	...	Solid-state	4CW25000A
Final amplifier	FET	MOSFET	3CX10000A7	Solid-state	Tetrode	2 4CX5000A	TH 537 (TH 558)
Modulator final	Polyphase PDM	Polyphase PDM	4CX15000A	Solid-state	Tetrode	Solid-state	TH 555 (TH 581)
Input AC power	220Vac 3φ	240Vac 3φ	220/380Vac	117Vac 1φ	230Vac 2φ	380/415Vac 3φ	11kVac 3φ
Power consumption	7.7kW	11.6kW	11kW	400W	...	30kVA	429kW (...)
Power factor (System Efficiency)	... (65%)	... (>65%)	... (40%)	0.9 (25%)	0.9 (...)	0.9 (...)	0.9 (64%)
Stereo capable	Yes	Yes	Yes	Yes	Yes	No	No
Fault logic	Solid-state	μP	Solid-state	relay	Relay	Solid-state	relay
Floor space used	28×30"	28×30"	45×37"	Wall-mount	3.65×1.54m <sup>2</sup>	65×33"	72(85)m <sup>2</sup>
Reader Service No	1308	1309	1310	1311	1312	1313	1314

<sup>5</sup>Gates One, 1kW; Gates Two 2.5kW. <sup>6</sup>SX-2.5A 2.5kW; SX-1A 1kW. <sup>7</sup>Systems at 7kW, 5kW and 2kW feature similar characteristics. <sup>8</sup>Series includes at 5W, 30W, 60W. <sup>9</sup>B6035 rated 100kW, B6036 rated 150kW and B6037 rated 200kW are combinations of the B6034 system.

Manufacturer	Nautel		RIZ Transmitter Factory		TELEFUNKEN
	AMPFET ND 10 <sup>10</sup>	AMPFET ND50 <sup>11</sup>	OR/K series <sup>12</sup>	OR S series <sup>13</sup>	S4006 (S4005) <sup>14</sup>
Model	AMPFET ND 10 <sup>10</sup>	AMPFET ND50 <sup>11</sup>	OR/K series <sup>12</sup>	OR S series <sup>13</sup>	S4006 (S4005) <sup>14</sup>
Band of service	Broadcast	Broadcast	SW 3.2-6.1MHz	AM/MW	Brdcst/MW (SW)
RF output	11kW	55kW	50-250kW	20kW-1MW	600kW (500kW)
RF output connection	1 1/8" 50Ω	3 1/8" 50Ω	50Ω/300Ω	50/60Ω, 120Ω	50Ω <sup>2</sup> 152(100/230)
Carrier stability	±5Hz	±5Hz	...	...	0.5×10 <sup>-6</sup> Hz/yr
Carrier shift	<1%	<1%	...	...	<3%, 1kHz (<3%)
Modulation maximum	125% at 11kW	125%, 55kW	...	[auto-tuning]	100%
Audio input connection	Bal 600Ω	600Ω bal	...	[on OR20S-02]	600Ω Bal
Audio response (dB Hz)	±0.5 30-10k	±0.5 30-10k	...	...	±1 40-4.5kHz
Audio distortion	<1% 95% mod	<1% 95% mod	< 3%	< 2-3%	< 2% 80% mod (< 3%)

Manufacturer	Nautil		RIZ Transmitter Factory		TELEFUNKEN
Model	AMPFET ND 10 <sup>10</sup>	AMPFET ND50 <sup>11</sup>	OR/K series <sup>12</sup>	OR/S series <sup>13</sup>	S4006 (S4005) <sup>14</sup>
AM noise figure	60dB	60dB	50/60dB	55/65dB	>55dB unwt'd
IPA driver stage	Solid-state	Solid-state	...	...	Tube type
Final amplifier	Modular SS	Modular SS	...	...	1-TH558
Modulator final	IRF 140	TRF 130	...	...	1-TH558
Input AC power	208Vac 3 $\phi$	480Vac 3 $\phi$	440Vac	440Vac	400Vac
Power consumption	20kVA	97.4kVA	40kVA-645kVA	60kVA-2.3MVA	1253kVA (1103kVA)
Power factor (System Efficiency)	0.98 (>75%)	0.98 (80%)	... (40%-65%)	... (49-72%)	>0.9 [73% (68%)]
Stereo capable	Yes	Yes	N.A.	...	No
Fault logic	Solid-state	Solid-state	...	...	Solid-state
Floor space used	45x24"	164x32"	...	...	5.5x5.6m
Reader Service No	1315	1316	1317	1318	1319

<sup>10</sup>ND 5 kW, ND 2.5 2.5kW, ND 1 1kW. <sup>11</sup>ND25 25kW. <sup>12</sup>OR250K-01/A 250kW, OR100K-01/A 100kW, OR50K-01/A 50kW, OR20K-02 20kW, OR10K-02 10kW, 10-20kW covers 3.2-22MHz. <sup>13</sup>OR20S-02 20kW, OR100S-02 100kW, OR300-05 300kW, OR1000-03 1MW. <sup>14</sup>Model S4004, S4003 rated 300kW, 4002, S4001 rated 100kW; TH-573, TH-555 devices used; PDM/PANTEL modulation and DAM volume-dependent carrier control improved efficiency.

## FM Exciters

Manufacturer	BEXT		Broadcast Electronics	C.T.E. Int'l	Cemty's		Continental Electronics	ELIT
Model	PTX30(TEX20)	PTX80	FX-50	VL30	#25.770 <sup>2</sup>	#27.905	802A <sup>3</sup>	TMF-4A20/SC-20 <sup>7</sup>
Power output	2-30W, 50 $\Omega$ N	5-80W, N	3-50W, 50 $\Omega$ BNC	2-30W, N	20W, 50 $\Omega$	0-18W, N	5-50W, 50 $\Omega$ BNC	20W, 50 $\Omega$ N
Frequency range MHz	87.5-108MHz		87-109	87.5-108	87.5-108	87.5-108	87-109	87.5-108
Modulation capability	>75kHz	75kHz	$\pm$ 350kHz	> $\pm$ 75kHz	$\pm$ 75kHz	$\pm$ 120kHz	$\pm$ 200kHz	> $\pm$ 75Hz
Asynchronous S/N	65dB	...	< 55dB	-65dB	...	< -60dB	73dB	>68dB
Synchronous S/N	55dB	...	< 50dB	-55dB	...	< -70dB	65dB	...
Composite input Z	10k $\Omega$	5k $\Omega$	10k $\Omega$ /50 $\Omega$	10k $\Omega$ , 600 $\Omega$	50 $\Omega$ N	2k $\Omega$ BNC	5k $\Omega$ B/Ub	600/4k $\Omega$ Lemo
Composite input level	2.2Vp-p	3.5Vp-p	3.5Vp-p	-12,+9dBm	3.5Vpp	1-10Vpp	1.25VRMS	-6, +14dBm
Composite THD	< 0.05% (< 0.1%)		$\leq$ 0.005%	< 0.05%	< 0.7%	< 0.3%	0.08%	< 0.3%
Composite IMD/TIM	< 0.05%	...	$\leq$ 0.005%, $\leq$ 0.01%	< 0.05%	...	...	0.08%, 0.1%	< 0.1%
Composite response	30-100k <sup>1</sup>	...	$\pm$ 0.05%	$\pm$ 0.3dB 100k	< $\pm$ 0.3dB	< $\pm$ 0.2dB	$\pm$ 0.1 20-100k	...
Phase response	...	...	$\pm$ 0.25°	...	...	...	$\pm$ 0.5°	...

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Circle (56) on Reply Card

Manufacturer	BEXT		Broadcast Electronics	C.T.E. Int'l	Cemtys		Continental Electronics	ELIT
Model	PTX30(TEX20)	PTX80	FX-50	VL30	#25.770 <sup>2</sup>	#27.905	802A <sup>3</sup>	TMF-4A20/SC-20 <sup>4</sup>
Composite group delay	...	...	+10ns	...	...	...	±25ns	...
Stereo separation	>45dB (>40)	40dB	52dB to 15kHz	>45dB	>40dB	>40dB	50dB	>45dB
SCA Inputs	3	...	3 unbal BNC	Yes	No	One	Two	One
SCA input Z	10kΩ	...	100kΩ	10kΩ	n.a.	1MΩ	15kΩ	2kΩ
SCA inputs level	2.2Vp-p	...	3.5Vp-p	0dBm	n.a.	2Vpp	1.25V RMS	0.5-3Vpp
Amplitude response	40k-100k <sup>1</sup>	...	±0.2dB	±0.5dB 100k	n.a.	n.a.	40k-100k	...
Stereo (SCA) generator	Ext.	TDSS2	FS-30 (FC-30)	...	...	...	External	Integral (Ext)
Reader Service No	1320	1321	1322	1323	1324	1325	1326	1327

<sup>1</sup> 0.8dB variation for same range with TEX20. <sup>2</sup> Includes receiver for translator service. <sup>3</sup> Model 813A 500W LPFM using 802 exciter. <sup>4</sup> RMF-44A20 transposer, RMF-44A20/D transposer enhanced selectivity for input channel separation; RMF series amplifiers from 100W to 10kW.

Manufacturer	ELIT	Harris Broadcast		Harris TVT	ITAME		Itelco	QEI
Model	TMF-4C20/SC	Digital 50 FM	THE-1	1246 <sup>5</sup>	A-20W	Galaxy EX20	T 241	#695
Power output range	5-20W, 50Ω N	2-15W	3-55W, 50ΩBNC	3-15W; 3-55W	15-100W, 50Ω N	5-20W, 50Ω N	100-600W, 50Ω N	25W, 50Ω N
Frequency range MHz	87.5-108MHz	87.5-108MHz	87.5-108MHz	Type N	87.5-108MHz	87.5-108MHz	87.5-108MHz	87.5-108MHz
Modulation capability	>±100Hz	>200% possible	±200kHz	±150kHz	>±75kHz	±200kHz	>±75kHz	100%
Asynchronous S/N	>68dB	-73dB	73dB	58dB	>65dB	>65dB	>60dB	>55dB
Synchronous S/N	...	-60dB	55dB	46dB	>65dB	>65dB	>52dB	>55dB
Composite input Z	600/4kΩ Lemo	2kΩ	2kΩ	...	1kΩ unbal	>1kΩ unbal BNC	Bal 600/5kΩ	10kΩ
Composite input level	-6, +14dBm	3.5Vpp	1Vrms	...	3.5Vp-p	3.5Vp-p	-4, 12dBm	3.5Vp-p
Composite THD	< 0.3%	0.01%	0.08%	< 0.3%	%	0.09%	< 0.07%	0.025%
Composite IMD	< 0.1%	0.2%, 0.02%	0.02%	< 0.3%	...	...	...	0.025%, 0.025%
Composite response	...	±0.1 30-100kHz	±0.1 30-53k	±0.5% 30-100k	±1 30-53k	±0.2 30-55k	0.2dB to 100kHz	±0.15 30-75k
Phase response	...	±0.1°	-1, +0.5°	±0.3°	...	...	...	±0.1°
Stereo separation	>45dB	...	to 50dB	40dB	49dB	>55dB	>50dB to 15kHz	60dB
SCA Inputs, Z	Also RDS, 2kΩ	Three, 10kΩ	Bal, 600Ω	Yes	[RF output 100W	[EP series amps	& RDS, 600Ω unbal	3 inputs, 10kΩ
SCA inputs level	0.5-3Vpp	3.5Vpp	10dBm	...	[to 1kW with	[at 100W	-10, 12dBm	1Vp-p
Amplitude response	[44C 100/D	±0.1 40k-100k	±0.5 30-15k	...	[aux power	[300W, 600W	±0.5 21k-100k	...
Stereo (SCA) generator	[100W output	External	Option	Yes	[amplifier	GE90	Integral	Any
Reader Service No	1328	1329	1330	1331	1332	1333	1334	1335

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Circle (57) on Reply Card

Manufacturer	QEI	Rohde & Schwarz	Telefunken	Thomson-LGT		TTC Television Technology Corp	
Model	Model 675 <sup>5</sup>	SU115	S3233	FMT series	FMT100S Ramsès II	FM-300J	Model X
Power output range	5-20W BNC	10W BNC	2-20W, Type N	4W, 50Ω N	30-100W, 50Ω N	150-275, 50Ω N	1-30W
Frequency range MHz	88-108MHz	87.5-108MHz	87.5-108	87.5-108MHz	87.5-108MHz	65-108MHz	76-108MHz
Modulation capability	150kHz pk	>±75kHz	±120kHz	±150kHz	±150kHz	±500KHz	±500kHz
Asynchronous S/N	>55dB	≥56dB	≥58dB unwt'd	>80dB	>80dB	>60dB	80dB
Synchronous S/N	>55dB	...	≥50dB unwt'd	>74dB stereo	>74dB	>60dB	80dB
Composite input Z	10kΩ	>3kΩ	600Ω/2kΩ	15kΩ bal	15kΩ bal	BNC	10kΩ
Composite input level	3.5Vp-p	-6, 9.5dBm	-4, +9.4	...	6dBm	...	3.5Vp-p
Composite THD	0.25%	≤0.6%	≤0.3%	< 0.15%	< 0.3%	0.01%	≤0.01%
Composite IMD/TIM	...	≤0.15%	< 0.1%	...	...	0.01%, 0.01%	≤0.01%
Composite response	±1 30-15k	≤0.3 to 75kHz	≤0.3dB 75kHz	±0.3 to 75kHz	±0.3 to 75kHz	±0.5 25-100k	±0.05 20-100k
Stereo separation	>40dB	≥43dB	>40dB	>50dB	>50dB	...	...
SCA Inputs	2, 10kΩ	Avail, ≥2k unb	Option	Yes	& RDS, 15kΩ	...	5 BNC, 10kΩ
SCA inputs level	1Vp-p	...	...	...	6dBm	...	1Vp-p
Stereo (SCA) generator	Model 772	Integral	Option	Integral (Opt)	Integral (Opt)	...	...
Reader Service No	1336	1337	1338	1339	1340	1341	1342

<sup>5</sup> #1237 300W; #1238 500W; 1239 1kW. <sup>6</sup> 675T300 300W; 675T150 150W.

## FM Broadcast Transmitters

Manufacturer	Broadcast Electronics			C.T.E. Int'l	Cemtys			Continental
Model	FM-300B <sup>1</sup>	FM-35B <sup>2</sup>	FM-5B <sup>3</sup>	VL5000 <sup>4</sup>	EF-20KX <sup>6</sup>	FM 2.000-SS <sup>6</sup>	FM 500C <sup>7</sup>	814C
Exciter suggested	FX-50	FX-50	FX-50	VL30	Model 18.128	Cemtys 18.128	Cemtys 18.128	802A
Output power range	400W	10-38.5kW	5.5kW	5kW	22.5kW	2kW	500W	3.8kW
Output connector, Z	Type N	3 1/8", 50Ω	1 1/2", 50Ω	1 1/2", 50Ω	3 1/8", 50Ω	Type N, 50Ω	Type N, 50Ω	1 1/2", 50Ω
Typical VSWR	1.1:1 max	1.8:1 max	2:1 max	Protected	1.8:1	...	...	1.2:1 max
Auto power control	...	Yes	Yes	Yes	Yes	...	...	Yes
Auto modulation control	...	...	...	Yes	...	...	...	Yes
Integrated remote control	Yes	Yes	Yes	Yes	Yes	...	...	Yes
μP diagnostics	...	Yes	Yes	Yes	CMOS logic	...	...	...



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Circle (58) on Reply Card

Manufacturer	Broadcast Electronics			C.T.E. Int'l	Cemlys			Continental
	FM-300B <sup>1</sup>	FM-35B <sup>2</sup>	FM-5B <sup>3</sup>	VL5000 <sup>4</sup>	EF-20KX <sup>5</sup>	FM 2.000-SS <sup>6</sup>	FM 500C <sup>7</sup>	814C
Model	FM-300B <sup>1</sup>	FM-35B <sup>2</sup>	FM-5B <sup>3</sup>	VL5000 <sup>4</sup>	EF-20KX <sup>5</sup>	FM 2.000-SS <sup>6</sup>	FM 500C <sup>7</sup>	814C
PA device or	Solid-state	4CX20000C or 8990 tetrode	4CX3500A tetrode	250kW SS modules	YL-1631 ceramic tetrode	Solid-state	Solid-state	Multiple 700W modules
PA circuit type	...	Folded $\lambda/2$	Folded $\lambda/4$	...	$\lambda/4$ cavity	...	...	...
IPA device	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor space	51x32"	91x32"	35x38"	1.28x.565x.680m	1.8x1.236x.9m	19" rack	19" rack	38x34"
Input ac power needed	194-266Vac	208VY/240V $\Delta$	208VY/240V $\Delta$	220V/380V	220/380Vac	200Vac	200Vac	220Vac
Power consumption/P.F./Eff.	1.2kW	51kW/.94/69%	8.3kW/.92/60%	9.8kW/51%	>0.93	...	950W	10.5kW
Reader Service No	1343	1344	1345	1346	1347	1348	1349	1350

<sup>1</sup> FM-250B 250W; FM-100 100W. <sup>2</sup> FM-20A to 22kW; FM-30A at 20kW; FM-30B 30kW; FM-20B 20kW; FM-10B 11kW <sup>3</sup> FM-3.5B 3.8kW; FM-1.5B 1.65kW; FM-1B 1.1kW <sup>4</sup> #VL2000 2kW; 10kW linear amplifier available. <sup>5</sup> EF-5KX 5kW; EF-10kX 10kW. <sup>6</sup> FM 1.000-SS 1kW. <sup>7</sup> FM 300C 300W; FM 100C 100W.

Manufacturer	Continental Electronics				ELENOS srl	Energy-Onix		
	814R-1 <sup>8</sup>	816A	816R-4B <sup>9</sup>	817A <sup>10</sup>	817R-5B <sup>11</sup>	T-2000-3 <sup>12</sup>	MK 22 <sup>13</sup>	MK 50 <sup>14</sup>
Model	814R-1 <sup>8</sup>	816A	816R-4B <sup>9</sup>	817A <sup>10</sup>	817R-5B <sup>11</sup>	T-2000-3 <sup>12</sup>	MK 22 <sup>13</sup>	MK 50 <sup>14</sup>
Exciter suggested	802A	802A	802A	802A	802A	60W required	SST-30	SST-30
Output power range	2.5kW	11kW	27.5kW	60kW	70kW	2kW	23.5kW	55kW
Output connector, Z	1 $\frac{1}{8}$ ", 50 $\Omega$	3 $\frac{1}{8}$ ", 50 $\Omega$	3 $\frac{1}{8}$ ", 50 $\Omega$	6 $\frac{1}{8}$ ", 50 $\Omega$	6 $\frac{1}{8}$ ", 50 $\Omega$	7 $\frac{1}{8}$ ", 50 $\Omega$	3 $\frac{1}{8}$ ", 50 $\Omega$	3 $\frac{1}{8}$ ", 50 $\Omega$
Typical VSWR	2:1 max	2:1 max	2:1 max	2:1 max	2:1 max	Cont. monitoring	<1.3:1	<1.3:1
Auto power control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auto modulation control	Yes	Yes	Yes	Yes	Yes	...	...	...
Integrated remote control	Yes	Yes	Yes	Yes	Yes	Optional	Opto isolation	Opto isolation
$\mu$ P diagnostics	Yes	Yes	...	8-bit	8-bit	via rmt ctl	...	...
PA device or	5CX1500A	Tetrode	4CX15000A	4CX40000G	2 9019/YC130	3CX1500A7	3CX10000A7	2 3CX15000A7
PA circuit type	$\lambda/4$ -cavity	...	Grounded Screen	Class C GS	90° hybrid	...	Grounded-grid	Grounded-grid
IPA device	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor space	35x24"	45x34"	72x28"	128x40"	160x28	19x24"	37x26"	37x52"
Input ac power needed	220Vac	220Vac 3 $\phi$	220Vac 3 $\phi$	220Vac 3 $\phi$	220Vac 3 $\phi$ s.ps.	240/380Vac	208-230V 3 $\phi$	208-230V 3 $\phi$
Power consumption	4.9kW	18.45kW	42kW	94.4kW	108kW	4.1kVA/64%	35kW for 22kW	75kW for 50kW
Reader Service No	1351	1352	1353	1354	1355	1356	1357	1358

<sup>8</sup> 815A 4CX3500A final; 5kW output, 9.8kW consumption. <sup>9</sup> 816R-2B 21.5kW; 816R-3B 25kW; 816Bs in tandem for 817R-2B 40kW; 817R-3B 50kW; 817R-4B 55kW. <sup>10</sup> 817B (60kW) dual cavity w/external combiner; update to 817A. <sup>11</sup> 816-R5B (35kW) one 9019/YC130. <sup>12</sup> Series 800W to >5kW. <sup>13, 14</sup> 1.5kW to 40kW

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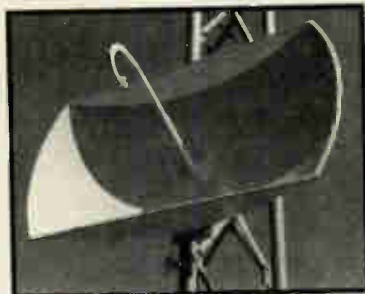
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Circle (59) on Reply Card



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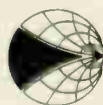


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Circle (60) on Reply Card

Manufacturer	Energy-Onix	Harris Broadcast				Harris TVT		ITAME SA
Model	SST-1000 <sup>15</sup>	FM 1FM <sup>16</sup>	HT 10FM <sup>17</sup>	HT 35FM <sup>18</sup>	Platinum PT10FM <sup>19</sup>	1239 <sup>20</sup>	1242-1247 <sup>21</sup>	ES-2000 (-1000)
Exciter suggested	SST-30	THE-1	THE-1	THE-1	THE-1	1248	1248	20W
Output power range	1kW	1kW	4-10kW	20-35kW	10kW	1kW	1.5kW-10kW	2kW (1kW)
Output connector, Z	7/8", 50Ω	7/8", 50Ω	3/8", 50Ω	3/8", 50Ω	3/8", 50Ω	Type N, 50Ω	1/2", 50Ω	1/2" (7/16), 50Ω
Typical VSWR	Protected	1.5:1	1.7:1 max	1.7:1 max	1.24:1	...	...	...
Auto power control	...	Yes	Yes	Yes	Yes	No	No	...
Auto modulation control	...	Yes	No	...	...	No	No	...
Integrated remote control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
μP diagnostics	...	...	Yes	Yes	Yes	No	No	...
PA device or	Solid-state	FET modules	4CX7500A	4CX2000D	FET1.35kW units	S-S 330W units	Solid-state FET	VMOS, 600W
PA circuit type	500W modules	...	λ/4-cavity	λ/4-cavity	...	...	modules	modules
IPA device	Solid-state	Solid-state	300W S-S	600W SS	Solid-state	Solid-state	Solid-state	Solid-state
Floor space	24x27"	23x25"	33x34"	34x34"	47x39"	23x29"	43x43"	24x36"
Input ac power needed	208-230Vac	220Vac	220-380 3	220-380 3φΔ	220/400Vac	380/415Vac	190-415Vac 3φ	220Vac
Power consumption/PF	2kW	2.9kW	15.7kW/0.95	52kW/0.95	28.2kVA/0.75	2.34kVA	3.2kW-21kW	<4.5kW
Reader Service No	1359	1360	1361	1362	1363	1364	1365	1366

<sup>15</sup> SSA-100 100W; SSA-300 300W; SSA-500 500W. <sup>16</sup> HT 250FM (250W), HT 500FM (500W) configurations upgrade to 1kW model. <sup>17</sup> Similar models include: HT 7FM (8kW); HT 5FM (5kW), HT 3.5FM (4kW) using 4CX3500A as PA device. <sup>18</sup> Similar models include HT30 FM 30kW; HT25 FM (25kW), HT20 FT (20kW) uses 8990 alternative PA. <sup>19</sup> PT 8FM 8.8kW; PT 5FM 5.5kW; PT 4FM 4.4kW; PT 2FM 2.2kW. <sup>20</sup> #1238 0.5kW; #1237 0.3kW. <sup>21</sup> #1242 1.5kW; #1243 2.5kW; #1244 3.5kW; #1245 5kW; #1246 7kW; #1247 10kW.

Manufacturer	ITAME SA	ITELCO	Marconi	Nautel	QEI Corporation			RIZ
Model	Tauro Mod 30 <sup>22</sup>	S233	B6526 (-25)	AMPFET FM	695T1kW	FMQ-30000B <sup>23</sup>	FMQ-5000 <sup>24</sup>	RBT, OR/U <sup>25</sup>
Exciter suggested	15W	T 241	Integral	Various	#695 or #675	#695 or #675	#695 or #675	...
Output power range	10-30kW	2kW	20kW (10kW)	4kW, 7kW	500-1250W	10-30kW	5.5kW	3-30kW
Output connector, Z	3/8", 50Ω	50Ω	3/8", 50Ω	1/2", 50Ω	1/2", 50Ω	3/8", 50Ω	1/2", 50Ω	50Ω
Typical VSWR	Protected	...	1.4:1	1.5:1	...	...	...	...
Auto power control	...	Yes	...	Yes	Yes	Yes	Yes	Yes
Auto modulation control	...	Yes	...	...	Automod	Automod	Automod	...
Integrated remote control	Yes	Yes	Option	Interface	ARC-27 opt	ARC-27 opt	ARC-27 opt	Yes
μP diagnostics	...	...	C-MOS logic	...	Option	Option	Option	Yes
PA device or	4CX-20000C	S-S 4-500W	9011 (8986)	Solid-state	Solid-state	3CX15000A7	3CX3000A7	<0.5% THD
PA circuit type	...	FET modules	Class C	250W modules	Solid-state	Grounded-grid	Grounded-grid	60-70 S/N
IPA device	Solid-state	Solid-state	200W S-S	...	...	3CX3000A7	Solid-state	...
Floor space	68x38"	22x30"	42x40"	29x32"	24x30"	72x30"	24x30"	...
Input ac power needed	220-380 3φ	380Vac 3φ	380-415V 3φ	220Vac (3φ opt)	208-240V 1φ	208-240V 3φ	208-240V 3φ	220Vac-440Vac
Power consumption	43kW	4.5kVA	33kW (17kW)	10.8kW for 7kW	2kW for 1.25kW	50kW	<9.5kW	5.5kVA-50kVA
Reader Service No	1367	1368	1369	1370	1371	1372	1373	1374

<sup>22</sup> Philips YL 1530 available as alternative PA device. <sup>23</sup> FMQ-20000B (20kW); #FMQ-10000 (10kW) uses Eimac YU148 PA device; FMQ-35000 w/4CX20000C. <sup>24</sup> FMQ-3500 (3.75kW). <sup>25</sup> RBT-3000 3kW, RBT-5000 5kW, RBT-10000 10kW, OR20U-01 20kW, OR30U-01 30kW

Manufacturer	Rohde & Schwarz	Telefunken	Television Technology Corp/TTC			Thomson LGT
Model	NU411 <sup>26</sup>	S3217	XLFM translators <sup>27</sup>	FM-25000J <sup>28</sup>	FMS-8000 <sup>29</sup>	FMT5000S RAMSESI <sup>30</sup>
Exciter suggested	SU155 R2	S3161	N.A.	Model X	Model X	Integral
Output power range	10kW	3kW-10kW	10W, 100W	15-25kW	8kW	5kW
Output connector, Z	Dezifix D <sup>26</sup> , 50Ω	1/2", 50Ω	Type N, 75Ω	3/8", 50Ω	1/2", 50Ω	1/2", 50Ω
Typical VSWR	≤1.8:1	...	...	...	2:1 max	1.4:1 max
Auto power control	Yes	Yes	...	...	...	Yes
Auto modulation control	Yes	Yes	...	Yes	Yes	Yes
Integrated remote control	Yes	Yes	...	Option	Option	Yes RS-232C
μP diagnostics	Yes	MCSG5364	...	...	...	Yes
PA device or	RS2024CL tetrode	RS2032CL tetrode	Solid-state	4CX15000A tetrode	Solid-state	Solid-state
PA circuit type	Grounded cathode	Grounded cathode	...	...	...	600W modules
IPA device	Solid-state	Solid-state	...	4CX250B	Solid-state	Solid-state
Floor space	23x29"	24x40"	Rack-mount	35x38"	46x31"	19x27"
Input ac power needed	220/380V 3φ	220/380Vac 3φ	110/220Vac	240V 3φ	240V	380V
Power consumption	21kVA	19kVA	75W (XL10FM2)	38kW	13kW	11kW
Reader Service No	1375	1376	1377	1378	1379	1380

<sup>26</sup> Other connectors available upon request. Model NU351 rated 5kW also uses Siemens RS 2024CL tetrode. <sup>27</sup> XL1FM 1W, XL1FM2 dual 1W output; XM10FM 10W, XL10FM2 dual 10W output; for translator service. <sup>28</sup> M-5000J to 6kW; FM-10000J to 11kW. <sup>29</sup> FMS-4000 to 4kW. <sup>30</sup> Related products in Ramseis II line include: 100W to 2kW solid-state, 10kW tube types; transposers to 100W.

In many cases, manufacturers have additional models beyond those shown in these comparisons. When speaking with the manufacturers about your needs, be sure to check on other models that may fit your requirements even more precisely.

# UHF Television Transmitters

Manufacturer	Acrodyne Industries			Comark Communications			CTE Int'l srl	EMCEE
	TL series	TR series <sup>1</sup>	TRU/1000 <sup>2</sup>	ESC series <sup>3</sup>	IOT series <sup>4</sup>	S-series <sup>5</sup>		
Model	TL series	TR series <sup>1</sup>	TRU/1000 <sup>2</sup>	ESC series <sup>3</sup>	IOT series <sup>4</sup>	S-series <sup>5</sup>	TRs ch/ch <sup>6</sup>	TTU5000DP <sup>7</sup>
Visual peak power	1kW (100W)	25kW (10.5)	1kW	60kW-280kW	40kW-240kW	10kW-280kW	100W	5kW
Response vs brightness	±0.75dB	±0.75dB	±0.75dB	±0.75dB	±0.75dB	±0.75dB	-0.75dB	...
Low frequency linearity	0.45dB	0.45dB	0.45dB	1.0dB	1.0dB	1.0dB	<1%	...
ICPM, uncorrected	±2'	±2'	±2'	2'	2'	2'	...	...
Diff phase gain	±1.5'/5%	1.5'/3%	±1.5'/3%	±3'/5%	±3'/5%	±3'/5%	<3'/N.A.	±3'/5%
K factor for 2T/12.5T	3%	2%/5%	2%/5%	2%/5%	2%/5%	2%/5%	...	2% 2T
Harmonics below visual	-60dB	-60dB	-60dB	-60dB	-60dB	-60dB	-60dB, <1mW	<-60dB
Visual (& aural) PA	S-S	Tetrode (Diplex)	Solid-state	ESC klystron	IOT	Klystron EC	S-S (Diplex)	TH382/9017 Dplx
Aural output power	10% of visual	10% of visual	100W	10% of visual	10% of visual	10% visual	% of visual	0.5kW
Carrier deviation	100kHz	100kHz	100kHz	±25kHz	±25kHz	±75kHz	...	...
Audio response	±0.1 50-50k	±0.1 50-50k	±0.1 50-50k	±0.5 30-15k	±0.5 30-15k	±0.5 30-15k	...	...
Applicable to stereo	BTSC	BTSC	BTSC	MTS BTSC	MTS	MTS/IRT	Per exciter	...
Harmonic distortion	1%	0.5%	0.5%	0.5%	0.5%	0.5%	...	1%
AM/FM noise	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	N.A.	...
Cooling method	Forced air	Water (5kW air)	Forced air	Water	Forced air/water	Forced air/water	Forced air	Air
Input AC power	120Vac (120/230)	208Vac	230Vac	...	...	480Vac 3φ	220Vac 50~	220Vac 3φ
Power consumption	4.4kVA (1.2kVA)	46kVA (26/16)	4.4kVA	F.O.M. to 120%	...	>70% efficient	1.1kVA	20kVA max
Reader Service No	1381	1382	1383	1384	1385	1386	1387	1388

<sup>1</sup> TRU/25k 10kV with 1kW s-s driver; 10kVC uses 400W s-s driver. <sup>2</sup> TLU/1000T with TCU frequency converter for translator use. <sup>3</sup> Powers from 60-70kW to 240-280kW, per sockets with 70kW ESC klystrons. <sup>4</sup> IOT inductive output tube from EEV development; 40kW to 240kW based on PA sockets; common amplification from 30kW-240kW. <sup>5</sup> External cavity; CCT-U-10S 10kW, -30S 30kW, -60SE 60kW, 1-tube visual; -60S 60kW, -120S 120kW, -240S 240kW hybrid-combined vision models; Comark/Thomson modulator, CTR-20 exciter. <sup>6</sup> Configures as LPTV transmitter or transposer, reception from bands I/III/IV/V. <sup>7</sup> TU1000E series translators; ceramic tetrode.

Manufacturer	Harris Broadcast		Harris TVT			ITS Corporation		
	TV-UM series <sup>8</sup>	TV-UX series <sup>9</sup>	1740 series <sup>10</sup>	1790 series <sup>11</sup>	SCEPTRE <sup>12</sup>	VISTA (1890) <sup>13</sup>	ITS-1240 <sup>15</sup>	ITS-220 <sup>16</sup>
Model	TV-UM series <sup>8</sup>	TV-UX series <sup>9</sup>	1740 series <sup>10</sup>	1790 series <sup>11</sup>	SCEPTRE <sup>12</sup>	VISTA (1890) <sup>13</sup>	ITS-1240 <sup>15</sup>	ITS-220 <sup>16</sup>
Visual peak power	120kW	120kW	10-30kW	60-240kW	3-30kW	60-240kW	10kW	100W
Response vs brightness	±0.75dB	±0.75dB	±1.0dB	±1.0dB	±1.0dB	±1.0dB	±0.5dB	±0.7dB

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Circle (65) on Reply Card

Manufacturer	Harris Broadcast			Harris TVT			ITS Corporation	
	TV-UM series <sup>8</sup>	TV-UX series <sup>9</sup>	1740 series <sup>10</sup>	1790 series <sup>11</sup>	SCEPTRE <sup>12</sup>	VISTA (1890) <sup>13</sup>	ITS-1240 <sup>15</sup>	ITS-220 <sup>16</sup>
Low frequency linearity	<1.0dB	<1.0dB	≤0.8dB	≤0.8dB	≤0.8dB	≤0.8dB	5%	10%
ICPM, uncorrected	±2.0'	±2.0'	≤±3'	≤±3'	≤±3'	≤±3'	±2'	±3'
Diff phase/gain	3'/<0.5dB	3'/<0.5dB	≤±3'/0.4%	≤±3'/0.4%	≤±3'/0.4%	≤±3'/0.4%	±1'/5%	±3'/5%
K factor for 2T/12.5T	2%/3%	2%/3%	<2%/<2%	<2%/<2%	<2%/<2%	<2%/<2%	2%/4%	2%/5%
Harmonics below visual	-60dB	-60dB	-70dB	-70dB	-70dB	-70dB	-60dB	-70dB
Visual (& Aural) PA	MSDC Klystron	Klystron	Klystron	Klystron	SS modules	VKP 7990 <sup>14</sup>	Tetrode (S-S)	Solid-state (dplx)
Aural output power	12kW (24)	12kW (24)	1-3kW	6-24kW	% of visual	6.6-24kW	500W, 1kW opt	5W
Carrier deviation	±120kHz	±120kHz	>100kHz	>100kHz	>100kHz	>100kHz	±75kHz	±75kHz
Audio response	±0.5 to 110k	±0.5 to 110k	0.5dB 30-15k	0.5dB 30-15k	0.5dB 30-15k	0.5dB 30-15k	±0.5dB 30-15k	±0.5dB 30-50k
Applicable to stereo	Yes	Yes	Yes	Yes	IRT/BTSC/NICAM	Yes	Yes	Yes
Harmonic distortion	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
AM/FM noise	-55dB/-60dB	-55dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB	-50dB/-60dB
Cooling method	Vapor phase	Vapor phase	Air/ vapor	Air/vapor	Air	Air/water	Air	Air/convection
Input AC power	480Vac ±5% 3φ	480Vac ±5% 3φ	380/415Vac	480Vac	380-480	480Vac	208/240Vac 1-3φ	117Vac
Power consumption	165kVA/10% aural	253kVA/10% aural	28-70kW	140-553kVA	11-45kVA	76-296kW	30kW black pix	0.75kW
Reader Service No	1389	1390	1391	1392	1393	1394	1395	1396

<sup>8</sup> TV-60UM 60kW; with combiner for higher power. <sup>9</sup> TV-60UX 60kW; with combiner for higher power. <sup>10</sup> #1740 rated 10-30kW; #1741 10-15kW; #1742 20-30kW; external cavity devices; LDM 17B1 similar with TH382visual, TH327 aural PA, forced air cooling. <sup>11</sup> #1790 60kW; 1790+1791 120kW; 1791+3 1790 240kW; aural 1790 24kW, 1791 12kW; 1792 6-8kW; external cavity klystrons. <sup>12</sup> Models for 3kW, 5kW, 10kW, 15kW; combiners for higher powers. <sup>13</sup> LDM 1890 60kW; LDM 1890+1891 120kW; LDM 1891+3 1890 240kW. <sup>14</sup> May use PT5080 klystron in aural service. <sup>15</sup> ITS-235A 5kW; 1-tube, multiplexed visual/aural. <sup>16</sup> ITS-210/-210A 10W, ITS-220/-220A 100W; translators ITS-222/-222A 100W, ITS-212/-212A 10W.

Manufacturer	ITS Corp.	Marconi	Rohde & Schwarz	Television Technology Corp			Thomson-LGT
	ITS-230A <sup>17</sup>	B7540 series <sup>18</sup>	NT UHF series <sup>19</sup>	UHF HP serie <sup>20</sup>	UHF-10MA	XL 1000U <sup>21</sup>	EUHF10000 <sup>22</sup>
Visual peak power	1kW	10kW-60kW	100W-40kW	30-120kW	10kW	1kW	10kW
Response vs brightness	±0.5dB	±0.5dB	<0.3dB	1dB	1dB	1dB	...
Low frequency linearity	5%	95%	...	0.8dB	0.8dB	0.8dB	5%
ICPM, uncorrected	±2'	±4'	...	3'	3'	2'	<3'
Diff phase/gain	±2'/5%	3'/0.95	≤3'/5%	4'/5%	4'/5%	3'/0.8dB	±3'/95%
K factor for 2T/12.5T	2%/4%	2% for 2T	<2% 20T	2%/2%	2%/2%	2%	±1.5%
Harmonics below visual	-60dB	-60dB (20mW)	≤-60dB	-65dB	-65dB	<-60dB	-60dB
Visual (& aural) PA	9017 (Diplex)	Klystron (or S-S)	Power dependent	See note 20	Klystrode (diplex)	TH-347 (diplex)	Solid-state
Aural output power	100W	1kW to 6kW	1/10-1/20 visual	2-10% visual	10% of visual	100W	1kW
Carrier deviation	±75kHz	±50kHz	≤50kHz	±25kHz	±120kHz	±40kHz	50kHz
Audio response	±0.5dB 30-15k	±1dB 30-15k	±0.3 to 60kHz	0.5 30-15k	±0.5 30-15k	0.5dB 30-15k	±0.5dB 40-20k
Applicable to stereo	BTSC	Yes	Dual carrier	BTSC/MTS	Yes	BTSC/MTS	Yes
Harmonic distortion	0.5%	0.5%	≤0.4% ±50kHz	0.5%	0.5%	<0.5%	0.5%
AM/FM noise	-50dB/-60dB	-50dB/-60dB	≥46dB/≥56dB	<-50dB/<-58dB	-55dB/-60dB	<60dB	-50dB
Cooling method	Forced air	Vapor	Per PA type	Vapor	Forced air	Forced air	Forced air
Input AC power	208/240Vac 1φ	380-415Vac 3φ	220-380Vac 3φ	480Vac	480Vac	220Vac	380Vac
Power consumption	5kW 50% APL	38kW-129kW	1.8kVA-119kVA	0.9 PF	27kVA	4.8kVA	34kVA
Reader Service No	1397	1398	1399	1400	1401	1402	1403

<sup>17</sup> ITS-232A 1kW translator; ITS-234A 2kW visual; ITS-1230 1kW solid-state w/50W aural. <sup>18</sup> B7545 10/15kW; B7546 20/30kW; B7547 30/45kW; B7548 65/60kW. <sup>19</sup> PAs use solid-state, tetrode or klystron devices, based on power level. <sup>20</sup> UHF-30 30kW, UHF-60 60kW, UHF-120 120kW; PA device options for klystron, MSDC klystron, Klystrode and IOT. <sup>21</sup> Translator XLS-1000U with solid-state PA, receives CCIR I/II/V/V; XL 100U/XLS 100U 100W. <sup>22</sup> EUHF 5000 5kW visual; RUHF 500S 500W; RUHF 100S 1kW, provision for translator.

## VHF Television Systems

Manufacturer	Acrodyne Industries		Harris Broadcast		ITELCO	LDL Communications/LARCAN	
	TR series1	TR series2	Platinum HT-10 <sup>1</sup>	Platinum HT-60 <sup>2</sup>	T134 (383A) <sup>3</sup>	TTS22M/TTP44M <sup>4</sup>	TTS5M/TTS10M
Frequency band (CCIR)	VHF-H (III)	VHF (I/III)	VHF (I/III)		CCIR I/III	VHF (I/III)	
Visual peak power	30kW (20)	10kW (5)	10kW	60kW	20kW (5kW)	22kW (44kW)	5kW (10kW)
Response vs brightness	±0.75dB	±0.75dB	±0.75dB	±0.75dB	0.5dB	±0.75dB	±0.75dB
Low frequency linearity	0.45dB	0.45dB	<0.5dB	<0.5dB	0.5dB	0.5dB	0.5dB
ICPM uncorrected	±2'	±2'	±1.5'	±1.5'	...	±1'	±1'
Diff phase gain	±1.5'/3%	±1.5'/3%	1'/3%	1'/3%	≤±3'/4%	±1'/±3%	±1'/±3%
K factor for 2T/12.5T	2%/5%	2%/5%	1.5%/3%	1.5%/3%	...	1%/3%	1%/3%
Harmonics below visual	-60dB	-60dB	-70dB	-70dB	<1mW	-80dB	-80dB
Visual (& aural) PA	Tetrode (Diplex)	Tetrode (Diplex)	SS modules	SS modules	TH 371 (S-S)	MOSGET SS	MOSGET SS
Aural output power	10% of visual	10% of visual	10% (20% opt)	10% (20% opt)	1/10; 1/20	2.2kW (4.4kW)	500W (1kW)
Carrier deviation	100kHz	100kHz	±200kHz	±200kHz	±50kHz	±200kHz	±200kHz
Audio response	±0.1 50-50k	±0.1 50-50k	±0.5 to 110k	±0.5 to 110k	0.5 40-15k	±0.5dB	±0.5dB
Applicable to stereo	BTSC	BTSC	Yes	Yes	...	Yes	BTSC
Harmonic distortion	0.5%		0.25%		<0.3%	0.05%	



Manufacturer	Acrodyne Industries		Harris Broadcast		ITELCO	LDL Communications/LARCAN	
	TR series1	TR series2	Platinum HT-10 <sup>1</sup>	Platinum HT-60 <sup>2</sup>	T134 (383A) <sup>3</sup>	TTS22M/TTP44M <sup>4</sup>	TTS5M/TTS10M
Model							
AM/FM noise	-50dB/-60dB	-50dB/-60dB	-55dB/-70dB	-55dB/-70dB	>50dB/>60dB	-60dB/-62dB	-60dB/-62dB
Cooling method	Forced air	Forced air	Forced air	Forced air	Air	Forced air	Forced air
Input AC power	208Vac	208Vac	280-415Vac 3φ	280-415Vac 3φ	380Vac 3φ	208-242Vac 3φ	380-440Vac 3φ
Power consumption	68kVA (39)	31kVA (21)	24.4kW for 10kW	135kW 10% aural	41.5kVA	36kW (80kW)	9.5kW (17.5kW)
Reader Service No	1404	1405	1406	1407	1408	1409	1410

<sup>1</sup> HT-5 5kW; HT-2 2kW; HT-1 1kW; HS (high-band) and LS (low-band). <sup>2</sup> HT-15 15kW; HT-30 30kW; HT-45 45kW; HS (high-band) or LS (low-band); consumption higher for HS Models. <sup>3</sup> T383A high-band with common amplification of visual, aural carriers. <sup>4</sup> TTS30M rated 30kW, TTS60M 60kW.

Manufacturer	GE-Marconi Communications		Rohde & Schwarz	Siemens	Thomson-LGT	Toshiba
	B7530 series1 <sup>5</sup>	B7530 series2 <sup>6</sup>	NT VHF series	5/10kW system <sup>7</sup>	EVHF20000 <sup>8</sup>	Series 2000
Model						
Frequency band (CCIR)	VHF-H (III)	VHF-H (III)	VHF-H (III)	VHF-H (III)	VHF (I, III)	VHF-L (I)
Visual peak power	1kW (2kW/5kW)	10kW (25/30kW)	100W-20kW	(5)/10kW	20kW	To 64kW
Response vs brightness	±0.5dB	±0.5dB	<0.3dB	...	...	...
Low frequency linearity	90%	90%	...	...	5%	<10%
ICPM uncorrected	±4*	±4*	...	...	<3*	±2%
Diff phase gain	±3*/0.95dB	±3*/0.95dB	≤3*/5%	≤±5*/≤±15%	±3*/5%	±3%/±5%
Harmonics below visual	60dB	60dB	≤60dB		-60dB	<-60dB
Visual (& aural) PA	SS & tetrode	SS & tetrode	SS or tetrode	RS 2026CL (dplx)	Solid-state	RF MOSFET array
Aural output power	0.1kW (.2-5kW)	1kW (2.5-3kW)	1/10-1/20 visual	(0.5)/10kW	2kW	10%-20% visual
Carrier deviation	±50kHz	±50kHz	≤50kHz	Per exciter	50kHz	±100kHz
Audio response	±1 30-15k	±1 30-15k	≤±0.3dB to 60kHz	Per exciter	±0.5dB 40-20k	±0.5dB 30-15k
Applicable to stereo	Yes	Yes	Dual carrier	Per exciter	Yes	BTSC
Harmonic distortion	0.5%	0.5%	≤0.4% ±50kHz	Per exciter	0.5%	<0.5% 30-15k
AM/FM noise	-50dB/-60dB	-50dB/-60dB	≥46dB/≥56dB unwd	...	-50dB	>50dB/>60dB
Cooling method	Forced air	Forced air	Per PA type	Forced air	Forced air	Forced air
Input AC power	380-415Vac 3φ	380-415Vac 3φ	220-380Vac 3φ	220-380Vac 3φ	380Vac	220Vac 3φ
Power consumption	4.9 for 1kW	59.5kW for 30kW	1kVA-52kVA	N.A.	36kVA	...
Reader Service No	1411	1412	1413	1414	1415	1416

<sup>5</sup> All high-band; 1kW to 5kW. <sup>6</sup> All high-band; 10kW, 25/30kW. <sup>7</sup> Various exciters; 5kW/5kW multiplexed; 20kW uses RS1034SK; typically for visual only unless multiplexed. <sup>8</sup> EVHF 5000S 5kW; EVHF 10000S 10kW.



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# Television Demodulators

Manufacturer	Barco Industries	Philips T&M	Rohde & Schwarz		Tektronix	Videotek
Model	VSD 1000 <sup>1</sup>	PM 5560 <sup>2</sup>	AMFS	EMFT & EMFD	1450-1	DM-141S
Serviceband (CCIR)	VHF, UHF (I-IV)	VHF UHF IF (I/III-V)	45MHz-960MHz	V/UHF/IF/CATV (I-V)	IF (I)	III-V)
Channel select	Xtal or PLL	PLL synthesized	Synthesized	Xtal, PLL, D/C	Fixed & tunable	Synthesized
RF input impedance	75Ω, 50Ω opt.	50Ω	50/75Ω	50/75Ω	50Ω	75Ω
Direct input range	-30/+30dBmV	3V max	0.5-100mV	0.5-100mV	80μV-5V	...
Offair input range	300μV-30mV	>100mV	0.5-100mV	0.5-100mV	80mV-5V	100μV-630mV
IF input range	0-40dBmV	70mV ±3dB	5-100mV	5-100mV	80μV-22mV	...
Input level Indicator	4-LED ladder	Analog meter	LED	Yes	LED display	No
Intercarrier input	...	Yes	Yes	Yes	50Ω	...
Split carrier mode	...	Yes	Yes	Yes	Yes	Yes
Zerocarrier reference	Yes	Int/Ext	Internal	Internal	Int	ext
Envelope, Synchronous detectors	Both	Envelop	Both	Both	Both	Synchronous
Quadrature detection	...	Yes	Yes	Yes	Yes	No
Aural signal reject	Yes	Yes	Yes	Yes	Yes	No
SAW filter design	Yes	No	Yes	Yes	Yes	Yes
# video outputs	2	3	1	1	2 75Ω	2
Aural deviation out	Yes	75kHz	Yes	±25kHz	50mV/kHz 600Ω	No
Audio line, speaker outputs	2 line, 2 spkr	0-6dBm var.	Both	Both	Includes spkr out	+4dBm & spkr out
Video clamp position	...	Backporch/sync	Backporch	Backporch	Sync	blank
Carrier, modulation failure alarms	Both	Carrier	Both	Both	...	No
Stereo audio type	Dual channel	MTS/dual aural/Nicam	Dual sound	BTSC & dual sound	BTSC system	BTSC
Reader Service No	1417	1418	1419	1420	1421	1422

<sup>1</sup> Available for I and BG (dual carrier stereo). <sup>2</sup> Accepts BTSC, dual aural and Nicam type signals for stereo audio.

# Waveform Monitors

Manufacturer	Electronic Visuals			Hamlet Video Int <sup>1</sup>	Leader Instruments				Magni Systems
	EV4042 (EV4031)	EV4051 Multiformat	EV4061 combo		HVI 204	5100 component	5860C (5860H)	5864 (5865)	
Model	EV4042 (EV4031)	EV4051 Multiformat	EV4061 combo	HVI 204	5100 component	5860C (5860H)	5864 (5865)	5870 (5871) <sup>4</sup>	MagniMonitor
Display size	8x10cm	8x10cm	8x10cm	128 linesx8.5μs	8x10cm	8x10cm	2.75" (8x10cm)	8x10cm	5.25x4.52-inch
Graticule	Int. illum	Internal	Illuminated	Internal	Int/electronic	Int illuminated	Int (illuminated)	Int illuminated	Int generated
Standards supported	N, P/-M, S	525/60, 625/50	N, P/-M, S	N, P/-M, S	N/P/HDTV/VAC	NTSC	NTSC	NTSC (PAL)	NTSC, PAL
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes	No (Yes)	Yes	No
Vertical response	Chroma, Lin.	LP, Lin.	∂G Flat	Chroma, ∂G	LP, ∂G	Chroma	LP, Gain Lin. <sup>3</sup>	Flat (∂G)	Chr. LP Flat ∂G
Time base magnification	1μs, 200μs/div	x5, x50	Yes	x3	x10/x25H x20V	x10 H, x20V	(x10 H, x20V)	x10 H, x20V	8X/32x/25x
RGB/YRGB displays	Yes (No)	Yes	Yes	Also YUV, YC	Yes	Yes	No (Yes)	Yes	Yes
VITS line select	7-22 (No)	No	No	2-line	...	No (Yes)	No (Yes)	Yes	No
Programmable	No	No	No	No	Presets	No	No (Yes)	Yes	...
Composite inputs	Yes	Yes	A B	Yes	Yes	Yes	Yes	Yes	Yes
Component inputs	No	YCrCb	No	Yes	Yes	No	No	No	Yes
Line strobe pulse	No	No	No	...	...	No (Yes)	No (Yes)	No	...
Vectorscope function	No	Yes	Yes	Yes	Yes, & shark-fin	No	No	Yes	Separate model
Waveform comparison	No	Superimposed	No	Yes	...	No	No	Yes	Parade
Reader Service No	1423	1424	1425	1426	1427	1428	1429	1430	1431

<sup>1</sup> James Grunder & Assoc. excl. US distributor; displays waveform, vector patterns on video monitor; expanded mode 512 linesx34μs; 300 series uses 4x sampling for clearer display. <sup>2</sup> Linearity response or 1-line H or 1-line V timebase on 5860H. <sup>3</sup> SC/H measurement, simultaneous A/B displays; full line select. <sup>4</sup> Model 5872 specifications as 5870, 5871 but no SC/H phase measurements, simultaneous A/B display and full line select capability.

Manufacturer	Magni Systems			Philips Test & Measuring			System Video		Tektronix
	WFM 530	WFM 560/561	WV 560/561	PM5661 (5662)	PM5664	PM5665	1258	2207 Combo	1480 series
Model	WFM 530	WFM 560/561	WV 560/561	PM5661 (5662)	PM5664	PM5665	1258	2207 Combo	1480 series
Display size	4x3.25"	4x3.25"	4x3.25"	8x10cm	8x10cm	8x10cm	10x10cm	8x10cm	8x10cm
Graticule	Int. illuminated	Int. illuminated	Int. illum	Internal	Int. electronic	Internal	Internal	Internal	Int
Standards supported	N P S	N P S	NTSC, PAL	NTSC PAL	RGB YP <sub>P</sub> , YIQ <sup>5</sup>	NTSC, PAL	NTSC, PAL/-M	NTSC, PAL	N, P/-M, S
Internal calibrator	Y	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vertical response	Chroma LP Flat	Chr. LP Flat	Chroma LP Flat ∂G	Chr /LP/Lin Flat∂G∂φ	Low pass, Flat	Chroma LP ∂G Flat, Linearity	Flat, LP, Lin, Chroma	Flat, LP, Lin, Chr. Parade	Flat, chroma, LP, IRE
Time base magnification	x10 (H/2H), x25 (2V)			x10, x20	x10, x25	x10, x20	....	25.6x	x5 10 20 25 50
RGB/YRGB displays	Yes	Yes	Yes	Yes	RGB only	Yes	Yes	Yes	Yes
DC restore	Back porch	Back porch	Back porch	Back porch	sync	Back porch	black	Back porch	sync
VITS line select	Yes	Yes	Yes	Any line	Any line	Any line	Yes	Yes	1L & 15L
Programmable	Yes	Yes	Yes	No	Yes	No	Yes	...	No
Composite inputs	Yes	Yes	Yes	Yes	No	Yes	A B	A B C	A B Aux

Model	WFM 530	WFM 560/561	WV 560/561	PM5661 (5662)	PM5664	PM5665	1258	2207 Combo	1480 series
Component inputs	Yes	Yes	Yes	No	Yes	No	...	No	...
Vectorscope function	No	Yes	Yes	w/SC/H $\phi$	Yes <sup>6</sup>	No	No	Simultaneous	No
Waveform comparison	Yes	Yes	Yes	Yes	Overlay	Yes	Overlays	No	Overlay
Reader Service No	1432	1433	1434	1435	1436	1437	1438	1439	1440
Manufacturer	Tektronix						Videotek		
Model	1710B series	1730 (1730-HD <sup>7</sup> -D2)	1740 series	1750 series	1780R series combo	WFM 300A	TSM-61 <sup>12</sup>	TVM-621 Combo	
Display size	8x10cm	8x10cm	8x10cm	8x10cm	2 8x10cm	8x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	Internal	Internal	Ext/Int/elect	Elect 1% accur.	Internal	Internal	Internal
Standards supported	N, P	N, P (multistd)	N, P-M	NTSC, PAL	NTSC, PAL	525/60, 625 50 RGB <sup>1</sup>	NTSC, PAL	NTSC, PAL	NTSC, PAL-M
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vertical response	LP, flat	Flat LP chr. (30MHz 2-tr filtr)	Flat, IRE, Luma, Chroma		Chr LP Flat Luma $\Delta$ step <sup>9</sup>	Chr., Lightning Bowtie LP	Chroma LP Flat, $\Delta$ Gain	Chroma LP Flat	Chroma LP Flat
Time base magnification	x10	x10, 20, 25	x10 20	x2 10 20 50	x5 10 20 25 50 100	x20	x20	x5V, x10H	
RGB/YRGB displays	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes R-Y Overlay
VITS line select	None	Any (& 14-line)	Internal jumper	8-23 6-21 319-334	1H or 15H	Any line	Yes	No	No
Programmable	No	Yes	All functions	All functions	Yes	...	No	Yes	Yes
Composite inputs	A B	A B	A B	A B	A B1 B2 B3 <sup>10</sup>	Yes	Yes	3	
Component inputs	No	3 each, A, B	No	No	A B1 B2 B3 <sup>10</sup>	RGB, YCrCb <sup>11</sup>	No	No	No
Vectorscope function	Burst phase	No	$\Delta\phi$ in R-Y mode	w/SC/H $\phi$	Yes	Yes	No	Yes	Yes
AF stereo phase mode	Yes	No	No	No	Yes	No	No	No	No
Waveform comparison	No	Parade, overlay	Parade, display	Ovrly Vctr/Wfm	Ovrly, Parade	Overlay, parade	No	Yes	Yes
Reader Service No	1441	1442	1443	1444	1445	1446	1447	1448	

<sup>5</sup> Also accepts Betacam inputs. <sup>6</sup> Star mode, Gamut, RGB out. <sup>7</sup> D-2 model for digital has same features. <sup>8</sup> 10ns/div and 1-1/2-3-line for -HD. <sup>9</sup> SC/H polar display, Diff Phase, Diff Gain. <sup>10</sup> Auxiliary in/out. <sup>11</sup> Transcoders for YIQ, YCrCb available. <sup>12</sup> TSM-51 has no 1H sweep or differential gain features.

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# Vectorscopes

Manufacturer	Electronic Visuals	Hamlet Video Int <sup>1</sup>	Leader Instruments		Magni Systems	
Model	EV4021	HVI 203	5850C	5854	VS 530/531	VS 560/561
Display size	8x10cm	128 linesx8.5µs3	8x10cm	2.75" diagonal	4x3.25	4x3.25"
Graticule	Internal	Electronic	Int	ext	Internal	Internal
Waveform mode	No	Yes	No	No	No	No
Standards	NTSC, PAL-M	NTSC, PAL, SECAM	NTSC	NTSC	NTSC, PAL	NTSC PAL
Function control	Manual	Manual	Manual	Manual	Manual or WFM530/560	
Integral calibrator	No	Yes	Yes	No	Test mode	Test mode
# composite inputs	A, B	2	...	2	3	6 composite <sup>3</sup>
Subcarrier reference	Yes	A B Black	A B Black	A B	A B C Black	A B C Black
Sync reference	A/B Black/Composite	A B Black	A B Blackburst	A B	A B C Blackburst	A B C Blackburst
Display reference	A/B/Ext	A B Ext	A B Ext	A B	A B C External	A B C Ext
Diff phase/gain measurements	2'	2%	1'	1%	1'	1%
VITS line select (range)	No	Full line range	Yes <sup>2</sup>	No	Yes w/WFM 530/560	w/WFM530/560
Luminance measurements	No	Yes	No	No	No	No
Reader Service No	1449	1450	1451	1452	1453	1454

<sup>1</sup>James Grunder & Associates exclusive US distributor; expanded mode 512 linesx34µs; unit displays vector, waveform patterns on standard video monitor; freeze, store functions; outputs recordable, transmittable; dual standard option; 300 series uses 4x sample rate for clearer display. <sup>2</sup>Determined by companion line select waveform monitor. <sup>3</sup>Or component inputs.

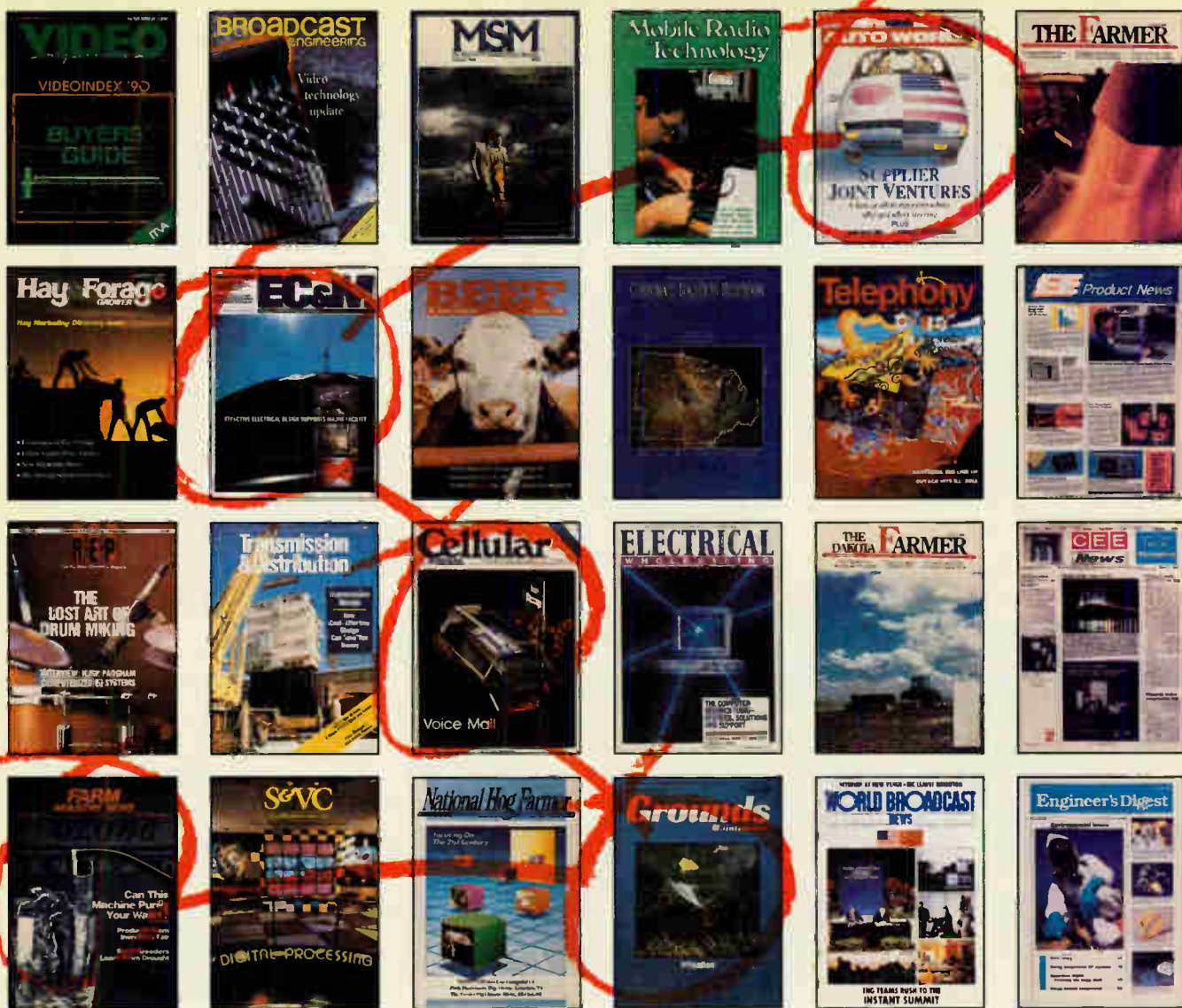
Manufacturer	Philips Test & Measuring		System Video	Tektronix	Videotek	
Model	PM5667	PM5668	1255	1720 series	TVM-720 combo	VSM-61
Display size	8x10cm	8x10cm	10x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	Internal	Internal	Internal	Internal etched
Waveform mode	Vector	∂φ	Vector	∂φ	SC/H φ	No
Standards	NTSC PAL-G/-M/-N	NTSC PAL-G/-M/-N	NTSC	PAL-M	NTSC	PAL
Function control	Manual	remote	Manual	remote	µP control panel	µP control
Integral calibrator	Yes	Yes	Yes	Yes	Yes	Yes
# composite inputs	A, B	2	A, B	A, B	To 8 <sup>6</sup>	2
Subcarrier reference	A B Blk CompSync	A B Blk CompSync	A B Ext Int	Ext ref	Various	A B Sync
Sync reference	A B Blk CompSync	A B Blk CompSync	A B Ext Int	Yes	Various	
Display reference	A B External	A B External	A B Ext Int	Int	Ext	Various
Diff phase gain measurements	0.2'	0.2'	to 0.05'	0.05% <sup>4</sup>	≤2'	≤2%
VITS line select (range)	from 5665 WFM	from 5665 WFM	...	From 1730 WFM <sup>5</sup>	Digital selector	No
Luminance measurements	No	No	No	No	Yes	No
Reader Service No	1455	1456	1457	1458	1459	1460

<sup>4</sup>With 1407 ∂φ/∂G option. <sup>5</sup>1725 for PAL; use with 1730, 1731, 1735 or WFM 300A waveform monitors. <sup>6</sup>Input for 2 CAV, 2 composite, 1 CAV and 5 composite or 8 composite signals; 3-D vector display shows luminance component on Z-axis; on-screen cursors; quad SC/H phase display; TVM-710 similar.

# Automated TV Test Systems

Manufacturer	GE-Marconi	PESA	Rohde & Schwarz				Systems Video	Tektronix	Videotek
Model	2924 analyzer	SWAT 2000	Model TIF <sup>1</sup>	Model UAF <sup>2</sup>	RMS100	UCMF system	WATCHDOG 2000	VM700 set	TVM-730 <sup>7</sup>
Standards supported	N/P/S	NTSC, PAL-B	N/P/S	N/P/S/	NTSC, PAL	NTSC, PAL	N/P dual <sup>6</sup>	NTSC, PAL	NTSC, PAL
Control computer	2-80188	Proprietary	Prop. transputer	Proprietary	IBM/PC comp.	IBM/PC comp.	Proprietary	Motorola 68020	...
Manual control mode	Yes	Yes	Yes	[Tests 3 inputs	Yes	Yes	Yes	Yes	Menu-driven
Programmable control	Yes	Yes	Yes	[simultaneously	Yes	Yes	9-/15-way D	Yes	Yes
Video test signal source	PM 5654	Video	Integrated generator				Ext 2360/2461	No	Ext source
Measurements per spc	FCC/RS-170, NTC-7	EIA, CCIR	Var. agencies	Var. agencies	C569 CBC NTC7 EIA250	per CCIR	EBU/CCIR/FCC	RS170A/NTC7 RS250B	NTC7
Line(s) used for test	Any line	Full field	...	Selectable	Line 17	...	Various	Any line	Any line
Automatic logging	Yes	Possible	Yes	Yes	Yes	Yes	EX800 Epson	via RS-232C	No
Waveform display-plot	VT100 terminal	CRT/LCD	External	No	No	Possible	# 2207 display <sup>2</sup>	Raster scan	w/Vectors
Data storage	Ext, int	Printout or PC	Memory cards	Memory cards	Internal	PC controller	Yes	Int, ext	To PC
Set parameter limits	3 upper & lower	Yes	Yes	Yes	Yes	Yes	All adjustable	Yes	Yes
Out-of-tolerance alarm	Yes	LED, ext, video	Yes	Yes	Yes	Yes	Alarms	On-screen	...
Carrier alarm	Yes	Yes	N.A.	N.A.	Yes	Yes	...	No	No
Modulation alarm	Yes	Yes	N.A.	N.A.	Yes	Yes	...	No	No
Reader Service No	1461	1462	1463	1464	1465	1466	1467	1468	1469

<sup>1</sup> Test period of 1s measures 26 video timing parameters. <sup>2</sup> Test period of 1s measures 25 parameters of video level, signal quality. <sup>3</sup> EIA 250B, CCIR 560 <sup>4</sup> System designed for Sound and Vision transmitters, active/passive 2-port networks. <sup>5</sup> Auto ID of standard. <sup>6</sup> Dual vector/waveform display. <sup>7</sup> TVM-730 Auto-Measure feature; 4 composite inputs.



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World Radio History

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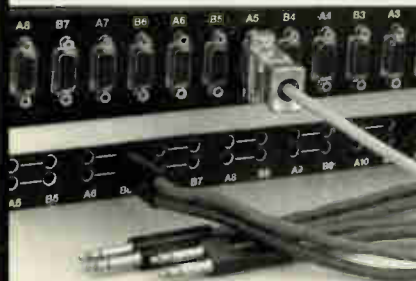
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Circle (61) on Reply Card

# Modulation Monitors

## AM Modulation Monitors

Manufacturer	Belar Electronics Laboratory	Broad-cast Elect.	Harris	ITAME	Motorola	TFT Inc	
Model	AMM2B (3)	AMM-3V	AS-10	AM-90	AM 90A	1410 AM/Stereo	753/755A
Frequency range	200k-160M	200k-160M	530-1620k	450k-30M	530k-4M	530-1620k	500k-4M
Off-air RF range	100µ-300m	...	500mV-15V	Ext RF amp	1-10Vrms	...	100µV-10V
Direct input range	5-10Vrms	5-10Vrms	...	1-10Vrms	...	500mV-15V	1-10V 50Ω
Input attenuator range	Continuous	Continuous	0-30dB, AGC	0-50dB	0-50dB	0-30dB	0/-50dB
Modulation range	0-133% <sup>1</sup>	0-133% <sup>1</sup>	0-133%	0-140%	0-133%	-0, +133%	0, +133%
Peak mod indicator	Adjustable	Program	Autoranging	Adjustable	LEDs	Adjustable	Adjustable
Peak flasher accuracy	2% (1%)	1%	...	±1%	...	2%	±10%
Audio output level	+10dBm	+10dBm	2.45VRMS	+10dBm	10dBm	100Bm	0dBm
Audio output connection	Unbal active	Bal Xlfr	600Ω bal	Bal	600Ω bal	AB	Bal/Unbal
AF resp (mono) dB Hz-kHz	±0.5dB 20-25k	...	...	0, -0.5dB	±0.5 20-25k	2dB, 30-20k	5% 20-25k
AF distortion (mono)	0.25% 99% mod	...	...	0.15%	...	0.25%	0.15%
Audio S/N ratio (mono)	75dB	75dB	...	75dB	75dB	+67dB	75dB
Meter, display type	Analog meters		Meters	Neon	Analog	Analog	Analog
Oscilloscope test output	Yes	Yes	Possible	Yes	...	Yes	No
Remote metering output	Yes	Yes	Possible	Yes	...	Yes	Yes
Failure alarms	Carrier; mod	±30% car; mod	...	Carrier; mod	Carrier fail.	...	Carrier off Mod low
Reader Service No	1470	1471	1472	1473	1474	1475	1476

## FM Modulation Monitors

Manufacturer	Belar	QEI	TFT Inc	
Model	FMM-2 <sup>1</sup>	Model 691	844A	884
RF range-channel	Xtal (Opt presets)	PLL	Preselector	Preselector
Off-air RF range	50µV-300mV	3.16-80mV	250µV-100mV	50µV-100mV
Direct input	1V-10V	1mW-50W	100mV-10V	0.5mV-100mV
Input attenuator	Continuous	...	0/-50dB 10dB steps	0/-50dB 10dB steps
Modulation range	0-133% on meter	0-133%	0, +133%	0, 133%
Meter response dB Hz-kHz	±0.1 10-100k	0.2 30-75k	±0.25 50-15k	±0.25 50-15k
Peak mod. adjustment	199%	0-199%	50-199%	50-199%
Peak flasher accuracy	1% 75kHz dev	±1%	1% 5kHz	20% 75kHz
Residual AM monitor	Integral	Yes	Integral	Integral
Audio output	+10dBm	1Vp-p	0dBm	0dBm
AF response	±0.01dB 10-50k	...	±0.5dB 30-120k	±0.5dB 50-15k
AF distortion (mono)	0.003% THD/IMD	0.05%	0.1%	0.2%
S/N ratio	90dB	>75dB	75dB	70dB
Composite output	1.5Vrms 75kHz dev	1V p-p	5Vrms 75kHz dev	50Vrms 75kHz
Stereo SCA monitor	Opt./FMS-2, 4-ch	.../Integral	Yes/Dual TFT 845	No/Dual TFT 845
Reader Service No	1477	1478	1479	1480

<sup>1</sup> Optional preselector. WIZARD analyzer may be used as adjunct for extensive modulation analysis.

## TV Aural Modulation Monitors

Manufacturer	Belar	Tektronix	TFT Inc	
Model	TVM-101 (-100)	751 BTSC	701 (Mono) <sup>2</sup>	850
RF range-channel	Any per request	Any US TV channel	Ch 2-83 (UHF/VHF)	
Off-air RF range V	200µ-1 50Ω	from 1450-1 demod	250µ-5m 75Ω	200µ-5m 50Ω
Modulation range	0-133% <sup>1</sup>	100% 73kHz max	0/133%	0/133%
Meter response dB HzkHz	±0.1dB 10-100k	±0.7k total	±0.2dB 50-15k	±2.0dB 50-120k
Audio output	+10dBm 600Ω bal	+8dBm 600Ω	2Vrms 600Ω	1.5Vrms 600Ω
AF response (out) ±dB HzkHz	±0.01 10-50k	±0.1 50-15k	0.2 15-15k	±0.5 50-50k
AF distortion (mono)	0.003% THD/IMD	<0.1dB main ch.	0.25%	0.1% 1kHz
S/N ratio (mono)	80dB	>70dB	-65dB	70dB
Composite output V/Ω	1.5V 75Ω	No	...	1.5V 75Ω
Meter display types	Analog (& digital)	EL bar graph	...	Analog meter
Carrier alarms	Yes	Yes	Yes	Yes
Stereo SCA monitor	TVM-210/SCM-2	Integral	No Single	Integral/Opt
Reader Service No	1481	1482	1483	1484

<sup>1</sup> Switchable for mono, BTSC stereo; integral residual AM, FM noise meter; split sound, quasi-parallel detection. <sup>2</sup> RF frequency counter, intercarrier frequency error measurements; remote meter.

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55	137	219	301	385	469	553	637	721	805	889	973	1057	1141	1225	1309	1393	1477
56	138	220	302	386	470	554	638	722	806	890	974	1058	1142	1226	1310	1394	1478
57	139	221	303	387	471	555	639	723	807	891	975	1059	1143	1227	1311	1395	1479
58	140	222	304	388	472	556	640	724	808	892	976	1060	1144	1228	1312	1396	1480
59	141	223	305	389	473	557	641	725	809	893	977	1061	1145	1229	1313	1397	1481
60	142	224	306	390	474	558	642	726	810	894	978	1062	1146	1230	1314	1398	1482
61	143	225	307	391	475	559	643	727	811	895	979	1063	1147	1231	1315	1399	1483
62	144	226	308	392	476	560	644	728	812	896	980	1064	1148	1232	1316	1400	1484
63	145	227	309	393	477	561	645	729	813	897	981	1065	1149	1233	1317	1401	1485
64	146	228	310	394	478	562	646	730	814	898	982	1066	1150	1234	1318	1402	1486
65	147	229	311	395	479	563	647	731	815	899	983	1067	1151	1235	1319	1403	1487
66	148	230	312	396	480	564	648	732	816	900	984	1068	1152	1236	1320	1404	1488
67	149	231	313	397	481	565	649	733	817	901	985	1069	1153	1237	1321	1405	1489
68	150	232	314	398	482	566	650	734	818	902	986	1070	1154	1238	1322	1406	1490
69	151	233	315	399	483	567	651	735	819	903	987	1071	1155	1239	1323	1407	1491
70	152	234	316	400	484	568	652	736	820	904	988	1072	1156	1240	1324	1408	1492
71	153	235	317	401	485	569	653	737	821	905	989	1073	1157	1241	1325	1409	1493
72	154	236	318	402	486	570	654	738	822	906	990	1074	1158	1242	1326	1410	1494
73	155	237	319	403	487	571	655	739	823	907	991	1075	1159	1243	1327	1411	1495
74	156	238	320	404	488	572	656	740	824	908	992	1076	1160	1244	1328	1412	1496
75	157	239	321	405	489	573	657	741	825	909	993	1077	1161	1245	1329	1413	1497
76	158	240	322	406	490	574	658	742	826	910	994	1078	1162	1246	1330	1414	1498
77	159	241	323	407	491	575	659	743	827	911	995	1079	1163	1247	1331	1415	1499
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2	84	166	248	332	416	500	584	668	752	836	920	1004	1088	1172	1256	1340	1424
3	85	167	249	333	417	501	585	669	753	837	921	1005	1089	1173	1257	1341	1425
4	86	168	250	334	418	502	586	670	754	838	922	1006	1090	1174	1258	1342	1426
5	87	169	251	335	419	503	587	671	755	839	923	1007	1091	1175	1259	1343	1427
6	88	170	252	336	420	504	588	672	756	840	924	1008	1092	1176	1260	1344	1428
7	89	171	253	337	421	505	589	673	757	841	925	1009	1093	1177	1261	1345	1429
8	90	172	254	338	422	506	590	674	758	842	926	1010	1094	1178	1262	1346	1430
9	91	173	255	339	423	507	591	675	759	843	927	1011	1095	1179	1263	1347	1431
10	92	174	256	340	424	508	592	676	760	844	928	1012	1096	1180	1264	1348	1432
11	93	175	257	341	425	509	593	677	761	845	929	1013	1097	1181	1265	1349	1433
12	94	176	258	342	426	510	594	678	762	846	930	1014	1098	1182	1266	1350	1434
13	95	177	259	343	427	511	595	679	763	847	931	1015	1099	1183	1267	1351	1435
14	96	178	260	344	428	512	596	680	764	848	932	1016	1100	1184	1268	1352	1436
15	97	179	261	345	429	513	597	681	765	849	933	1017	1101	1185	1269	1353	1437
16	98	180	262	346	430	514	598	682	766	850	934	1018	1102	1186	1270	1354	1438
17	99	181	263	347	431	515	599	683	767	851	935	1019	1103	1187	1271	1355	1439
18	100	182	264	348	432	516	600	684	768	852	936	1020	1104	1188	1272	1356	1440
19	101	183	265	349	433	517	601	685	769	853	937	1021	1105	1189	1273	1357	1441
20	102	184	266	350	434	518	602	686	770	854	938	1022	1106	1190	1274	1358	1442
21	103	185	267	351	435	519	603	687	771	855	939	1023	1107	1191	1275	1359	1443
22	104	186	268	352	436	520	604	688	772	856	940	1024	1108	1192	1276	1360	1444
23	105	187	269	353	437	521	605	689	773	857	941	1025	1109	1193	1277	1361	1445
24	106	188	270	354	438	522	606	690	774	858	942	1026	1110	1194	1278	1362	1446
25	107	189	271	355	439	523	607	691	775	859	943	1027	1111	1195	1279	1363	1447
26	108	190	272	356	440	524	608	692	776	860	944	1028	1112	1196	1280	1364	1448
27	109	191	273	357	441	525	609	693	777	861	945	1029	1113	1197	1281	1365	1449
28	110	192	274	358	442	526	610	694	778	862	946	1030	1114	1198	1282	1366	1450
29	111	193	275	359	443	527	611	695	779	863	947	1031	1115	1199	1283	1367	1451
30	112	194	276	360	444	528	612	696	780	864	948	1032	1116	1200	1284	1368	1452
31	113	195	277	361	445	529	613	697	781	865	949	1033	1117	1201	1285	1369	1453
32	114	196	278	362	446	530	614	698	782	866	950	1034	1118	1202	1286	1370	1454
33	115	197	279	363	447	531	615	699	783	867	951	1035	1119	1203	1287	1371	1455
34	116	198	280	364	448	532	616	700	784	868	952	1036	1120	1204	1288	1372	1456
35	117	199	281	365	449	533	617	701	785	869	953	1037	1121	1205	1289	1373	1457
36	118	200	282	366	450	534	618	702	786	870	954	1038	1122	1206	1290	1374	1458
37	119	201	283	367	451	535	619	703	787	871	955	1039	1123	1207	1291	1375	1459
38	120	202	284	368	452	536	620	704	788	872	956	1040	1124	1208	1292	1376	1460
39	121	203	285	369	453	537	621	705	789	873	957	1041	1125	1209	1293	1377	1461
40	122	204	286	370	454	538	622	706	790	874	958	1042	1126	1210	1294	1378	1462
41	123	205	287	371	455	539	623	707	791	875	959	1043	1127	1211	1295	1379	1463
42	124	206	288	372	456	540	624	708	792	876	960	1044	1128	1212	1296	1380	1464
43	125	207	289	373	457	541	625	709	793	877	961	1045	1129	1213	1297	1381	1465
44	126	208	290	374	458	542	626	710	794	878	962	1046	1130	1214	1298	1382	1466
45	127	209	291	375	459	543	627	711	795	879	963	1047	1131	1215	1299	1383	1467
46	128	210	292	376	460	544	628	712	796	880	964	1048	1132	1216	1300	1384	1468
47	129	211	293	377	461	545	629	713	797	881	965	1049	1133	1217	1301	1385	1469
48	130	212	294	378	462	546	630	714	798	882	966	1050	1134	1218	1302	1386	1470
49	131	213	295	379	463	547	631	715	799	883	967	1051	1135	1219	1303	1387	1471
50	132	214	296	380	464	548	632	716	800	884	968	1052	1136	1220	1304	1388	1472
51	133	215	297	381	465	549	633	717	801	885	969	1053	1137	1221	1305	1389	1473
52	134	216	298	382	466	550	634	718	802	886	970	1054	1138	1222	1306	1390	1474
53	135	217	299	383	467	551	635	719	803	887	971	1055	1139	1223	1307	1391	1475
54	136	218	300	384	468	552	636	720	804	888	972	1056	1140	1224	1308	1392	1476
55	137	219	301	385	469	553	637	721	805	889	973	1057	1141	1225	1309	1393	1477
56	138	220	302	386	470	554	638	722	806	890	974	1058	1142	1226	1310	1394	1478
57	139	221	303	387	471	555	639	723	807	891	975	1059	1143	1227	1311	1395	1479
58	140	222	304	388	472	556	640	724	808	892	976	1060	1144	1228	1312	1396	1480
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65	147	229	311	395	479	563	647	731	815	899	983	1067	1151	1235	1319	1403	1487
66	148	230	312	396	480	564	648	732	816	900	984	1068	1152	1236	1320	1404	1488
67	149	231	313	397	481	565	649	733	817	901	985	1069	1153	1237	1321	1405	1489
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72	154	236	318	402	486	570	654	738	822	906	990	1074	1158	1242	1326	1410	1494
73	155	237	319	403	487	571	655	739	823	907	991	1075	1159	1243	1327	1411	1495
74	156	238	320	404	488	572	656	740	824	908	992	1076	1160	1244	1328	1412	1496
75	157	239	321	405	489	573	657	741	825	909	993	1077	1161	1245	1329	1413	1497
76	158	240	322	406	490	574	658	742	826	910	994	1078	1162	1246	1330	1414	1498
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