

BROADCAST[®] engineering

AN INTERTEC PUBLICATION

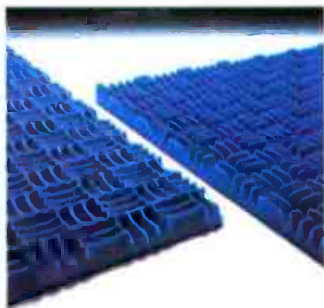
1991 ANNUAL ISSUE/S20

*Equipment
Reference
Manual*

THE MOST IMPORTANT AUDIO CONTROL EQUIPMENT WORKS FROM HERE TO HERE



Keeping sound clean and accurate can make or break your audio projects. SONEX from illbruck ensures that you're getting the sound you want. Our complete line of acoustical materials gives you total control—in the studio, the control room, or wherever sound quality is critical. There's a reason SONEX continues to lead—nothing works better. Put the leader to work for you; call today for all our performance specs and application guides—800-662-0032.



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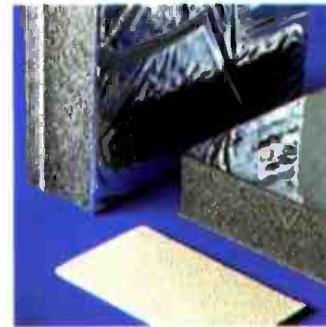
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..... The Price is \$13,000 Less.

Starting with a Four-Field Wide Band Synchronizer for \$5,995.*



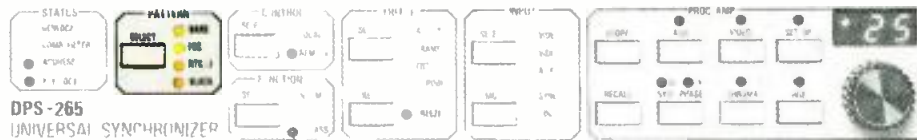
An infinite window TBC for \$4,995.*



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A 4-Pattern Digital Test Signal Generator with programmable VITS Inserter will set you back another \$4,995.*

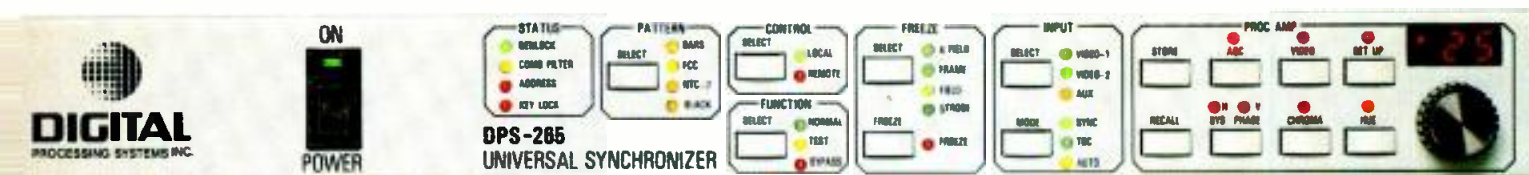


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*Based on published list price of leading industry manufacturers.

6 Letter from the Editors

8 Product directory

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

58 Manufacturers' addresses

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

95 Dealers/distributors

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

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The 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 courtesy of AT&T Graphics Software Labs. Artwork created by Katherine Hanley, using the RIO software package.)

One of Our CCD Cameras Should Be One of Yours

Presenting the Hitachi SK-F Series...
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The **SK-F1** is our ENG/EFP model that makes FIT technology affordable.

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“We chose Ikegami Cameras with an

When it comes to attracting future business to their remote mobile units, NEP understands the critical importance of selecting the right equipment.

Not surprisingly, when it came to selecting Studio Chip Cameras, they chose Ikegami's HK-355.

A long time Ikegami camera user, NEP's national recognition and quality reputation has been earned on such diverse productions as: *The Cosby Show*, *The Goodwill Games*, *Farm Aid Concert*, *The Tyson-Douglas Heavyweight Championship*, and *The Academy of Country Music Awards*.

When it comes to CCD technology, the right equipment for NEP is Ikegami.

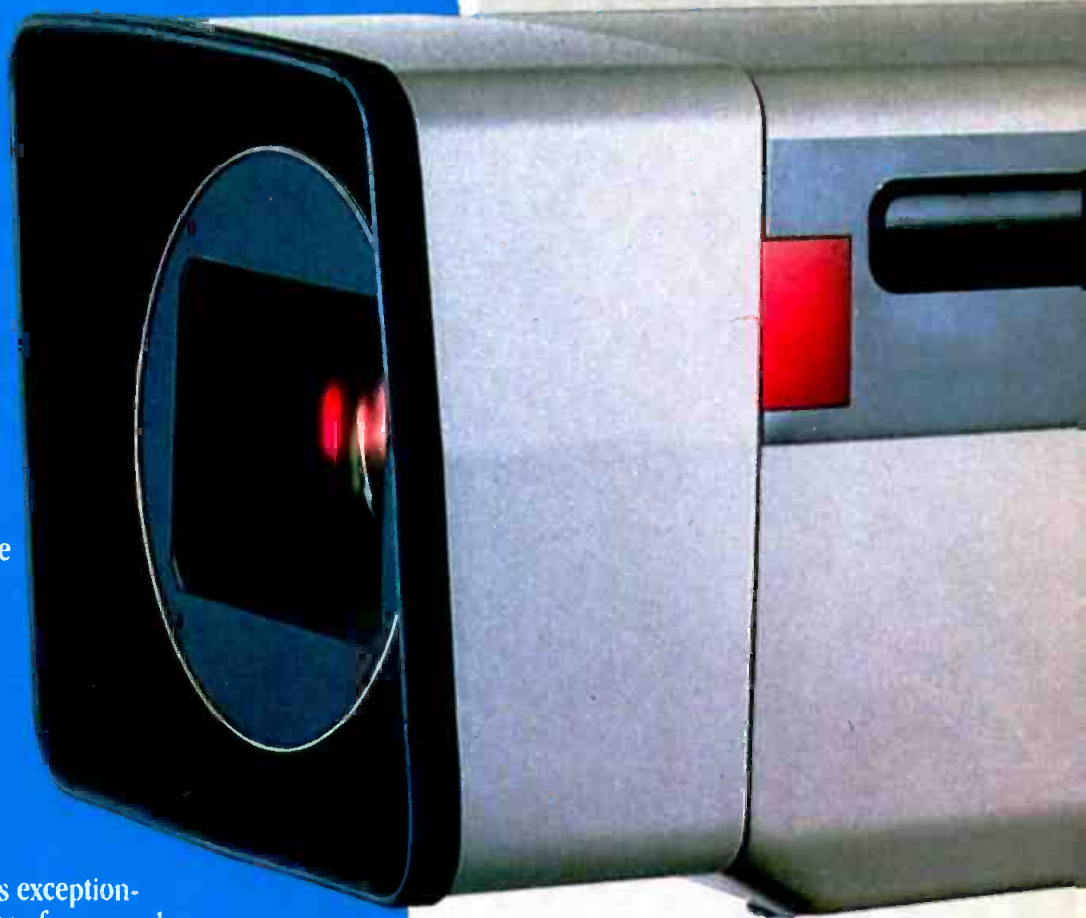
The HK-355 Studio Chip Camera offers many exceptional features:

- Three 2/3" FIT CCDs each with 450,000 pixels, deliver a resolution of 800 TVL and S/N ratio of 62 dB.
- 6-vector Color Corrector provides remote control of camera colorimetry-including a unique Auto-Color facility to produce matching colorimetry accurately and automatically.
- Computer Control System enables complete remote control, Full Auto Setup, extensive Diagnostics, and Multiple Filing System.
- Full 3 Channel Detail System reproduces exceptionally fine details in entire picture, regardless of scene colors.
- A hand-held version, the HK-355P, offers extensive remote control, Auto Setup and Diagnostics.

For more information, contact your Regional Ikegami Sales office.

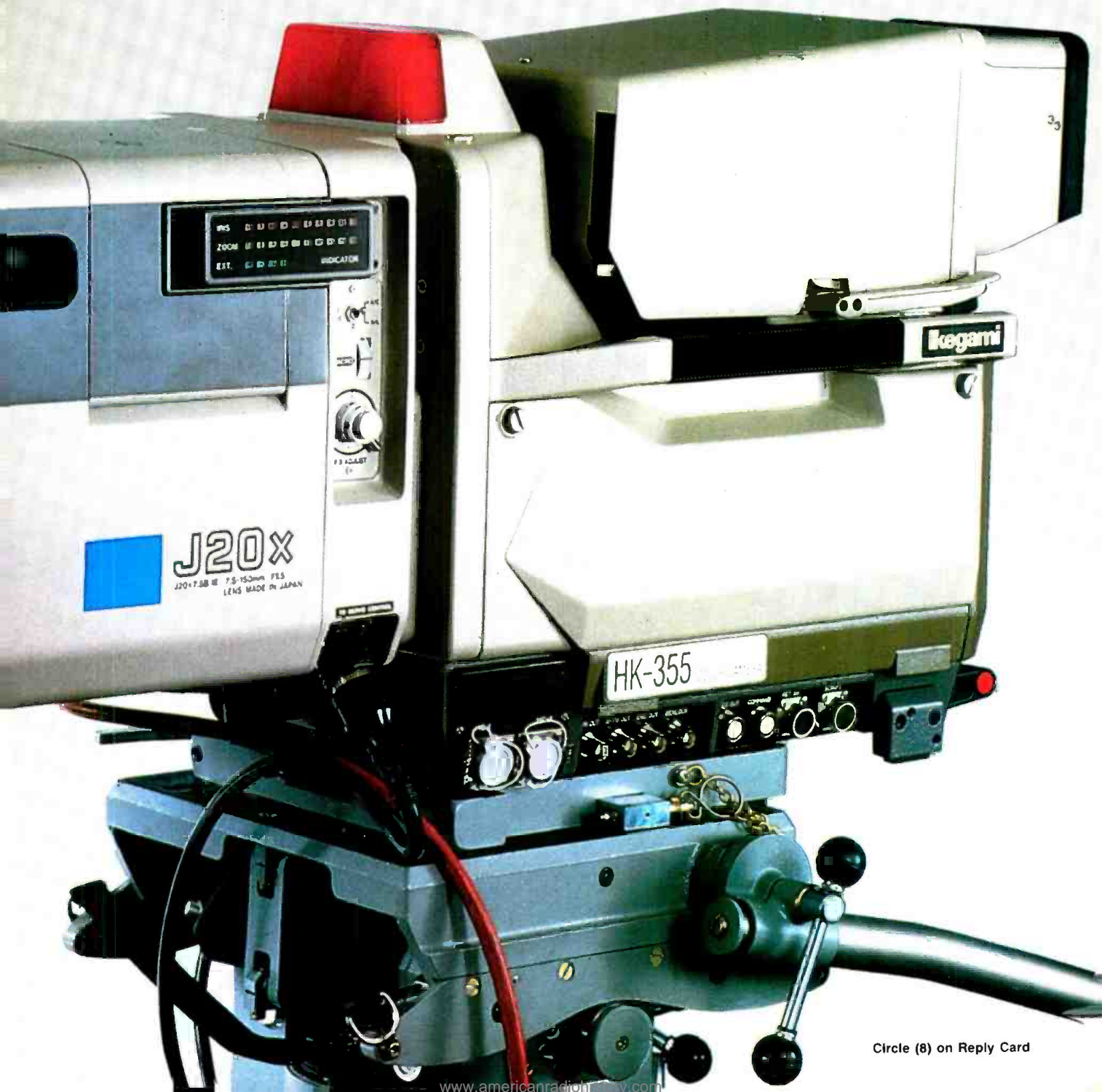
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Ikegami Electronics (U.S.A.) Inc., 37 Brook Ave., Maywood, NJ 07607
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Midwest: (708) 834-9774 Hawaii: (808) 946-5955



HK-355 Studio Chip eye on the future.”

-George Wensel, V.P. Operations, NEP



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1991 Equipment Reference Manual

Tradition continues with the **Broadcast Engineering 1991 Equipment Reference Manual**. Over the past 23 years, we have brought you the most extensive guide to product sources for the industry. Even though many changes have taken place in the industry, the 1991 edition of our annual directory remains the most complete guide we know of. It represents all new information provided by those companies responding to our request for information. Requests were directed to all participants of previous directories, to new companies exhibiting at trade shows and to those appearing in our *New Products* columns during the year. If a company is missing from this compendium, it is because we received no information from that company after repeated requests.

It was 10 years ago, when **Broadcast Engineering** first brought you the *Spec Book*, a unique presentation of com-

parative specifications for a variety of most-sought types of equipment. First, a stand-alone book, the *Spec Book* was later logically incorporated into the *Buyers' Guide*. As part of the long tradition of offering you as much information toward buying decisions as possible, the equipment specifications are included in this volume. These, too, represent new material from responding companies.

Fold-out tab pages quickly guide you to the different sections of this issue: *Buyers' Guide product listings*, *Manufacturers' addresses* and *Dealers & Distributors*. Throughout the product listings, color highlighting alerts you to advertisements in this issue. In addition, fold-outs are used to designate the beginning of *Audio Products*, *Video Products* and *RF & Test Products*. Within the specifications comparisons, company names are color highlighted to indicate advertisers.

As always, the staff of **Broadcast Engineering** is interested in serving you to the best of our ability. We enjoy bringing you this reference information and remain open to your suggestions of ways that we can help you in streamlining your research in future equipment purchases.

Pat Blanton

Pat Blanton, directory editor

Carl Bentz

Carl Bentz, special projects editor

BROADCAST engineering

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Advertising offices listed on page 143.

**INTERTEC
PUBLISHING**

The Urban Family of Broadcast Products

OPTIMOD-FM



8100A1 OPTIMOD-FM Audio Processor: The dominant choice for highest quality FM audio processing, on all continents.



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



222A Stereo Spatial Enhancer: Gives your station the competitive *leading edge* sound by naturally magnifying the stereo image.

OPTIMOD-AM/HF



9100B OPTIMOD-AM Audio Processor: Achieves extraordinarily natural audio quality on both voice and music, with loudness, intelligibility, remarkable source-to-source consistency, and FM-like brightness. Mono or stereo.



9105A OPTIMOD-HF Short-wave Audio Processor: Louder than OPTIMOD-AM; punches through noise, fading, and interference with outstanding intelligibility.

OPTIMOD-TV



8182A OPTIMOD-TV Audio Processor: For both stereo and mono television; works with all stereo systems (BTSC, NICAM, dual-carrier, EIAJ). Controls levels from any source artfully and automatically, without audible processing artifacts. Effectively controls loudness of commercials.

BTSC TV Stereo (for NTSC countries): BTSC TV Stereo, Second Audio Program (SAP) and Professional Channel (PRO) Generators. Meets the highest specifications.

AND OUR NEW TRANSMISSION LIMITER



4000A Transmission Limiter: We aimed for undetectable peak limiting... And we reached our goal. The sound is so transparent that you can't hear it work.

Orban OPTIMOD products are used by tens of thousands of broadcast stations all around the world, by local broadcasters and the world's most influential national broadcast organizations. Orban products are known for their high standard of construction and reliability. We're proud of our products and stand behind them with technical support from broadcast engineers who understand your needs.

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LISTEN TO THE DIFFERENCE.

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Buyers' Guide product listings

Audio Products

Color highlighting denotes advertisers and ad page numbers

AMPLIFIERS, DISTRIBUTION

1-in/N-out; stand-alone, modular, rack frame with power supply; may include multiple sections.

Acron Ltd.
 ADA Signal Processors
 Advanced Video Associates
 AEQ-Aplicaciones Electronicas Quasar
 Aiphone Intercom Systems
 Allen Avionics
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 API-Audio Products
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 Logitek Electronic Systems
 LPB
 MBI Broadcast Systems Ltd.
 McCurdy Radio Industries
 McCurdy Telecommunication Products
 McMartin
 Modular Audio Products/Modular Devices
 MTC/Mycomp Technologies Corp.
 Multidyne Electronics

Neumade Products Corp.
 NTP Elektronik
 NVision
 Omicron Video 100
 Opamp Labs
 OpTex
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 ProTech Audio Corp.
 Radio Systems
 Ram Broadcast Systems
 Ramko Research
 Rane Corp.
 Reliance Comm/Tec
 Richmond Sound Design
 ROH Products
 ROOD Megatronics B.V.
 RTS Systems/Telex Communications
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 Spectra Sonics
 Summit Audio
 Target Technology
 Tech Electronics
 Telex Communications
 Video Accessory Corp.
 Videoquip Research Ltd.
 Videotek
 Vortex Communications Ltd.
 Ward-Beck Systems Ltd. BC
 Wheatstone Corp.

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 ITI Electronics
 JBL Professional
 JNS Electronics
 KINTEK
 Logitek Electronic Systems
 McCurdy Radio Industries
 McCurdy Telecommunication Products
 McMartin
 Mobile-Cam Products
 Modular Audio Products/Modular Devices
 Multidyne Electronics
 Numark Electronics
 Opamp Labs
 Peavey Electronics
 ProTech Audio Corp.
 QSC Audio Products
 Ram Broadcast Systems
 Ramko Research
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 Richmond Sound Design
 ROH Products
 RTS Systems/Telex Communications
 Schafer World Communications Corp.
 Seem Audio
 Sescorm
 Societe Anonyme Des Techniques Digitales Digitec S.A.
 Spectra Sonics
 Symetrix
 Target Technology
 Tech Electronics
 Telex Communications
 TOA Electronics
 UREI, JBL Professional
 US Audio
 Videoquip Research Ltd.
 Wohler Technologies 169
 World Video
 Yamaha/Professional Audio

CABLE, AUDIO, MIC

1-/multiple-pair, shielded.

Arcor Broadcast Products
 Audio-Technica U.S.
 AVS France
 Barco-EMT
 Berk-Tek
 Beyer Dynamic
 Bi-Tronics
 Black Audio Devices
 C.A.E.
 Canare Cable 143
 Canford Audio plc
 Chester Cable/Alcatel n.a.
 Clark Wire & Cable
 Comprehensive Video Supply Corp.
 Connectronics Corp.
 Crouse-Hinds CAM-LOK Products
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 OpTex
 Peavey Electronics

Ramko Research
 Seam-Tech
 Sescorm
 Teledyne Thermatics
 TOA Electronics
 Videoquip Research Ltd.
 Whirlwind
 Wireworks Corp.

CD PLAYERS

Barco
 Barco-EMT
 Broadcast Automation
 Canford Audio plc
 Carver Professional
 Century 21 Programming
 Denon America
 Discrete Technology Labs
 DKW Systems
 Leonardo Software
 Numark Electronics
 Ram Broadcast Systems
 Ramsa/Panasonic 9
 Sony Business & Professional Group 14-15, 128-129
 Studer Revox America
 TASCAM/Teac Corp. of America

DELAY SYSTEMS

Systems and devices introducing audio delays to compensate for signal delays in video processing; excludes audio effects, reverb.

AMS Industries
 Audio/Digital
 Barco-EMT
 Digital Audio Research
 Eventide
 IRP, A Knowles Div.
 Klark-Teknik
 Leitch Video 87
 Lexicon 77
 MacroMedia Design
 Orban Associates/AKG Acoustics 7, 146
 Peavey Electronics
 Ram Broadcast Systems
 Spectra Sonics
 TC Electronic
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 Yamaha/Professional Audio

DUPLICATORS, AUDIO

Accurate Sound Corp.
 Canford Audio plc
 Gauss
 Lyrec Mfg. AS
 Magnetax International
 Otari Corp.
 RTS Systems/Telex Communications
 TASCAM/Teac Corp. of America
 Telex Communications

DYNAMICS PROCESSORS

Including compression, limiting, expansion, noise reduction, de-essing, spectral enhancements.

AKG Acoustics 146
 Antex Electronics
 Aphex Systems Ltd.
 Ashly Audio
 ATI-Audio Technologies 165
 Audio Animation 59
 Audio Developments Ltd.

Is your company missing from this directory? Either your company is not on our mailing list or someone failed to respond to requests for material. To be on the list for the 1992 edition, send a note to: BE Directory Editor, PO Box 12901, Overland Park, KS 66212.

You can't afford to spend less on a DAT. And you certainly can't afford to spend more!

Introducing the new, improved Pro-DAT Recorder from Panasonic: the SV-3700. "New?" "Improved?" Aren't those just overused buzz-words for breakfast food or laundry detergents? Sure. But the SV-3700 is new, and it is improved, and we want to tell the professional user about its 4th generation technology as directly as we can.

You know the sonic and performance excellence of the Panasonic SV-3500 DAT. Who in the industry doesn't? The new SV-3700 incorporates significant advances in analog-to-digital converters, digital-to-analog converters, transport accuracy and reliability plus control and interface technology. In the SV-3700, one bit A-D converters bring dramatically improved performance and linearity compared to conventional successive approximation A-D converters. These high-performance one-bit ADCs reduce both signal and zero cross distortion producing cleaner, clearer audio at low as well as high levels.

Subjectively, these technical advances translate to accuracy in the spectral balance, ambience, and "space" around instruments that form the most important part of natural musical and "correct" sound.

Oh yes, there's another very important improvement in the SV-3700. Price. When you visit your dealer, you'll find that in professional applications you can't afford anything less than the SV-3700. And you certainly don't have to spend more. For more information, contact Panasonic Pro Audio, 6550 Katella Avenue, Cypress, CA 90630. 714-373-7278.

Panasonic
Professional Audio Systems

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*Especially for
budget-conscious CEs...*

First,
there were
patchbays...

Then,
there were
routing switchers...

Now,
there's
AutoPatch™

Making 21st Century connections...  ...TODAY.

AutoPatch matrices provide complete signal distribution capabilities for:

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- ❖ 3 ru enclosures can contain any mixture of signal types
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- ❖ **2YDM:** non-expandable as 4x4, 8x4, 4x8, and 8x8
- ❖ **4YDM:** field expandable in increments of 4: 4x4 thru 32x128

- ❖ **8YDM:** field expandable in increments of 8: 8x8 thru 64x256
- ❖ **Larger matrix?** Please call.

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- ❖ Line level audio (+22 dBu; 5 Hz - 50 kHz)
- ❖ Line level video (>2.5 v p-p; 12 mHz)
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- ❖ Prices start under \$1100



AutoPatch A/V Division

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*Customer Service:
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Gentner Electronics Corp. 149
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Hit Design
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JNS Electronics
Kahn Communications
Klark-Teknik
Lectrosonics 91
Logitek Electronic Systems
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Modular Audio Products/Modular
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Texar Div./Gentner Electronics Corp.
TOA Electronics
Valley International
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Yamaha/Professional Audio

EDITORS, DIGITAL WORKSTATIONS

Hard disk recorders, software.
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AGAP
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Otari Corp.
Schafer World Communications Corp.
Solid State Logic
Soundmaster USA
Studer Editech
Studer Revox America
Symetrix
Time Logic
Wheatstone Corp.

EFFECTS PROCESSORS

Plate/room simulation, reverb, flanging, chorus functions; profanity delays; may include simple delay function but excludes delay-only compensation.
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AKG Akustische u. Kino-Geräte
AMS Industries
Audio Developments Ltd.
Barco-EMT
BBE Sound
D&R Electronica b.v.
Eventide
Gotham Audio Corp.
Klark-Teknik
Lexicon 77
Numark Electronics
Peavey Electronics
Soundmaster USA
Studio Technologies
TC Electronic
TOA Electronics
Yamaha/Professional Audio

EQUALIZERS

HP-/LP-Filters, parametric, psophometric, swept.
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Biamp Systems
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JBL Professional
JNS Electronics
Klark-Teknik
Lectrosonics 91
Matthey Electronics
McCurdy Telecommunication Products
MicroAudio
Modular Audio Products/Modular
Devices
NTP Elektronik
Numark Electronics
Opamp Labs
Orban Associates/AKG
Acoustics 7, 146
Peavey Electronics
Ram Broadcast Systems
Rane Corp.

Richmond Sound Design
Rocktron/RSP Technologies
Sescom
Spectra Sonics
Summit Audio
Symetrix
TC Electronic
TOA Electronics
Trident Audio USA
TTE
UREI, JBL Professional
Valley International
Vortex Communications Ltd.
Wheatstone Corp.
White Instruments Div. of C. Van R.
Yamaha/Professional Audio

FADERS, ATTENUATORS

Console replacement and automated faders; audio attenuator pads.
AMEK Systems & Controls
Canford Audio plc
D&R Electronica b.v.
GML George Massenburg Labs
Henry Engineering
IGM Communications
Intelix Corp.
McCurdy Telecommunication Products
Neve
NTP Elektronik
Penny & Giles
Ramko Research
Richmond Sound Design
Schafer World Communications Corp.
Shalco
Spectra Sonics
Vortex Communications Ltd.

HEADPHONES, HEADSETS

AKG Acoustics 146
AKG Akustische u. Kino-Geräte
Audio-Technica U.S.
Beyer Dynamic
Bims & Sawyer
Broadcast Electronics 17
Canford Audio plc
Cine 60
Clark Co., David
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Countryman Associates
Drake Electronics Ltd., Philip 52
Dynatech Tatical Communication
EDCOR
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Hamaphot KG
Multidyne Electronics
Nady Systems
Numark Electronics
OpTex
R-Columbia Products Co.
Ram Broadcast Systems
ROH Products
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Sennheiser Electronic Corp. 85
Setcom Corp.
Stanton Magnetics
Systems Wireless Ltd.
Target Tuning
Technical Projects
Television Equipment Associates
Telex Communications
Telfax Communications
TOA Electronics
Valcom Ltd.
VXI Corp.
Yamaha/Professional Audio

INTERCOMS

Alphone Intercom Systems
Atlas/Soundolier

AVEC
AVS France
Bogen Communications
Brabury International
Canford Audio plc
Clark Co., David
Clear-Com Intercom Systems 105
Drake Electronics Ltd., Philip 52
Dukane Corp.
Heikki Malkki Ltd.
HM Electronics
Intelix Corp.
JNS Electronics
Lee Dan Communications
Marti Electronics
McCurdy Radio Industries
McMartin
Nady Systems
Professional Sound Corp.
R-Columbia Products Co.
Ram Broadcast Systems
ROH Products
ROOD Megatronics B.V.
RTS Systems/Telex Communications
Setcom Corp.
Societe Anonyme Des Techniques
Digitales Digitec S.A.
Studio Technologies
Swintek Enterprises
Systems Wireless Ltd.
Technical Projects
Telectro Systems Corp.
Television Engineering Corp.
Television Equipment Associates
Telex Communications
Telos Systems
TOA Electronics
Vega/Mark IV
Vortex Communications Ltd.
Ward-Beck Systems BC
Wheatstone Corp.

MIC ACCESSORIES

Windscreens; direct boxes; booms, stands
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API-Audio Products
Atlas/Soundolier
Audio Visual Assistance
Audio-Technica U.S.
Beyer Dynamic
Bims & Sawyer
Black Audio Devices
Bogen Communications
Broadcast Electronics 17
Bruel & Kjaer Instruments
Canford Audio plc
Carvin Corp.
Cine 60
Countryman Associates
Da-Lite Screen Co.
Dukane Corp.
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Electro-Voice
Gotham Audio Corp.
Heitz, Karl
Keith Monks Ltd.
OpTex
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ROH Products
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Studio Technologies
Summit Audio
Symetrix
TC Electronic
Telectro Systems Corp.
Valley International
Vortex Communications Ltd.
World Video

RECORDERS, CARTRIDGE

NAB; includes digital products emulating standard cart machines.
AMS Industries
Asaca/Shibasoku Corp. of America
Audi-Cord Corp.
Barco-EMT
Broadcast Automation
Broadcast Electronics 17
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Cartridge Technology Professional Recording Eqpt.
CompuSonics Corp.
Corporate Computer Systems Audio Products Div.
Fidelipac Corp.
Granite Telecom Corp.
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International Tapetronics Corp.
MacroMedia Design Management. The
Otari Corp.
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Ramko Research
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Sonifex Ltd.
Soundmaster USA
360 Systems
Wheatstone Corp.

RECORDERS, CASSETTE

Accurate Sound Corp.
Canford Audio plc
IMC/Akai
OpTex
Peavey Electronics
Ram Broadcast Systems
Sharp Electronics Corp. Professional Products Div.
Sony Business & Professional Group 14-15, 128-129
Studer Revox America
TASCAM/Teac Corp. of America
Telectro Systems Corp.
Tiffen Mfg. Corp.
Uher of America
Yamaha/Professional Audio

RECORDERS, DIGITAL

All formats
Apogee Electronics Corp.
Asaca/Shibasoku Corp. of America

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Uher of America

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Northern Magnetics
Nortronics Co. c/o Applied Magnetics
Otari Corp.
Saki Magnetics
Studer Revox America

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Ampex Recording Media Corp. 60
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Canford Audio plc
Cine 60
CoarcVideo
Fidelipac Corp.
International Tapetronics Corp.
Polyline Corp.
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Sony Magnetic Products Co.
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Monroe Electronics
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NVision
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Telfax Communications
360 Systems
Titus Technological Labs
Utah Scientific
Videoquip Research Ltd.
Videotek
Vortex Communications Ltd.
Ward-Beck Systems BC
Whirlwind

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Includes integrated amplifier-speaker units.
ADA Signal Processors
AKG Akustische u. Kino-Gerate
Atlas/Soundolier
Audio-Technica U.S.
Auerheimer Labs & Co.
Auratone Corp.
AVS France
Bogen Communications

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ROH Products
Samson Technologies Corp.
Spectra Sonics
Target Technology
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Tiffen Mfg. Corp.
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STEREO CORRECTORS, SYNTHESIZERS

Includes audio phase correction systems.
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Studio Technologies
Titus Technological Labs

TELEPHONE BANDWIDTH EXTENDERS

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Kahn Communications
McCurdy Telecommunication Products
Multidyne Electronics
Ram Broadcast Systems
ROOD Megatronics B.V.
Telfax Communications
Titus Technological Labs

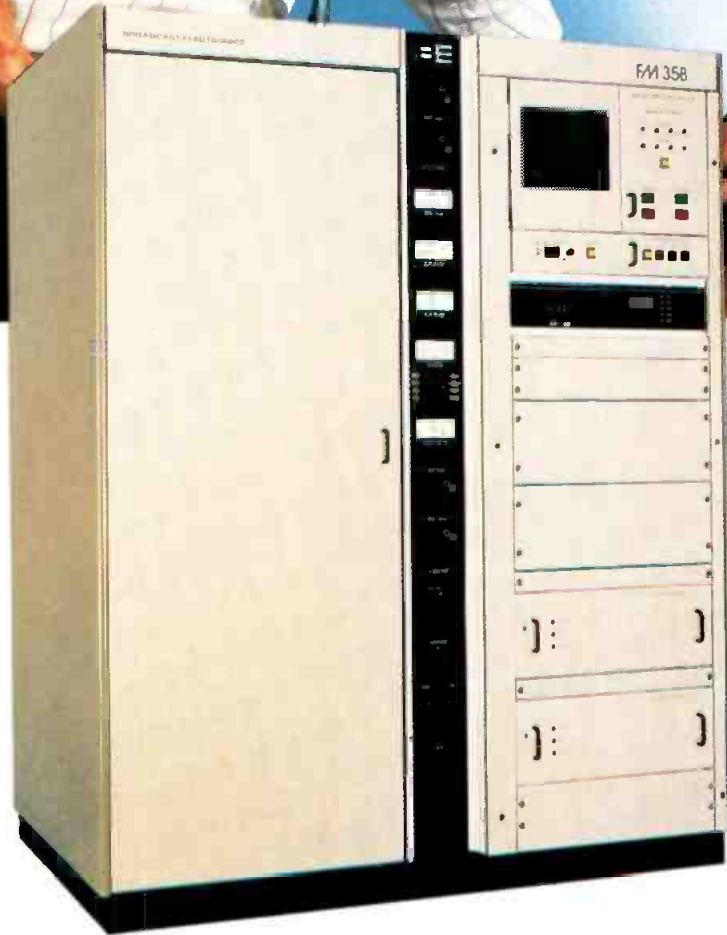
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ITI Electronics
McCurdy Radio Industries
McCurdy Telecommunication Products
Multidyne Electronics
NTP Elektronik
Ram Broadcast Systems

Who's Setting The Pace For FM Transmitter Technology?



When it comes to technological developments in FM transmitters, the record is very clear.



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Broadcast Electronics has the largest and most skilled engineering staff dedicated to the radio broadcast equipment industry. Significant FM transmitter design patents awarded to B.E.:

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- Internal Second Harmonic Suppressor, patented 1982.
- Broadband Input Impedance Matching Circuit, patented 1985.

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AVS France
BP/Porta-Pattern

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JNS Electronics
Laird Telemedia
Leitch Video 87
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MTC/Mycomp Technologies Corp.
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Omicron Video 100
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OpTex
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Pro-Bel Ltd.
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Ram Broadcast Systems
Shintron Co.
Sierra Video Systems 101
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Solutec (H.A.)
Tech Electronics
Technology Resource Group
Thomson Video Equipment
TRW LSI Products
Utah Scientific
VGV
Video Accessory Corp.
Videoquip Research Ltd.
Videotek
Vortex Communications Ltd.

ANIMATION EQUIPMENT

Film, digital video.
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Blue Feather Co.
Chyron Corp.
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Digital Arts
Dubner Computer Systems
Dynatech ColorGraphics
Electronic Graphics
Getris Images
Grass Valley Group
Hotronic
Interactive Motion Control
Kavouras
Lazerus
MPB Technologies
Neilson-Hordell Ltd.
Pinnacle Systems
Pioneer Technology Corp.
Quantel
Roberts Film Services, Mark
Stardent Computer
TDI America
United Media
Videssence

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1-piece camera recorder products;
includes still video acquisition
products.

Ampex Corp. 112
BTS 111
Ikegami Electronics (USA) 4-5
OpTex
Panasonic Broadcast Systems 64-65
Sharp Electronics Corp. Professional
Products Div.
Sony Business & Professional
Group 14-15, 128-129
Teledac
Thomson Broadcast
Thomson Video Equipment

CAMERA CABLES

Multicore, triaxial.
Arcoor Broadcast Products
AVS France
Bi-Tronics
C.A.E.
Canare Cable 143
Canford Audio plc
Chester Cable/Alcatel n.a.
Cine 60
Clark Wire & Cable
Comprehensive Video Supply Corp.
Connectronics Corp.
Hitachi Denshi America 3
Marshall Electronics
Mohawk Wire & Cable Corp. 109
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Nemal Electronics International
Panasonic Broadcast Systems 64-65
Seam-Tech
Telemetrics 45
Thomson Video Equipment
VDO-PAK

CAMERA REMOTE CONTROLS

For remote camera adjustments,
lens control; may include camera
positioning, CCU capability.
A.F. Associates 97
AMX Corp.
Birns & Sawyer
CCTV Corp.
Cohu, Electronics Div.
Concept W Systems/CAMPLEX
Fujinon
Hitachi Denshi America 3
Innovation Optics
JVC Professional Products Co. 21
Matthews Studio Equipment
Neilson-Hordell Ltd.
OpTex
Roberts Film Services, Mark
Sony Business & Professional
Group 14-15, 128-129
Telemetrics 45
Thomson Video Equipment
Vicon Industries Professional Products
Vinten Broadcast 63

CAMERA STABILIZERS

Specialized lens systems and
camera support products to reduce
image vibration, operator or mount-
ing instability.
Carter Cartop, Harry
Miller Fluid Heads (USA)
O'Connor Engineering
OpTex
Peter Lisand
Technology Resource Group

CAMERA IMAGING DEVICES

Tubes, CCDs.
BURLE INDUSTRIES 137
CCTV Corp.
EEV 71

Hitachi Denshi America 3
Philips Components
Richardson Electronics Ltd.
Teltron
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CAMERAS, ENG, EFP

Portable; may include docking
cameras; excludes camcorder sys-
tems.
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BTS 111
BURLE INDUSTRIES 137
Hitachi Denshi America 3
Ikegami Electronics (USA) 4-5
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Panasonic Industrial A/V Systems
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CAMERAS, STUDIO TV

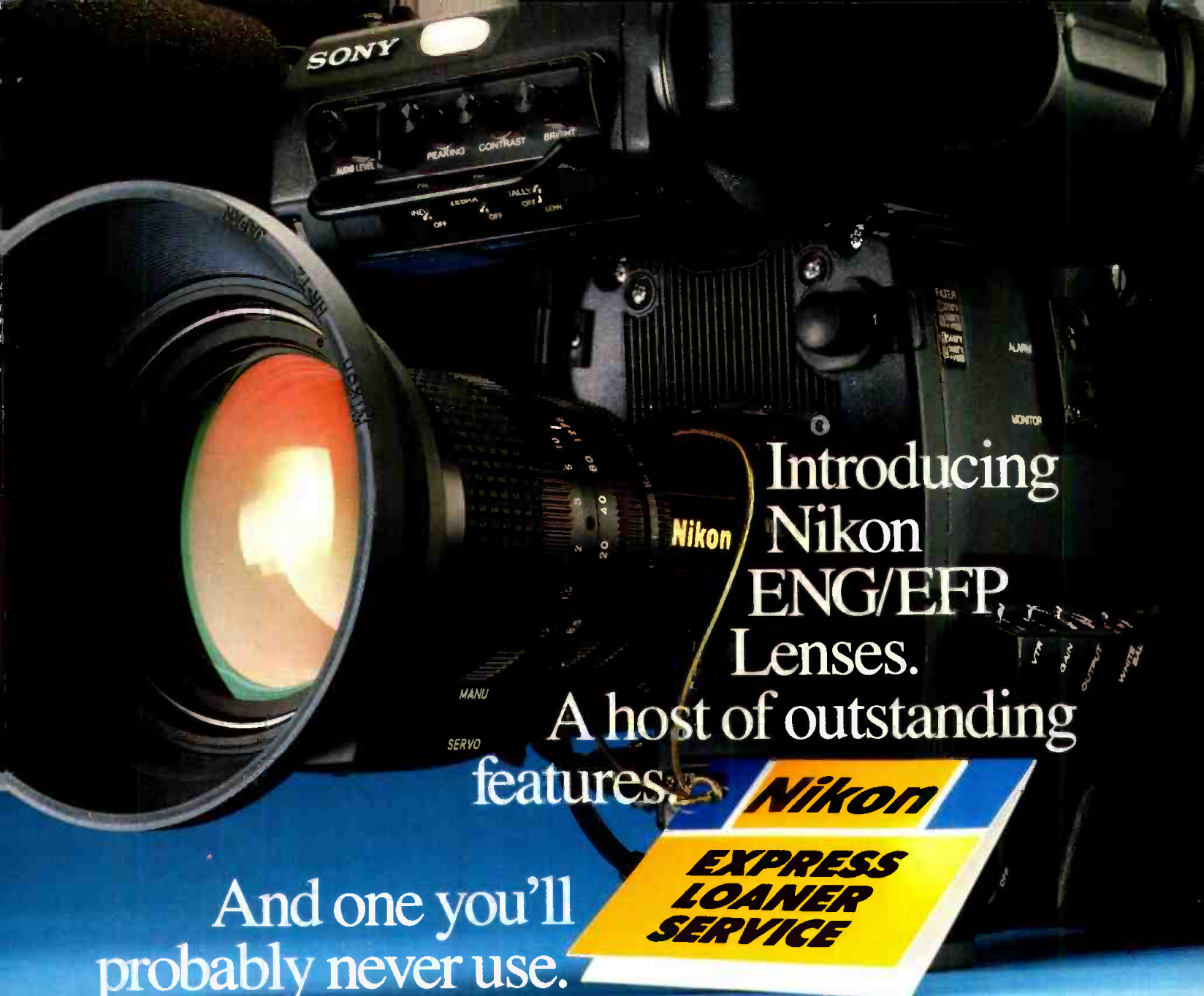
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CAPTIONING, VBI DATA SYSTEMS

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Colorado Video
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EEG Enterprises
Jasmin Electronics Ltd.
Norpak Corp.
Skotel Corp.
VG Electronic Ltd.
Video Data Systems

CHARACTER GENERATOR, TITLERS

Video titling systems; excludes time
code character insertion.
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Aston from Paltech Imaging Systems
AVS Broadcast Ltd.
AVS France
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CCTV Corp.
Chyron Corp.
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Croma Research Ltd.
Dubner Computer Systems
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Lazerus



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Teledac
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World Video

COLOR CORRECTION EQUIPMENT

Providing color balance, component level adjustments, color enhancement.

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Dynatech ColorGraphics
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Faroudja Labs
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Includes simple delay-lines and packaged delay systems.

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Sigma Electronics
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Tech Electronics

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Time Logic
TimeLine
United Media
Vac Systems Corp.
Videomedia

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Scan conversion; component-to-composite, composite-to-com-

ponent; computer-to-video.

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BFE AG
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Optical Electronics
Polar Video Ltd.
RGB Spectrum
Shintron Co.
Sierra Video Systems 101
Sigma Electronics
System Video
Thomson Video Equipment
VGV
Vistek Electronics Ltd.
Vortex Communications Ltd.

FILM CAMERAS/EDITORS

Includes motion picture film cameras and editing equipment.

Amiflex Corp.
Birns & Sawyer
CMX
Ediflex Systems
J&R Film
Mitchell Camera Corp.
MPB Technologies
Neumade Products Corp.
OpTex
Pioneer Technology Corp.
Roberts Film Services, Mark
Steenbeck
Time Logic

FILTERS, OPTICAL

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

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Hamaphot KG
Lee Filters Ltd.
OpTex
The Great American Market
Tiffen Mfg. Corp.

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For inter-format conversions among video component types.

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Cox Associates Ltd.
Digital Processing Systems
I-Den Videotronics Corp.
Nova Systems 125
Omicron Video 100

Panasonic Broadcast Systems 64-65
Shintron Co.
Sierra Video Systems 101
Vistek Electronics Ltd.

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AVS France
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Target Technology
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Videoquip Research Ltd.
Vortex Communications Ltd.

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Dedicated and PC-based products; software packages

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Artel Communications Corp.
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Digital Arts
Dubner Computer Systems
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Getris Images
Imaging Systems
Kavouras
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Media Computing
MPB Technologies
Pinnacle Systems
Processor Sciences
Quantel
Recortec
Stardent Computer
Thomson Video Equipment
Time Arts
Video Data Systems

HARDCOPY PRINTERS, VIDEO

Hitachi Denshi America 3
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Nikon Photo/Electronic Imaging Products 19
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Sony/Still Image Systems

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 Faroudja Labs
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KEYERS

DSK, chroma, linear, luminance,
 compositing
 Aston from Paltex Imaging Systems
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 Cox Associates Ltd.
 Florical Systems
 Getris Images
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LAMPS

Light sources for telecine projectors,
 studio lighting equipment.
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 VMI-Visual Methods

LIGHTING CONSOLES, DIMMERS

Includes dimmer units and control
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 Union Connector Co.
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 Broadcast Marketing International
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 Frezzolini Electronics
 Hamaphot KG
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 Rank Cintel
 Rank Cintel-Unimedia
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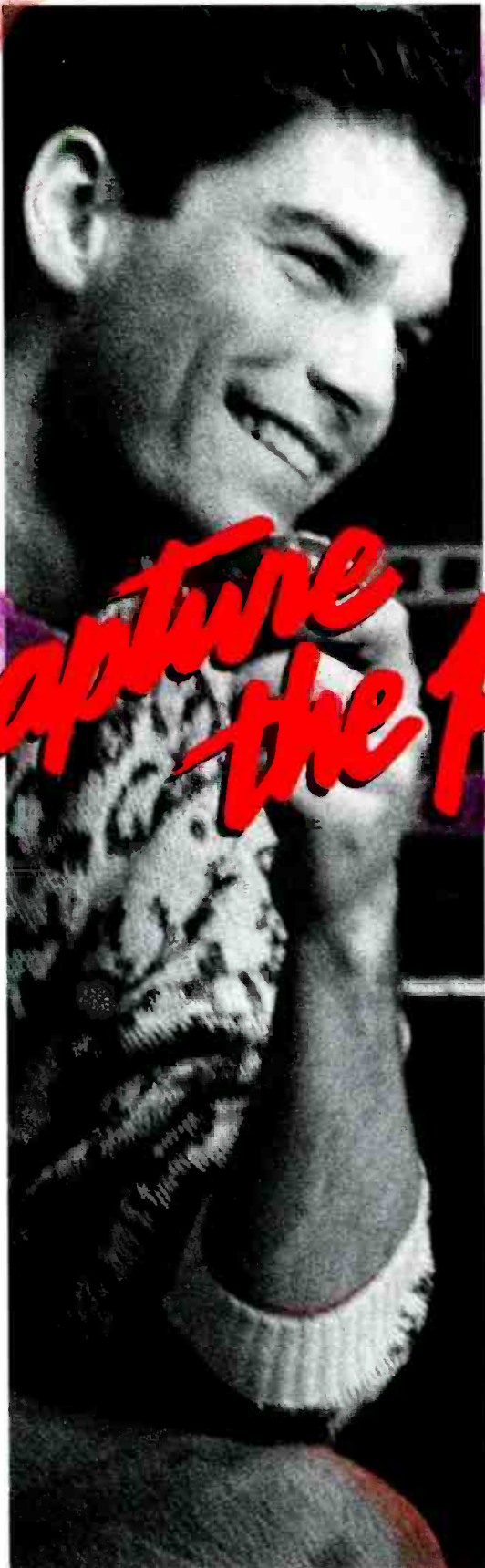
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May include functions of time base
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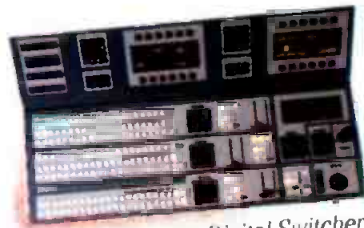
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 Ikegami Electronics (USA) 4-5
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 Telescript
 Video Data Systems

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All formats.
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AVEC
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 Hitachi Denshi America 3
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 OpTex
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Panasonic Industrial A/V Systems
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 Aston from Paltex Imaging Systems
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 Quantel
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 Wide Range Electronics Corp.

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 Sony Magnetic Products Co.
 3M Professional A/V & Specialty
 Products

SIGNAL ENHANCERS

Detail correction, enhancement
 equipment.
 Digital Processing Systems
 Faroudja Labs
 Geneva Group of Companies
 Intelvideo
 Multidyne Electronics
 Optical Electronics
 Shintron Co.
 Vidicraft

STANDARDS CONVERTERS

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 SECAM; may include video com-
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 AVS Broadcast Ltd.
CEL Electronics 25
 Fougerolle Video
 Grunder & Associates, James
 I-Den Videotronics Corp.
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 OKI Electric Industry Co.
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 Video International Development Corp.
 Vistek Electronics Ltd.
 Vortex Communications Ltd.

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TV on-air switching.
AVS France

BASYS
BTS 111
 Channelmatic
Drake Electronics Ltd., Philip 52
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 Image Video Ltd.
 IRIS Technologies
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Ampex Corp. 112
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 VGV
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 Vistek Electronics Ltd.

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 Jem-Fab Corp.
 Kaitronics Corp.

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 Monroe Electronics
 Multidyne Electronics
 Novadyne
Omicron Video 100
 Opamp Labs
 Patch Bay Designation
 PESA America
 Pro-Bel Ltd.
 Professional Sound Corp.
 Shintron Co.
Sierra Video Systems 101
 Sigma Electronics
Sony Business & Professional
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 Thomson Broadcast
 Thomson Video Equipment
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 VGV
 Videotek Research Ltd.
 Videotek
 Vidicraft
 Vortex Communications Ltd.

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Produces video drive pulses, subcar-
 rier, blackburst, color bar, test pat-
 terns.
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 Asaca/Shibasoku Corp. of America
AVS France
 Brabury International
 BTC Test & Measurement
 Cox Associates Ltd.
 Digital Processing Systems
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 Vortex Communications Ltd.

TBCs, SYNCHRONIZERS

Video signal timing correction equip-
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 TimeLine
 Videotek
 Vistek Electronics Ltd.

TELECINE SYSTEMS

Film-to-video presentation, transfer systems.
 BTS 111
 Buhl Optical Co.
 Ikegami Electronics (USA) 4-5
 Image Transform
 Laird Telemedia
 Marconi Communication Systems Ltd.
 RADMAR
 Rangertone Research
 Rank Cintel
 Rank Cintel-Unimedia
 SONDOR Willy Hungerbuhler AG
 Steenbeck
 Tamron Industries
 Thomson Video Equipment
 Time Logic
 Wide Range Electronics Corp.

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 Canon USA Broadcast Equipment Div.
 DMC Digital Video Div. of Digital Microwave Corp.
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 Microdyne Corp.
 Nytone
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 PESA America
 Radamec EPO Ltd.
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 Telemetrics 45
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 Vortex Communications Ltd.

TEST CHARTS, SLIDES

Includes illuminators.
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 Birms & Sawyer
 BPI/Porta-Pattern
 Brabury International
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TEST, ALIGNMENT TAPES

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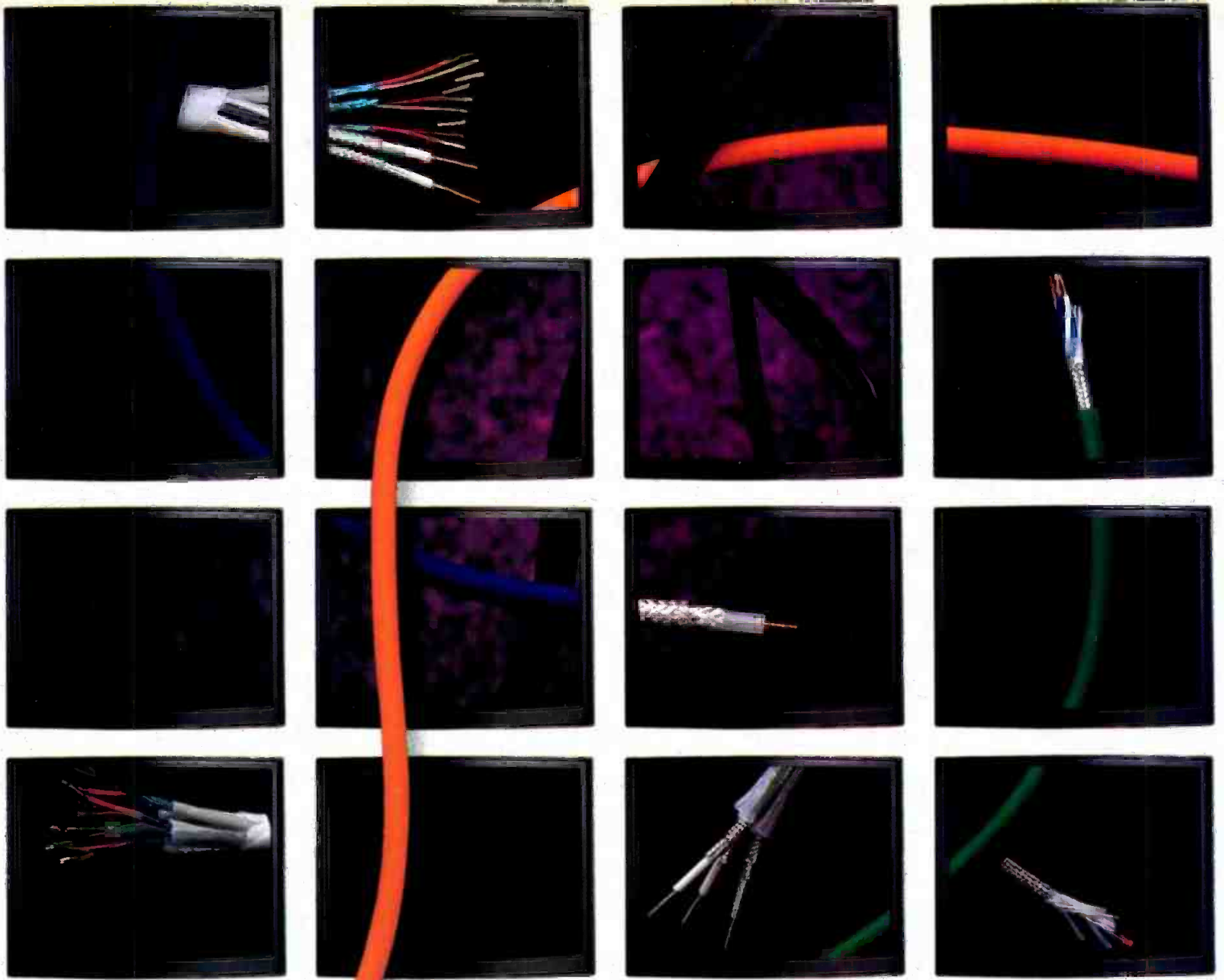
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Trompeter Electronics
Wide Band Engineering Co.

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Dielectric Communications
Environmental Technology
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Shively Labs Div. of Howell Labs

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Mobile-Cam Products
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Radiation Systems SatCom Technologies Div.
RF Industries
RF Technology
Richardson Electronics Ltd.
Swintek Enterprises
Tectan

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UTE Microwave
Wide Band Engineering Co.

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Varian Associates Traveling Wave Tube Products
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Vizcom/California Tube Labs

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OKI Electric Industry Co.
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MFJ Enterprises
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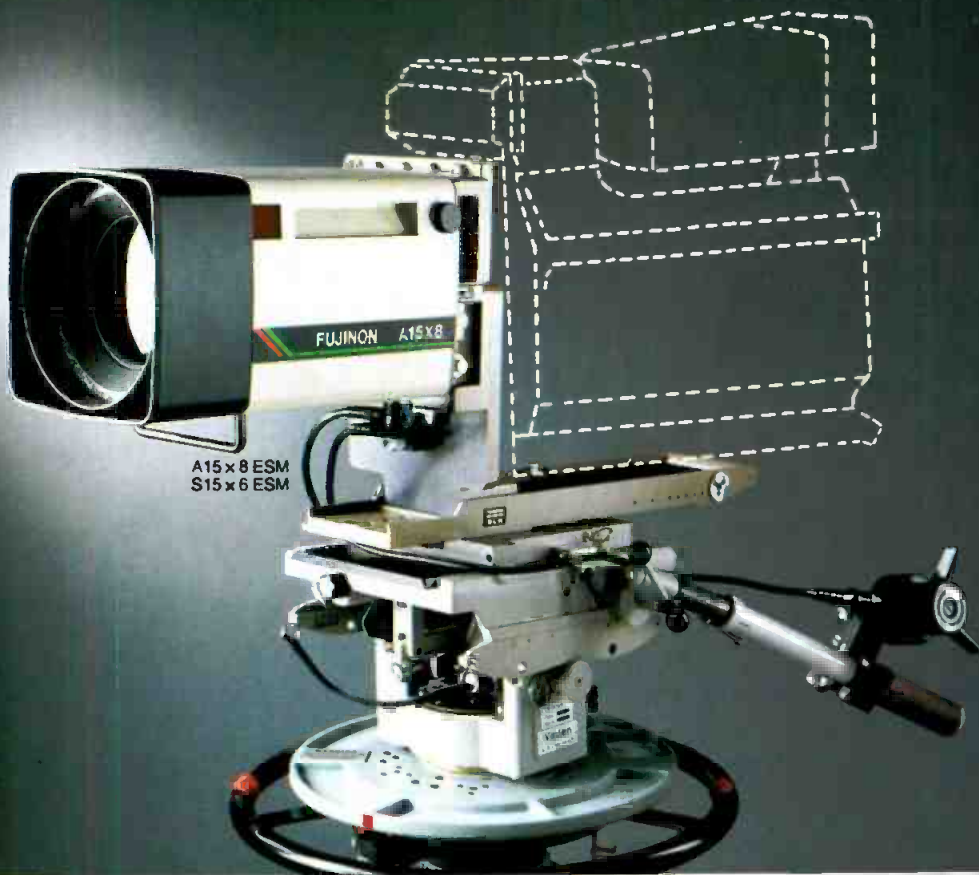
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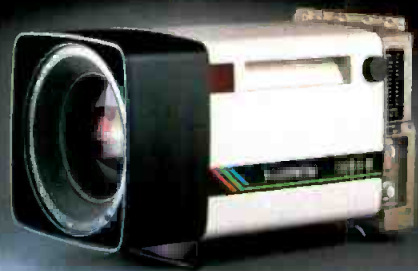
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 TWR Lighting
 Utility Tower Co.
 Will-Burt Co., The

TOWERS, ANTENNA S & SUPPORT STRUCTURES

Allied Tower Co.
 Aluma Tower Co.
 Andrew Corp.
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 Central Tower
 EMCEE Broadcast Products
 Express Tower Co.
 Fort Worth Tower Co.
 Kline Towers
 LDL Communications
 Magnum Towers
 Marconi Communication Systems Ltd.
 Microfect Co.
 Nudd Corp., Fred A.

PiRod
 Rapid Deployment Towers
 RTS Systems/Telex Communications
 SIRA s.r.l.
 Stainless
 Telex Communications
 Transmission Structures
 Tylon Mfg. Co. Ltd.
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 Central Tower
 EMCEE Broadcast Products
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 Express Tower Co.
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 Nudd Corp., Fred A.
 Rapid Deployment Towers
 RF Technology
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 Transmission Structures
 Will-Burt Co., The

TRANSFORMERS, POWER, MODULATION

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 Henry Radio
 Telefunken Sendertechnik GmbH

TRANSLATORS, TRANSPOSERS, FM

Receiving, retransmitting systems.
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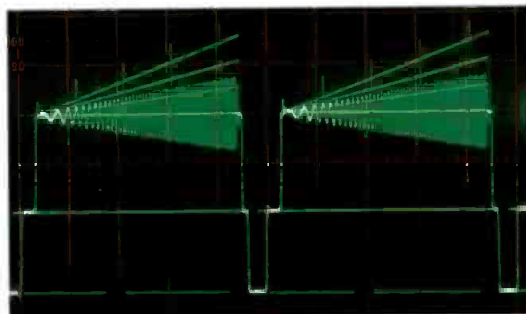
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Excludes FM translators.
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 Energy-Onix
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 Schafer World Communications Corp.
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 Time Logic
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 DKW Systems
 EDX Engineering
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 Media Computing
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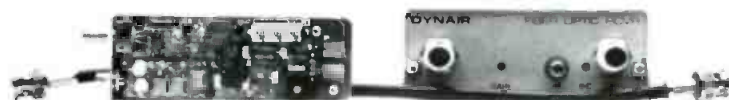


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 Corporate Computer Systems Audio Products Div.
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 DKW Systems
 IGM Communications
 Image Video Ltd.
Leitch Video 87
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 Multidyne Electronics
Nesbit Systems 56
 Porter Communications
 Ramko Research
 Richmond Sound Design
 Time Logic
 Wynford Technologies

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 AVS France
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Broadcast Electronics 17
 Century 21 Programming
 CompuSonics Corp.
 Computer Concepts Corp.
 Concept Productions
 Connolly Systems Ltd.
 Corporate Computer Systems Audio Products Div.
 Cox Associates Ltd.
 DKW Systems
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 Fougerolle Audio
 Granite Telecom Corp.
 IGM Communications
 Leonardo Software
 MacroMedia Design
 Management, The
Matco Mfg. & Test Co. 98
 McCurdy Radio Industries
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 Schafer World Communications Corp.
 Sentry Systems
Sierra Automated Systems 104
 Systemation Corp.
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 Asaca/Shibasoku Corp. of America
 AVS France
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 Connolly Systems Ltd.
 Cox Associates Ltd.
 DKW Systems
ESE 169
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Leitch Video 87
 Logica Communications/ Broadcast
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 Tech Electronics
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 Video Data Systems
 Videoquip Research Ltd.
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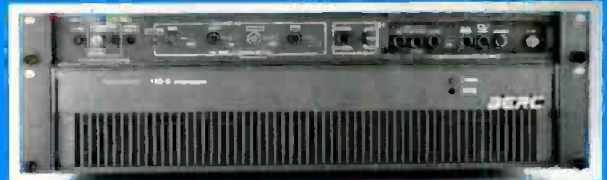
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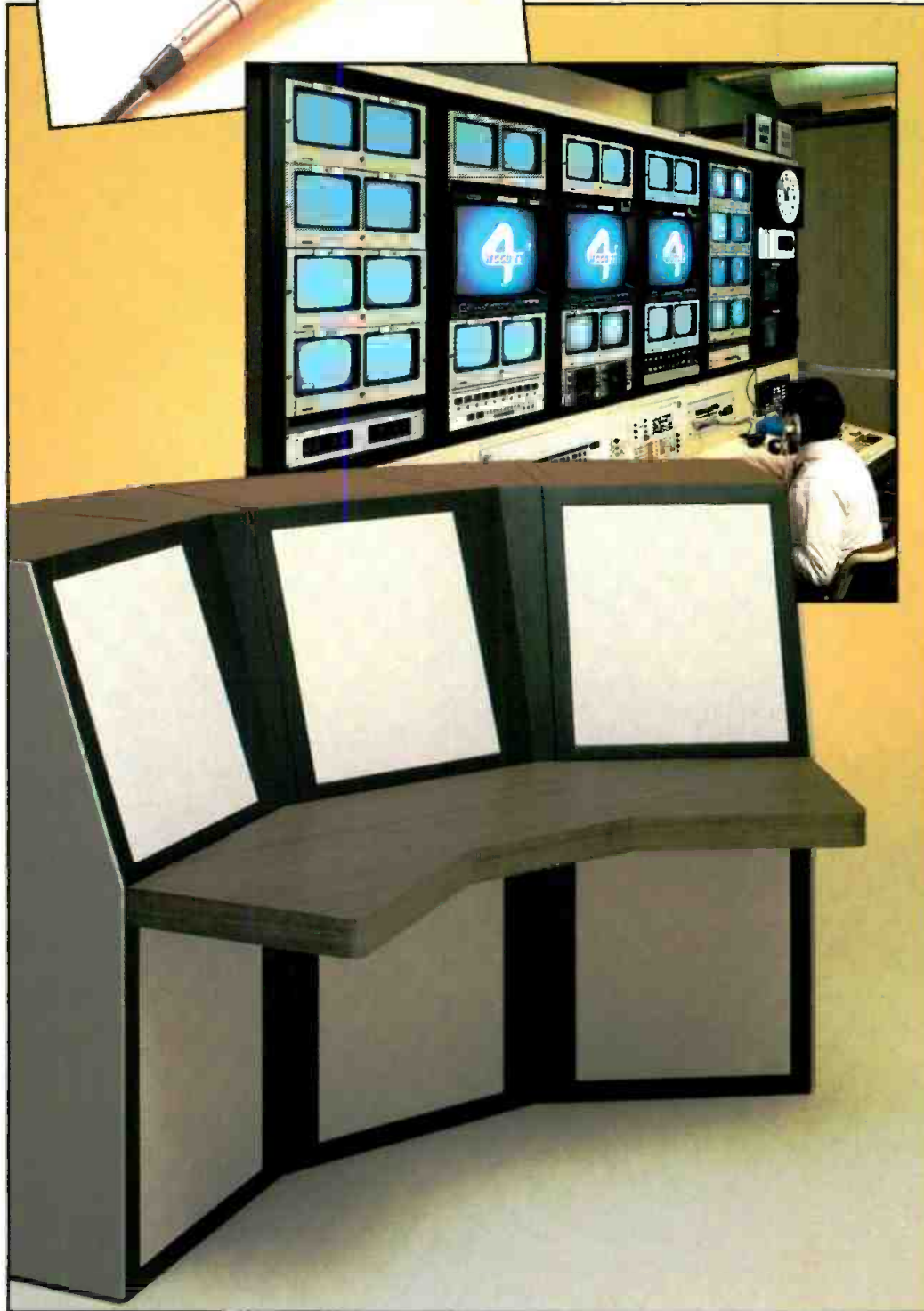
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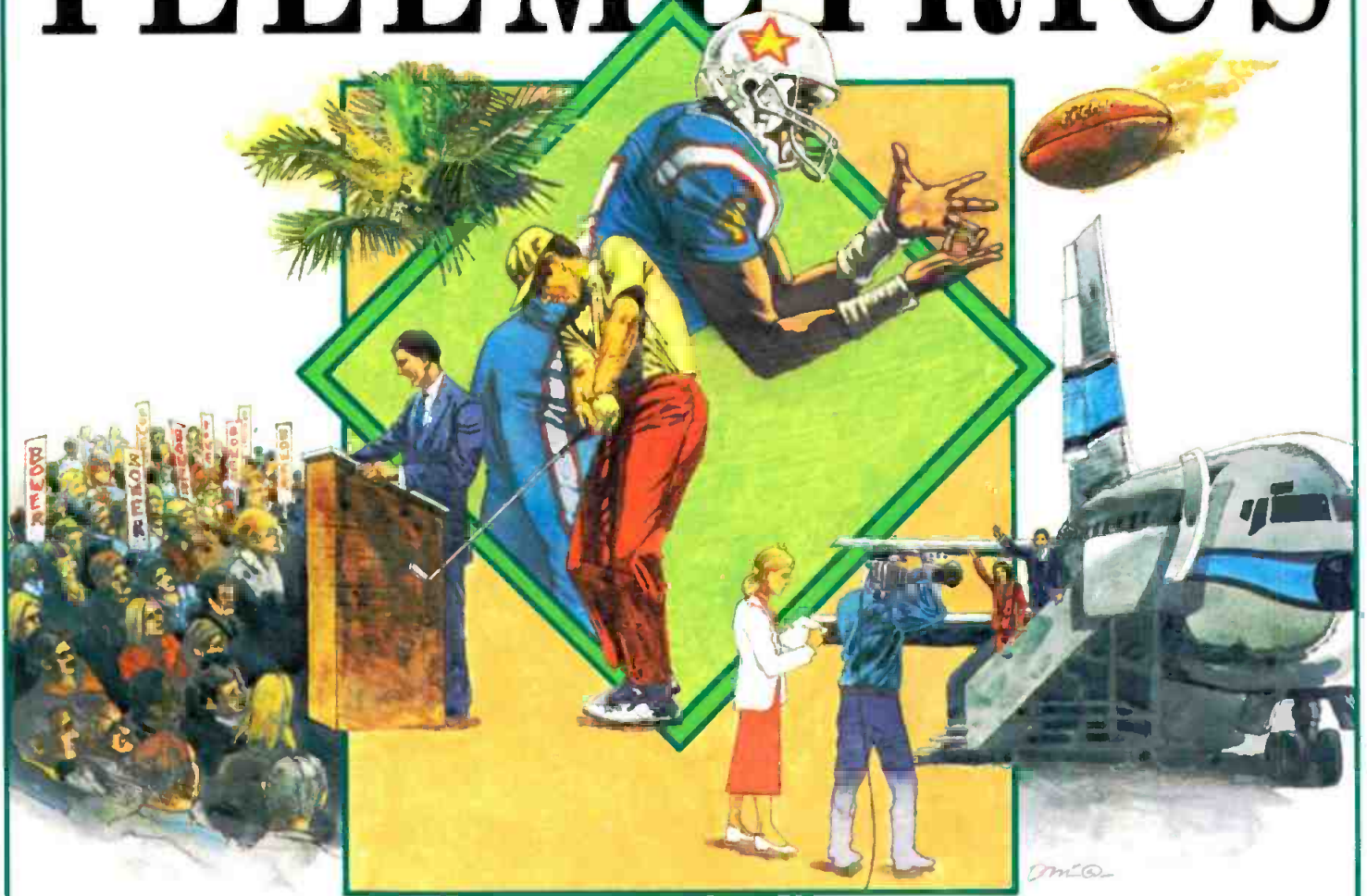
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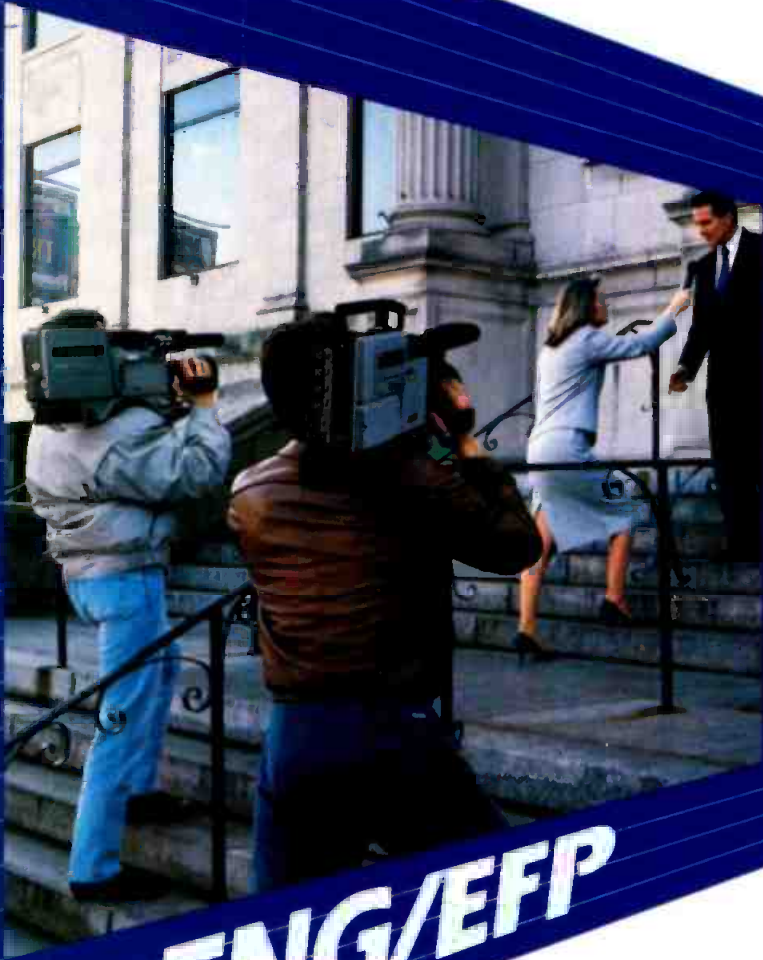
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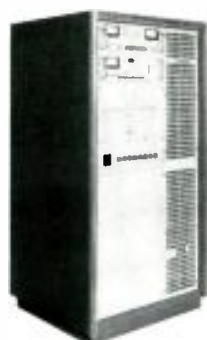
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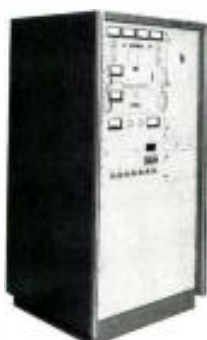
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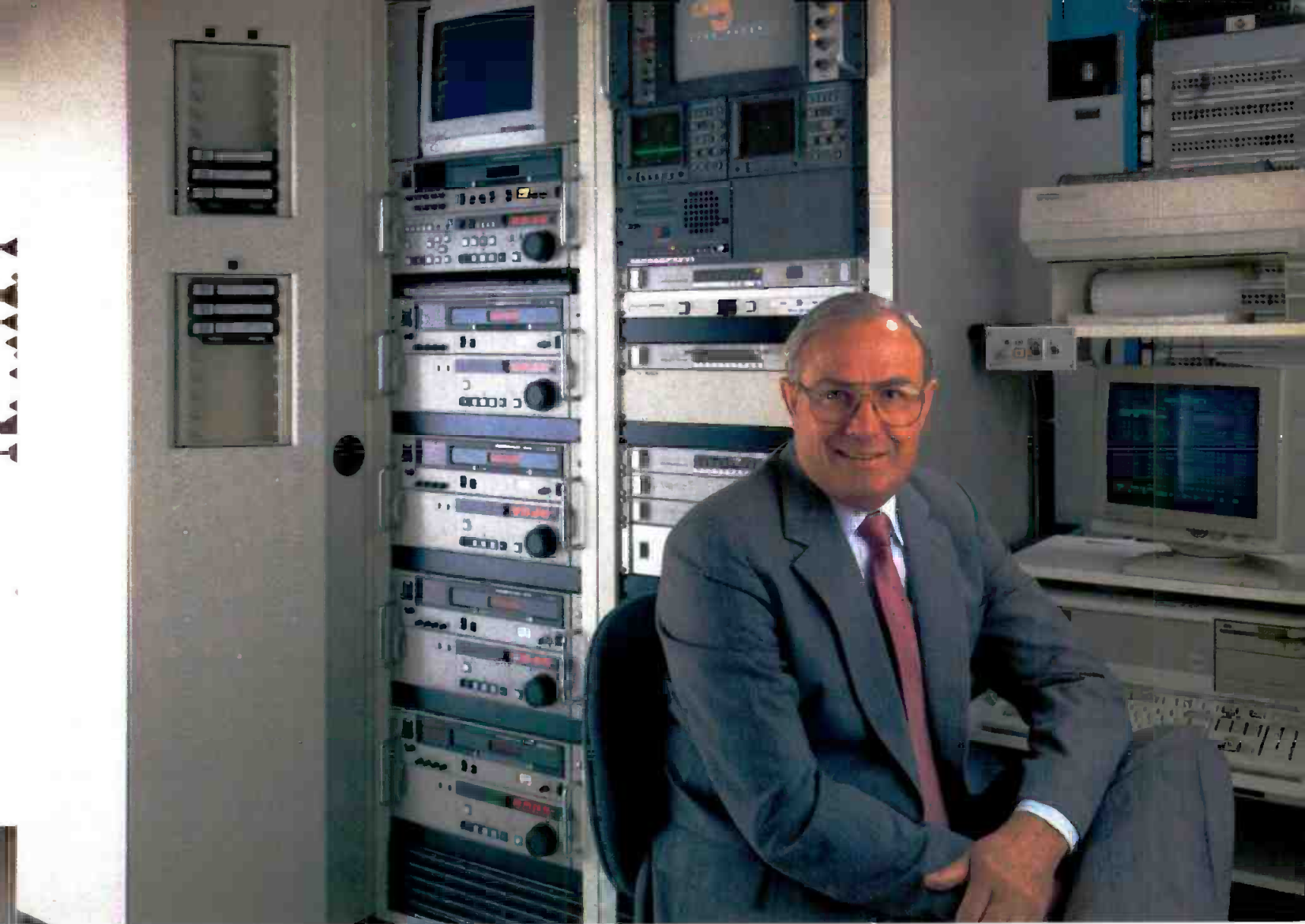
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Odetics had already installed about 80 machines at other stations, so I called some of those chief engineers. I didn't talk to anyone who wasn't happy with the Odetics machine.

Most of the engineers I talked to emphasized the exceptional after-sale service and support Odetics provided. We found that out for ourselves when our new machine was installed. The training and support our operations people got was efficient, thorough and highly professional.

If you'd like to know about what the Odetics cart machine has done for KPHO, why not get some firsthand information? Feel free to give me a call at (602)264-1000.”

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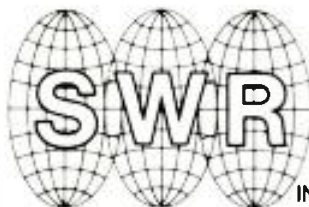
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The only sure way to know if a DAT recorder meets your professional needs is to turn it around and see if it has the right connections.

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Synchronize • Monitor Tape • Punch-In/Out • Control Pitch

You can post-stripe time code on an existing DAT tape (recorded on any DAT machine), or you can record time code and stereo audio on the D-20 and play that tape back on any other DAT machine with complete compatibility.

The 20-pin synchronizer port allows interface with our synchronizer system (others as well) and there's an RS-422 port for control which requires serial communication.

Then there's an external sync input for composite video, plus Word Sync Input and Output capability - all standard on the D-20.

In our unique 4-head system, two pairs of heads are positioned around the drum at 91.5° intervals. One pair is for record, the other for reproduce; but it's the revolutionary ability to reverse functions that opens up the format for true professional use.

Thus the D-20 features off-the-tape monitoring - a very important feature considering the DAT's ability to record for two straight hours (no more multiple reels and alignment hassles).

You'll be able to control all transport functions by remote control - including instant punch-in/out. Built-in cross-fade timing gives you seamless punches.

There's even a pitch control complete with digital read-out. It's on our front panel (not shown), along with other professional touches.

The D-20 has been shipping since last year and it's being used daily in audio and video post-production suites. It works.

And it will keep on working as future software is developed, thanks to the built-in flexibility of the DIP switches and an additional 40-pin connector.

Most important of all, the D-20 sounds great. It records and reproduces all the music completely, faithfully, and better than analog alternatives.

So when it comes down to professional *performance*, plug into the digital master recorder that faces the truth, back against the wall.

D-20 Digital Master Recorder Fostex®

Complete technical information is available in the form of reprints of "A Professional R-DAT Recorder", presented at the 85th AES Convention, November 6, 1988. Please send a check or money order in the amount of \$2.00 to cover shipping and handling.

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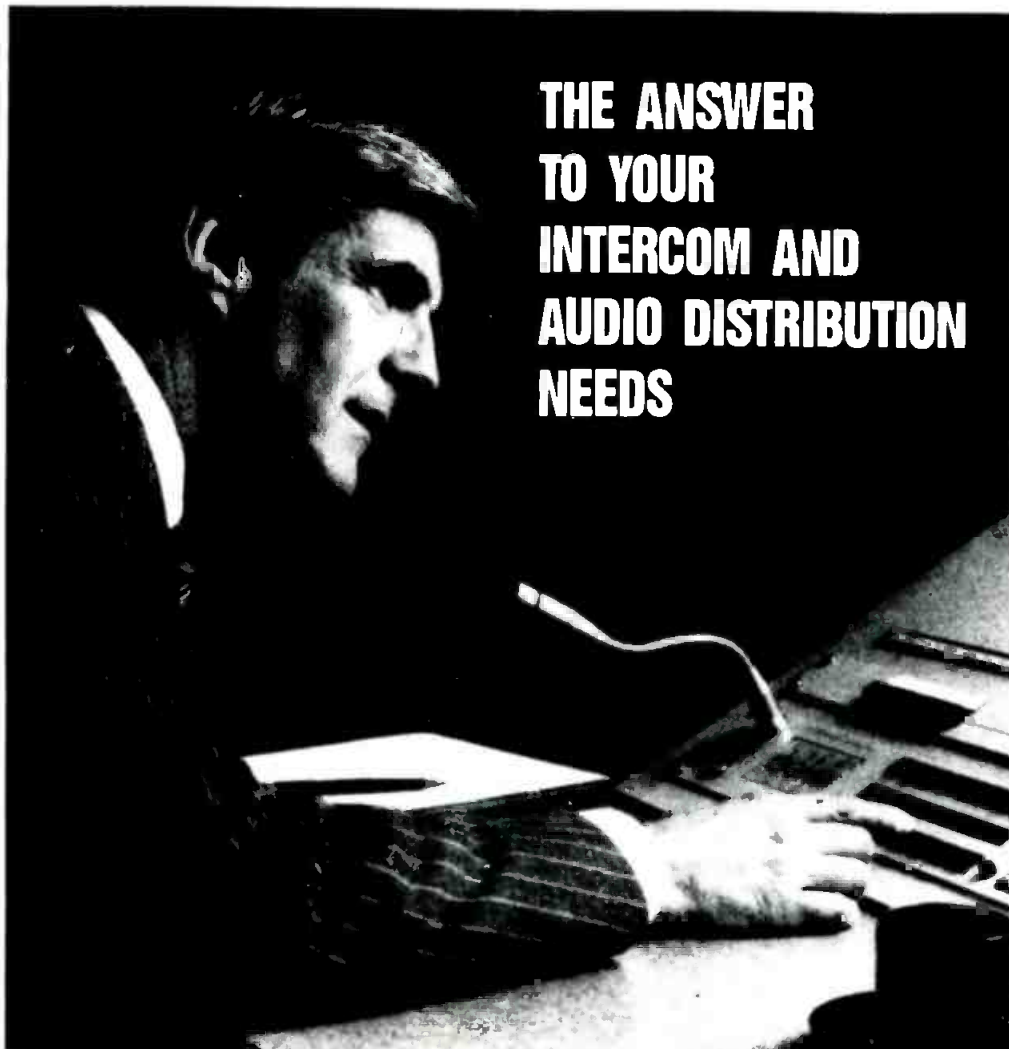
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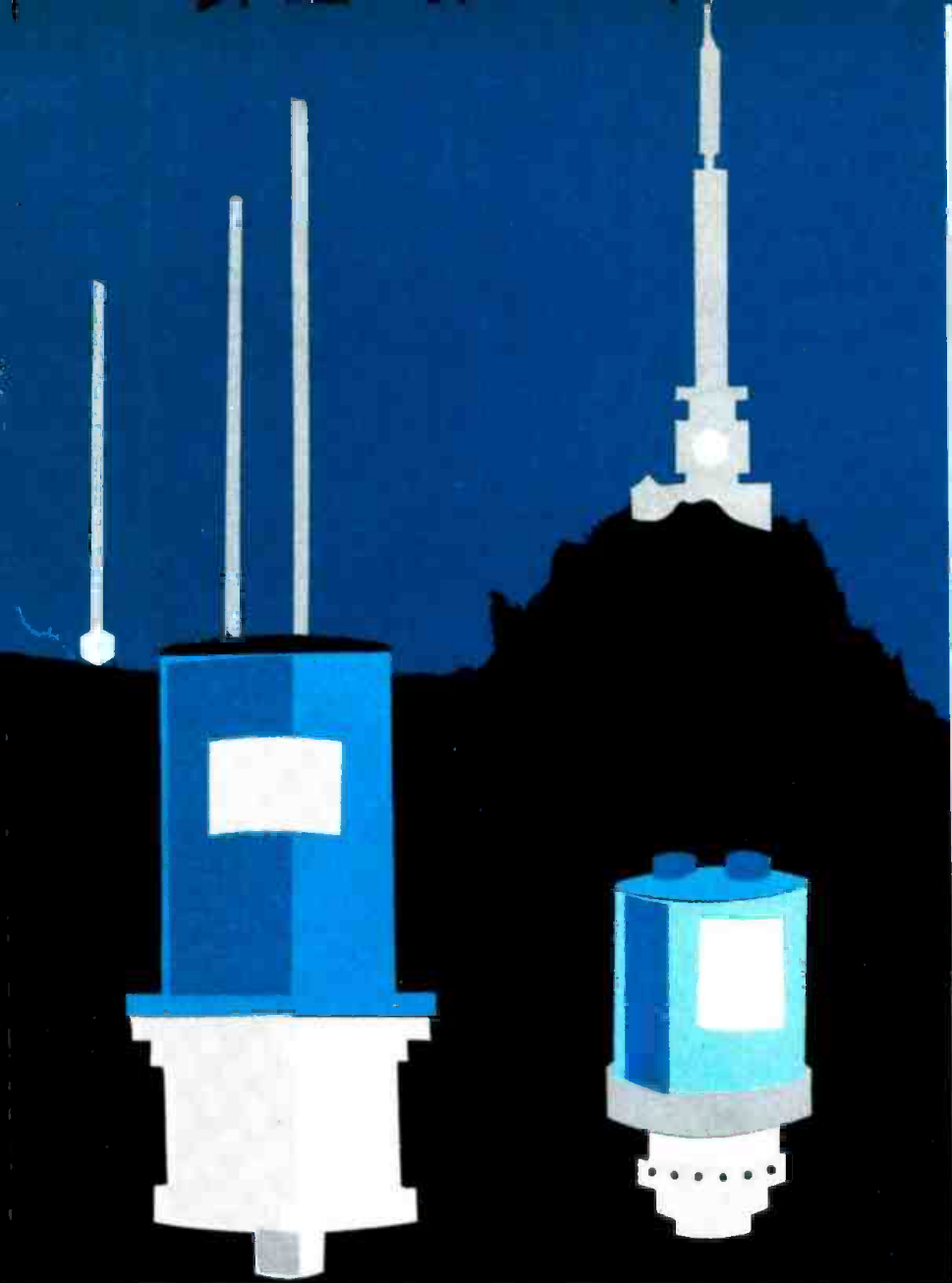
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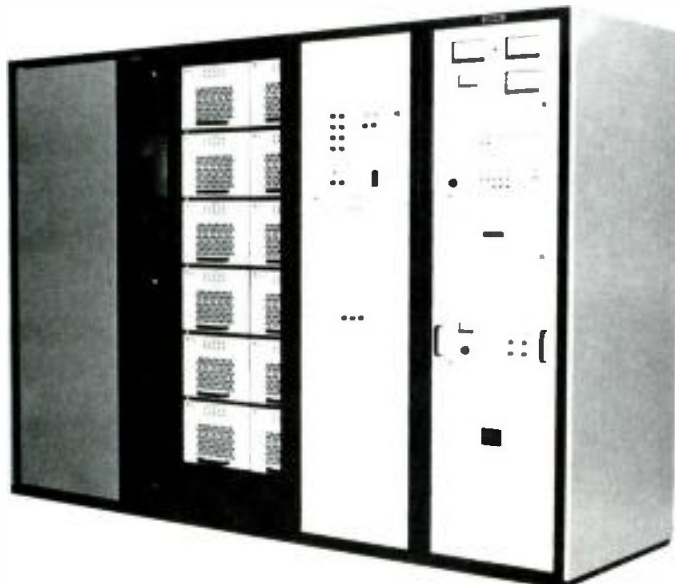
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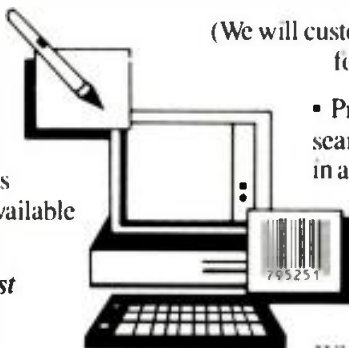
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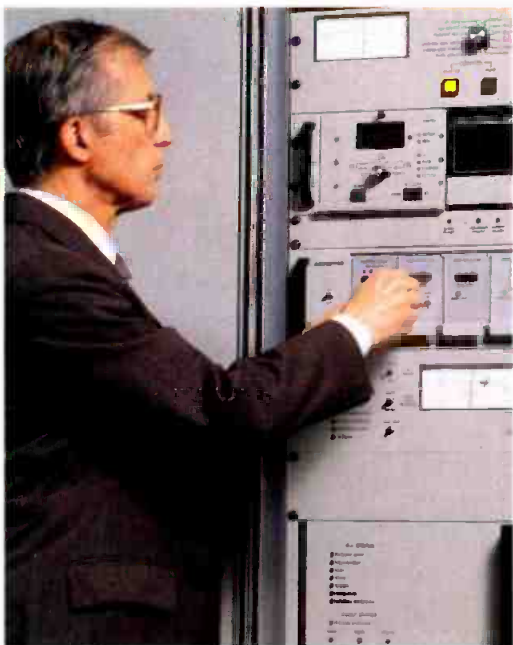
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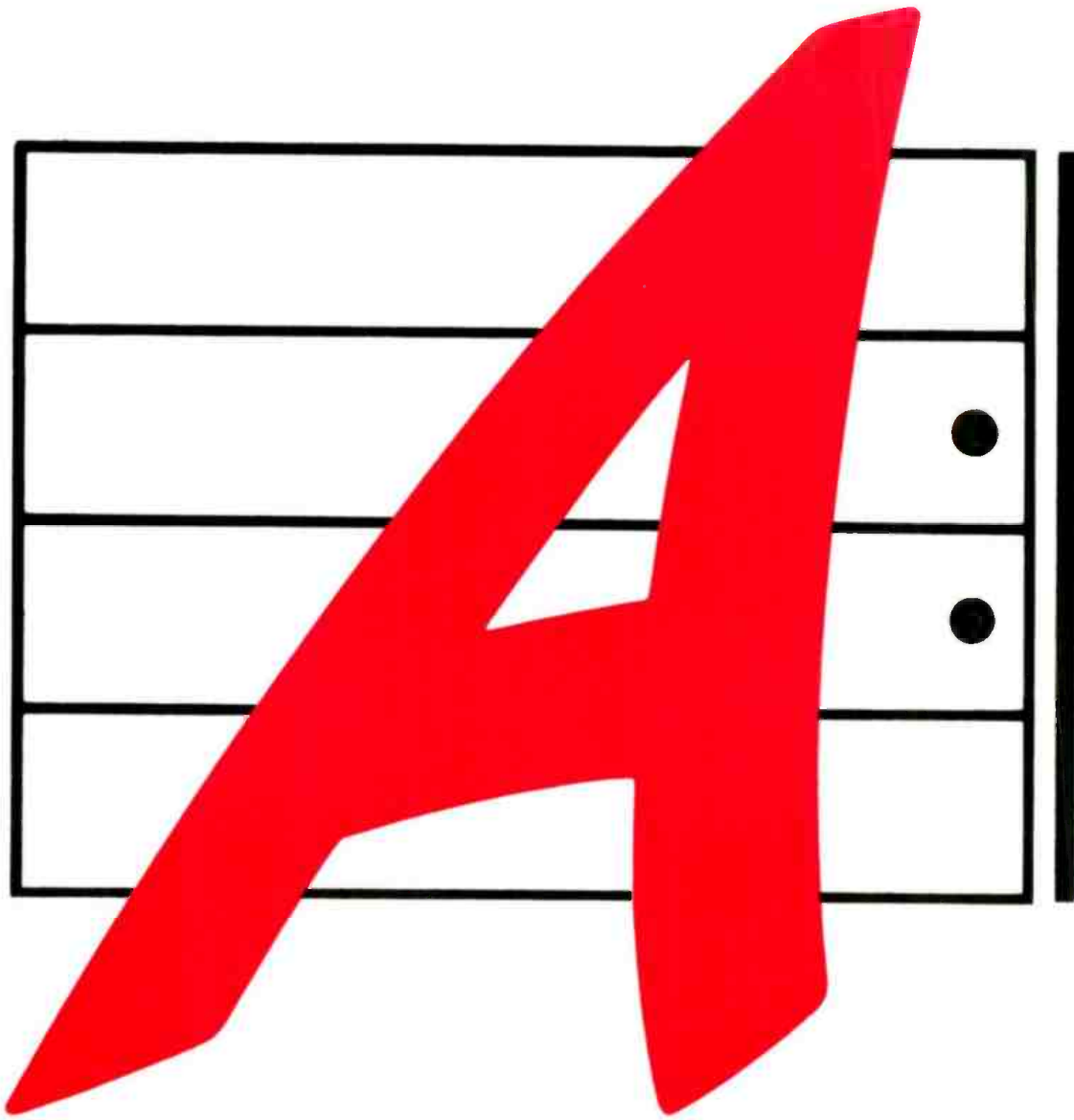
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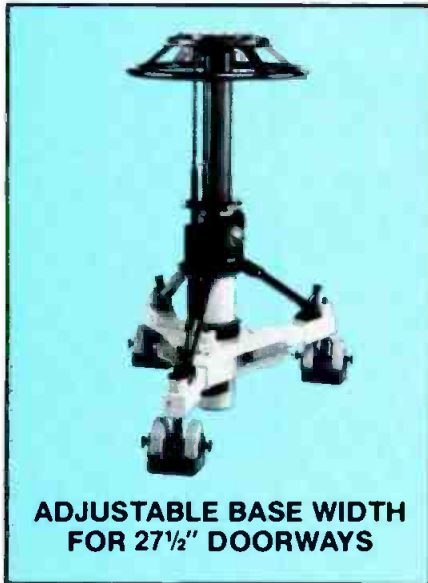
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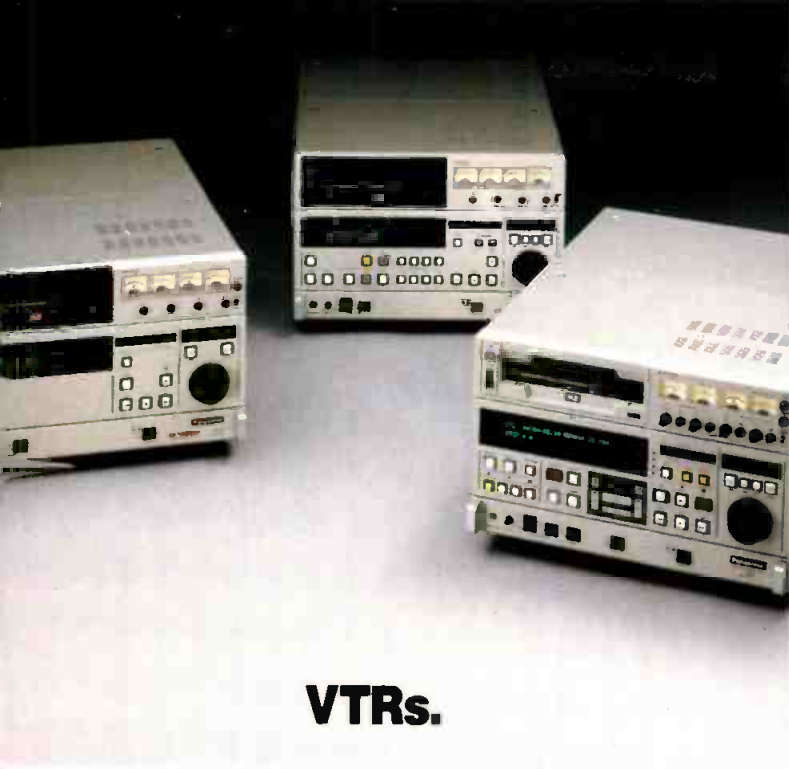
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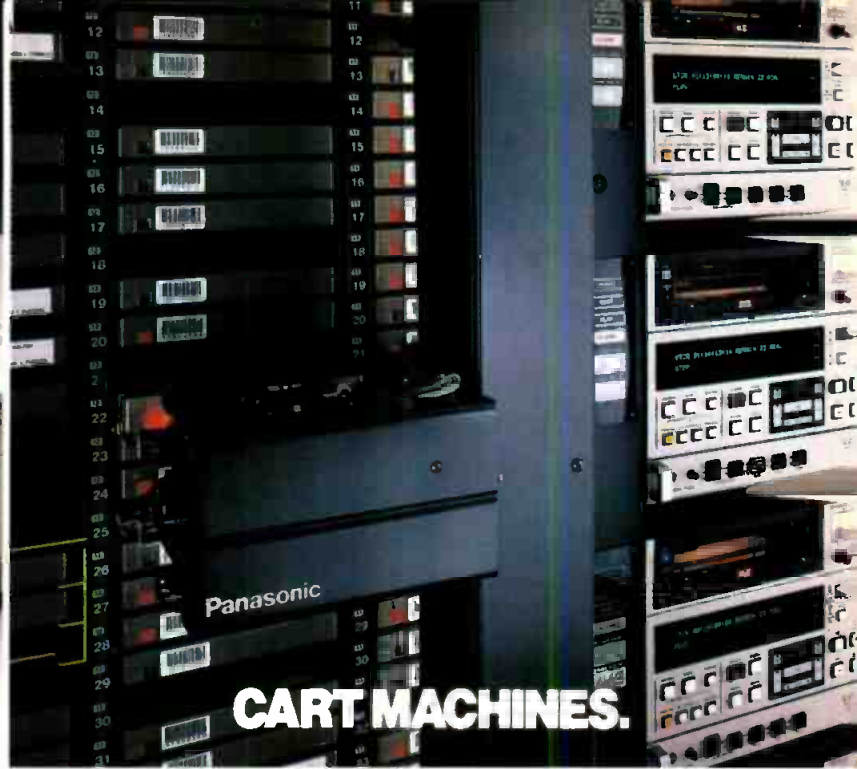
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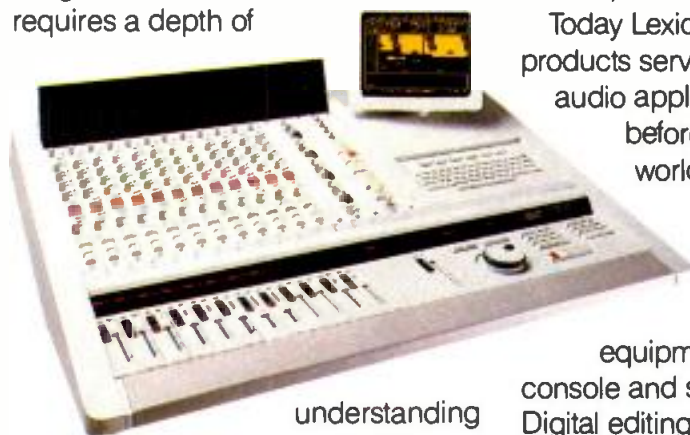
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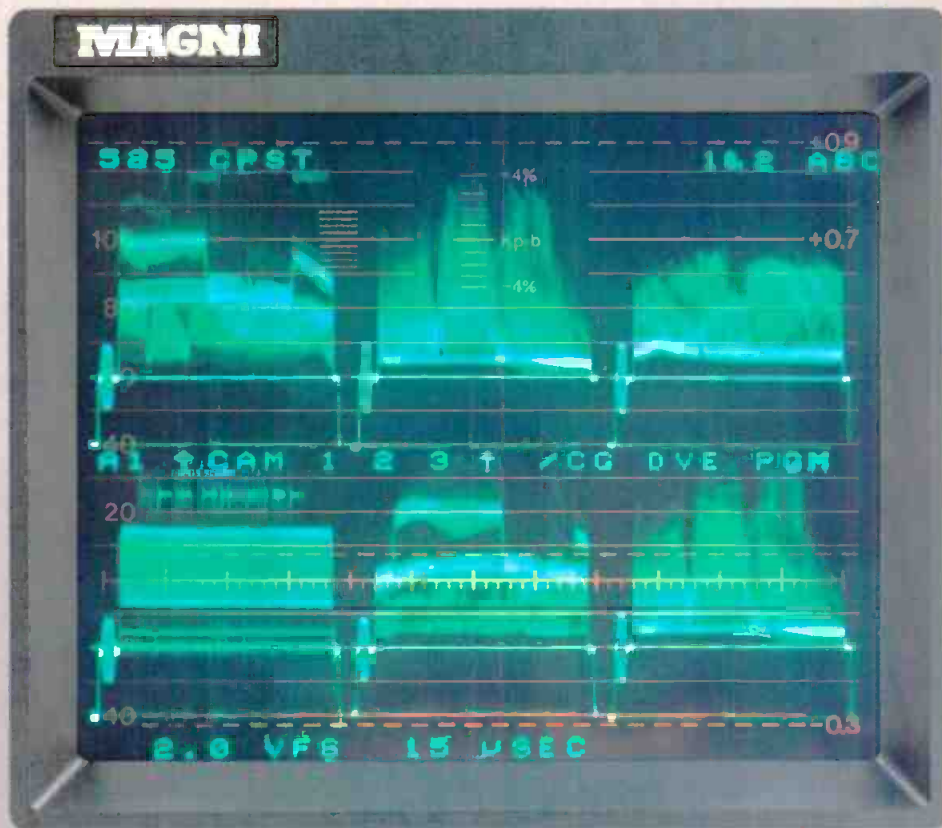
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Youngstown, OH 44503
216-747-4111
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312-792-2700
Fax: 312-792-2129

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Seattle, WA 98199
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Fax: 206-283-5504

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Culver City, CA 90232
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Venture House, Davis Road
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England KT9 1TT
081-391-5678
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Systemation Corp.

337 N. Water
Decatur, IL 62523
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Fax: 217-423-9764

Systems Development Group

18601 Darnestown Road
Poolesville, MD 20837
301-972-7355
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465 Herndon Parkway
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703-471-7887; 800-542-3332
Fax: 703-437-1107

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Fax: 516-484-8906

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Kitchener, Ont., Canada N2M 2C8
519-745-1158
Fax: 519-745-2364

Target Technology

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Penn Valley, CA 95946
916-639-2102
Fax: 916-639-2212

Target Tuning, Inc.

6 Caesar Place
Moonachie, NJ 07074
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Fax: 201-935-6548

TASCAM Div.

Teac Corp. of America
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Montebello, CA 90640
213-726-0303

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7510 Sunset Blvd., Suite 537
Hollywood, CA 90046
818-765-0782
Fax: 213-874-3393

TC Electronic A/S

Grimhøjvej 3
DK-8220 Bradbrand, Denmark
45-86262800
Fax: 45-86262928

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1270 Ave. of the Americas, Ste 508
New York, NY 10020
212-247-1950
Fax: 212-247-1957

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Norcross, GA 30071
404-446-1416
Fax: 404-448-5724

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500 Tenth St.
Palisades Park, NJ 07650
201-944-2221

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Pittsburgh, PA 15206-5295
412-661-2629

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215-825-4990
Fax: 215-828-5623

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Barrington, IL 60010-3247
708-381-5350; 800-562-5872
Fax: 708-381-4360

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Kingston, NY 12401
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Fax: 914-338-2809

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Concord, CA 94527
415-798-2222
Fax: 415-798-2224

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Surrey, BC, Canada V3R 7A2
604-589-1100
Fax: 604-589-1185

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P.O. Box 500, D/S 58-699
Beaverton, OR 97077
503-627-4697
Fax: 503-627-4486

Austin Basso, 503-627-1844

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DC, Washington, 301-948-7151
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IL, Chicago, 312-259-7580
IN, Indianapolis, 317-872-3708
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PA, Philadelphia, 215-825-6400
PA, Pittsburgh, 412-244-9800
TX, Dallas, 214-550-0525

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Canada L7N 3G2
416-681-2450

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Germantown, MD 20874
301-353-1550; 800-638-2049
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Corona, NY 11368
718-651-8900
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St. Lambert, Que.
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Fax: 514-671-4747

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Timonium, MD 21093
301-252-8220
Fax: 301-252-5514

Teledyne Thermatics

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Elm City, NC 27822
919-236-4311
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D-1000 Berlin 21, West Germany
Fax: 0049-30-34632419

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201-767-6733
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Fax: 313-562-8612

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619-268-1100
Fax: 619-268-1790

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580 Goddard Ave.
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314-532-4700
Fax: 314-536-2045

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Broomfield, CO 80020-8385
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Fax: 612-884-0043

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613-226-5870
Fax: 613-727-1247

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916-939-4005; 800-538-6894

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Fax: 801-977-0087

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Long Beach, CA 90810
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Fax: 213-603-1929

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Fax: 206-646-0132

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612-733-2142

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St. Paul, MN 55144-1000
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49-05105-8 11 44
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MA, Danvers, 617-777-7228
TX, Dallas, 214-247-5999

Wegener Communications Inc.
11350 Technology Circle
Duluth, GA 30136
404-623-0096
Fax: 404-623-0698

Weircliffe International Ltd.
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England EX4 2AG
44-392-72132
Fax: 44-392-413511

Weircliffe Ltd.
Paltex International
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Tustin, CA 92680
714-838-8833
Fax: 714-838-9619

Western Electronic Products
915-G Calle Amanecer
San Clemente, CA 92672
714-492-4677
Fax: 714-492-5952

Western Int'l.
Communications Aristocart
17-825 McBride Blvd.
New Westminster, BC
Canada V3L 5B5
604-526-3214

Westlake Audio, Pro
Products Mfg. Group
2696 Lavery Court, Unit 18
Newbury Park, CA 91320
805-499-3686
Fax: 805-498-2571

Wheatstone Corp.
6720 VIP Parkway
Syracuse, NY 13211
315-455-7740
Fax: 315-454-8104

Wheelit, Inc.
P.O. Box 7350
Toledo, OH 43615
419-531-4900; 800-523-7508
Fax: 419-531-6415

Whirlwind
P.O. Box 1075
Rochester, NY 14603
716-663-8820
Fax: 716-865-8930

White Co., Inc., Brian R.
313 Henry Station Road
Ukiah, CA 95482
707-462-9795
Fax: 707-462-4800

White Instruments
Div. of C. Van R., Inc.
P.O. Box 698
Austin, TX 78767
512-892-0752
Fax: 512-892-0855

Wide Band Engineering Co.
P.O. Box 21652
Phoenix, AZ 85036
602-254-1570

Wide Range Electronics Corp.
174 Chesterfield Industrial Blvd.
Chesterfield, MO 63005
314-532-5887
Fax: 314-532-5492

Will-Burt Co., The
P.O. Box 900
Orville, OH 44667-0900
216-682-7015
Fax: 216-684-1190

Winsted Corp.
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Minneapolis, MN 55438
612-944-8556; 800-447-2257
Fax: 612-944-1546

Wireworks Corp.
380 Hillside Ave.
Hillside, NJ 07205
201-686-7400; 800-642-9473
Fax: 201-686-0483

Wohler Technologies, Inc.
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Fax: 415-821-6414

Wolf Coach, Inc.
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Auburn, MA 01501
508-791-1950
Fax: 508-799-2384

World Video Inc.
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Boyertown, PA 19512
215-754-6700

Wynford Technologies Inc.
424 Mt. Pleasant Road
Toronto, Ont.
Canada M4S 2L7
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Reseda, CA 91335
805-492-1355

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Professional Audio Div.
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Buena Park, CA 90620
714-522-9312
Fax: 714-539-2680

Yamashita Engineering
559-1 Funako Atsugi-City
Kanagawa 243, Japan
81-44-0462-28-8692
Fax: 81-44-0462-29-1944

Z

Zero Stantron Cabinets
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North Hollywood, CA 91605
818-841-1825
Fax: 818-841-8892

Ziehl Electronic Service
8611 Dale Road
Gasport, NY 14067
716-772-7800

Zonal Ltd.
Holmethorpe Ave.
Redhill, Surrey
England RH1 2NX
0737-767171
Fax: 0737-767610

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 - 2000 SCT-12S \$4995
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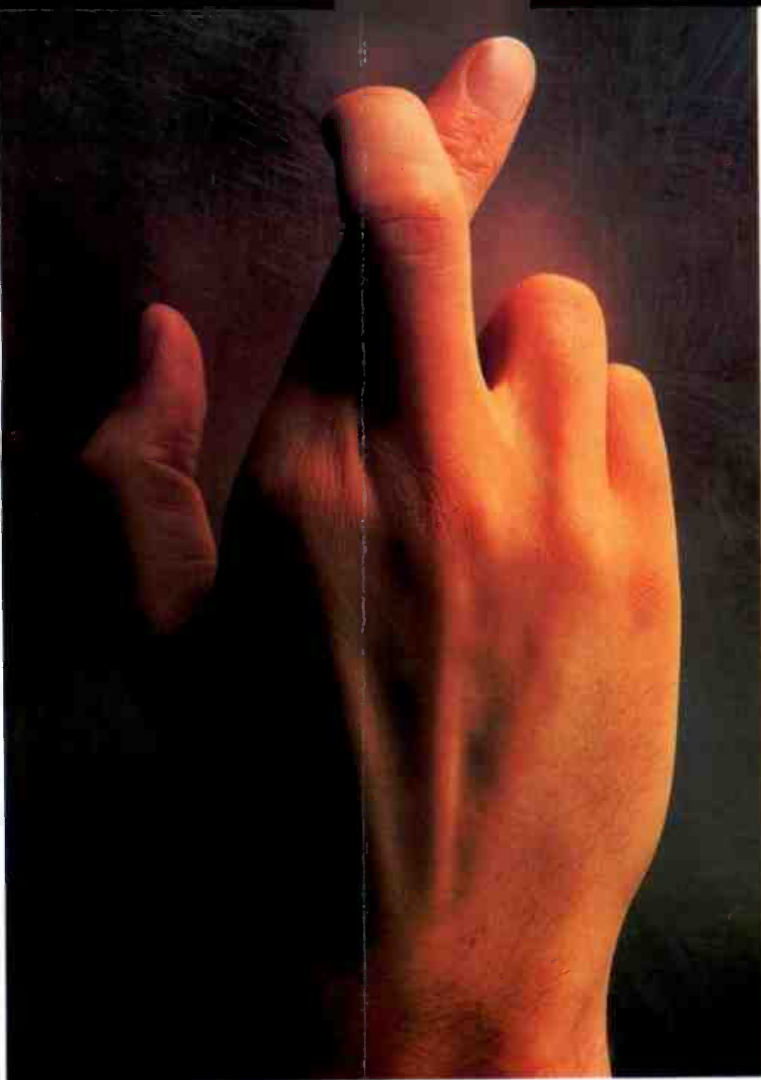
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Antenna Technology Corp., 1140 E. Greenway St., Mesa, AZ 85203, 602-264-7275, Fax: 602-898-7667; *Satellite antennas, up-/downlink equipment.*

EAR Professional Audio-Video, 2641 E. McDowell, Phoenix, AZ 85008, 602-267-0600, Fax: 602-275-3277; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Recording media, all audio & video formats.*

Jensen Tools Inc., 7815 South 46th St., Phoenix, AZ 85044, 602-968-6231, Fax: 602-438-1690; *Test & measurement equipment.*

ROH'S, Inc., 2922 N. Campbell Ave., Tucson, AZ 85719, 602-795-8573, Fax: 602-325-0169; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Recording media, all audio & video formats.*

Spencer Broadcast, Inc., 7003 W. Union Hills Drive, Glendale, AZ 85308, 602-242-2211, Fax: 602-843-2860; *Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguide, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.*

CALIFORNIA

Advanced Marketing, P.O. Box 97, Redwood City, CA 94064, 415-365-3944, Fax: 415-365-1630; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment.*

Audio Services Corp., 10639 Riverside Drive, North Hollywood, CA 91602, 818-980-9891, Fax: 818-980-9911; *Audio mixers, mics, recorders, processing equipment.*

Audio Video Supply, 4674 Cardin St., Suite D, San Diego, CA 92111, 619-565-1101; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Production acces-*

sories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all formats.

Barrett Associates Inc., 3205 Production Ave., Oceanside, CA 92054, 619-433-5600, Fax: 619-433-1590; *Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguide, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

BCS, 4525 Valerio St., Burbank, CA 91505, 818-845-7000, 212-268-8800, Fax: 818-845-9483; *Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Recording media, all audio & video formats.*

BERC, 4545 Chermak, Burbank, CA 91505, 818-841-3000, Fax: 818-841-7919; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Production vehicles & accessories.*

Birns & Sawyer Inc., 1026 N. Highland Ave., Hollywood, CA 90038, 213-466-8211, Fax: 213-466-7049; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Black Audio Devices, P.O. Box 106, Ventura, CA 93002, 805-653-5557; *Audio mixers, mics, recorders, processing equipment.*

Broadcast Cartridge Service, 15131 Triton Lane, Suite 108, Huntington Beach, CA 92649; *Recording media, all audio & video formats.*

C.A.E., 11552 Knott St., Unit 1, Garden Grove, CA 92641, 714-895-1887, Fax: 714-895-3827; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, microwave equipment.*

Cal-Scope, 473-707 Macara Ave., Sunnyvale, CA 94086, 408-730-4573, 800-828-3547, Fax: 408-730-9537; *Audio*

mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; transmitters, antennas, towers, waveguide, STL/MDS microwave equipment; Test & measurement equipment.

CMTV, Inc., 3407 Winona Ave., Burbank, CA 91504, 818-843-6644, Fax: 818-843-2478; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Daily Electronics Corp., 909 N. Alameda St., Compton, CA 90220, 213-774-1255, 800-346-6667, Fax: 213-603-1348; *Camera tubes, CRTs, rectifiers, all RF power devices.*

ESP-Extraordinarily Superior Products, 7210 Jordan Ave., Suite B-45, Canoga Park, CA 91303, 818-883-2138, 818-704-5601, Fax: 818-347-4366; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment.*

Funke & Associates, 908 Marilyn Drive, Campbell, CA 95008, 408-866-0648, 800-748-6308, Fax: 408-866-1975; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment.*

Gordon Enterprises Inc., Alen, 1430 Cahuenga Blvd., Hollywood, CA 90028, 213-466-3561, 800-825-MOVI, Fax: 213-871-2193; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, edit-*

ing, lighting equipment; Recording media, all audio & video formats.

Jensen Transformers Inc., 10735 Burbank Blvd., North Hollywood, CA 91601, 213-876-0059, Fax: 818-763-4574; *Audio mixers, mics, recorders, processing equipment.*

JP Associates, Inc., 3115 Kashiwa St., Torrance, CA 90505, 213-539-8533, Fax: 213-539-8634; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices.*

Magnetic Communications Systems, Inc., 1929 Main St., Suite 106A, Irvine, CA 92714, 714-756-1989, Fax: 714-756-2031; *Recording media, all audio & video formats.*

Marcom, P.O. Box 66507, Scotts Valley, CA 95066, 408-438-4273, Fax: 408-438-6617; *RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.*

Meyer & Ross, Inc., 1485 Rollins Road, Burlingame, CA 94010, 800-888-9906, Fax: 415-348-5296; *Audio mixers, mics, recorders, processing equipment.*

Mobile-Cam Products, 340-F Vernon Way, El Cajon, CA 92020, 619-441-1295, Fax: 619-441-9263; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Production vehicles & accessories.*

Northern Video Systems, 4234 N. Freeway Blvd., Sacramento, CA 95834, 916-646-0033, Fax: 916-646-1221; *Audio*

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PO Box 12901
Overland Park, KS 66212

mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

NTSC Productions, 3208 Cahuenga Blvd. W., Suite 333, Hollywood, CA 90068, 818-505-9430, Fax: 818-505-1223; *Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Pacific Coast Marketing, 14125 Capri Drive, Los Gatos, CA 95030, 408-370-3505, Fax: 408-370-7926; *Test & measurement equipment.*

Pacific Radio Electronics, 1351 Cahuenga Blvd., Hollywood, CA 90028, 213-462-1393, Fax: 213-462-3964; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Pacific Recorders & Eng. Corp., 2070 Las Palmas Drive, Carlsbad, CA 92009, 619-438-3911, Fax: 619-438-9277; *Audio mixers, mics, recorders, processing equipment.*

Penstock So. CA, 11050 Strathmore Drive, Suite 416, Los Angeles, CA 90024, 213-383-6100, Fax: 213-208-4471; *or*

Penstock, Inc., 520 Mercury Drive, Sunnyvale, CA 94086-4018, 408-730-0300, 800-PENSTOCK, Fax: 408-730-4782; *transmitter, antenna, tower, waveguide, STL/MDS microwave equipment.*

Pioneer Technology Corp., 1021 N. Lake St., Burbank, CA 91502, 818-842-7165, Fax: 818-842-0921; *Film cameras, processing and projection equipment.*

Professional Sound Corp., 10639 Riverside Drive, North Hollywood, CA 91602, 818-760-6544, Fax: 818-980-9911; *Audio mixer, mic, recorder, processors; Camera, recorders, monitors, effects, editing, lighting equipment.*

Provideo Inc. (A VIP Co.), 10635 Vanowen St., Burbank, CA 91505, 818-762-9671, Fax: 818-762-7356; *Cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment.*

RAG Electronics, Inc., 21418 Parthenia St., Canoga Park, CA 91304, 818-998-6500, Fax: 818-407-5559; *Test, measurement equipment.*

RF Specialties of California, 3463 State St., Suite 229, Santa Barbara, CA 93105, 805-682-9429, Fax: 805-682-5170; *Audio mixers, mics, recorders, processing equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.*

ROH Products, 1101-A Air Way, Glendale, CA 91201, 818-500-0269, 800-999-5260, Fax: 818-240-1828; *Audio mixers, mics, recorders, processing equipment; Test & measurement equipment.*

Sprague Magnetics, Inc., 15720 Stagg St., Van Nuys, CA 91406, 818-994-6602; *Audio mixers, mics, recorders, processing equipment; Recording media, all audio & video formats.*

SSL Industries Inc., P.O. Box 3410, Camarillo, CA 93011, 805-482-9884; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Strand Lighting, Inc., 18111 S. Santa Fe Ave., Rancho Domingue, CA 90221, 213-637-7500, Fax: 213-632-5519; *Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Televideo San Diego, 4783 Rufner St., San Diego, CA 92111, 619-268-1100, Fax: 619-268-1790; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

Time Arts Inc., 1425 Corporate Center Parkway, Santa Rosa, CA 95407, 707-576-7722, Fax: 707-576-7731; *Video graphics software.*

Videomedia, Inc., 211 Weddell Drive, Sunnyvale, CA 94089, 408-745-1700, Fax: 408-745-6721; *Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Videotape Products Inc., 320 N. Madison Ave., Los Angeles, CA 90004, 213-664-1144, Fax: 213-661-2177; *Cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Western Broadcast Systems Inc., 3350 Scott Blvd., Building 5, Santa Clara, CA 95054, 408-727-9898, Fax: 408-727-9927; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Whitehouse Audio Visual, 2696 Lavery Court, Suite 8, Newbury Park, CA 91320, 805-498-4177, Fax: 805-499-7947; *Film cameras, processing and projection equipment.*

COLORADO

Didier Broadcast Associates, 8528 W. Dartmouth Plaza, Lakewood, CO 80227, 303-987-0256; *Audio mixers, mics, recorders, processing equipment; camera, recorder, monitor, effect, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL, MDS microwave equipment; Recording media, all audio & video formats.*

Film/Video Equipment Service Co., 800 S. Jason, Denver, CO 80223, 303-778-8616, Fax: 303-778-8657; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Television Technology Corp., P.O. Box 1385, Broomfield, CO 80020-8385, 303-665-8000, Fax: 303-673-9900; *RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.*

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Infotronics, Inc., P.O. Box 935, Woodbury, CT 06798, 203-263-5350; *Video cameras, recorders, monitors, effects, editing, lighting equipment.*

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Computer Prompting Corp., 3408 Wisconsin Ave. N.W., Suite 201, Washington, DC 20016, 202-966-0980, Fax: 202-966-0981; *Camera, recorder, monitor, prompter, editing, lighting equipment.*

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Bencsik Associates Inc., 3730 N.E. 42nd Ave., Ocala, FL 32670, 904-732-9775; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment.*

Broadcasters General Store, Inc., 2480 S.E. 52nd St., Ocala, FL 32671, 904-622-9058, Fax: 904-622-9058; *Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, transmission line, waveguide, STL/MDS microwave equipment.*

Camera Mart Inc., International Div. 8200 N.W. 27th St., Miami, FL 33122, 305-591-8118, Fax: 305-591-8880; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.*

Control Technology, Inc., 2950 S.W. Second Ave., Fort Lauderdale, FL 33315, 800-327-4121, Fax: 305-764-3298; *Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, transmission line, waveguide, STL/MDS microwave equipment; Production vehicles & accessories.*

Electrex Co., 18620 N.E. Second Ave., Miami, FL 33179, 305-651-5752, Fax: 305-654-1386; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitter, antenna, tower, waveguide, transmission line, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

Family Marketing Group Inc., 3638 S.E. 46th Place, Ocala, FL 32671, 904-629-9410, Fax: 904-622-9058; *Audio mixers, mics, recorders, processing equipment; transmitters, antennas, towers, waveguides, MDS microwave equipment.*

Gendra International Inc. Broadcast & Communications Div., 2800 Biscayne Blvd., Suite 700, Miami, FL 33137, 305-372-8845; *Test & measurement equipment.*



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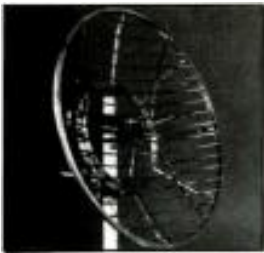


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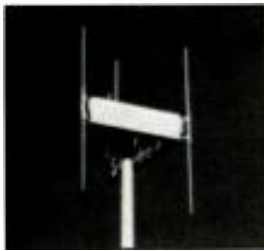
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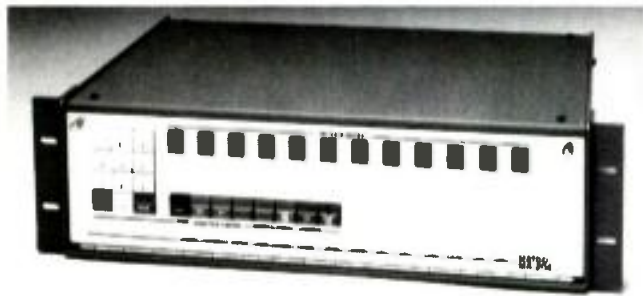
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6801; or

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MPCS Hollywood, 4100 North
28th Terrace, Hollywood, FL
33020, 305-923-3448, Fax:
305-923-3449; or

MPCS Orlando, 5422 Carrier
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32819, 407-351-0660, Fax:
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Singer Products, Inc., 1840
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3000, Fax: 305-558-2801;
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Fax: 407-648-2604; Video
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lando, FL 32811, 407-649-
6444, Fax: 407-648-1352;
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425-0630, Fax: 404-427-0562;
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MPCS Video Industries Atlanta,
2254 Northwest Parkway, Suite
C, Marietta, GA 30067, 404-
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microwave equipment.

Victor Duncan, Inc.-Atlanta,
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4758; Audio mixers, mics, re-

coders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories.

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Audico Chicago, Inc., 7206 W. Grand Ave., Elmwood Park, IL 60635, 708-456-0003, Fax: 708-456-0418; Recording media, all audio & video formats.

Broadcasters General Store, Inc., 746 Cypress Lane, Carol Stream, IL 60188, 708-231-7120, Fax: 708-231-7246; Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

Center Video Industrial Co. Inc., 5615 W. Howard St., Niles, IL 60648, 708-647-8700, 800-621-4354, Fax: 708-647-8707; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment.

Clark Wire & Cable, 1801 Holste Road, Northbrook, IL 60062, 708-272-9889; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF

transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

Discount Video Warehouse, P.O. Box 36, Mount Prospect, IL 60056, 708-299-5258, 800-323-8148, Fax: 708-299-4206; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Recording media, all audio & video formats.

Joseph Electronics, 8830 N. Milwaukee Ave., Niles, IL 60648, 708-297-4200, Fax: 708-297-6923; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices.

Pennstock Midwest, 1250 W. Northwest Highway, Palatine, IL 60067, 708-934-3700, Fax: 708-934-3748; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

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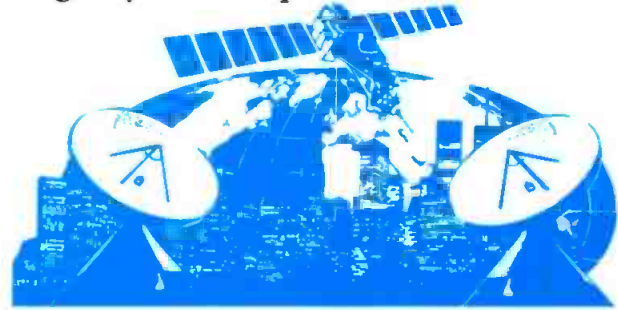
Richardson Electronics Ltd., 40W267 Keslinger Road, LaFox, IL 60147, 708-208-2200, 800-348-5580, Fax: 708-208-2550; Camera tubes, CRTs, rectifiers, all RF power devices.

Roccor Corp., 1061 Feehanville Drive, Mount Prospect, IL 60056, 708-299-8080 Ext, Fax: 708-299-4206; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers,

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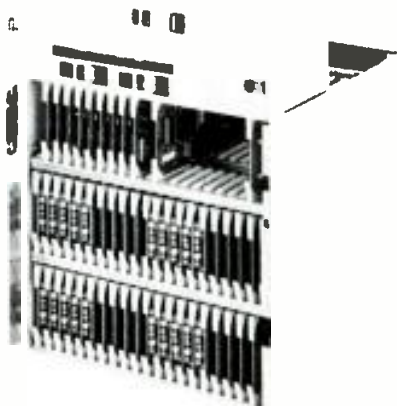
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Victor Duncan, Inc., 661 N. LaSalle St., Chicago, IL 60610-3770, 312-943-7300, Fax: 312-943-9043; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories.

Video Images-Chicago, 1121 Tower Lane, Bensenville, IL 60106, 708-766-1100, Fax: 708-766-1106; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

6652; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

Gray Supply Co., 4415 Indianapolis Blvd., East Chicago, IN 46312-2696, 219-398-2362, 800-238-2244, Fax: 219-398-0038; Video cameras, recorders, monitors, effects, editing, lighting equipment.

Harris Allied Broadcast Equipment, 3712 National Road W., Richmond, IN 47374, 317-962-8596, Fax: 317-962-8961; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.

Harris Allied International, P.O. Box 1487, Richmond, IN 47375, 317-935-1704, Fax: 317-966-0402; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.

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Penstock Indiana, 4030 S. Southport Road, Suite 27, Indianapolis, IN 46237, 317-784-3870, Fax: 317-784-4250; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

IOWA

Audiovisual Inc., 415 S.W. Eighth St., Des Moines, IA 50309, 515-282-4800, Fax: 515-283-2607; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, audio & video formats.

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Central Tower Inc., 2855 Highway 261, Newburgh, IN 47630, 812-853-0595, Fax: 812-853-

Electronic Communication Systems, 2906 Brady St., Davenport, IA 52803, 319-322-

1525, Fax: 319-322-5920; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Production vehicles & accessories; Recording media, all audio & video formats.

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KANSAS

Computer Concepts Corp., 8375 Melrose Drive, Lenexa, KS 66214, 913-541-0900, 800-255-6350, Fax: 913-541-0169; Audio mixers, mics, recorders, processing equipment.

Penstock Midwest, 302 S. Clairborne, Suite I Office 4, Olathe, KS 66062, 913-829-9330, Fax: 913-829-9331; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

Professional Studio Distributors, 1059 Porter, Wichita, KS 67203, 316-267-1573; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Recording media, all audio & video formats.

RSC Electronics, Inc., 131 Laura, Wichita, KS 67201, 316-267-5213, Fax: 316-267-8917; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

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Dawson & Associates, Bruce L., 1752 Frankfort Ave., Louisville, KY 40206, 502-896-2266, 800-633-0195, Fax: 502-895-8736; Video cameras, recorders, monitors, effects, editing, lighting equipment; Recording media, all audio & video formats.

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MARYLAND

Bradley Broadcast Sales Inc., 8101 Cessna Avenue., Gaithersburg, MD 20879, 301-948-0650, Fax: 800-732-7665; Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguide, STL/MDS microwave equipment; Recording media, audio & video formats.

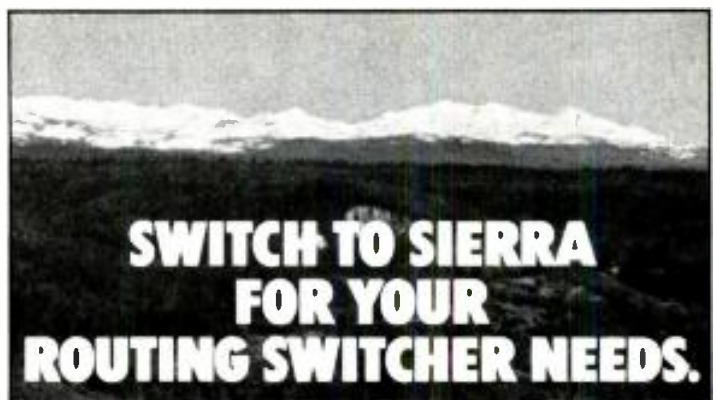
Brothers Co. Inc., David H., 2893 Baltimore Blvd., Finksburg, MD 21048, 301-833-0920, 301-861-8364; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment.

Harrison Systems Ltd., RF Systems Engineering, 6802 Industrial Drive, Suite 204, Beltsville, MD 21114, Fax: 301-937-2968; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

Penta Labs, 10820 Guilford Road, Suite 211, Annapolis Junction, MD 20701-9973, 800-852-1033, 800-783-2555; Camera tubes, CRTs, rectifiers, all RF power devices.

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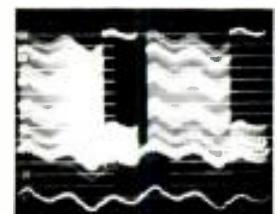
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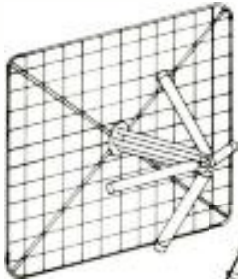
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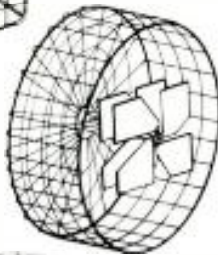


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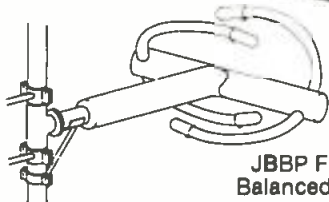
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BAF Communications Corp., 16 Bourbon St., Peabody, MA 01960, 508-535-1969, 800-633-8223, Fax: 508-535-5303; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitter, antenna, tower, waveguide, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories.

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Contact East Inc., 335 Willow St. S., North Andover, MA 01845, 508-682-2000, 800-225-5370, Fax: 508-688-7829; Test & measurement equipment.

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Landy Associates, Inc., 330 Bear Hill Road, Waltham, MA 02154, 617-890-6325, Fax: 617-890-9122; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

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Audio Broadcast Group, Inc., 2342 S. Division Ave., Grand Rapids, MI 49507, 616-452-1596, Fax: 616-452-1596; Audio mixer, mic, recorder, processing equipment; transmitters, antennas, towers, waveguide, microwave equipment.

CM Sales, Inc., 31700 W. 12 Mile Road, Suite 206, Farmington Hills, MI 48018, 313-553-8070, Fax: 313-553-8043; Audio mixers, mics, recorders, processing equipment.

Communications Systems Group, General TV Network, 13355 Capital Ave., Oak Park, MI 48237, 313-399-2000, Fax: 313-548-0028; Audio mixer, mic, recorder, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Production vehicles & accessories; Recording media, all audio & video formats.

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Victor Duncan, Inc., 23801 Industrial Park Drive, Suite 100, Farmington Hills, MI 48024, 313-471-1600, Fax: 313-471-1940; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories.

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Television Engineering Corp., 580 Goddard Ave., Chesterfield, MO 63005, 314-532-4700, Fax: 314-536-2045; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories.*

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Wide Range Electronics Corp., 174 Chesterfield Industrial Blvd., Chesterfield, MO 63005, 314-532-5887, Fax: 314-532-5492; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Recording media, all audio & video formats.*

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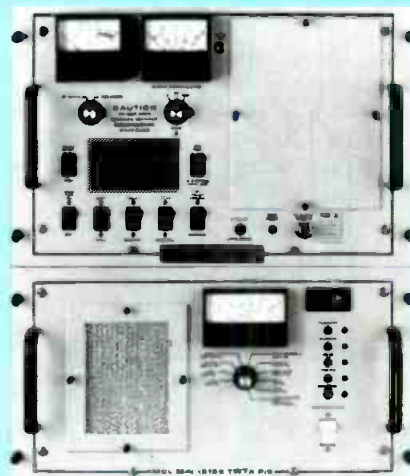
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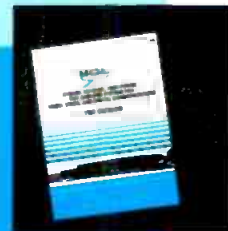
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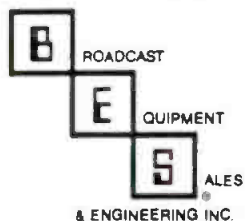
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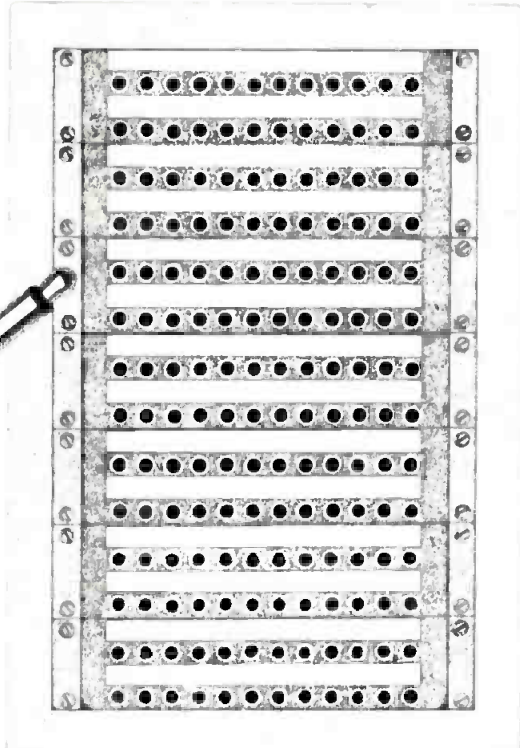
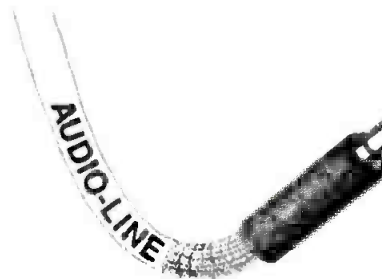
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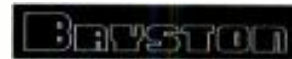
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Continental Electronics, P.O. Box 270879, Dallas, TX 75227, 214-381-7161, Fax: 214-381-4949; Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

Crouse-Kimzey Co., 3507 W. Vickery, Fort Worth, TX 76107, 817-737-9911; Audio mixer, mic, recorder, processor equipment.

GP Enterprises, Inc., P.O. Box 912, Arlington, TX 76004-0912, 817-572-0132, Fax: 817-478-9264; *Audio mixer, mic, recorder, processor equipment; Video camera, recorder, monitor, effects, editing, switcher equipment; transmitters, antennas, towers, waveguides, microwave equipment; Test, measurement equipment.*

The Management, P.O. Box 1-36457, Fort Worth, TX 76136, 817-625-9761, 800-334-7823, Fax: 817-624-9741; *Audio mixers, mics, recorders, processing equipment.*

MPCS Amarillo, 5410-B Bell St., Suite 412, Amarillo, TX 79109, 806-355-9676, Fax: 806-359-5508; *or*

MPCS Austin, 4030 W. Braker Lane, Suite 410, Austin, TX 78759, 512-343-8600, Fax: 512-343-9492; *or*

MPCS Dallas, 6221 N. O'Connor, Suite 102, Irving, TX 75039, 214-869-3001, Fax: 214-869-2533; *or*

MPCS Houston, 8760 Westpark, Houston, TX 77063, 713-977-1992, Fax: 713-977-6768; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test, measurement equipment; Recording media, all audio & video formats.*

Pro Video & Film Equipment Group, 11419 Mathis St., Dallas, TX 75234, 214-869-0011, Fax: 214-869-0145; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

Professional Audio Supply, 5700 East Loop 820 South, Fort Worth, TX 76119-7099, 817-483-7474, Fax: 817-483-9952; *Audio mixer, mic, recorder, processor equipment; transmitters, antennas, towers, waveguides, microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

RF Specialties of Texas, P.O. Box 7630, Amarillo, TX 79114, 806-372-4518, Fax: 806-373-8036; *Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.*

Victor Duncan, Inc., 6305 N. O'Connor, Building 4, Irving, TX 75039, 214-869-0200, Fax: 214-869-9810; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories.*

UTAH

RIA Corp., 50 E. Malvern, Salt Lake City, UT 84115, 801-486-8822, Fax: 801-486-2741; *Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equip-*

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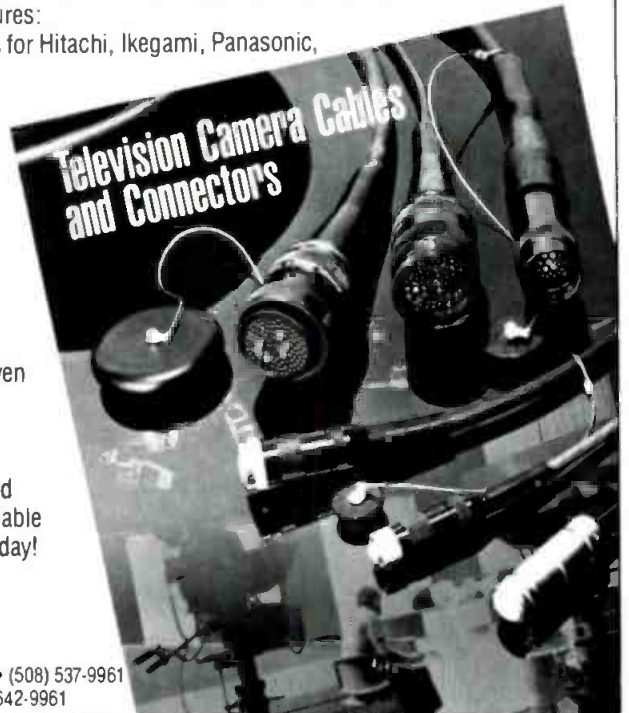
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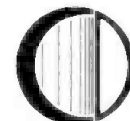
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ment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Production vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

VIRGINIA

Alpha Audio, 2049 W. Broad St., Richmond, VA 23220, 804-358-3852, Fax: 804-358-9496; Audio mixers, mics, recorders, processing equipment.

Avec Electronics Corp., 711 Grandy St., Norfolk, VA 23510, 804-627-3502, Fax: 804-627-1710; or

Avec Electronics Corp., 2009 Williamson Road, Roanoke, VA 24012, 703-344-6288, Fax: 703-344-0081; or

Avec Electronics Corp., 2002 Staples Mill Road, Richmond, VA 23230, 804-359-6071, Fax: 804-359-5609; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

Broadcast Services/EME, P.O. Box 309, Front Royal, VA 22630, 703-635-1413, Fax: 703-635-9762; Audio mixer, mic, recorder, processor equipment; Video camera, recorder, monitor, effects, editing, lighting equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, audio & video.

Hall Electronics, Inc., 1305-F Seminole Trail, Charlottesville, VA 22901, 804-974-6466, Fax: 804-974-6450; Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measure-

ment equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, audio & video formats.

Old Dominion Broadcast Eng. Service, 9505 Lakewater Court, Richmond, VA 23229, 804-740-4717; Audio mixers, mics, recorders, processing equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

Schafer World Communications Corp., P.O. Box 31, Marion, VA 24354, 703-783-2000, Fax: 703-783-2064; Audio mixer, mic, recorder, processing equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Recording media, audio & video formats.

Systems Wireless Ltd., 465 Herndon Parkway, Herndon, VA 22070, 703-471-7887, 800-542-3332, Fax: 703-437-1107; Audio mixers, mics, recorders, processing equipment.

WASHINGTON

Audio Control Industrial, 22313 70th Ave. W., Mountlake Terrace, WA 98043, 206-775-8461, Fax: 206-778-3166; Test & measurement equipment.

Broadcast Supply West, 7012 27th St. W., Tacoma, WA 98466, 800-426-8434, Fax: 206-565-8114; Audio mixers, mics, recorders, processing equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.

Northshore Marketing, 16 W. Harrison St., Suite 205, Seattle, WA 98119, 206-284-9699, Fax: 206-285-9412; Audio mixers, mics, recorders, processing equipment.

Omni Q Inc., P.O. Box L, Blaine, WA 98230, 206-384-1750;

Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment.

Penstock Northwest, 10800 N.E. Eighth St., Suite 800, Bellevue, WA 98004, 206-454-2371, Fax: 206-451-9418; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

RF Specialties of Washington, Inc., 19237 Aurora Ave. N., Seattle, WA 98133, 206-546-6546, Fax: 206-546-2633; Audio mixers, mics, recorders, processing equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment.

WISCONSIN

Full Compass Systems, Ltd., 5618 Odana Road, Madison, WI 53719, 608-271-1100, 800-356-5844; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Test & measurement equipment; Production vehicles & accessories; Recording media, all audio & video formats.

Vaughn Broadcast Rentals Vaughn Duplication Services, 700 W. Michigan Ave., Suite 270, Milwaukee, WI 53233, 414-276-6511, Fax: 414-276-0555; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; Production vehicles & accessories; Recording media, all audio & video formats.

Video Images-Milwaukee, 285 N. Janacek Road, Waukesha, WI 53186, 414-785-8998, Fax: 414-785-9264; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Produc-

tion vehicles & accessories; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, all audio & video formats.

CANADA

DKW Systems, 9919 105th St., Unit 730, Edmonton, Alta, Canada, T5K 1B1, 403-426-1551, Fax: 403-426-1551; Audio mixers, mics, recorders, processing equipment.

GERR Electro Acoustics Ltd., 363 Adelaide St. E., Toronto, Ont., Canada, M5A 1N3, 416-868-0528, Fax: 416-868-6419; Audio mixers, mics, recorders, processing equipment.

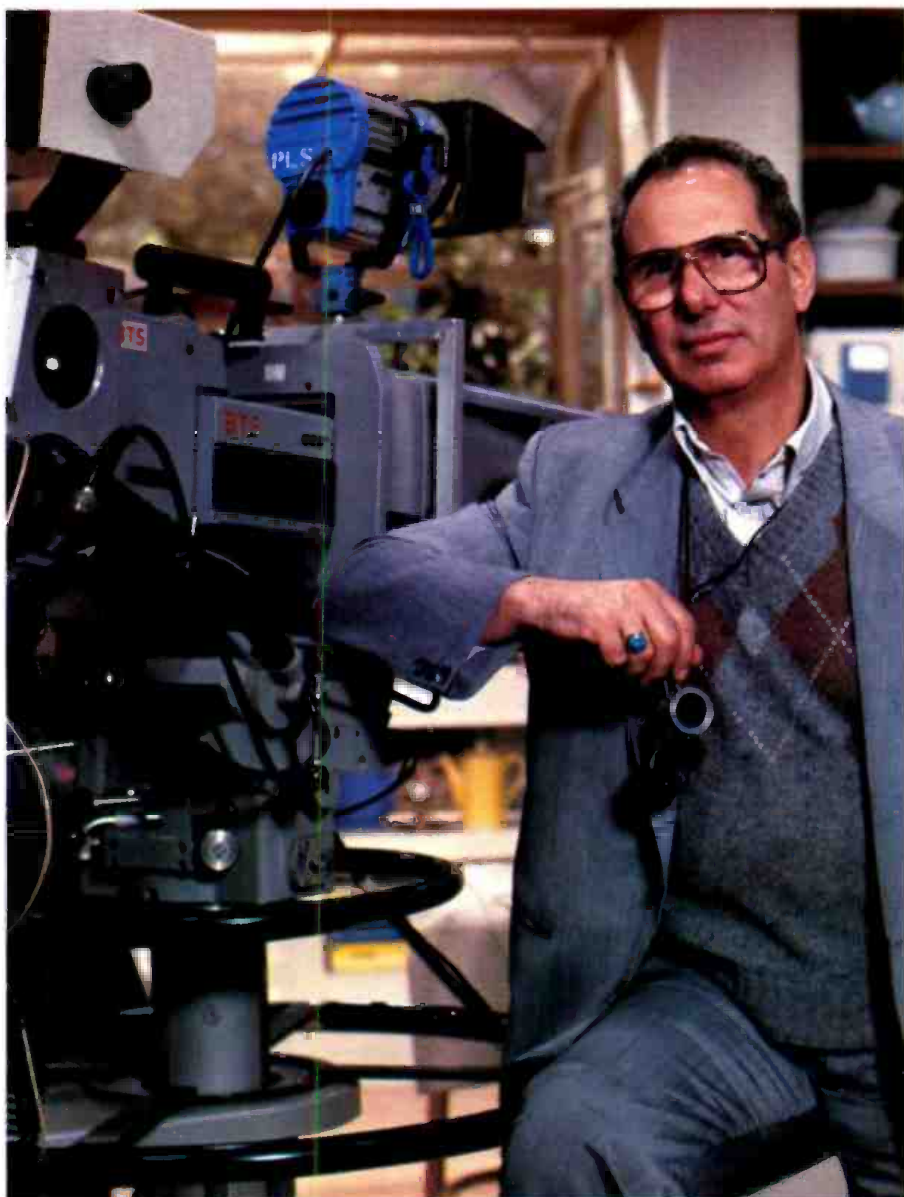
Harris Allied Broadcast-Canada, 10 W. Pearce St., Unit 6, Richmond Hill, Ont., Canada, L4B 1B6, 416-731-3697, Fax: 416-764-0729; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; RF transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Recording media, all audio & video formats.

Lumitrol, Ltd., 253 Merton St., Toronto, Ont., Canada, M4S 1A7, 416-485-4817, Fax: 416-485-4826; Video cameras, recorders, monitors, effects, editing, lighting equipment.

M.S.C. Electronics Ltd., 147 W. Beaver Creek Road, Richmond Hill, Ont., Canada, L4B 1C6, 416-731-9500, Fax: 416-731-5195; Audio mixers, mics, recorders, processing equipment; Video cameras, recorders, monitors, effects, editing, lighting equipment; transmitters, antennas, towers, waveguides, STL/MDS microwave equipment; Test & measurement equipment; Camera tubes, CRTs, rectifiers, all RF power devices; Recording media, audio & video formats

Is your company's name missing from this directory? If so, either the name is not on our mailing list or someone did not respond to repeated requests for information. If you wish to be included in the 1992 issue, write a letter, before May 1, to:

BE Directory Editor
PO Box 12901
Overland Park, KS 66212



George Spiro Dibie on BTS LDK-90 cameras...

“BTS’s LDK-90 video cameras are really the top performers on all of my shoots. They make multi-camera video productions look like film. Tube-type cameras have problems with resolution, hot spots and comet tailing. But thanks to BTS frame-transfer CCD chip technology, I light for my video cameras exactly the way I light for film cameras.”



Name: George Spiro Dibie

Profession: Senior Director of Multicamera Photography for Warner Brothers Television.

Current Credits:
Growing Pains
Just The Ten Of Us

Organizations:
President, International Photographers Guild, Local 659, Hollywood; member, Directors Guild of America (DGA); member, Society of Motion Picture and Television Engineers (SMPTE), TV Academy, A.S.L.D. and S.O.C.

Awards:
Winner of three Emmys.
Gold Award (Houston International Film Festival)
Chris Statuette (Columbus Film Festival)

George Spiro Dibie on Production Lighting:

“The most important concept is to follow the source. Windows, doors, lamps... these are the sources of light in a scene. I start from there. To accommodate one camera or multi-cameras, you deal with the feel of the source.”

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KARK	CCTV	KJTV	KGBT	KSEE	WGAL	KVVU
KELO	VOK	WISN	KRGV	KRMA	KOAT	KPHC
WCBS	TTV	WCVB	KTXS	WOFL	WUTR	WHMM
WDVM	RAI	WAKA	WSLS	WATL	WCET	WAVY
WTOL	KBC	KSTS	WHME	WHO	WSYX	WXEX
WEHT	BTQ-7	WJCL	WJZY	WGN	WCAU	WOWB
WBRZ						KBDI
KMOX						KWHY
KAIT						WTV
WNEM						WGN
WSLA						WAVE
KETK	STW-9	WIPB	WETK	WTVW	WNEP	WECT
WLVI	BCV-8	WTVJ	KHJ	WPSD	WVIA	WMH
KETK	KBS	KGUN	KARK	KPLC	WIS	KWTV
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CFQC	BBC	WHCT	WTTV	KMOV	KCOS	WSAV
CFMT	WABI	WMAZ	KFME	WFIE	KPRC	WBT
CBFT	WCCB	WBAL	KLTV	WHAS	KTRK	WFM
CITV	WETM	WBFF	WSFA	KLFY	WWCP	WCPC
CKVR	WXXI	KSPR	KPNX	WDSU	WYFF	WCIV
CKVU	KEZI	WPTZ	KICU	WMAR	KBTX	KUTV
CJOH	WTAE	WHYY	KSBW	WLOS	KFDM	KUSA
CBUT	KSFY	KLRN	KCNC	WXII	KSAT	KXLY
CIVM	WCFE	KTMD	WRC	WRGB	KVUE	KXAS
HSV-7	WTTW	KODE	WXEL	WBNS	KSL	KWCH

These stations had to pay us to get on this list.

What we mean, of course, is that they all have purchased Ampex switchers, and we don't exactly give those things away. But what's more important is what the TDs and directors at stations like these are saying about our switchers...

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"We store all of our switcher setups on the same disk where we store our program options. Then we can pop the disk

in and have our entire switcher ready, bingo, for the whole program... with all the panel memory setups... in 3 or 4 seconds!"

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AMPEX

BE-SPBK-CENB

Video equipment specs

Color Television Cameras

These cameras typically use three pickup devices in Studio, Outside broadcast, ENG and EFP applications. All models derived image enhancement from the green channel, while some also use enhancement from red and blue channels. All units, except HDTV products, are available for NTSC, most in PAL and SECAM, as well. Abbreviations N, P, S may be used. All units include one or more black/white balance memories. Signal formats supported by some models may require an adapter for that operation. Cameras designed for EFP and studio typically include intercom and return video capability, as well as a program audio channel for a camera-mounted mic. Sensitivity reflectance is typically 89.9%; light is given in lux. All provide for highlight compensation. [Camcorder (1-piece) systems are identified in the video recorder section of this reference guide.] Under filters, read C for color, N for neutral density.

Manufacturer	Ampex			BTS			
	Model	CVC-50 (-5)	CVC-7(-70) ¹	CVC-7000HS ²	KCH 1000 ³	KCM-125 (KCM-318)	LDK 90 (900)	LDK 91 (910)
Composite output	Yes	Yes	Yes	Any HDTV	Yes N P S	Yes N P S	Yes N P
RGB output	Yes (No)	No	No	Yes	Yes	Yes	Yes
Y/C _b /C _r output	Yes	Yes	Yes	Yes	..	Yes	Yes
S-VHS/Y-C output	No	No	No	No	Yes	No	No
μP in camera head	No	Yes	Yes	Yes	Yes	Yes	Yes
Direct VCR cable	Yes	Yes	Yes	No	No	Yes	Yes
Coax/Triax/Fiber Optic Cable	-50 only	C/T/FO	C/T/FO	Triax	Yes	Triax	Triax
Multicore cable	-50 only	Yes	Yes	No	Yes	Yes	Yes
Docking VCR	Yes	Yes	Yes	No	No	Yes	Yes
Color balance memories	Yes	Yes	Yes	Scenes	Yes	Yes	Yes
ND/color filters	4C-2N	4C-2N	4C-2N	4-position	Optic/electronic	(4-position)	(4-position)
Application ENG EFP Studio OB	ENG/EFP	ENG/EFP	ENG/EFP	HDTV	Studio	E & (F/S)	E & (F S)
Pickup size/type	FIT CCD	2/3 IT (FIT)	IT CCD	30mm Ph0	1 (2/3)	3 FT CCD 1/2	3 FT CCD 1/2
CCD array size/type	510x492	768x493	768x493	or 24mm SAT	DG Pb0 (HS Pb0)	610x492 (2/3)	806x504
Standard sensitivity	2000 .6	2000, 5.6	200, 5.6	800, 4 Pb0	630(800), 1.6	1750, 4.0	1750, 4.0
Limiting sensitivity	15, 1.4	15, 1.4	1.5, 1.4	70, 2	30(25), 1.6	27; 1.4 (54)	13; 1.4
Maximum video gain	18	18	18	9	18	12, 18 opt	18 (24 opt)
S/N ratio	60dB (58)	62dB NTSC	62dB NTSC		58dB/N, 56dB P/S	58dB	61dB
Limiting resolution	550 TVL	700 lines	370 lines	1200 50% 600TVL	>700 TVL (60%)	>650 (45% 5MHz)	>700 50% 5MHz
Electronic shutter	7-speed on -50	6-sp to 1/2000s		No	No	2-speed	2-speed
Registration error %	0.05%	0.005%	0.01/ 2/ 5%	0.02%	μP corrected	0.05%	0.05%
Color correction matrix	Option	Option	No	Yes	Yes	... (Yes)	... (Yes)
Remote control panel	Option	Option	...	Yes	Yes	Yes	Yes
Camera control unit	Option	Option	...	Yes	Yes	Yes	Yes
Multi-camera panel	...	...	...	Yes	Yes	... (Yes)	... (Yes)
Operating power	10.5-17V	10.5-17V	10.5-17V	350W		11W (110W)	11W (170W)
Camera head weight lbs	7.5	7.5	9.9	72.6	73 (17.6)	7.5 (<40)	7.5 (<40)
Reader Service No	565	566	567	568	569	570	571

¹-T7 has separable optical block & lens for special purposes. ² Image intensifier for low light use. ³ Software adjustable to all current HDTV proposals.

Manufacturer	BTS		Hitachi Denshi				
	Model	LDK6/6A (54)	FP-C1 (-C2)	SK-F1 (-F3) ⁴	SK-F700/710	SK-F750(-760) ⁵	SK-H500 (-H50) ⁶	Z-One (CK-28)
Composite output	Yes N P S	Yes	Yes	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y/C _b /C _r output	(LDK-54)	No	Yes	Option	Option	Yes	Yes
S-VHS/Y-C output	No	Yes	Option	Option	...	...	Yes
μP in camera head	Yes	...	Yes	Yes	Yes	Yes	...
Direct VCR cable	No	Yes	Yes	Yes	..	(Yes)	Yes
Coax/Triax/Fiber Optic Cable	Triax	..	C/T	Triax	Triax	C/T	...
Multicore cable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Docking VCR	No	Yes	Yes	No	No	No	Yes
Color balance memories	Yes	Yes	32 scenes	32 data files	32 scenes	..	Yes
ND/color filters	Optical	1N-3C	2N-2C	4N-3C	4N-4C	4N-4C	1N-3C
Application ENG EFP Studio OB	S & (O E F)	ENG/EFP	ENG/EFP	OB/S	Studio/EFP	O/F/S	ENG/EFP
Pickup size/type	1 : 1 1/4 Pb0	3 2/3	2/3 FIT CCD	2/3 FIT CCD	2/3 FIT CCD	Harpicon	3 2/3 CCD
CCD array size/type	[Pb0 2/3]	574x499	300kpixel	400kpixel	450kpixel	..	754x485 (x499)
Standard sensitivity	700, 2.8 (900)	2000, 5.6	2000, 5.6	2000, 5.6	2000, 5.6	200, 4	2000, 5.6
Limiting sensitivity	46; 2.8 (24)	23, (25) 1.7	15	15, 1.4	15, 1.4	17, 1.8	23 (25); 1.7
Maximum video gain	12 (18)	18	18	21 3-step	18 3-step	18	18
S/N ratio	58dB/N, 56dB:P	60dB	60dB (62dB)	60dB/N/ 57dB/P	62dB	57dB	60dB
Limiting resolution	400TVL (>650)	660	650 (700)	700 TVL	800 TVL	700	750 (660)
Electronic shutter	No	No	6-sp to 1/2000	No	6-st to 1/2000	Mech. to 1/200	5-(6)sp 1/2000
Registration error %	<25/40/40ns	..	0.05% all zones	0.05% all zones	0.05% all zones	<0.1%	0.05%
Color correction matrix	Yes	No	Option	Yes	Yes	Option	No
Remote control panel	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Camera control unit	Yes	No	Option	Yes	Yes	Yes	No
Multi-camera panel	Yes	No	Option	Yes	Yes	Yes	No
Operating power	...	12Vdc 11W	10.5-17V 14W	300VA	300VA	250VA	12Vdc 11W
Camera head weight lbs	94.6 (9.35)	8.7 (9.2)	7.5	66	66	..	7.7 (9.2)
Reader Service No	572	573	574	575	576	577	578

⁴SK-F2 uses 400k IT CCD for 700TVL resolution. ⁵ CCD version of SK-971/-970D ⁶ -H50 is portable companion unit.

Color Television Cameras

Manufacturer	Ikegami						
Model	HC-200/230/240 ⁷	HK-323 (323P) ⁸	HK-327 (327P) ⁹	HK-353 ¹⁰	HK-355 (355P) ¹¹	HL-53 Unicam	HL-55A Unicam ¹²
Composite output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YCrCb output	Yes	No	Yes	No	(355P)	Yes	Yes
S-VHS/Y-C output	Yes	No	No	No	..	No	No
μP in camera head	...	Yes	Yes	Yes	Yes	...	...
Direct VCR cable	Yes	No	No	No	No	Yes	Yes
Coax/Triax/Fiber Optic Cable	Coax	C/T/FO	C/T/FO	C/T/FO	Triax	Coax/triax	Coax/triax
Multicore cable	..	Yes	Yes	Yes	Yes	Yes	Yes
Docking VCR	Yes	No	No	No	No	Yes	Yes
Color balance memories	..	One	Yes	..	Yes	..	..
ND/color filters	3C 1N	4C-4N (3C-3N)	4C 4N	4N 5C	4C-4N (3C-3N)	2N-4C	2N-4C
Application ENG EFP Studio OB	ENG EFP	Studio/EFP	Studio/EFP	Studio/EFP	Stu EFP	E F S	E F S
Pickup size/type	3 IL /FIT 1/2	1 PbO DG	30mm M-S PbO	IT 2 ₃	FIT CCD 2 ₃	IT CCD 2 ₃	FIT CCD 2 ₃
CCD array size/type	510Hx492V	(2 ₃ PbO DG)	..	400k pix	450k pixel	400k pix	400k pix
Standard sensitivity	2000: 5.0	2000: 5.6(4.5)	1500: 5.6	f/5.6	2000: 5.6	2000: 5.6	2000: 5.6
Limiting sensitivity	20-25: 1.4	..	94: 1.4	..	..	10	10
Maximum video gain	18	12	12	..	12	24	24
S/N ratio	58/60	59(60)	59dB	62dB	62dB	62dB	62dB
Limiting resolution	530/600/700	700 (650)	800 65% 400TVL	700H 400V	800 (700)	700H 400V	700H 400V
Electronic shutter	6, 3, 6 speeds	No	No	Variable	Variable	6-speed	6-speed
Registration error %	0.05%	0.05/1/2	0.05%	0.05%	0.02%	0.05%	0.05%
Color correction matrix	No	Yes	Yes	Yes	Yes	No	No
Remote control panel	..	Yes	Yes	Yes	Yes	Yes	Yes
Camera control unit	No	Yes	Yes	Yes	Yes	Yes	Yes
Multi-camera panel	No	Yes	Yes	Yes	Yes	..	No
Operating power	12V 11.5W	230VA	360VA	110 220Vac	130VA (26W)	11-16V	11-16V
Camera head weight lbs	6.6-9.2	57 (15.4)	79.2	55	55 (13.2)	6.8	6.8
Reader Service No	579	580	581	582	583	584	585

⁷Variations in models include different CCD types. ⁸-323P portable companion to studio unit. ⁹327P portable companion unit. ¹⁰Optical axis of prism adjusts to center lens on CCDs. ¹¹355P portable companion unit. ¹²Also HL-55 with Beta option.

Manufacturer	Ikegami			JVC Company			Panasonic
Model	HL-791	HL-87M Owl ¹³	MKC-300 30 ¹⁴	BY-10U	KY-15CIBU ¹⁵	KY-25U	AK 400
Composite output	Yes	Yes	..	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YCrCb output	..	Yes	..	No	Yes	Yes	Yes
S-VHS/Y-C output	No	..	Yes	Yes	Yes	Yes	No
μP in camera head	Yes	..	..	..	..	Yes	..
Direct VCR cable	Yes	Option	No	Yes	Yes	Yes	Option
Coax/Triax/Fiber Optic Cable	Coax/triax	No	..	Coax	..	Coax	Coax/triax
Multicore cable	Yes	No	Special	Yes	Yes	Yes	Yes
Docking VCR	Yes	Betacam	No	Yes	..	Yes	AU 400
Color balance memories	..	..	[and monitor	..	..	..	..
ND/color filters	4C-3N	2N 4C	2C-1N	1N-3C	1N-3C	1N-3C	3N 4C
Application ENG EFP Studio OB	EFP	C	EFP	ENG/EFP	Graphics	ENG/EFP	E F S C
Pickup size/type	PbO 2 ₃	FIT 2 ₃	FT CCD 2 ₃	1 2 ₃ IT CCD	1 2 ₃ IT CCD	3 2 ₃ IT CCD	FIT 2 ₃
CCD array size/type	..	420k pix	400k	380k pixel	668x485 pixel	360k pixel	574x494
Standard sensitivity	2000: 4.5	150: 5.6	2000: 5.6	2000: 8	2000: 4	2000: 5.6	2000: 5.6
Limiting sensitivity	..	0.02	15: 1.2	10: 1.6	..	23: 1.7	20: 1.6
Maximum video gain	..	18	..	18	..	18	18
S/N ratio	61dB	58dB	60dB	58dB	58dB	60dB	60dB
Limiting resolution	650 lines	380H	600	450	..	700	650
Electronic shutter	No	2-speed	Variable	3-speed	to 1/500s	3-sp to 1/1000	4-speed
Registration error %	0.05/1/3	±0.5%	0.05%	..	0.05%	0.05%	0.05%
Color correction matrix	..	No	Yes	No	No	No	Yes
Remote control panel	Yes	Yes	Yes	Yes	No	Yes	No
Camera control unit	Yes	Yes	..	No	No	No	Yes
Multi-camera panel	Yes	..	..	No	No	No	..
Operating power	21W 12V	12V 15W	10.8VA	12Vdc 12W	12Vdc 15W	12Vdc 18W	10.5 17V
Camera head weight lbs	12	9	2	5.1	8	6.6	7.5
Reader Service No	586	587	588	589	590	591	592

¹³Pil Proximity Image Intensifier/MCP Micro-Channel Plate. ¹⁴With appropriate accessories, and 120Hz V scan, produces 3D images. ¹⁵Designed for image capture for graphics.

Manufacturer	Panasonic Broadcast			Sony			
Model	AK 450	AQ-20 (-10)	BVP-360A/360AP ¹⁶	BVP-370 (270)	BVP-77P ¹⁷	BVW-500 series ¹⁸	DXC-3000A ¹⁹
Composite output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RGB output	Yes	Yes	Yes	CCU	Yes	..	CCU
YCrCb output	Yes	Yes	Yes	CCU	Yes	Yes	No
S-VHS/Y-C output	No	No	No	No	No	..	Yes
μP in camera head	..	..	Yes	Yes	..	..	Yes
Direct VCR cable	Option	Yes	No	Option	Yes	Yes	Yes
Coax/Triax/Fiber Optic Cable	Coax/triax	C/T/FO	Triax	Triax	Triax	..	..
Multicore cable	Yes	Yes	Yes	..	Yes	Yes	Yes
Docking VCR	AU 400	AU 400	No	No	Yes	Yes ¹	No

Manufacturer	Panasonic Broadcast			Sony			
	AK 450	AQ-20 (-10)	BVP-360A/360AP ¹⁶	BVP-370 (270)	BVP-77P ¹⁷	BVW-500 series ¹⁸	DXC-3000A ¹⁹
Color balance memories	...	...	...	...	...	...	...
ND/color filters	3N 4C	4N-4C (2N-2C)	3N 4C	4N 3C	2N 4C	2N 4C	1N 3C
Application ENG EFP Studio DB	E F S C	E F S C	S F	S F	E F	E F	S E F
Pickup size/type	FIT 2 ₃	FIT 2 ₃	3 PbD 2 ₃	FIT (IT) 2 ₃	IT 2 ₃	FIT & IT 2 ₃	CCD IT 2 ₃
CCD array size/type	838x485	768x499 (574x)	...	380k	768x493	510(768)x492	250k
Standard sensitivity	2000; 5.6	2000; 5.6	2000; 4.5	2000; 5.6	2000; 5.6	2000; 5.6	2000; 5.6
Limiting sensitivity	20; 1.6	20; 1.6	9; 1.2	15; 1.4	15; 1.4	15; 1.4	16; 1.4
Maximum video gain	18	18	4	18	18	18	18
S/N ratio	60dB	60dB	60dB	62dB	62dB	62dB (60)	58dB
Limiting resolution	800	750 (630)	700	700	700	550 (700)	560
Electronic shutter	5-speed	6-speed	No	6-speed	6-speed	No	No
Registration error %	0.05%	0.05%	0.05/0.1/0.15	0.05%	0.05%	0.05%	0.05%
Color correction matrix	Yes	Yes	Yes	Option	Yes	No	No
Remote control panel	No	Yes	Option	Option	Option	Option	...
Camera control unit	Yes	Yes	Yes	Yes	Option	No	Option
Multi-camera panel	...	...	Option	Option	Option	No	No
Operating power	10.5 17V	12V	110/220V 350W	120V 350W	12Vdc 13W	12V	12Vdc 9.2W
Camera head weight lbs	7.5	6.5	66	44	7.5	15.3	7.3
Reader Service No	593	594	595	596	597	598	599

¹⁶360AP for PAL 360/360P uses SAT or PbO (350 portable). ¹⁷T7 has removeable optical and sensor block; BVP-7000HS uses image intensifier Hi-Sense for extreme low-light use. ¹⁸BVP-5, -7, -50 units use BVW-505/-507/-550 docking VCRs. ¹⁹3000IR/IRP infrared or normal lightmodes.

Manufacturer	Sony			Thomson Video Equipment			
	DXC-325/325P	DXC-M7	HDC-300	TTV 1250 Proscan ²⁰	TTV1542	TTV1645 Sportcam	TTV1647
Composite output	Yes	Yes	No	No	Yes	Yes ...	Yes
RGB output	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YCbCr output	No	Yes	Yes	Yes	Yes	Yes	Yes
S-VHS/Y-C output	Yes	Yes	No	No	No	No	...
µP in camera head	...	...	Yes	Yes	Yes	Yes	Yes
Direct VCR cable	Yes	Yes	No	No	No	...	Yes
Coax/Triax/Fiber Optic Cable	C	C	No	No	Triax	T	T
Multicore cable	Yes	Yes	Yes	200m	Yes	No	...
Docking VCR	U/S	No	No	No	No	No	Betacam
Color balance memories	...	...	...	...	...	...	10
ND/color filters	1N 3C	2N 4C	4N 4C	6 pos	2x6-pos	4 pos	4 pos
Application ENG EFP Studio DB	Utility	S E F	HDTV	HDTV(1)	S F	S F	E F S
Pickup size/type	CCD IT 1/2	CCD IT 2/3	SFSD SAT 1	PbO or SAT 2/3	IT 2/3	IT 2/3	IT 2/3
CCD array size/type	510x492	380k	...	...	440k	440k	440k
Standard sensitivity	2000; 5	2000; 5.6	2000; 4.7	2200; 4.3 S	1000; 4	1250; 4	1250; 4
Limiting sensitivity	20; 1.4	26; 1.8	...	50; 1.4	15; 1.4	10; 1.4	14; 1.4
Maximum video gain	18	18	6	12	18	21	21
S/N ratio	58dB	60dB	...	43dB/47dB	61dB	62dB	62dB
Limiting resolution	530	700	1200	... 20% 20MHz	... 60%	700 TVL	700
Electronic shutter	6-speed	6-speed	No	No	1/60-1/1000	5-speed	5-speed
Registration error %	0.05%	0.05%	0.025; 0.05	0.05%; 0.1%	0.05%; 0.1%	<0.05%	0.05%
Color correction matrix	No	No	Yes	Option	Yes	Opt	Option
Remote control panel	Option	Option	No	Option	Yes	Opt	Option
Camera control unit	Option	Option	Yes	Option	Yes	Yes	Option
Multi-camera panel	No	...	Option	Option	Yes	Opt	Option
Operating power	12Vdc 8W	10.5-17Vdc	120/240V 400W	110/220V	110-220Vac	110-220V	16.5W
Camera head weight lbs	6.5	9.3	18	28kg	28kg	26.5kg	3.5kg
Reader Service No	600	601	602	603	604	605	606

²⁰1250:50 and 1050:60 interlaced or 625:50 and 525:60 progressive scanning possible

Television Zoom Lenses

These camera lenses are grouped by image format size. All systems use focus, zoom and iris servos. The use of lenses not noted as *CCD optimized* should be discussed with the manufacturer for applicability with CCD cameras. Abbreviations for lens applications include E ENG, F EFP, O Outside Broadcast, S Studio.

Television Zoom Lenses, 1/2"

Manufacturer	Angenieux		Canon USA			Fujinon		Schneider
	14x7 ¹	20x7 ²	PH14ax6.6BIRS	PH20xSuper	PH55xSuper	S14x6.4ERM ³	S8.5x4.2ERM	TV59 Apo-Varon
Application	E/F/O	S/F/O	E/F	Studio	EFP	E/F	E/F	E/F
CCD optimized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zoom range (mm)	7-98	7-140	6.6-92.4	6-120	7-385	6.4-90	4.2-36	6.5-91 (HM14x)
Aperture (Wide-Tele)	1.4-1.6	1.2	1.4-1.55	1.4-1.5	1.4-2.2	1.4-1.5	1.4-1.5	1.4-3
MOD distance	31"	0"	31.5"	23.6"	7.2"	29.1"	11"	31.5"
MDD area (HxV) in mm	52x39	110x83	712x534	813x610	178.8x134.1	75.1x56.3	46.9x35.1	53x40
Horizontal angle (Wide-Tele)	52°-4'	51.5°-2.75'	51.7°-4'	56.1°-3.06'	49.1°-0.95'	53°-4'	74°-10'	53°-4'
Back focus (mm)	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	...	...	35.5
Aperture (Front-Back)	...	...	...	...	...	...	...	70.5-30.5
Extender(s)	2x; 0.8	2x	2x	2x; 1.5x	2x; 2.6x	2x	1.7x	2x; W.W
Macro focus	to 0" MOD	to 0" MOD	Yes	(at 3.74" MOD)	at 15.7" MOD	Yes	Yes	Yes
Diascope	No	3-lamp	No	No	No	Yes	Yes	...
Operating wt	3.1 lbs	39 lbs	2.87 lbs	35.2 lbs	39 lbs	2.81 lbs	4 lbs	3.95 lbs
Reader Service No	501	502	503	504	505	506	507	508

¹Wide angle, tele and retrozoom models available. ²Optional integral shutter; other extenders: 1.2x, 1.4x, 1.6x, 1.8x. ³Similar ERD lens for 2/3" is A14x8.5ERM/ERD.

Television Zoom Lenses, 2/3"

Manufacturer	Angenieux				Canon USA			
	14x8	14x9	20x8.5 ²	40x9.5	J13x9BIRS-11A	J14x8.5BIRS	J15x9.5B IRS	J18x8.5B IRS
Model	14x8	14x9	20x8.5 ²	40x9.5	J13x9BIRS-11A	J14x8.5BIRS	J15x9.5B IRS	J18x8.5B IRS
Application	E/F/O	E/F/O	S/F/O	S/F/O	E/F	ENG/EFP	E/F	E/F
CCD optimized	...	...	Yes	Yes	Yes	Yes	Yes	Yes
Zoom range (mm)	8-112	9-126	8.5-170	9.5-380	9-117	8.5-119	9.5-143	8.5-153
Aperture (Wide-Tele)	1.6-2	1.6-2	1.3	1.3-2.1	1.6-1.9	1.7-2.0	1.8-2.1	1.7-2.3
MDD distance	31"	31"	0"	0"	29.1"	31.5"	34.6"	35"
MDD area (HxV) in mm	61x46	52x39	121.9x91.7	55x41.5 ³	...	755x566	86.2x64.7	86.2x64.6
Horizontal angle (Wide-Tele)	58°-4.5°	52°-4°	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	Var	man adj	Adjustable	Adjustable
Aperture (Front-Back)	...	...	...	...	72.6.31.7	...	...	82.8
Extender(s)	2x: 0.6x	2x: 0.8x ¹	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	3-lamp	3-lamp	Option	No	No	Option
Operating wt	3.9 lbs	3.1 lbs	39 lbs	43 lbs	2.84 lbs	2.82 lbs	3.5 lbs	3.5 lbs
Reader Service No	509	510	511	512	513	514	515	516

¹Wide angle attachment; 1.55x tele adapter available. ²Optional integral shutter, other extenders include, 1.2x, 1.4x, 1.6x, 1.8x. ³Based on MOD of 8.2"

Manufacturer	Canon USA			Fujinon				
	J20xSuper	J50xSuper	J55xSuper	A12x9ERM ⁴	A14x8.5ERM ⁵	A15x8ESM ⁶	A16x9.5ERM ⁷	A18x8.5ERM ⁸
Model	J20xSuper	J50xSuper	J55xSuper	A12x9ERM ⁴	A14x8.5ERM ⁵	A15x8ESM ⁶	A16x9.5ERM ⁷	A18x8.5ERM ⁸
Application	Studio	EFP	EFP	E/F	E/F	EFP	E/F	E/F
CCD optimized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zoom range (mm)	7.5-150	9.5-475	9-500	9-108	8.5-119	8-120	9.5-152	8.5-153
Aperture (Wide-Tele)	1.5-1.9	1.4-2.7	1.4-2.8	1.7-1.9	1.7-2.0	1.5-1.7	1.8-2.2	1.7-2.3
MDD distance	21.8"	24"	8.2"	5.4"	31.5"	27.5"	37.4"	35.4"
MDD area (HxV) in mm	89x67	180x135cm	190x143	877x658	777x583	915x686	817x613	879x659
Horizontal angle (Wide-Tele)	61.9°-3.3°	49.7°-1.1°	52.1°-1°	52°-4°	54°-4°	57°-4°	49°-3°	54°-3°
Back focus (mm)	Adjustable	Var. man adj	...	...	...	...	...	...
Extender(s)	2x: 1.5x	2x	2x: 1.5x	2x	2x	2x	2x	2x
Macro focus	Yes	...	No	Yes	Yes	No	Yes	Yes
Diascope	Option	Option	Option	Yes	Yes	Yes	Yes	Yes
Operating wt	35.2 lbs	37.5 lbs	37.5 lbs	3.2 lbs	2.8 lbs	28.6 lbs	3.2 lbs	3.34 lbs
Reader Service No	517	518	519	520	521	522	523	524

⁴Similar unit for 1/2" is S12x6.6ERM ⁵Similar unit for 1/2" is S14x6.4ERM/ERD ⁶Similar unit for 1/2" is S15x6ESM ⁷Similar unit for 1/2" is S16x7ERM/RM ⁸Similar unit for 1/2" is S18x6.2ERM/ERD.

Manufacturer	Fujinon							
	A20x7ESM ⁹	A24x11.5ERD ¹⁰	A34x10ESM ¹¹	A34x20.5ESM	A44x9.5ESM ¹²	A55x9.5ESM ¹³	A8.5x5.5ESM	HA14x8RD
Model	A20x7ESM ⁹	A24x11.5ERD ¹⁰	A34x10ESM ¹¹	A34x20.5ESM	A44x9.5ESM ¹²	A55x9.5ESM ¹³	A8.5x5.5ESM	HA14x8RD
Application	EFP	E/F	EFP	EFP	EFP	EFP	E/F	HDTV
CCD optimized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zoom range (mm)	7-140	11.5-276	10-340	20.5-700	9.5-420	9.5-525	5.5-47	8-112
Aperture (Wide-Tele)	1.4-1.6	2.0-2.7	1.6-2.4	2.4-3.5	1.4-2.5	1.4-2.9	1.7-1.9	1.7-2.1
MDD distance	29.5"	5.9'	5.9'	16.4'	7.2'	7.8'	11.8"	43.3"
MDD area (HxV) in mm	1166x874	1296x972	1446x1085	20001500	1863x1397	2028x1521	492x369	1086x611
Horizontal angle (Wide-Tele)	64°-3°	41°-1°	47°-1°	24°-0.7°	49°-1°	49°-0.97°	77°-10°	57°-4°
Extender(s)	2x	2x	2x	2x	2x	2x	1.7x	...
Macro focus	No	Yes	No	No	No	No	Yes	...
Diascope	Yes	Yes	Yes	Yes	Yes	Yes	Yes	...
Operating wt	33 lbs	6.38 lbs	28.6 lbs	42.9 lbs	31.9 lbs	36.9 lbs	4 lbs	6.2 lbs
Reader Service No	525	526	527	528	529	530	531	532

⁹Similar unit for 1/2" is S20x5.4ESM ¹⁰Similar unit for 1/2" is S24x8.8ERD. ¹¹Similar unit for 1/2" is S34x8ESM. ¹²Similar unit for 1/2" is S44x7.3ESM. ¹³Similar unit for 1/2" is S55x7.3ESM

Manufacturer	Nikon			Schneider		Schwem	Tamron	
	S13x9B	S15x8.5B	S19x8B	TV56 Apo-Varon	TV80	Gyrozoom FP-1	466H (14x9B)	Model 47HD
Model	S13x9B	S15x8.5B	S19x8B	TV56 Apo-Varon	TV80	Gyrozoom FP-1	466H (14x9B)	Model 47HD
Application	E/F	E/F	E/F	E/F	O/S	E/F/O/S	ENG	CCTV
CCD optimized	Yes	Yes	...	Yes	No	...	...	...
Zoom range (mm)	9-117	8.5-127.5	8-152	9-126 (HM14x)	8.5-150	60-300	9-126	8-16
Aperture (Wide-Tele)	1.7-2.0	1.7-2.2	1.7-2.2	1.7-2.1	1.4-2	6.2	1.6-1.9	1.6
MDD distance	31.5"	31.5"	35.4"	31.5"	27.5"	10'	39.37"	39.37"
MDD area (HxV) in mm	72.2x54.2	76.4x57.5	89.3x67.4	54x41	53x40	...	...	...
Horizontal angle (Wide-Tele)	52.1°-4.3°	54.7°-4.0°	57.6°-3.3°	52°-4°	55.5°-3.4°	8.38°-1.68°	52.6°-4°	57.62° -30.75°
Back focus (mm)	Adjustable	Adjustable	Adjustable	42.5-47.6	42.4	...	38.98	10.85
Aperture (Front-Back)	...	...	...	72-29.5	133-33	...	76.5-24.8	26-9.4
Extender(s)	2x	2x	2x	2x, W.A.	2x	...	None	No
Macro focus	Yes	Yes	Yes	...	No	No	Yes	No
Operating wt	2.42 lbs	2.75 lbs	2.75 lbs	3.96 lbs	33 lbs	7.4 lbs	3.33 lbs	0.21 lbs
Reader Service No	533	534	535	536	537	538	539	540

Editor's Note:

The information contained in this issue of the *Broadcast Engineering Equipment Reference Manual* was derived from most-recent specifications sheets provided by the manufacturers this year. Not every company in the industry is represented, nor is every product included from those companies who are represented. The issue does give you a wide range of products to consider when you begin your search for new equipment, however.

Television Zoom Lenses, 1" (Non-CCD)

Manufacturer	Angenieux		Canon USA			Fujinon		
	Model	15x12 ¹	40x14	PV14x12.5BIE	PV40x13.5BIE	PV50x13.5BIE*	HR11x11SD	HR12x11SD	HR14x12.5ES
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	15-180	12.5-175
Aperture (Wide-Tele)	1.5-1.8	1.9-3	1.6	1.7-2.8	2.0-3.7	1.8-2.0	1.8-2.0	1.6-1.7
MOD distance	0"	0"	27.5"	8.2'	8.2'	3.9'	5.2'	4.6'
MOD area (HxV) in mm	60x34.5	55x41.5	960x125	211x158	213x160	1179x663	982x589	1058.6x595.5
Horizontal angle (Wide-Tele)	60.25°-4.5°	49.75°-1.33°	54.2°-4.3°	50.7°-1.4°	50.7°-1.1°	64°-6°	49°-4°	58°-4°
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
Macro focus	...	to 0" MOD	...	...	at 19.7" MOD	No	No	No
Diascope	3-lamp	3-lamp	Option	Option	Option	Option	Option	Option
Operating wt	54 lbs	43 lbs	51 lbs	68 lbs	46 lbs	18.7 lbs	16.5 lbs	45.1 lbs
Reader Service No	541	542	543	544	545	546	547	548

¹ Similar unit is 6x10 10-60mm zoom f/1.5 with 16" MOD.

Manufacturer	Fujinon					Nikon		
	Model	HR22x18ES	HR6x12.5SD	R17x12.5ESM	R20x10.5ESM	R34x29.5ESM	R44x13.5ESM	R10x12AED-HD2	R6x8AED-HD2
Application	HDTV	HDTV	F/S/O/S	F/S/O	F/S/O/Special	F/S/O/Special	HDTV	HDTV
Zoom range (mm)	18-400	12.5-75	12.5-215	10.5-210	29.5-1000	13.5-600	12-120	8-48
Aperture (Wide-Tele)	1.8-2.7	1.5	1.6-2.0	1.6-2.1	3.5-5.0	1.8-3.0	1.8-2.2	1.7
MOD distance	18'	3.9'	29.5"	29.5"	18.7'	8.2'	51.6"	31.6"
MOD area (HxV) in mm	3644x2050	1013x570	987x174	1168x876	2021x1516	2181x1636	...	...
Horizontal angle (W-T)	42°-2°	58°-10°	54°-3°	62°-3°	24°-0.6°	50°-1°	60°19'-6'39"	82°9'-16'32"
Extender(s)	2x	...	2x; 1.5x	2x; 1.5x	2x	2x	2x	2x
Macro focus	No	No	No	No	No	No	Yes	Yes
Diascope	Yes	Option	Yes	Yes	Yes	Yes	...	...
Operating wt	57.2 lbs	15 lbs	42.9 lbs	45.1 lbs	45.1 lbs	55 lbs	16.5 lbs	16.5 lbs
Reader Service No	549	550	551	552	553	554	555	556

Television Zoom Lenses, 1¼" (Non-CCD)

Manufacturer	Angenieux	Canon USA			Fujinon			
		Model	15x16	P14x16.5BIE	P18x15BIE	P40x18BIE	HPSx16SD	P17x16.5ESM	P20x14ESM	P44x18ESM
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 (Wide-Tele)	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) in mm	60x34.5	965x724	922x692	211x158	1055x594	1000x750	1171x878	2181x1636
Horizontal angle (Wide-Tele)	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
Macro focus	...	...	...	...	No	No	No	No
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	557	558	559	560	561	562	563	564

Video Monitors

These monitors are designed primarily for monitoring of composite and component video, while some are also useful for digital signals. N NTSC, P PAL and S SECAM abbreviations are used. A dagger (†) indicates an X-Y output for vector type displays on X-Y signal monitors.

Manufacturer	ASACA/ShibaSoku					Barco			
	Model	CM 23/43 ¹	CM93A1/95A1	CM99A	CMM 11 series†	CMM 7 series†	AVM series ²	CVS series ³	HOM XX53 series
Beam feedback CRT		Yes	...	...	Yes	Yes	Yes	Yes	
Aperture correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
NTSC test matrix	No	Yes	No	Yes	No	No	No	No	No
Blue gun only test	No	Yes	No	No	No	Yes	Yes	No	No
Underscan/overscan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Crosspulse display	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
# composite inputs	3	3	2	3	2	3	2	None	
RGB inputs	Yes	Yes	Yes	Opt	Opt	Yes	Yes	Yes	Yes
S-VHS inputs	Yes	Yes	No	Opt	No	No	No	No	No
Y/Cb/Cr inputs	No	Yes	No	Opt	No	Yes	Opt	Opt	No
Audio amp/speaker	No	No	Yes	No	No	Amp	-ASP opt	No	No
Application	Grade 2	Grade 1	Grade 2	Grade 1	Grade 2	Grade 1	Grade 1	Grade 1	HDTV
CRT diagonal (in.)	21 (15)	20 (14)	9	20 (14.26)	20 (14)	10-28	14 (20)	20-40	
CRT type	In-line dot	In-line dot	In-line dot	Delta gun/dot	In-line dot	In-line slot	In-line dot	In-line dot	
Dot/strip pitch (mm)	0.39	0.44 (.31)	0.3	0.44	0.44	0.31	0.31	0.26	
Resolution at center	550TVL	600TVL	400TVL	600TVL	600TVL	>500 15"	900TVL	1000TVL	
Luminance bandwidth	7MHz	7MHz	7MHz	7MHz	6MHz	6MHz	6MHz	30MHz	
Chrominance bandwidth	0.5MHz	1.3MHz	0.5MHz	to 4.4MHz	1.3MHz	0.6MHz	0.6MHz	...	

Video Monitors

Manufacturer	ASACA/ShibaSoku					Barco		
	CM 23/43 ¹	CM93A1/95A1	CM99A	CMM 11 series†	CMM 7 series†	AVM series ²	CVS series ³	HDM XX53 series
Demodulation axes	R-Y/B-Y	I/O	No	I/O	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	...
Decoder filter	Comb: notch	Notch: comb	Comb, notch	Comb; notch	Comb: notch	Comb filter	Comb: notch	...
Standards	NTSC/PAL	NTSC/PAL opt	NTSC/PAL	N/P/S/multi	NTSC/PAL	NTSC	N/P/S	Any HDTV
Multiscan capability	No	No	No	No	No	No	No	to 33.75kHz
µP/auto-setup	...	Yes	No	No	No	Option	Yes: setup opt	...
Reader Service No	607	608	609	610	611	612	613	614

¹ Flat square CRT also available in 14" rack-mount CM44. ² Available with MMRC. SRC multiple, single monitor remote controller. ³ Multiple input cards allow added input capability including quad input, NTSC-4.43, PAL-M/N; D-1/D-2, CCIR 601 digital.

Manufacturer	Conrac	Electronic Visuals	Hitachi Denshi	Ikegami				
				15 series†	16 series	17 series	19 series	9 series
Model	6545†	EV6351B ⁴	CM-150 (-210)	15 series†	16 series	17 series	19 series	9 series
Beam feedback CRT	Yes	Yes	...	Yes	Yes	Yes	Yes	...
Aperture correction	Yes	...	...	Yes	Yes	Yes	Yes	Yes
NTSC test matrix	No	...	No	...	No	...	...	...
Blue gun only test	No	...	No	Yes	No	...	...	...
Underscan/overscan	Yes	Yes	Yes	Yes	Under	Under	Under	Under
Crosspulse display	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
# composite inputs	3	Yes	3	3	Yes	Yes	Yes	Yes
RGB inputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
S-VHS inputs	Opt	Yes	Yes	No	Yes	Yes	No	No
Y/Cr/Cb inputs	Opt	Yes	...	Option	No	Yes	Yes	Yes
VCR 8-pin input	No	No	No	No	No	No	No	No
Audio amp/speaker	No	No	No	No	No	No	No	No
Application	Grade 1	Video	Video	Video	Video	Video	Video	Video
CRT diagonal (in.)	t9 (13)	20	15 (21)	13 (19)	13 (19)	14 (20)	13 (19)	8.5 (13/19)
CRT type	In-line dot	In-line dot	Dark-Tint	In-line dot	In-line slot	In-line slot	In-line dot	In-line dot
Dot/stripe pitch (mm)	0.43 (0.31)	0.43 (0.47)	0.57	0.31 (0.43)	0.41 (0.55)	0.41 (0.55)	0.31 (0.43)	0.31 (0.43)
Resolution at center	800TVL RGB	...	450 (500)	700	500	500	700	700
Luminance bandwidth	13MHz	8MHz	...	to 10MHz	to 7MHz	50-8MHz	60-10MHz	to 8MHz
Chrominance bandwidth	...	...	...	0.6MHz	to 3.58MHz	3.58MHz	0.6MHz	0.6-1; 0.3-Q
Pixels HxV	...	...	...	...	...	...	...	...
Demodulation axes	R-Y/B-Y	U/V	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	I/O
Decoder filter	Comb. notch	Notch	Notch (NTSC)	Adaptive comb	Comb; notch	Notch	Comb: notch	Notch: Comb
Standards	NTSC/PAL	PAL	NTSC/PAL	NTSC	NTSC	NTSC	NTSC	NTSC
Multiscan capability	No	No	No	No	No	No	No	No
µP/auto-setup	...	No	No	Yes	No	Digital control	No	No
Reader Service No	615	616	617	618	619	620	621	622

⁴ EV6351 Grade II; -B model Grade I; switchable aspect ratio shows 4:3 or 16:9 pictures.

Manufacturer	JVC Company			Melford Electronics			Mitsubishi	Panasonic
	TM-1400SU ⁵	TM-2084U/CA ⁶	VM-R190SU ⁷	DU5-20C	DU6 16C	DU6 series ⁸	AM-3501R	AT series
Model	TM-1400SU ⁵	TM-2084U/CA ⁶	VM-R190SU ⁷	DU5-20C	DU6 16C	DU6 series ⁸	AM-3501R	AT series
Beam feedback CRT	Yes	...	Yes	Yes	Yes	...	...	Yes
Aperture correction	...	Yes	Yes	[EBU	...	...	...	10dB
NTSC test matrix	No	No	No	[phosphors	No	No	...	Yes
Blue gun only test	Yes	No	Gun switch	No	No	Yes	...	Yes
Underscan/overscan	Under	No	Yes	Overscan	Overscan	Yes	Yes	Yes
Crosspulse display	Yes	No	Yes	...	No	Yes	...	Yes
# composite inputs	2	2	2	2	2	Yes	3	3
RGB inputs	No	No	Yes	Yes	Yes	Yes	Yes	Yes
S-VHS inputs	Yes	No	Yes	No	No	No	Yes	Yes
Y/Cr/Cb inputs	No	No	Yes	No	No	No	...	Yes
VCR 8-pin input	Yes	Yes	Yes	No	No	No	Yes	...
Audio amp/speaker	Yes	Yes	No	No	No	No	Yes	No
Application	Video/data	Video	Video/data	Video; Data	Video; data	Video	data	Data; Mon/Rcvr
CRT diagonal (in.)	14 Full Square	19	19	20	16	9-26	35	13; 19
CRT type	In-line dot	...	In-line dot	In-line dot	In-line dot	In-line	In-line dot	In-line dot
Dot/stripe pitch (mm)	0.499 stripe	...	0.4	0.4; 0.31	0.31mm	0.31; 0.43	1.0 center	0.31, 0.44
Resolution at center	450	350TVL	600	5.5MHz pattern	6MHz pattern	5.5MHz pattern	600 TVL	...
Luminance bandwidth	...	...	...	to 10MHz	10MHz	to 8MHz	...	>7
Chrominance bandwidth	...	...	...	...	...	...	...	0.6
Pixels HxV	...	...	CGA	...	...	...	640x480	...
Demodulation axes	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	UV	UV	UV	...	I/O
Decoder filter	Comb	Comb	Comb	Notch	Notch	Notch filter	...	Both
Standards	NTSC/Y/C358	NTSC	NTSC/component	PAL; NTSC	525/625	PAL	NTSC	N/P/S
Multiscan capability	No	No	No	525/625	No	No	...	...
µP/auto-setup	No	No	No	No	No	No	...	Option
Reader Service No	623	624	625	626	627	628	629	630

⁵ VM-R200SU 20". TM-R190SU 9" have similar characteristics. ⁶ TM-9UCV 9", TM-13U/CA 13" have similar characteristics; TM-9U does not include 8-pin VCT input. ⁷ VM-R140SU 14" unit with similar characteristics. TM-R14U/CA 14", TM-R9U/CA 9" do not support color difference inputs. ⁸ 22", 26" models have slot-mask CRT as standard with 0.85mm strip spacing; EBU or near EBU phosphors standard.



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Circle (91) on Reply Card

Component	Yes	Yes	No	Yes	Yes
Heterodyne operation	...	Yes	Yes	No	Yes
Dropout compensation	...	Yes	Yes	[Auto selects	Yes

Video Recording Equipment

The designs of these products follow specific format criteria for placement of the signal onto the recording medium to permit interchange from one transport to another within the same format. Major variations between machines of the same format are features provided by individual manufacturers. Reader service numbers in parenthesis, braces and brackets refers to manufacturer and product in column above in matching enclosure symbols.

Manufacturer	Betacam SP					M-II			S-VHS		D-2		
	Ampex	BTS	Ikegami	Sony	Thomson Video	JVC	Panasonic	JVC	Panasonic	Sharp	AMPEX	BTS	Sony
VCR use													
Camcorder	CVR-200 CVR-300	KCB590 LDK 391	HL-V55	BVW-200 BVW-300 BVW-400	TTV3505				AG450/460				
Docking	CVR-5	LDK-391				KR-M260U	AU-400	BR-S411U BR-S511U	AG-7450	(Hitachi)			
Portable	CVR-35	BCB-35	(AVEC)		TTV3535	KR-M470U	AU-500/-505	BR-S600U	AG-7400	(VL-S100)			DVR-2
Field/office player	CVR-22	BCB-22	(CVR22EXS)		TTV3522		AU-620 AU-630	BR-S601U			(Hitachi) (VL-D500)		
Studio player	CVR-60 CVR-65	BCB-60 BCB-65		BVW-65	TTV3560 TTV3565	KR-M800U	AU-640/X80	BR-S810U	AG-7100 series				(Panasonic) (AJ-D350)
Studio recorder	CVR-70 CVR-75	BCB-70 BCB-75		BVW-70 BVW-75	TTV3570 TTV3575	KR-M820U KR-M860U	AU-650/-660	BR-S611U	AG-7300 AG-7500	XA-2500S	VPR300, 200 VPR305 VPR350 250	DCR-10 DCR-18	DVR-10 DVR-18
Duplicator								BR-S711U					
Circle No.	1171	1172	1173 (1174)	1175	1176	1177	1178	1179	1180	1181 (1182)	1183 (1184)	1185 (1186)	1000

Videocassette Automation Systems

Manufacturer	Ampex Corporation	ASACA ShibaSoku	AVS France	Odetics Broadcast	Panasonic Broad-cast	Sony Broadcast Products
Model	ACR-225 ¹	ACL-6000C	DIVA ²	TCS 2000 ³	MARC system ⁴	BVC-1000S LMS ⁵
Video record format	D-2	Betacam/SP; M-II	Various	Various	M-II; 1/2" digital	Beta SP, D-2
# playback decks	3-4 & external	4; 5	3/system	6 & external	5 max	4, 6 max
Specific playback model	No	No	No	Per format	Per format	Per format
Output channels	4 simultaneous	...	to 6 systems	Multiple	Multiple	2 simultaneous
# record decks	3-4	1	per transport	6 & external	1 or 2	4, 6 max
Editing features	Full feature	...	per transport	Per transport	Per transport	..
Control computer	IBM PC/comp	Charles River	IBM PC/comp	IBM/PC	IBM/PC AT	UNIX OS
Control protocol	RS-323/422	RS-422	RS-323	422; Ethernet; EBus	RS-422	RS-422
Master automation port	Yes	Yes	Yes	Yes	Option	Yes
Record/delay play feature	Future opt	No	Yes	Yes	Yes	Option
Cassette ID type	Barcode	Barcode	Barcode	Barcode; TC/UB	Barcode; TC/UB	Barcode; TC/UB
Integral TC reader	LTC	Per transport	LTC	LTC	Yes	LTC/VITC
Integral TC generator	LTC	Per transport	LTC	LTC	..	LTC/VITC
Storage magazine	256 32 min D2	600 max	...	280	107 expandable	1036 for D-2
Shortest segment	7s w/4 decks	15s cycle	4s	12s recycle	10-15s	10s
System TBC	Integral	Per transport	Per transport	Per transport	AU-TB50	Integral
Reader Service No	1145	1146	1147	1148	1149	1150

¹ Multi-event per cassette system; features AutoResolve software utility to preview playlist, recognize and automatically resolve playback conflicts ² Betacam, U-matic, M-II, S-VHS, Hi8; to 99 events per cassette. ³ D-2, Betacam/SP, M-II systems available including PAL capability; capacity of system extended with expansion units, maximum of 1495 cassettes in D-2 format. ⁴ Expansion units permit systems from 472 to 1176 cassettes; external VTRs may also be used. ⁵ Also BVC-10 with 40-cassette storage and 4 BVW-95 VTRs, three external transports may be controlled; several sizes available based on small, medium and large cassettes.

Time Code Generators, Readers

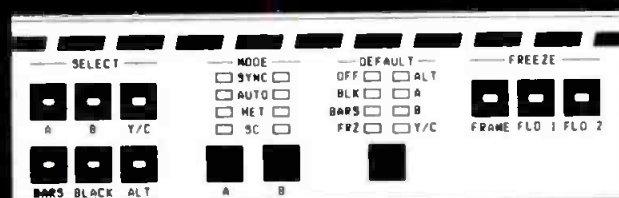
Manufacturer	Adams-Smith	Adams-Smith	AOx Systems	Cipher Digital							
				System 2600	Zeta-Three	ADX-02 (ADX-03)	CDI-4800 Shadow II	CDI-4810 Phantom ²	CDI-710A	CDI-716A	CDI-735L	CDI-735V
Internal reference	Yes	Yes	...	Yes	No	No	Yes	Yes	No	No	No
Reader function	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Generator function	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
Character generator function	Yes	..	Yes	No	No	Yes	No	No	No	Yes	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	Yes	...	...	Yes	Yes	Yes	Yes	Yes	Yes
Supports jam sync	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
Supports 3:2 film pull-down	Yes	Yes	..	...	...	No	No	No	No	No	No
Supports LTC	I/O	Yes	I/O	Input	Input	I/O	I/O	I/O	I/O	I/O	I/O
Supports VITC	I/O	MIDI	(-03)	No	No	No	No	No	No	No	No
Editor interface	Yes	...	(-03)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Character keyer	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
Keyed window display	Adj	No	Adj	No	No	Adj	No	No	No	No	Adj
Time code entry	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
Time code comparisons	Yes	..	(-03)	Yes	Yes	No	No	No	No	No	No
User bit entry	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
User bit comparisons	Yes	..	..	No	No	No	No	No	No	No	No
Synchronizer function	Yes	Yes	..	Yes ¹	Yes	No	No	No	No	No	No

Manufacturer Model	Adams-Smith System 2600	Adams-Smith Zeta-Three	ADx Systems ADx-02 (ADx-03)	Cipher Digital CDI-4800 Shadow II	CDI-4810 Phantom ²	CDI-710A	CDI-716A	CDI-735L	CDI-735V
TC UB display	LED	Yes	LED	...	...	LED	LED	LED	None
TC UB display size	Various	Yes	...	...	...	0.7"	0.7"	0.7"	...
Reading speed range	1-100x	1/10-100x	1/32-80x	1/30-50x	1/30-50x	1/50-80x	1/30-15x	1/30-80x	1/30-80x
LTC output signal	1Vp-p	Yes	10dBm	...	...	+4dBm 600Ω	+4dBm 600Ω	+4dBm 600Ω	+4dBm 600Ω
Power requirement	110/220Vac	AC power	110Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac	110/220Vac
Reader Service No	801	802	803	804	805	806	807	808	809

¹To Synchronize and control one master and one slave. ²Interface for single transport; makes it appear as a VPR-3 or BVH-2000 RS-422 serial device.

Manufacturer Model	Cipher Digital CDI-750	Denecke TC-1 (Syncbox)	ES257	ES263	ES452	ES453	ES456	ES461	ES488
Internal reference	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
Reader function	Yes	TC-1	Yes	No	Yes	Yes	Yes	No	Yes
Generator function	Yes	Syncbox	No	Yes	...	No	No	Yes	Yes
Character generator function	Yes	...	No	No	Yes	No	No	No	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	...	No	Yes	No	No	No	Yes	Yes
Supports jam sync	Yes	Yes	No	No	No	No	No	Yes	Yes
Supports 3:2 film pull-down	No	...	No	No	No	No	No	No	No
Supports LTC	I/O	Yes	In	Out	In	In	In	I/O	I/O
Supports VITC	No	No	No	No	No	No	No	No	No
Editor interface	Yes	Opt	No	No	No	Yes	No	No	No
Character keyer	Yes	No	No	No	Yes	No	No	No	Yes
Keyed window display	Adj	No	No	No	Multiline	No	No	No	Adj
Time code entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time code comparisons	Yes	...	Yes	No	No	No	No	No	No
User bit entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
User bit comparisons	...	...	Yes	No	No	No	No	No	No
Synchronizer function	No	No	No	No	No	No	No	No	No
TC UB display	LED	TC-1 LED	LED	...	Video	LED	LED	LED	LED
TC UB display size	0.7"	...	0.4"	...	5% of screen	0.56"	0.56"	0.56"	0.56"
Reading speed range	1/30-80x	1/50-50x	1x	...	1x	1x	1/30-30x	...	1/30-30x

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Circle (110) on Reply Card

Time Code Generators, Readers

Manufacturer	Cipher Digital	Denecke	ESE						
Model	CDI-750	TC-1 (Syncbox)	ES257	ES263	ES452	ES453	ES456	ES461	ES488
LTC output signal	+4dBm 600Ω	1V 10kΩ	...	1V 0dBm 75Ω	...	...	...	1V 0dBm 75Ω	1V 0dBm 75Ω
Power requirement	110/220Vac	ac/dc	110Vac	Rechargeable bat	110Vac	110Vac	110Vac	110Vac	110Vac
Reader Service No	810	811	812	813	814	815	816	817	818

Manufacturer	ESE	Evertz Microsystems							Fast Forward Video
Model	ES727	3700D	4015 ³	7200e ^{2 4}	Chaser 7000	ECM 4010	Emulator 7100	EV-Bloc ⁵	P1† (F21)
Internal reference	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Reader function	Yes	Yes	No	Yes	Yes	Yes	Yes	611	Yes
Generator function	No	Yes	Yes	No	Yes	Yes	Yes	612	Yes
Character generator function	No	Yes	Yes	No	No	Yes	No	613	F21
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Supports jam sync	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Supports 3:2 film pull-down	No	No	Yes	No	No	No	No	...	No
Supports LTC	In	I/O	Opt	In	I/O	I/O	I/O	I/O	I/O
Supports VITC	No	No	Opt	In	In	I/O	No	I/O	No
Editor interface	No	No	No	Yes	No	No	Yes	Yes	No
Character keyer	No	Yes	Yes	No	No	Yes	No	613	F21
Keyed window display	No	...	...	No	No	...	No	Yes	No (Adj)
Time code entry	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Time code comparisons	Yes	No	No	No	Yes	No	No	...	No
User bit entry	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
User bit comparisons	Yes	No	No	No	No	No	No	...	No
Synchronizer function	No	No	No	Yes	Yes	No	Yes	No	No
TC UB display	LED	LED	LED	...	LED	LED	LED	LED	LCD (LED)
TC UB display size	0.4"	0.75"	0.75"	...	0.75"	0.75"	0.75"	0.75"	0.55"
Reading speed range	1/30-30x	1/30-70x	...	0-70x	0-70x	0-70x	1/30-70x	0-70x	1x (1/30-15x)
LTC output signal	...	-20/12dBm	-20/12dBm	...	-20/12dBm	-20/12dBm	-20/12dBm	+6dBm	0dBm (0.5-8V)
Power requirement	110Vac	110/220Vac	110/220Vac	12Vdc	110/220Vac	110/220Vac	110/220Vac	110/220Vac	12Vdc (110Vac/9Vdc)
Reader Service No	819	820	821	822	823	824	825	826	827

³Film footage encoder. ⁴Intelligent interface. ⁵Modular system of building blocks to perform required functions.

Manufacturer	For-A	Fostex	Gray Eng. Labs	Horita	OpTex	Skotel			
Model	TGR-2000	4010/4011	DT-213/VID-225	TRG-50 ⁶	AVTC-20	TCG-132	TCG-132c	TCG-311	TCG-313
Portable unit	No	No	No	Yes	Yes	No	No	No	No
Internal reference	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
Reader function	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Generator function	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Character generator function	Yes	(4011)	Yes	Yes	-20VI	Yes	Yes	No	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non drop frame	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	Yes	No	...	Yes	Yes	Yes	Yes
Supports jam sync	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Supports 3:2 film pull-down	No	...	Yes	No	...	Yes	Yes	No	No
Supports LTC	I/O	Yes	I/O	I/O	Yes	I/O	I/O	I/O	I/O
Supports VITC	No	Yes	I/O	In	...	Input	Input	No	No
Editor interface	Yes	Yes	Yes	No	No	No	Yes	No	No
Character keyer	Yes	401t	Yes	Yes	...	Yes	Yes	No	Yes
Keyed window display	Adj	Yes	Adj	Adj	...	Adj	Adj	No	Adj
Time code entry	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Time code comparisons	No	Yes	Yes	No	No	No	No	No	No
User bit entry	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
User bit comparison	No	Yes	Yes	No	No	No	No	No	No
Synchronizer function	...	4030	No	No	No	No	No	No	No
TC UB display	LED	LED	LED	...	LED	...	...	LED	LED
TC UB display size	Adj	...	0.6"	...	...	...	...	0.6"	0.6"
Reading speed range	1/30-80x	1/10-100x	1/10-100x	1/30-10x	...	1/40-80x ⁷	1/40-80x ⁷	1/40-80x	1/40-80x
LTC output signal	2.2Vp-p	0.1-10V adj	+8dBm 600Ω adj	1V/-6dBm 2kΩ	3dB 1kΩ	0.5-5V 100Ω	0.5-5V 100Ω	0.5-5V 100Ω	0.5-5V 100Ω
Power requirement	110Vac	110/220ac	100/220Vac	110Vac/9-12Vdc	12Vdc	ac/dc	ac/dc	ac/dc	ac/dc
Reader Service No	828	829	830	831	832	833	834	835	836

⁶TG-50 generator includes window dub insertion feature. ⁷0-50x VITC.

Manufacturer	Skotel						Sony	Telcom Research	
Model	TCG-80N-FT/008	TCG-80N/104	TCR-111 (111c)	TCR-112	TCR-80/114	TCR-80V/114	BVG series	Model 800	T 7000A
Portable unit	No	No	No	No	No	No	(BVG-100)	Yes	Yes
Internal reference	No	No	No	No	No	No	Yes	Yes	Yes
Reader function	Yes	Yes	Yes	Yes	Yes	Yes	BVG-1600	Yes	Yes
Generator function	Yes	Yes	No	No	No	No	BVG-1500	Yes	Yes

Manufacturer	Skotel						Sony	Telcom Research	
	TCG-80N-FT/008	TCG-80N/104	TCR-111 (111c)	TCR-112	TCR-80/114	TCR-80V/114	BVG series	Model 800	T 7000A
Model									
Character generator function	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports jam sync	Yes	Yes	No	No	No	No	Yes	Yes	Yes
Supports 3:2 film pull-down	No	No	No	Yes	No	No	...	No	No
Supports LTC	I/O	I/O	I/O	I/O	I/O	I/O	Yes	I/O	I/O
Supports VITC	Output	No	No	No	No	Input	Yes	I/O	No
Editor interface	No	No	-111c	No	No	No	Yes	No	No
Character keyer	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
Keyed window display	Adj	Adj	No	Adj	Adj	Adj	Yes	No	No
Time code entry	Yes	Yes	No	No	No	No	Yes	Yes	Yes
Time code comparisons	No	No	-111c	No	No	No	...	No	No
User bit entry	Yes	Yes	No	No	No	No	Yes	Yes	Yes
User bit comparisons	No	No	-111c	No	No	No	...	No	No
Synchronizer function	No	No	No	No	No	No	No	No	No
TC UB display	LED	LED	LED	...	LED	LED	LED	LED	LED
TC UB display size	0.3"	0.3"	0.6"	...	0.3"	0.3"	...	...	0.3"
Reading speed range	0.9-1.1x	0.9-1.1x	1/40-80x	1/40-80x	1/20-40x	1/20-40x	...	1x only	1/50-8x
LTC output signal	0.5-5V 100%±	0.5-5V 100%±	0.5-5V 100%±	0.5-5V 100%±	0.5-5V 100%±	0.5-5V 100%±	to 8dBm	+3dBm	11dBm 600%±
Power requirement	ac/dc	ac/dc	ac/dc	ac/dc	ac/dc	ac/dc	110ac (9dc)	110Vac/9Vdc	6-16Vdc
Reader Service No	837	838	839	840	841	842	843	844	845

Manufacturer	Telcom Research						Time Line	United Media	
	T5010	T6010	TCG-550	TCR 660	TCR 680	TCR-500	Lynx TC module	Model 505	Model 515 TCR/CG
Internal reference	Yes	...	Yes	...	...	No	Yes	Yes	Yes
Reader function	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Generator function	Yes	No	Yes	No	No	No	Yes	Yes	No
Character generator function	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes
Supports drop frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports non dropframe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports color framing	Yes	Yes	Yes	Yes	...	Yes	No	Yes	Yes
Supports jam sync	Yes	...	No	...	...	No	Yes	Yes	Yes
Supports 3:2 film pull-down	No	No	No	No	No	No	Film module	Yes	Yes
Supports LTC	I/O	I/O	Out	Input	Input	Input	I/O	I/O	I/O
Supports VITC	No	No	No	No	No	No	No	I/O	I/O
Editor interface	No	No	No	No	No	No	Yes	Yes	Yes
Character keyer	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Keyed window display	Adj	Adj	No	No	Adj	Adj	No	Multiline Adj	Multiline Adj
Time code entry	Yes	...	Yes	...	...	No	Yes	Yes	Yes
Time code comparisons	No	...	No	...	...	No	No	Yes	Yes
User bit entry	Yes	...	No	...	...	No	Yes	No	No
User bit comparisons	No	...	No	...	...	No	No	No	No
Synchronizer function	No	No	No	No	No	No	Yes	No	No
TC UB display	LED	LED	LED	LED	Video	...	LED	LED	LED
TC UB display size	0.8"	0.8"	0.6"	0.6"	...	1"	0.3"	4"	4"
Reading speed range	1/30-8x	1/30-83x	...	1/50-10x	1/50-8x	1/5-5x	1/2-60x	1/20-50x	1/20-50x
LTC output signal	11dBm 600%±	...	11dBm 600%±	...	...	1Vp-p	-1dBm 200%± adj	0.5-4Vp-p	0.5-4Vp-p
Power requirement	110/220Vac	110/220Vac	110/220Vac	110/220Vac	8-16Vdc	110Vac	110/220Vac	110/220Vac	110/220Vac
Reader Service No	846	847	848	849	850	851	852	853	854

Editor's Note:

The category of Time Code equipment does not include such devices as code translators or character generator/inserters. You may consult any of the manufacturers noted in this section for such products.

Videotape Editing Controllers

Dedicated control equipment, not a software package with plug-in card for use with personal computers (PCs, may, however, perform as a terminal with the editing system).

Manufacturer	Abekas Video Systems	Ampex Corporation	Amtel Systems	BTS	Cipher Digital	CMX		
Model	A34 Solo ¹	ACE 25 ⁴	E-Pix	B8E-900 ⁶	CDI-5000 Sol-touch II	300	3100B ⁷	3600
Suggested for	On-line	On, Off-line	Off-line	On/off-line	On-line	On/Off-line	On-line	On-line
Editing type	Linear	Linear	Non-linear	Linear	Linear	Linear	Linear	Linear
Transports controlled R/P	2-R, 4-P	1R, 3P	8 R, 8 P	1R, 3P	4-R, 4-P	1 R/3 P	6 R/6 P	6 R/6 P
Videodisc interface	No	No	Yes	No	No	Option	Option	Option
Control µP type	Centralized	80286 PC	Distributed	Centralized 8-bit	Multiple	Centralized	Distributed	Distributed
# events (internal storage)	512	1000	2000	128	16	999	999	999
External event storage	FD	FD dual 3.5"	Floppy disk	None	3.5 FD	FD	FD	FD, HD
Edit decision list	Yes	Yes	Yes	Yes	Multi per 3.5" FD	Yes	Yes	Yes
Edit data display	CRT	CRT	CRT	CRT	CRT	CRT	CRT	CRT
Printer interface	3.5" disk on PC	RS-232 ser/par	Centronics parallel	None	RS-232, parallel	Parallel	RS-232	RS-232
Command entry via	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard/console	Keyboard, Gismo	Keyboard, Gismo
Deck motion control via	KB, Joystick ²	Keyboard, Knob	Joystick	Keyboard, knob	Keyboard	Keyboard/Gismo	Keyboard, Gismo	Keyboard, Gismo

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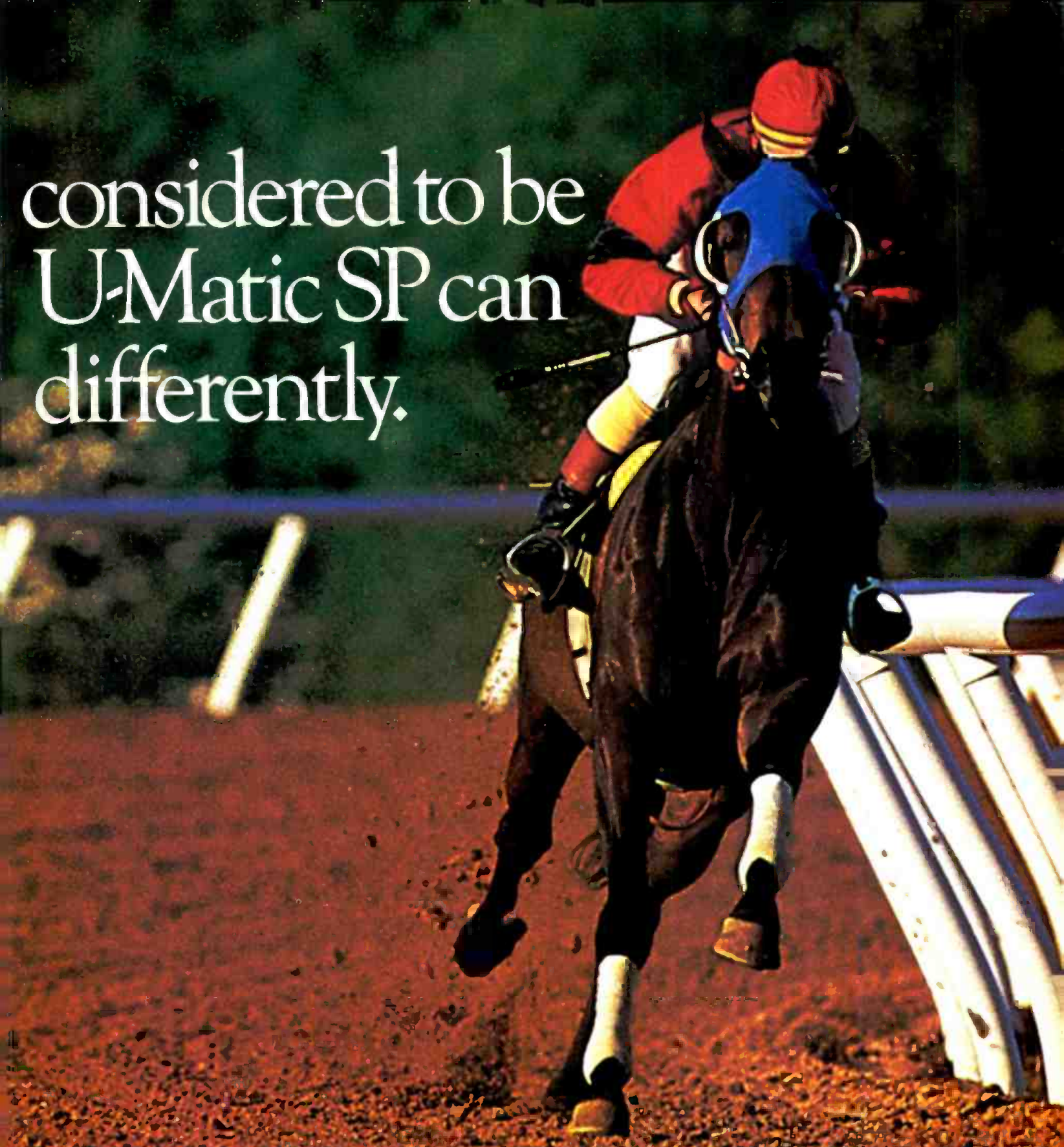
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Videotape Editing Controllers

Manufacturer	Abekas Video Systems	Ampex Corporation	Amtel Systems	BTS	Cipher Digital	CMX		
Model	A34 Solo ¹	ACE 25 ⁴	E-Pix	BBE-900 ⁶	CDI-5000 Sol-touch II	300	3100B ⁷	3600
Assemble edit	Yes	Yes	Yes	Yes	...	Yes	Yes	Yes
Insert edit	Yes	Yes	Yes	Yes	[Audio editing	Yes	Yes	Yes
Split A-V edits	Yes	Yes	Yes	Yes	[stores user setup	Yes	Yes	Yes
A-B sync roll	Yes	Yes	Yes	Yes	[w/edit list	No	Yes	Yes
Animation mode	No	No	Yes	..	[Interface to four	No	Yes	Yes
Integral TC reader	No	No	No	Yes	[Shadow II and	No	Option	Option
Integral TC generator	No	No	No	No	[CDI-750 G/R	No	Option	Option
Time reference support for	LTC VITC Ctl-Trk	LTC VITC CtlTrk	LTC VITC	LTC VITC CtlTrk Sync	LTC	LTC/VITC/CtlTrk	LTC/VITC CtlTrk/Film	LTC/VITC CtlTrk/Film
Color framing	Yes	Yes	Yes	NTSC, PAL	...	NTSC/PAL	NTSC/PAL	NTSC/PAL
Editing accuracy	1 TC ±2 CtlTrk ²	0 TC ±1 CtlTrk	±0 TC	±0 TC, ±2 CTL	0.01 Frame w/TC	0 TC	0, 0	0, 0
Interfaces available	AF mixer, Video effects system	AuF mixer, video switcher, multi-track ATR, Serial-parallel interfacing ⁵	AF mixer, video switcher, multi-track ATR, titler	Switcher, mixer, GPI-controlled equipment	Audio mixer, video switcher	Audio mixer, video switcher, video effects	telecines, multitrack ATRs,	
Control protocol	RS-422, GPI	RS-232	RS-422	GPI	RS-232/-422/GPI	RS-422, ESBUS, GPI	RS-232, GPI	RS-422, GPI
Reader Service No	911	912	913	914	915	916	500	917

¹ Combines editing control with 8-input A/V switcher. ² D digital effects. ³ TBCs, flying bus, luma and DSK keying. ⁴ Or thumbwheel control. ⁵ Accuracy dependent upon VTRs used in the system. ⁶ 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. ⁷ ACE-MIF, digital effects system on GPI. ⁸ BBE-600, scaled down version with fewer VTRs and reduced effects type control. ⁹ Upgradable to CMX-3600 system.

Manufacturer	CMX	Convergence			Editing Machines Corp.	FOR-A	Grass Valley Group	
Model	DMNI-1000	ECS-185	ECS-195	ECS-985	EMC	EC-740	IPS-100 system	VPE-141
Suggested for	On-, off-line	...	Off- (& on-line)	Off-line	Off-line	Dn-line	On, Off	On, Off
Editing type	...	Linear	Linear	Linear	Non-linear	Linear	Linear	Linear
Transports controlled R/P	Multiple R/P	2-/3-VTR	1 R/2 P	4 or 6 total	Opt configs	1R, 2P	1-R, 6-P	1-R, 6-P
Videodisc interface	...	No	No	No	Option	...	No	No
Control µP type	68020	...	Multiple	...	PC	...	...	...
# events (internal storage)	999,999	500-line EDL	450	1000-line EDL	...	1-event	2,000	2,000
External event storage	3.5 FD, 40M HD	Floppy disk	FD/paper tip	Floppy disk	FD	None	FD	FD, papertape
Edit decision list	Yes	Yes	Yes	Non volatile	Yes	No	Yes	Yes
Edit data display	CRT, X-window	External CRT	CRT	External CRT	RGB CRT	LED displays	CRT	CRT
Printer interface	RS-232	RS-232	RS-232	RS-232	RS-232	None	RS-232	RS-232
Command entry via	Knob, keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	KB
Deck motion control via	Knob, keyboard	Joystick	Joystick	Joystick	Keyboard	Knob	Keyboard	KB
Assemble edit	Yes	Yes	Yes	Yes	Option	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	Yes	Yes
Animation mode	Yes	Yes	No	..	No	...	Option	Option
Integral TC reader	1 ² interfaces	Yes	Yes	Integral	No	...	No	No
Integral TC generator	2 ² interfaces	No	Yes	Integral	No	...	No	No
Time reference support for	LTC/VITC/Film	LTC CtlTrk	LTC CtlTrk	LTC CtlTrk	LTC	...	L/A/Ct	L/A/CT
Color framing	Yes	Yes	Yes	No	Yes	...	Yes	Yes
Editing accuracy	0	±0 TC, ±1 CtlTrk	±0 TC, ±1 CtlTrk	±0 TC ±1 CtlTrk	...	±2	±0 TC, 1 CT	±0 TC, ±1 CT
Interfaces available	9 ports, 16 GPI	2 GPI, 2 serial, PSI interface	AuF mixer, Video switcher, Multi-track ATR, titler	PSI, GPI, parallel equipment	..	Various	Audio mixer, video switcher, still-store, multitrack ATRs, titlers, digital effects	
Control protocol	CMX, ESBUS	RS-232/-422, parallel VTRs	RS-232/-422/GPI, parallel VTRs	RS-422	..	GPI, RS-422	RS-422	RS-422
Reader Service No	918	919	920	921	922	923	924	925

Manufacturer	Grass Valley Group	JVC Professional Products			Paltex			QUANTEL
Model	VPE-151	RM C850U	RM C86U	RM-C810U (-410U)	Abner	ELAN	Elite	Harry Suite
Suggested for	Dn-line	Off-line	Off-line	Off-line	On-, Off-line	On-, Off-line	On-, Off-line	Either
Editing type	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Random access
Transports controlled R/P	1-R, 6-P	1-R, 2-P	1-R, 1-P	1R, 1P	1 R, 2 P	4/4, any 4 of 8	3/3 or any 3 of 6	[RGB/Y/UV
Videodisc interface	...	No	No	No	No	Option	Option	[composite
Control µP type	...	...	...	...	Centralized	Multiple	Multiple	[CCR 601
# events (internal storage)	16,000	1 event	1 event	1	20	326	250	[I/O support.
External event storage	FD, papertape	None	None	..	FD PT	FD PT	FD PT	...
Edit decision list	Yes	No	No	No	Yes	Yes	Yes	...
Edit data display	CRT	LED display	LED display	LED display	CRT	CRT	CRT	CRT menus
Printer interface	RS-232	...	..	..	RS-232	RS-232	RS-232	...
Command entry via	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard
Deck motion control via	Keyboard	Knobs	Knobs	Knobs	Keyboard, knob	Keyboard, knob	Keyboard, knob	Yes
Assemble edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	[For editing of

Manufacturer	Grass Valley Group	JVC Professional Products			Paltex			QUANTEL
Model	VPE-151	RM G850U	RM G86U	RM-G810U (-410U)	Abner	ELAN	Elite	Harry Suite
Insert edit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	[short segments]
Split A V edits	Yes	No	No	Yes	Yes	Yes	Yes	[in memory]
A B sync roll	Yes	No	No	No	Yes	Yes	Yes	[CRT display]
Animation mode	Yes	No	No	No	Yes	Yes	Yes	[of video and]
Integral TC reader	No	No	No	No	Yes	Yes	Yes	[commands]
Integral TC generator	No	No	No	No	No	No	No	[may link to]
Time reference support for	L/V/CT	LTC CtiTrk	CtiTrk	Cti Trk	LTC CtiTrk ⁸	LTC CtiTrk VITC	LTC CtiTrk VITC	
Color framing	Yes	N	N	No	No	No	No	[Mirage, Encore]
Editing accuracy	±0 TC, ±1 CT	±0 TC ±2 CtiTrk	±2 CtiTrk	±2 (±6) frms CtiTrk	±0 TC, ±1 CtiTrk ⁸	±0 TC, ±1 CtiTrk	±0 TC, ±1 CtiTrk	[effects]
Interfaces available	AF mixer, video switcher, still-store, multitrack ATR, titler, effects	...	...	None	GPI	Audio mixer, video switcher, telelines, still-store, multitrack ATR, titler, digital effects		
Control protocol	RS-422	RS-422	...	...	RS-422/GPI Parallel	RS-422/GPI, Parallel, RS-232		...
Reader Service No	926	927	928	930	931	932	933	934

⁸ Abner-VITC supports VITC time code.

Manufacturer	Sony			United Media			Videomedia	
Model	BVE-600 (BVE-910)	BVE-9000	RM-450	MultiTasking	UMI 400 series	UMI 500 (600)	Mickey	VLC-32 (Micron)
Suggested for	On (& Off) line	On & Off line	On-line	On, Off-line	On	Off-line	On, Off-line	On/Off line
Editing type	Non-linear	Non-linear	Non-linear	Linear	Linear	Linear	Linear	Linear
Transports controlled R P	1-R/2-P, 1-R/3-P	2-R/12-P	1-R, 1-P	3; 2-6; 2-9	2, 3, 4 total	4 (6) total	R/P	R/P
Videodisc interface	No	Option	No	Yes	Yes	...	Option	Option
Control µP type	Centralized	Central, Distribute	Centralized	Multi distributed	Multi distrib	MC68000	Distributed	Distributed
# events (internal storage)	... (998)	1000	...	2000, 3000	250	1000 (2000)	400	500 (250)
External event storage	Floppy disk	Floppy disk	None	Floppy disk	Floppy disk	3.5 Floppy disk	FD	FD
Edit decision list	No (Yes)	Yes	No	Yes	Yes	Yes	Yes	Yes
Edit data display	LED (CRT)	CRT	LED	CRT	CRT	CRT	CRT	CRT
Printer interface	RS-232	RS-232	...	RS-232	RS-232	RS-232	RS-232	RS-232
Command entry via	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard joystick	Keyboard	Keyboard, Mouse	Keyboard
Deck motion control via	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Joystick	Mouse	Keyboard
Assemble edit	No (Yes)	Yes	No	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	No (Yes)	Yes	No	Yes	Yes	Yes	Yes	Yes
Animation mode	No (Yes)	Yes	No	Yes	Yes	Yes	No	Yes
Integral TC reader	No (Opt)	Option	No	Yes	Yes	...	Option	Option
Integral TC generator	No (Opt)	Option	No	Yes	Yes	Yes	No	No
Time reference support for	LTC VITC CtiTrk	LTC VITC CtiTrk	LTC VITC CtiTrk	LTC VITC CtiTrk Tmr	LTC VITC CtiTrk Tmr	LTC VITC CtiTrk	LTC/VITC/CtiTrk	LTC/VITC/CtiTrk
Color framing	Yes (Opt)	Yes (Opt)	No	Yes	Yes	Yes	Yes	Yes
Editing accuracy	0 TC, ±2 CtiTrk	0 TC, ±2 CtiTrk	0 TC, ±2 CtiTrk	±0 TC ±2 CtiTrk	±0 TC, ±2 CtiTrk	±0 TC	...	...
Interfaces available	AF mixer, Video switcher, multitrack ATR, digital effects		None	AF mixer, video switcher, multitrack ATR	Audio mixer, video switcher	Various	V-LAN units	V-LAN control-table networks
Control protocol	RS-422, GPI	RS-422, GPI	RS-422, GPI, parallel for VO, SLO series VTRs.	RS-232/-422/GPI	RS-232/-422/GPI	RS-232/-422, 6 GPI	RS-232/-422/GPI	RS-232/-422/GPI
Reader Service No	935	936	937	938	939	940	941	942

Video Switchers, Production/Master Control

Video control switching equipment for production, master control; effects are described by Rot rotary, S-E soft-edged, H-E hard-edged, Adj edge adjustable edge effects

Manufacturer	A.C.E./Midwest Communications	Abekas Video Systems		Ampex Corporation		BTS	Central Dynamics
Model	ARENA	A82 Digital	A84 Digital Post	AVC Vista series	Century series	MCS-2000	Strata-10
Control application	Production	Post production	Post production	Production	Production	Master control	Production
Standard	NTSC	Composite D-2	CCIR 601 0-1	NTSC/PAL	NTSC/PAL	NTSC, PAL	NTSC/PAL ⁶
# inputs	13	32 video or key	12 ²	10 or 18	16 or 32	to 250	24/16/30
Integral matte source	6 generators	Yes	Yes	5 generators	per keyer	4 generators	16 generators
Key sources	4 ext/13 int	Any input ¹	12 ext 12 int	2 ext 10/18 int	2 ext 10/18 int	Ext/Int	Int/Ext
Chroma keyers	1 RGB	8 RGB	8 RGB	3 RGB/2 comp ³	3 per ME ⁵	Luminance only	RGB/composite
Downstream keyer	Yes	No	No	w/UNIKEY	w/UNIKEY	Yes	w/1 of 2 titler
Switching buses	4 prime/1 aux	...	...	4 prime, 5 aux	4 prime, 5 aux	3	7 prime/3 aux
# switcher M E amps	3	4 Multilayer	8 layer capability	1.5	2 or 3 multilevel	...	2
# pattern generators	2 gen w/89	2	3	1 w/32 patterns	164 patterns/ME	None	4/-/100 patterns
Wipe effects	Rot, S-E, Adj-Edge	Rot/S-E/Adj edge	Rot/S-E/Adj edge	Hard, soft edge	H-E, S-E, Rot	No	Rot S-E Adj Edge
Spotlight effects	Yes	...	...	Yes	Yes	No	Yes
Border effects	Yes	Yes	Yes	Opt	Opt	Yes	Yes
Shadow effects	Yes	Yes	Yes	Opt	Opt	Yes	Yes
Programmable routines	Yes	Yes	Yes	24 routines	SuperSTAR Memory	Yes	>100 routines
Memory backup battery	Yes	Yes	Yes	No	No	Yes	Yes
Diagnostic software	No	Yes	Yes	Yes	Yes	Yes	Yes

Video Switchers, Production/ Master Control

Manufacturer	A.C.E./Midwest Communications	Abekas Video Systems		Ampex Corporation		BTS	Central Dynamics
Model	ARENA	A82 Digital	A84 Digital Post	AVC Vista series	Century series	MCS-2000	Strata-10
Digital effects port	Yes	Yes	Yes	Digi-Loop ⁴	Yes	No	Yes
Automation port	RS-422	From edit control	From edit control	GPSI, PIPS	GPSI, PIPS	Yes	ESbus
Input timing adjustment							
Path length		440ns			1.5	1'	±1'
Crosstalk at subcarrier	-50dB		Not applicable	55dB	<-55dB	<-60dB	<-56dB
Link to rack electronics	1-line digital	1 digital line	1 digital line	Multicore cable	Multicore cable		1-line digital
Audio preview function	No	No	No	Option	Option	Yes	No
Audio metering	No	No	No	Option	Option	Yes	No
Audio level control	No	No	No	Option	Option	Yes	No
Audio mixer interface	No	No	No	Option	Option		Yes
Edit control interface	Yes	Yes	Yes	Option	Option	No	Yes
Reader Service No	951	952	953	954	955	956	957

¹ Adaptive Sub-Pixel Intelligent Keying; framestores associated with each keyer. ² Frame store associated with each input and all 12 key inputs, Adaptive Sub-Pixel Intelligent Keying. ³ SpectraKey. ⁴ Fully integrated ADO-100 option. ⁵ All keyers capable of linear, RGB luminance, external and encoded modes. SpectraKey processing. ⁶ Models available with 20, 12 and 26 inputs; inputs may include analog composite and components

Manufacturer	ECHOLab Inc			For-A		Grass Valley Group	
Model	DV-5	DV-7	SE-6	CVM-600 Component	PVM-600 ⁸	110/CV ⁹	200 Composite
Control application	Production	Production	Production	Production	Production	Production/Post	Production, post
Standard	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC RGB R-Y/B-Y	NTSC/PAL	RGB or YUV	NTSC/PAL
# inputs	10	6	10	12 component ⁷	12	10	20
Integral matte source	3 generators	3 generators	3 generators	2 generators	2 generators	3 generators	9 generators
Key sources	4 ext/10 int	3 ext/1 int	5 ext/20 int	4 ext/2 int	4 ext/2 int	2 ext/8 int	6 ext/20 int
Chroma keyers	RGB/Composite opts	RGB opt	RGB/Comp opts	CCK-500C Exkey	CCK-500 Exkey	1 RGB optional	to 8 optional
Downstream keyer	Y	Yes	Yes	Yes	Yes w/NAM	DSK-101	Standard
Switching buses	3 primary	3 primary	4 primary 1 aux	2 prime	4	3 prime	8 prime/4 aux
# switcher M/E amps	1 1/2	1	2 1/2	1	1	1	1 or 2
# pattern generators	1 1/2/39 patterns	1, 10 patterns	2/40 patterns	1 w/24 patterns	1 w/24 patterns	1 gen/10 patterns	2 gen 56 patterns/10
Wipe effects	Rotary/adj edge	Soft-edge	Adjustable edge	Soft-edge Adj edge	Adj edge	Soft edge/adj edge	Rot/S-E/Adj Edge
Spotlight effects	Yes	No	Yes	No	No	Yes	Standard
Border effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shadow effects	Opt	No	Option	Yes	Yes	Yes	Yes
Programmable routines	1 std/5 opt	No	10/297 keyframes	FMX-500 Extrol	FXM-500 Extrol	E-MEM memory	E-MEM system
Memory backup battery	Yes	No	Opt	No	No	Yes	Yes
Diagnostic software	Yes	Yes	No	No	No	Yes	Yes
Digital effects port	Yes	No	No	No		to DPM-100	
Automation port	No	No	No	RS-422	GPI serial	Serial editor	Serial editor opt
Input timing adjustment	±0.001ms	±0.001ms	±0.001ms			Unspecified	
Path length		1'	1...	1'		1 ...	Unspecified
Crosstalk at subcarrier	-52dB	-51dB	-51dB		-60dB	≤-54dB DC-5MHz	<-54dB
Link to rack electronics	2 coaxial	Single digital line	Multicore cable		Multicore	1-line digital	1-cable 2-port serial
Audio preview function	No	No	No	Option	Option	Option	No
Audio metering	No	No	No	Option	Option	Option	No
Audio level control	No	No	No	Option	Option	Option	No
Audio mixer interface	No	No	No	Option	Option	to AMX-170S mixer	No
Edit control interface	GPI Opt	Opt	No	Option	to AFV-500 mixer	Option	Option
Reader Service No	958	959	960	961	962	963	964

⁷ CVM-400 component mixer is 8-source, 6-input system. ⁸ PVM-650 8-input with 5 layer effects, keying capability; 4-bus architecture. ⁹ 110 composite, 110CV component. ¹⁰ Programmable ((20+4)x16)+32.

Manufacturer	Grass Valley Group			JVC Professional Products			
Model	200-2CV	KADENZA	MASTER 21	Model 300 2A/2B	KM-1600U	KM-2500U	KM-3000U
Control application	Production, post	Production	Master control	Production	Production	Production	Production
Standard	Y/R-Y/B-Y, YUV	NTSC/PAL ¹¹	NTSC/PAL	NTSC	PAL	S-VHS Y-C	NTSC
# inputs	20	32 maximum	16 V/stereo audio	24/16 ¹²	4	8	8
Integral matte source	9 generators		1 Int generator	5 generators	1 generator	2 gen w/DSK	2 generators
Key sources	16 ext	20 int	32 maximum	4 ext std/5 opt	6/31 Ext 18/26 Int	Ext/ Int	Ext/Int
Chroma keyers		Options	1 RGB opt	6 RGB, 14/22 Comps	RGB	RGB	RGB soft key
Downstream keyer	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Switching buses	8 prime/4 aux	10-channel	2 prime	9 prime/5 aux	2, flip/flop	3 prime 1 aux	3 prime
# switcher M/E amps	2 M/Es		1 opt	2			
# pattern generators	2 gen/56 patterns	2 w/44 patterns	1 w/10 patterns	2 w/44 patterns	6 patterns	13 patterns	23 patterns
Wipe effects	Rot S-E Adj Edge	Rot/S-E/Adj-Edge	SE/Adj E	Rot/S-E/Adj-Edge	Soft wipes	S-E	Adj
Spotlight effects	Yes	Yes	Option	Yes	No	No	No
Border effects	Yes	Yes	Option	Yes	No	Yes	Yes
Shadow effects	Yes	Yes	Option	Yes	No	No	No
Programmable routines	E-MEM 30 event	Yes	Event Stacker	20 per M/E	No	No	16-event
Memory backup battery	Yes	Yes	Yes	Yes		No	Yes
Diagnostic software	Yes	Yes	Yes	Yes	No	No	No
Digital effects port	No	Kaleidoscope	Opt w/GVG DPM-100	Yes	No		No
Automation port	Serial editor opt	Editor option	RS-422	Editor option		GPI	GPI
Input timing adjustment							
Path length		Not applicable		100ns length	≤1.5'		

Manufacturer	Grass Valley Group				JVC Professional Products		
	Model	200-2CV	KADENZA	MASTER 21	Model 300 2A/2B	KM-1600U	KM-2500U	KM-3000U
Crosstalk at subcarrier	<-56dB DC-4MHz	...	56dB	-54dB	...	...	...
Link to rack electronics	1-line digital	...	Multicore cable	Multicore cables	...	1-line digital	1-line digital
Audio preview function	No	No	Yes	No	No	No	No
Audio metering	No	No	Yes	No	No	No	No
Audio level control	No	No	Yes	No	No	No	No
Audio mixer interface	No	Option	No	Option	No	No	Yes
Edit control interface	Option	Option	No	Option	No	GPI opt	Serial, GPI
Reader Service No	965	966	967	968	969	970	971

¹¹Supports RGB, YUV SMPTE, YUV Betacam, CCIR 601/656 digital. ¹²Model 300-3A 24-input system, 300-3B 16-input; Model 300 units includes 3 M/Es.

Manufacturer	Polar Video	Prime Image	Ross Video Ltd		Sony		
	Model	# 600 S-Switch	Model 210A/216A	Model 416 (424)	BVS 3100	BVS 3200 (3200C)	BVS 8000 (8000C)
Control application	Production	Production	Production	Production	Production	Production	Production
Standard	PAL/NTSC	NTSC	NTSC	PAL	NTSC/PAL	NTSC	NTSC/PAL (RGB/Y/Ca/Cs)
# inputs	4 (U-matic/S-VHS)	6	8/14	16 (24)	8	8 composite ¹⁶	24
Integral matte source	Yes	3 generators	3 generators	6	3 generators	4 generators	4 generators
Key sources	Int/Ext	1 Ext 8 Int	3-Ext. 8/14-Int	6-E	14-I	3 ext/8 int ¹³	3 ext/8 int ¹³
Chroma keys	Yes	Composite, Y/C	RGB & composite	4-RGB/1-composite	1 RGB	1 RGB	1 RGB
Downstream keyer	...	Option	Yes	Option	Yes	Yes	Yes
Switching buses	3	2 prime/1 aux	3 prime	6 prime, aux avail	3 prime 0 aux	4 prime 0 aux	4 prime 4 aux
# switcher M E amps	1	1 M/E	1	2 multilevel keys	1	1	2 w/2 keys each
# pattern generators	1 w/8	16 w/16 patterns	1 w/53 patterns	2 w/64 patterns	1 w/18 patterns	1 w/18 patterns	1 w/18 patterns
Wipe effects	Yes	Soft-edge, Adj edge	S-E, Adj E	Rot/S-E/AdjE	Soft-edge, adj edge	Soft-edge/adj edge	Various
Spotlight effects	No	No	No	No	No	No	...
Border effects	No	Yes	Yes	Option	Yes	Yes	Yes
Shadow effects	No	No	No	No	Yes	Yes	Yes
Programmable routines	No	No	No	(40 event 424)	E-File registers ¹⁴	E-File registers ¹⁴	Yes
Memory backup battery	No	No	Yes	Yes	No	No	No
Diagnostic software	No	No	Yes	Yes	Yes	Yes	...
Digital effects port	No	No	Yes	Yes	Yes ¹⁵	Yes ¹⁵	Link to DME-5000
Automation port	GPI	No	RS-422 option	RS-422 opt	No	No	Yes
Input timing adjustment	...	±3ms	...	...	...	...	...
Crosstalk at subcarrier	...	-50dB	-53dB	-53dB	-54dB	-54dB	...
Link to rack electronics	...	...	Dig 1-line	Dig 1-line	Digital/RS-422	Digital/RS-422	Digital/RS-422
Audio preview function	No	Yes	No	No	No	No	No
Audio metering	No	No	No	No	No	No	No
Audio level control	No	No	No	No	No	No	No
Audio mixer interface	No	Yes	No	No	No	No	No
Edit control interface	PSI-1 serial	Yes	Option	Option	Yes	Yes	Yes
Reader Service No	972	973	974	975	976	977	978

¹³Any input on key bus may be assigned as an internal key source ¹⁴10 E-File registers std. may be sequenced from editor. ¹⁵Dedicated RS-422 control of DME 450. ¹⁶3200C is RGB/Betacam component.

Manufacturer	Thomson Video Equipment		Utah Scientific		VGV		Videotek
	Model	IMPULS	TTV5645	MC-500B series	PVS2	D2500	D2500 (D3200)	Prodigy
Control application	Production	Production	Master	Production	Production	Production	Production
Standard	4 2 2 digital	Analog component ¹⁷	NTSC/PAL	NTSC	D-2 Digital	D-2 Digital	NTSC
# inputs	16	16	30	24	20	10 to 20 ²⁰	8
Integral matte source	Yes	9 backgrounds	1 generator	1 generator	8 ¹⁸	8x2 ²¹	1 generator
Key sources	Int/Ext	Int/Ext	3 ext, 1 int	6x12-input	10 ext 20 int	10 ext 20 int	3 ext 8 int
Chroma keys	Yes	3	None	Analog	RGB, R-Y/B-Y	RGB, R-Y/B-Y	RGB Opt
Downstream keyer	...	...	None	Analog	...	...	Yes
Switching buses	5 prime	8 + 6 aux	2 prime/1 aux	3 prime/2 aux	5 prime/4 aux	5 prime/4 aux	3 prime
# switcher M E amps	Multiple	2	1	Dual	3	3, multilevel keys	1 ME
# pattern generators	Multiple digital	4 generators	1 w/4 patterns	1 w/42 patterns	6 w/100 patterns	6 w/100 patterns	24 pat/program-mable
Wipe effects	Yes	Yes	Soft-edge	Full feature	Rot/S-E/Adj E	Rot/S-E/Adj E	Soft-edge/adj edge
Spotlight effects	Yes	Yes	No	Yes	Yes	Yes	Yes
Border effects	Yes	Yes	Yes	Yes	Option	Option	Yes
Shadow effects	Yes	Yes	Yes	Yes	Option ¹⁹	Option ²²	No
Programmable routines	Yes	Yes	Opt 99 routines	250 event	More than 100	EZMEM than 100	100 routines
Memory backup battery	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic software	Yes	Yes	Yes	...	Yes	Yes	Yes
Digital effects port	Yes	Yes	No	...	Yes	Yes	Option
Automation port	Yes	Yes	Yes	Yes	RS-422	RS-422	Option
Input timing adjustment	...	...	...	...	...	...	...
Crosstalk at subcarrier	...	...	-60dB	-55dB	...	...	<-60dB
Link to rack electronics	...	...	Multicore	Multicore	1-line digital	1-line digital	...
Audio preview function	No	No	Yes	Yes	No	No	Yes
Audio metering	No	No	Yes	Yes	No	No	No
Audio level control	No	No	Yes	Yes	No	No	No
Audio mixer interface	No	No	No	No	No	No	No
Edit control interface	Yes	Yes	No	No	Option	Option	Yes
Reader Service No	979	980	981	982	983	984	985

¹⁷RGB or Y/Ca component inputs, outputs: processing in 4:2:2 domain. ¹⁸Including complex functions. ¹⁹Flying total screen. ²⁰D3200 includes 20-input phantom analog package; digital inputs are 8-10 bit parallel or serial. ²¹Eight complex function generators with two paint-type generators. ²²Includes flying the entire screen.

Routing Switchers, Video and Audio

This category contains all matrix type distribution routing switchers of audio only, video only, combined V/A forms and various digital types. These products exclude the utility type unit of N-inx1-out, which could be developed into a matrix by stacking and looping inputs from one group to the next.

Manufacturer	AKAI/MC		AVS France	Auditronics	AutoPatch /XN Technologies		Barco	BTS
Model	DP2000	DP3200	Dnyx	1900 IF8	4XDM	4Y-140DM (8Y-)	BVRS/BARS	BSB-3000
Audio/Video/Data	V/A	Audio only	V/A	Audio	V/A/Data	V/A/Data	V/A	Audio
Basic crosspoint matrix	16x16	32x32	16x8	16x8	4x4: 12x12	4x4 (8x8)	16x16	4x4
Typical system size	...	...	128x128	48x24	16x48	32x128 (64x256)	32x32	...
Audio response ±dB Hz-kHz	±0.5 5-40k	...	-0.25 20-20k	±0.5 20-20k	5-50k	±0.1 20-30k	±0.1 20-20k	±0.1 20-20k
Harmonic distortion	<0.1%	<0.01%	<0.05%	<0.01%	<0.03%	<0.002%	<0.02%	<0.002%
S/N ratio	...	...	82dB	91dBu	>100dB	120dB	...	95dB
Audio crosstalk (worst)	<085dB	<-85dB	<075dB	-88dBu 1kHz	<-88dB	<-95dB	-100dB	<-95dB 20kHz
Video response	...	[Designed	-3 to 60MHz	...	to 12MHz	to 50MHz	to 40MHz	...
Diff phase/gain	17/1%	[for digital	<0.5'/<0.5%	...	<0.17/0.1%	<0.05'/0.1%	<0.17'/<0.1%	...
Chroma Luma delay	...	[audio use.	2ns	...	...	...	1' 4.43MHz	...
Video S/N ratio	...	...	...	...	1.5mV floor	80dB	...	...
Video crosstalk (worst)	-40dB 3 48	...	<-56dB 4.43	...	-65dBdB	<-78dB 10MHz	50dB 5MHz	...
Multilevel audio control	Yes	...	Possible	...	Yes	Yes	Possible	...
Useable for component video	...	...	Possible	...	No	Yes	Possible	...
Reader Service No	744	745	746	747	748	749	750	751

Manufacturer	BTS				CEL Electronics	Central Dynamics	Datatek	
Model	BSX-350A-V	BVS-350C	DRS 7	TAS/TVS-2000	TAS/TVS-3000	P169V/P169A	SDS-2+	D-2000
Audio/Video/Data	V/A	Component video	Digital video	V/A	V/A	V/A	V/A	V/A
Basic crosspoint matrix	10x10	3x10x1	8x4	10x10	10x10	8x4	16x8	50x25
Typical system size	10x10-V 20x-A	3x20x1	8x8/8x12/8x16	250x150	200x200	8x4	32x32	50x50; 250x500
Audio response ±dB Hz-kHz	±0.1 20-20k	...	[This system	±0.1 20-20k	±0.1 20-20k	±0.5 100-15k	±0.2 50-15k	±0.1 20-20k
Harmonic distortion	<0.007%	...	[for CCIR	<0.007%	<0.007%	...	<0.1%	0.05%
S/N ratio	85dB	...	[601 4:2:2	85dB	85dB	<-90dBm	>100dB	105dB
Audio crosstalk (worst)	<-90dB	...	[digital video	<-90dB	<-90dB	-70dB	<-80dB 15k	-85dB 20kHz
Video response	to 20MHz	±0.7 30MHz	[signals in	to 20MHz	to 20MHz	0.1 to 6MHz	±0.1 to 8MHz	0.25 to 10MHz
Diff phase/gain	<0.1%	<0.17'/<0.1%	[8/9/10-bit	<0.17'/<0.1%	<0.157'/<0.15%	±0.27'/0.2%	<0.17'/<0.1%	0.157'/0.15%
Chroma Luma delay	<±1'	±1.5'	[sampling:	<±1'	<±1'	...	±1' 4.43MHz	5ns
Video S/N ratio	>75dB	>75dB	[system auto-	>75dB	>70dB	>80dB	>66dB	...
Video crosstalk (worst)	-60dB	-40dB 30MHz	[selection of	-60dB 3.58	-30dB 30MHz	<-55dBm	<-60dB	...
Multilevel audio control	Possible	Yes	[525 and 625.	Yes	Yes	...	Yes	Yes
Useable for component video	Possible	Yes	Digital	Possible	Possible	...	Yes	...
Reader Service No	...	753	754	755	756	757	758	759

Manufacturer	Datatek	Di-Tech						
Model	D-2400	5216	5217 Wideband	5616/5618	5815/5820	5856 HDTV/RGB	5862/5861	5865A/5864V
Audio/Video/Data	V/A	Video D1/D2	Video	V/A	V/A AFV	Video	V/A	V/2A
Basic crosspoint matrix	160x20	16x16	16x16	16x8/16x16	15x7/20x6	20x20 RGB	64x32	32x64
Typical system size	40x20x4	64x16	...	16x32 audio	x7n/x6n	60x20 HDTV	256x256	...
Audio response ±dB Hz-kHz	±0.05 20-20k	[Digital: 75	...	±0.5 20-100k	±0.25 20-20k	...	±0.5 20-100k	±0.1 20-20k
Harmonic distortion	<0.005%	[input/output	...	<0.25%	<0.5% +18dBm	...	<0.1%	<0.05%
S/N ratio	116dB	[at 0.8Vp-p:	...	>70dB	>70dB	...	>70dB	>70dB
Audio crosstalk (worst)	-82dB 20kHz	[data rates	...	<-80dB20-1k	<-70dB	...	<-80dB	<-75dB
Video response	-3/0.5 60MHz	[to 270Mbit/s	±0.25 50MHz	-1/0 20MHz	-3/0 20MHz	-3 to 45MHz	-1.5/0 20MHz	-1/0 20MHz
Diff phase/gain	0.057/0.05%	[in D1 & D2	<0.27'/<0.2%	<0.257'/0.25%	0.257'/0.25%	<0.27'/<0.2%	<0.257'/<0.25%	<0.257'/<0.25%
Chroma Luma delay	±0.75"	[formats.	...	<1"dB	<1"	±2"	<1"	<1"
Video S/N ratio	75dB	...	>60dB	>70dB	<-65dBV	>60dB	>70dB	>70dB
Video crosstalk (worst)	<-63dB 5MHz	...	<-40dB	<-60dB 4.5MHz	<-60dB 4.5MHz	<-35dB 40MHz	<-60dB 4.5MHz	<-60dB 4.5MHz
Multilevel audio control	Yes	...	No	Yes	Yes	No	...	...
Useable for component video	Yes	...	...	Possible	Yes	...	...	No
Reader Service No	760	761	762	763	764	765	766	767

Manufacturer	DYNAP Corporation				Grass Valley Group			HEDCO
Model	DYNA MITE	DYNASTY WB	DYNASTY	DYNASTY 100	20-TEN/TEN-20	Horizon DHX-532	Horizon systems ¹	HD-16X A/V
Audio/Video/Data	V/A	V/A (70MHz)	V/A 30(40)MHz	Video/digital	V/A	Video/digital	V/A	V/A
Basic crosspoint matrix	10x10	10x10	10x10	10x10	20x10/10x20	8x8	8x16	16x4/16x8
Typical system size	30x10 A/V	100x30	100x100 (x50) V	50x100	20x20-10x40	32x32	128x128	16x16-64x64
Audio response ±dB Hz-kHz	±0.2 30-20k	±0.1 20-20k	±0.1 20-20k	...	±0.1 20-20k	[Conforms to	±0.1 20-20k	-0.05 20-100k
Harmonic distortion	0.1%	0.1%	0.1%	...	0.05%	[SMPTe RP125	<0.05%	<0.02%
S/N ratio	75dB	75dB	75dB	...	120dB	[CCIR 601/F	>100dB	-80dB
Audio crosstalk (worst)	80dB	<-80dB	56dB	...	80dB	[EBU 3246-E	<-80dB	>86dB
Video response	-3dB 40MHz	-3/1.5 70MHz	±0.3 20MHz	±2 to 100MHz	±0.5 10MHz	[standards	±0.015 8MHz	-3dB >32MHz
Diff phase/gain	0.057/0.05%	0.27/0.15%	0.057/0.05%	0.257/0.25%	0.27/0.1%	...	<0.17/0.1%	<0.37/0.2%
Chroma Luma delay	1' 5MHz	1'	1' 5MHz	...	>±1'	[DHX-88 8x8;	±1'	<±2ns
Video S/N ratio	30dB RMS	55dB 70MHz	80dB < 1Vp-p	55dB 100MHz	>75dB	[DHX-1616 16x16	>75dB	>70dB 10MHz
Video crosstalk (worst)	<-50dB 5MHz	<-25dB 70MHz	<-60dB 5MHz	-25dB 100MHz	-50dB 10MHz	[DHX-3216 32x16	-60dB 5MHz	<-60dB 4.43MHz
Multilevel audio control	Yes	Yes	Yes	...	Yes	...	Yes	Yes
Useable for component video	Yes	Yes	Yes	Yes	Yes	Digital	Yes	Yes
Reader Service No	768	769	770	771	772	773	774	775

¹Series includes HX-16 16x16; HX-32 8x16/16x16/24x16/32x16; HX-48 to 48x48; HX-64 to 64x64.

Manufacturer	International Tapetronics	JNS Electronic Industries	McCurdy Radio	PESA			Pro-Bel	
Model	Audio Switcher	9000 series	Century (Mini)	15x series	Model 40x	Series H ²	ADAM	HD series ³
Audio/Video/Data	Audio only	Audio	Audio	A/V	A/V	A/V	Analog/digital	V/A
Basic crosspoint matrix	16x16	15x8 stereo	...	15x12	40x20	128x32	128x128	32x32
Typical system size	64x48 mono	(15x16 mono)	200x24 (24x24)	15x12	40x20	128x128	500 in/a out	256x256
Audio response ±dB Hz-kHz	±0.1 20-20k	<±0.2dB 10-20k	-0.2 20-20k	±0.5dB 20-20k	±0.25 20-20k	±0.15dB to 20k	±0.35 20-20k	±0.2 20-20k
Harmonic distortion	0.01%	30k	<0.1%	<0.5%	<0.3%	<0.1%	<0.1%	<0.1%
S/N ratio	95dB	+24dBm	>95dB	85dB	80dB	92dB	>86dB	>88dB
Audio crosstalk (worst)	<-95dB	>80dB	<-80dB	<-80dB	<-70dB	<-88dB	<-96dB	>100dB 16kHz
Video response	...	Bal 40	...	±0.5dB 12MHz	±0.5 12MHz	-1.5 to 20MHz	[48dB 18-bit	±1dB 30MHz
Diff phase/gain	...	+24dBm max	...	<0.5°/0.5%	<0.4°/0.4%	0.1°/0.1%	[3.072MHz	<0.15°/0.15%
Chroma Luma delay	...	<±0.2dB 10-20k	...	...	...	±10ns	[words/s data	±1°
Video S/N ratio	...	<0.01%	...	60dB	60dB	73dB	[rate 29-bit	>80dB
Video crosstalk (worst)	...	>90dB	...	-52dB 3.58MHz	-60dB 3.58MHz	-62dB 4.43MHz	[parallel.	<-54dB
Multilevel audio control	Yes	<-90dB	Yes	Yes	Yes	Yes	...	Yes
Useable for component video	No	...	No	Yes	...	Yes	...	Yes
Reader Service No	776	777	778	779	780	781	782	783

²Series H also available in 256x32 and 32x32. ³Prodigy 24x12 model similar to HD series with smaller matrices.

Manufacturer	Sierra Automated Systems	Sierra Video Systems		Thomson Video Equipment	360 Systems	Utah Scientific		
Model	SAS32000	MAXIN series	Series 16 ⁴	TTV5790	AM-16	AVS-1B (-1BW) ⁵	AVS-2 ⁶	DVS-1
Audio/Video/Data	Audio	Video only	V/A	Video/digital	Audio	V/A	V/A	Video/digital
Basic crosspoint matrix	32x16 stereo	16x4	16x4	30x15	8x8/16x16	10x10	10x10	4x16
Typical system size	64x32	32x4 to 80x4	16x8/16x16	30x30	16x16x4	320x (150x10)	1280x1280	32x16
Audio response ±dB Hz-kHz	±0.25 20-20k	...	±3 150kHz	[Conforms to	-3 to 50k	±0.05 30-20k	±0.05 30-20k	[10-bit
Harmonic distortion	<0.05%	...	0.1%	[EBU 3247 &	<0.008%	0.05%	0.05%	[conforms to
S/N ratio	>86dB 20kHz	...	>100dB	[CCIR 656 rec.	105dB	85dB	85dB	[SMPTE RP125
Audio crosstalk (worst)	<-70dB	...	<-80dB 1kHz	[for digital	88dB 1kHz	-90dB to 20k	-90dB to 20k	[EBU 3246E
Video response	...	3dB 30MHz	-3dB 30MHz	[video; for	...	-3/0.5 60MHz	±0.5dB 30MHz	[spec for
Diff phase/gain	...	0.25°/0.25%	0.25°/0.25%	[signals to	...	0.05°/0.05%	±0.05°/0.05%	[digital
Chroma Luma delay	...	5ns	...	[243 Mbits/s	...	±0.75°	±0.75°	[signals.
Video S/N ratio	...	60dB	60dB	[data rate.	...	80dB	80dB	[8-bit or
Video crosstalk (worst)	...	-50dB 3.58MHz	-50dB 3.58MHz	...	...	-60dB 4.43MHz	-60dB 4.43MHz	[9-bit may
Multilevel audio control	...	No	Yes	...	Yes	Yes	Yes	[be used.
Useable for component video	...	Yes	Yes	Digital	...	Possible	Possible	...
Reader Service No	784	785	786	787	788	789	790	791

⁴Series 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. ⁵-1BW model rated to 100MHz; matrix size determined by bandwidth. ⁶VX-2 video crosspoints offer -3dB to 100MHz.

Production Titlers, Character Generators

Dedicated character generation systems, not software packages for PCs. Abbreviations for storage media include HD hard disk, FD floppy disk, ST streaming tape, RHD removable hard disk.

Manufacturer	Abekas Video Systems	Ampex Corp.	Aston/Paltex		AVS	AVS France	BTS
Model	A72	ALEX	Aston 4	Caption	Manuscript	S161-M/-T/-GC ¹	Vidifont II
Subtitling	Variable	Variable	Variable	Variable	Variable	Variable position	Variable
Tab	Yes	Yes	Yes	Yes	Yes	No	Yes
Undertitling by	C/W/L	C/W/L	Yes	Yes	Various	No	Yes
Page format	Free-form	Free-form	54 C/14 L	Free-form	Free-form	16Cx4L-16TVL ²	64-Cx31-L
Resolution	5.5MHz luminance	4.6ns	10ns	<10ns	10ns effective	100ns	48ns
Anti-aliasing	Hardware 256 level	Hardware, software	Software, hardware	Software	Yes	None	Hardware, software
On-line type faces	Unlimited	30	8	Multiple	50 faces	1	8
Character planes	Unlimited	16	4	...	Multiple	...	32
Background planes	1	1	Yes	Yes	Multiple	...	Yes
Animation by	C/W/L	C/W/L	Yes	Yes	Yes	No	Yes
Type styles	Serif, non-serif	Serif, non-serif	Multiple	Multiple	Serif, non-serif	...	N/NS/Script/Italic
Italicize	Variable angle	Variable	Yes	Yes	Variable	No	Yes
Rotation	No	360°	...	...	360°	No	No
Sizing, scaling	Yes	Yes	Yes	Yes	4-400 scan lines	No	Yes
Non Arabic faces	...	...	Yes	Yes	44 languages	No	Yes
Type face storage	FD/HD/ST	RAM/FD/HD	Disk	Disk	...	PROM (RAM)	FD/RAM
Face font compose	No	Option	Logo opt	Dption	Yes	No	Option
Display flash by	No	C/W/L	Yes	Yes	Various	Character	Yes
Edging effects	Surround, shadow	Surround, shadow	Yes	Yes	Drop, solid shadow	Surround, shadow	Yes
Auto centering	H/V	H/V	Yes	Yes	H/V	No	Yes
Roll crawl control	Variable	∞ speed variation.	8 each	Yes	Multiple	...	Yes
Keyer colorizer	2 encoders std	Integral or external	External	External	Yes	No	Integral
Color palette	16.7M/screen	16.7M, 1024/screen	4096, 40/screen	16.7million	16.7M on screen	...	4096, 64/screen
S-VHS output format	No	No	No	...	also RGB	YCRB	No
Integral still store	No	No	No	No	40MByte	No	Graphic Store opt
Internal memory	4-4 4-4/13.5MHz	Pipeline architectur	2 pages	24-bit	RISC architecture	...	300 page
Off-line storage	FD/ST	FD/HD	FD/HD	Disk	3.5" FD	...	FD/HD
Access time per page	...	Per complexity	<1s	<1s	...	...	<0.9s
Remote control	RS-232	...	RS-232/422	RS-232/422	Yes	No	RS-232/-422

Production Titlers, Character Generators

Manufacturer	Abekas Video Systems	Ampex Corp.	Aston/Paltex		AVS	AVS France	BTS
Model	A72	ALEX	Aston 4	Caption	Manuscript	\$161-M/-T/-GC ¹	Vidifont II
Image sources	RGB components	C/TV, Tablet, Comp video, CCIR-601	...	Camera LogoMaster Draw	Any video source	Composite video	RGB, Composite
Multi-user system	No	2 user	2-station	...	...	No	2 Keyboards
Automation interface	RS-232	Ethernet	RS-232/422	RS-232/422	...	RS-232	RS-422
Paint system interface	No	No	...	...	Networked	No	...
Reader Service No	442	443	444	445	446	447	448

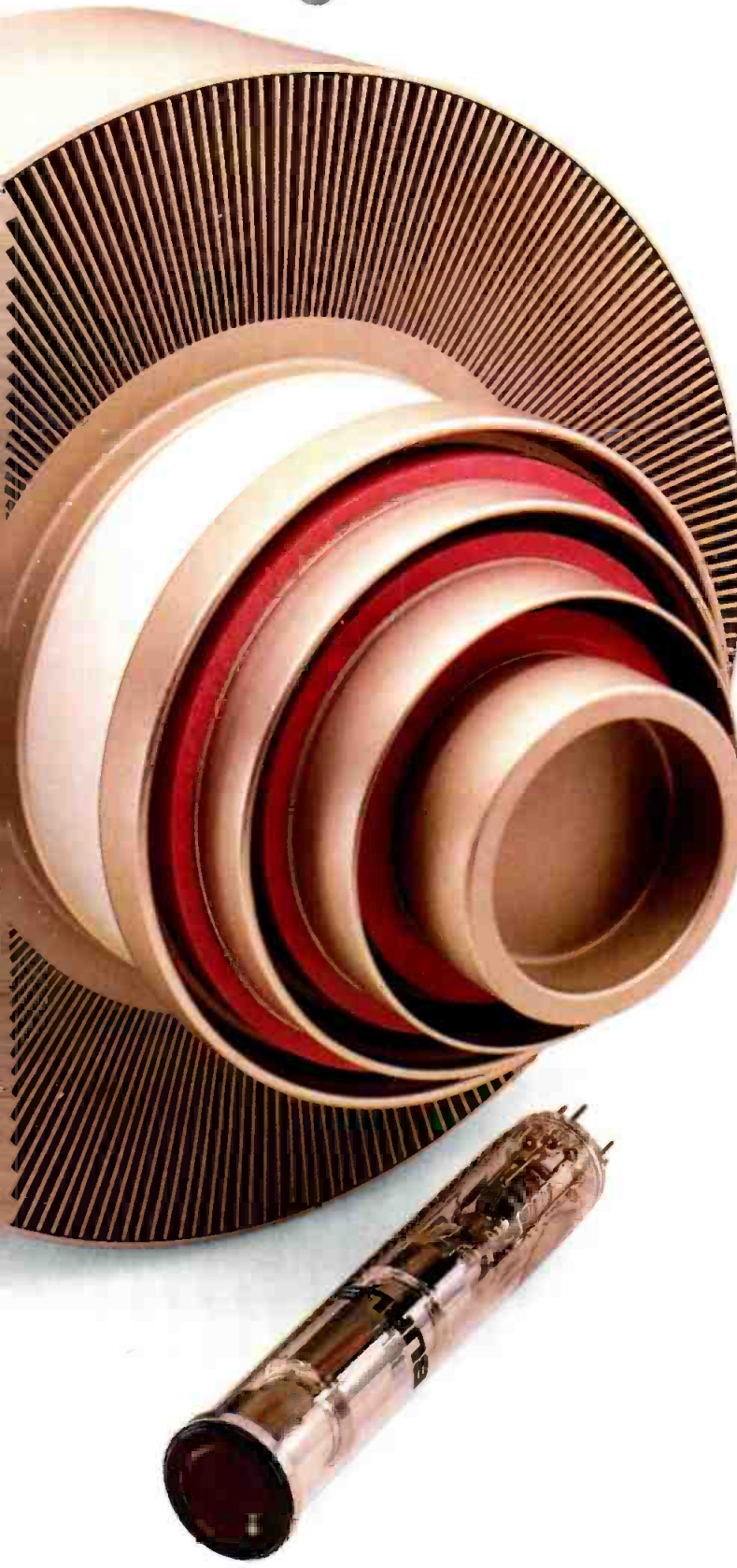
¹ -HC clock, counter inserter; -S logo; -V, VU meter; -GC character generator. ² 32Cx16L for 32TVL letters.

Manufacturer	Chyron Corporation				Dubner Computer Systems		ESE
Model	ACG	Chyron IV/4200	INFINIT ¹	Scribe JNR	30K ³	Graphics Factory ⁴	ES-CG89
Subtitling	Variable	Lower 3rd	Variable	Variable	Any location	Any location	Lower 1/3
Tabs	Yes	Yes	Yes	Yes	Yes	Yes	...
Underlining by	All	All	All	All	by Character	by Character	...
Page format	Free form	64Lx24L 18TVL	Free form	64Cx24L 10TVL/free	Free form	Free form	20x5
Resolution	35ns	27ns	5ns	10ns	760x486	760x486	70ns
Anti-aliasing	Hardware	...	Software	Software	Software	Software	Software
On-line type faces	8	12	8	8	Infinite	Infinite	8
Character planes	Unlimited	2	Unlimited	unlimited	2	2	...
Background planes	1	2	3	1	Infinite	Infinite	...
Animation by	All	All	All	Line	C/W/L	C/W/L	...
Type styles	Serif, non-serif	Serif, non-serif	Serif, non-serif	Serif, non-serif	Serif, non-serif	Serif, non-serif	Non-serif
Italicize	Yes	Yes	Yes	Yes	Variable	Variable	No
Rotation	Row, page	Yes	Yes	Yes	360°	360°	...
Sizing, scaling	No	Yes	Yes	Yes	Yes	Yes	No
Non Arabic faces	...	Cyrillic	Cyrillic	Cyrillic	Cyrillic, Chinese	Cyrillic	No
Type face storage	RAM	RAM	RAM	RAM	Ram/FD/Bernoulli	Ram/FD/Bernoulli	RAM
Face font compose	Option	Yes	No	No	Yes	Yes	No
Display flash by	All	All	All	All	Character	Character	Character
Edging effects	Surr shad to 16lines	Surround, shadow	Surround, Shadow	All	Surround, shadow	Surround, shadow	Surround
Auto centering	H/V	Horizontal	H/V	H/V	H/V	H/V	Horizontal
Roll crawl control	9 speeds	4 speeds	9 speeds	9 speeds	9 speeds	9 speeds	1 speed
Keyer colorizer	Integral	External	Integral	Integral	Integral	Integral	Integral
Color palette	16.7M 527/screen	512 200/screen	16.7M; 16.7M/screen	16.7M 667/screen	16.7M, 256/screen	16.7M, 256/screen	16/16
S-VHS output format	Option	No	No	No	No	No	No
Integral still store	No	No	Yes	No	Option	Option	No
Internal memory	Proprietary	Proprietary	Proprietary	Proprietary	8MBytes, 32-bit	16MBytes, 32-bit	...
Off-line storage	FD HD RHD	FD HD	FD HD RHD	FD/HD/RHD	HD/Bernoulli SCSI/FD	HD, Bernoulli	...
Access time per page	...	...	...	...	...	...	100ms
Remote control	RS-232 MODEM GPI	RS-232	RS-232, Modem	RS-232 Modem	RS-232	RS-232	No
Image sources	Tablet	Composite, Data svc Weather svc	Component, Tablet Data service	Component, tablet	Tablet, weather data	Encoder, composite video, weather data	Composite
Multi-user system	No	Yes	Yes	Yes	2 users	2 users	No
Automation interface	RS-232 GPI	RS-232/-422	RS-232/-422 ARCNET	RS-232, ARCNET	RS-232, -422, GPI	RS-232, -422, GPIB	...
Paint system interface	No	Yes	Yes	Yes	Option	Option	No
Reader Service No	449	450	451	452	453	454	455

³ 5K, 10K, 20K have similar characteristics with varying amounts of internal storage and FD external storage. ⁴ 20KWN Weather Station also available with weather background graphics capability.

Manufacturer	For-A	Laird					
Model	VTW-240 (222S)	1450	1500 PROM	CG 7000 (7000 YC)	Legend (Turbo)	Legend GX (Turbo)	Legend-LX
Subtitling	...	Variable	Variable	Variable	Variable	Variable	Variable
Tabs	Yes	Yes	Yes	No	Yes	Yes	Yes
Underlining by	by character	Character	Character	...	Character	Character	Character
Page format	32C x 8L	Free form	Free form	39x16 24TVL	Free form	Free form	Free form
Resolution	24x20 dot matrix (12x20 on 222S)	35ns 1506x483	35ns 1506x483	80ns	35ns 1506x483	35ns 1506x483	35ns 1506x483
Anti-aliasing	...	...	...	Hardware	Hardware/software ⁵	Hardware/software ⁶	Hardware/software
On-line type faces	4	6 + 6 opt	6 + 6 opt	1	16	16	16
Character planes	1	1/unlimited overlap	1/unlimited overlap	1	w/unlimited overlap	1/unlimited overlap	2/unlimited overlap
Background planes	1	1	1	1	1	1	2
Animation by	...	Character	Character	Line	Character	Character	Character
Type styles	Serif, non-serif	Serif, non-serif	Serif, non-serif	Non-serif standard ²	S/N/S 35 type faces	S/N/S 35 type faces	S/N/S 35 type faces
Italicize	...	Variable	Variable	No	Variable	Variable	Variable
Rotation	...	H/V/flip	H/V/flip	No	H/V flip options	360° by <1 step	360° by <1 step
Sizing, scaling	...	No	No	4 sizes/face	Option	Yes	Yes
Non Arabic faces	No	No	No	No	No	No	No
Type face storage	FD	ROM	ROM	ROM cartridge	RAM/FD	RAM/FD	RAM/FD/HO
Face font compose	No	No	No	No	Option	Yes	Yes
Display flash by	to character	Character	Character	Character	Character	Character	Character
Edging effects	Shadow edge	Surround, shadow	Surround, shadow	Surround/shadow	Surround, shadow	Surround, shadow	Surround, shadow
Auto centering	H/V	Horizontal	Horizontal	H/V	Horizontal	Horizontal	Horizontal

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BURLE Electron
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Production Titlers, Character Generators

Manufacturer	For-A			Laird			
	VTW-240 (222S)	1450	1500 PROM	CG 7000 (7000 YC)	Legend (Turbo)	Legend GX (Turbo)	Legend-LX
Model	Multiple speeds	9R, 6C	9R, 6C	4 R/4 C	9 R, 6 C	9R, 6C	9R, 6C
Roll crawl control	Yes	Integral	External	Integral	Integral	Integral	Integral
Keyer colorizer	Yes	Integral	External	Integral	Integral	Integral	Integral
Color palette	512, 14/screen	65,536/966	65,536/966	Analog 2/screen	65,536/966	65,536/966	65,536/65,536
S-VHS output format	(-222S)	Option	Option	7000YC only	Option	Option	Option
Integral still store	No	No	No	No	No	No	No
Internal memory	1600 page	...	...	...	...	...	...
Off-line storage	3.5" FD	via PC connection	via PC connection	Non-vol RAM module	FD, HD	FD, HD	FD/HD
Access time per page	...	1s average	1s average	1.4s	1s average	1s average	1s average
Remote control	RS-232	RS-422	RS-422	GPI & (Proprietary)	RS-422	RS-422	RS-422
Image sources	Composite video	Composite	Composite	Composite (Y-C)	Composite, tablet	Composite, tablet	Composite, tablet
Multi-user system	No	No	No	No	No	No	No
Automation interface	Remote control	RS-422, GPIB	RS-422, GPIB	GPIB	RS-422, GPIB	RS-422, GPIB	RS-422, GPIB
Paint system interface	No	No	Upgrade option	No	Option	Option	Yes
Reader Service No	456	457	458	459	460	461	462

⁵Serif opt; 18 type styles available for 7000. ⁶anti-aliasing requires additional hardware.

Manufacturer	PESA		Quanta Corporation			Quantel	Ryley Communica- tions Ltd
	CG-4722	Delta 1	Microgen Plus	Drion	Cypher ³	CAPGEN ser 2	
Model	Option	Lower 1/3	Lower 1/3s	Lower 1/3s	Any location	Variable	
Subtitling	8 tabs	Yes	No	Yes	Yes	Yes	
Underlining by	Yes	Character	None	Character	Yes	Word	
Page format	32 char x 16 line	Free form	32C x 12 L	64 C 36 L/10-126TVL	Free form	Free form	
Resolution	35ns	0.289ns	50ns	5ns	...	11ns	
Anti-aliasing	...	Hardware	None	Software	256-level 4-4-4-4	Hardware	
On-line type faces	8 in RAM	Unlimited	4	250	Infinite	8	
Character planes	...	Unlimited	1	1	Multiple	1	
Background planes	...	Unlimited	1	1	Multiple	1	
Animation by	No	Character	None	Character	Yes	...	
Type styles	Various	Serif, non-serif	Serif, on-serif	Serif, non-serif	Serif, non-serif	Serif, non-serif	
Italicize	by line	Variable	No	Variable	Variable	Yes	
Rotation	No	360° by font	None	360° by font	360°	...	
Sizing, scaling	...	Yes	No	Yes by font	Yes	Yes	
Non Arabic faces	Script, designer	None	None	None	Various	Roman	
Type face storage	3.5" disk	RAM, HD	ROM	Floppy disk	FD cartridge	RAM	
Face font compose	Option -4722	Yes	No	Option	Yes	No	
Display flash by	Yes	Character	Character	Character	Various	Word	
Edging effects	Full control	Surround, shadow	Surround, shadow	Surround shadow ⁷	Surround, shadow	Surround	
Auto centering	H/V	H/V	Horizontal	Horizontal	H/V	H/V	
Roll crawl control	8 speeds	2560 roll, 10 crawl	9 speeds	99 speeds	...	9 speeds	
Keyer colorizer	Integral	Integral	Integral	Integral	Integral	External	
Color palette	121, 121/s	16.7million	256, 24/screen	16.7million 1000/s	16.7M, 256/screen	64, 64/screen	
S-VHS output format	No	No	No	No	No	No	
Integral still store	No	Yes	No	No	Yes, 50-image	No	
Internal memory	15 pg/4096 lines	4MB, 32-bit	8-bit 600 row RAM	2.5MB, 16/64-bit	...	...
Off-line storage	3.5" floppy	HD/FD/ST/RHD	None	HD/FD	Yes	FD	
Access time per page	...	0.65s	4ms	0.5ms	...	500ms	
Remote control	RS-232, timecode	RS-232	RS-232	RS-232/-422	Yes	...	
Image sources	Video source	Composite, component	Composite	Composite	Any video	...	
Multi-user system	-4722 dual channel	No	Option	No	...	No	
Automation interface	RS-232	None	RS-232	RS-232/-422	Various	...	
Paint system interface	...	Option	No	No	Yes	No	
Reader Service No	463	464	465	466	467	468	

⁷Also outline, highlight effects. ⁸Cypher Sprint; also Cypher Sports with 3-D effects; both allow mixing of pictures, graphics, titles.

Digital Video Effects Systems

These include systems designed for broadcast facility and production for broadcast; PCs may be used as control terminals for this equipment, but none are software packages for PC-based systems.

Manufacturer	Abekas Video Systems		ALTA Group	Ampex Corporation		CEL Electronics	Digital F/X
	A52	A53-D ¹	Pictoris	ADD 100 ²	ADD 2000 ²	P164 series ³	DF/X 200
# Inputs channels	1 basic 2 exp	1 basic 2 exp	1 basic	2 basic 4 exp	2 basic 8 exp	4 basic 8 exp	2 basic
# Output channels	1 basic 2 exp	1 basic 2 exp	1 basic	1 basic 2 exp	1 basic 4 exp	1 basic 2 ext	1 basic
# Image planes	...	...	2 fore & background	...	...	2	1
Control system	Prop CPU/Ctl Pnl	Prop CPU/Ctl Pnl	CtlPnl	Prop. CPU/Ctl Pnl	Prop. CPU/Ctl Pnl	Proprietary/CtlPnl	Prop CPU/Ctl Pnl
Instruction memory form	RAM EPROM Data-Key	Floppy disk	...	FD for effects	FO	FD	HD FO RHO
Parameter display	On Ctl Pnl	On Ctl Pnl	...	Real Numbers	Real Numbers	LCD/TouchScreen	HR 14029x800

Manufacturer	Abekas Video Systems		ALTA Group	Ampex Corporation		CEL Electronics	Digital F/X
Model	A52	A53-D ¹	Pictoris	ADD 100 ²	ADD 2000 ²	P164 series ³	DF/X 200
Y/C, S-VHS input, output	No	No	I/O	...	...	I/O Std	No
Component input, output	No	I/O	...	Analog I/O	Analog I/O	I/O Std	I/O
Digital input, output	I/O Composite	I/O Composite	...	Component/composite	Component/composite	I/O Dpt	I/O component
Dub input, output	No	No	...	...	...	input Std	No
Still store functions	No	No	No	No	No	Option	Yes
TBC functions	No	No	No	No	No	Yes	Yes
Remote protocol	RS-232/-422/GPI	RS-232/-422/GPI	GPI	GPI LAN	RS-422/GPI/ESBus	GPI	RS-422/GPI/LAN
System S/N ratio	52dB	52dB	55dB	...	...	56dB	...
Differential phase, gain	2°, 2%	2°, 2%	2°, 2%	...	...	2°, 2%	...
Sample rates, bits	14.3MHz, 8-bit	14.3MHz 8-bit	13.5MHz 8-bit	...	13.5MHz 8-bit	13.5MHz 8-bit	13.5MHz 32-bit
Image size variation	0x min, 99x max	0x min, 99x max	Any size ratio	...	...	0x-8x	Unlimited
Image compression ratio	...	...	Infinite	Zero	Zero	Yes	Unlimited
Image expansion ratio	...	...	None	Zero	Zero	Yes	Unlimited
Rotation around axes	X/Y	X/Y/Z	None	X/Y/Z	X/Y/Z	X/Y	X/Y/Z
Image freeze	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Strobe	Yes	Yes	No	...	Option	Yes	Yes
Iterative (trails, streamers)	Yes	No	No	...	Option	Opt	No
Perspective effects	No	Yes	No	Option	Yes	Yes	Yes
Curvilinear effects	No	Yes	Option	...	Yes	Yes	Yes
Picture splits	H/V	H/V Opt	No	...	...	H	No
Mirror effects	No	No	Option	H/V	H/V	H/V	No
Push-on, -off	H/V/Diagonal	H/V Opt	H/V/Diagonal	H/V	H/V Option	H/V/Diagonal	No
Solarize	Yes	Yes	No	Yes	Yes	Yes	No
Posterize	Yes	Yes	Yes	Yes	Yes	Yes	No
Mosaic tiling	Yes	No	Yes	Yes	Yes	Yes	No
Programmed sequences	Yes	Yes	Yes	Yes	Yes	Yes	No
Reader Service No	1288	1289	1290	1291	1292	1293	1294

¹ System processes composite or component signals; various connections can be used with editing systems; sampling at 13.5MHz available. ² One key channel is standard ³ MS830 831, MS850/851 single channel systems are based on P164 effects/TBC unit; with Maurice controller forms MS832, MS852 dual channel systems.

Manufacturer	DSC Digital Services Corporation			ECHDIab	For-A	Fougerolle Video	GML/GML Grove
Model	Eclipse 5500CC	Illusion	Paragon	Tempest	MF-2000 Multiflex ⁴	MPV 4000	System DVP
# inputs channels	1 basic	1 basic	1 basic 4 exp	Video	Dual option	1 basic 4 exp	1 exp to 2
# output channels	1 basic	1 basic	1 basic 4 exp	Video, key	Dual option	1 basic 4 exp	1 exp to 2
# image planes	1	1	1	2-D, 3-D	2-D only	Multiplane	1
Control system	Prop CPU/CtlPnl	Prop CPU Ctl/Pan	Prop CPU CtlPnl	34010 mouse	Dedicated panels	Proprietary	Dedicated
Instruction memory form	Floppy disk	PROM	Floppy disk	3.5" floppy	Memory card	FD option	Non-volatile
Parameter display	CRT	7-seg LED	CRT	CRT menu	Keyboard indicators	Fluorescent panel	Lighted keys
Y/C, S-VHS input, output	...	...	...	Yes	)	PAL or SECAM	No
Component input, output	I/O	...	I/O	and composite	and Composite	RGB R-Y/B-Y	No
Digital input, output	...	...	I/O Component	No	No	D-1 interface	No
Dub input, output	...	...	...	No	No	No	No
Still store functions	No	No	No	Yes	...	No	No
TBC functions	No	No	No	...	(MF-1000)	& synchronizer	Dual frame store
Remote protocol	GPI	GPI	RS-422/PI	SCSI	Yes	RS-422/GPI	GPI/RS-232/422
System S/N ratio	52dB	52dB	52dB	52dB	55dB	...	58dB
Differential phase, gain	2°, 2%	2°, 2%	2°, 2%	2°, 2%	2°, 2%	...	2°, 2%
Sample rates, bits	14.3MHz 8-bit	14.3MHz 8-bit	14.3MHz 8-bit	4.2:2 CCIR 601	13.5MHz 8-bit 4:2:2	13.5MHz 8-bit	8-bit
Image size variation	...	...	...	...	Yes	...	...
Image compression ratio	...	...	...	Yes	Yes	1 to infinite	...
Image expansion ratio	...	...	...	Yes	Yes	...	...
Rotation around axes	X/Y/Z	X/Y/Z	X/Y/Z	Yes	X/Y	X/Y Options	...
Image freeze	Yes	Yes	Yes	& multifreeze	Yes	Yes	Yes
Strobe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Iterative (trails, streamers)	No	No	Opt	Yes	Yes	Yes	Yes
Perspective effects	Yes	Yes	Yes	Yes	No	Yes	...
Curvilinear effects	Yes	No	Yes	Yes	Yes	Yes	Yes
Picture splits	H/V	H/V	H/V	Yes	Yes	H/V	H/V
Mirror effects	H/V	H/V	H/V	Yes	Yes	H/V	H/V
Push-on, -off	...	...	...	Yes	Yes	Yes	H/V
Solarize	No	No	...	Yes	...	Yes	Yes
Posterize	Yes	Yes	Yes	Yes	...	Yes	Yes
Mosaic tiling	Yes	Yes	Yes	Yes	...	Yes	Yes
Programmed sequences	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	1295	1296	1297	1298	1299	1300	1301

⁴ MF-1000 for S-VHS, 1/2" & 3/4 VCRs; upgrades to 2-channel with perspective capability.

Editor's Note:

The information appearing in this **Broadcast Engineering Equipment Reference Manual** was derived from brochures sent by the manufacturers in response to invitations to participate. It does not contain information from every manufacturer, nor does it contain every model of a product type produced by any specific manufacturer. It does, however, offer you a wide range of products to consider, when you begin the process of searching for new equipment for your facility.

Digital Video Effects Systems

Manufacturer	GML/GML Grove	Grass Valley Group			Microtime		Pinnacle Systems
Model	X-Calibre (II)	DPM-100	Kaleidoscope DP	Genesis Act 3	Impact ser 4	RP-1 3D	2100 Series
# inputs channels	1 exp to 2	1 base 2 exp	1 base 5 exp	1 basic 2 exp	3	1 basic 2 exp	1 basic
# output channels	1 exp to 2	1 base 1 exp	1 base 4 exp	1 basic 2 exp	2	1 basic 2 exp	1 basic
# image planes	1		5	2	2	2	2
Control system	Dedicated/soft keys	Prop CPU/Ctl pnl	Prop CPU/ctl pnl	Prop CPU Ctl Pnl	Proprietary	Prop CPU Ctl Pnl	IBM/AT-based
Instruction memory form	ROM/FD opt	FD	FD	EAROM	RAM, 3.5 FD	FD	FD (HD in 2010)
Parameter display	Ctl pnl	2x40-character	Fluorescent/CRT opt	Vacuum fluorescent	CRT	CRT	Menu driven
Y/C, S-VHS input, output	...	No	...	...	No	...	NA
Component input, output	YUV/YIQ/RGB	I/O	I/O	I/O	Composite	I/O	In/Out
Digital input, output	...	I/O C/C	I/O C/C	...	D-2	I/O component	No
Dub input, output	...	No	...	...	No	...	No
Still store functions	No	Option	No	No	No	No	Yes (in 2010)
TBC functions	Dual frame sync	No	No	No	No	No	No
Remote protocol	GPI/RS-232/422	RS-232/422/GPI ⁵	RS-422/GPI	GPI	RS-422/GPI	RS-232/422/GPI	RS-232/-422 GPI/ESbus
System S/N ratio	58dB	55dB	...	58dB	58dB	58dB	58dB
Differential phase, gain	2°, 2%	2°, 2%	<0.25°, <0.25%	3°, 3%	2°, 2%	2°, 2%	2°, 2%
Sample rates, bits	8-bit	13.5/14.3 8-bit	13.5MHz 8-bit	8MHz 8-bit	14 3 4 2 2 2	13.5MHz 8-bit	10MHz 8-bit
Image size variation	1/2 & infinite	0x min, 100x max	0x min, 999x max	...	Infinite	...	0x-8x
Image compression ratio	1/2 & infinite	Infinite	0-1	Infinity.1	...	Infinity.1	Aspect ratio adj
Image expansion ratio	1/2 & infinite	1-100	1-Infinity	2-1	...	Infinity 1	8-1
Rotation around axes	X/Y/Z	X/Y/Z	X/Y/Z	X/Y/Z	X/Y/Z	X/Y/Z	X/Y
Image freeze	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Strobe	Yes	Opt	Yes	Yes	Yes	Yes	Yes
Iterative (trails, streamers)	Yes	Opt	Yes	No	Yes	Doption	Yes
Perspective effects	Yes	No	Yes	Yes	True 3-D	Yes	Option
Curvilinear effects	Yes	No	Yes	Yes	Yes	Yes	Option
Picture splits	H/V	H/V	H/V	H/V	Yes	H/V	H/V
Mirror effects	H/V	H/V	H/V	H/V	Yes	H/V	H/V
Push-on, -off	H/V	H/V	H/V/diagonal	H/V/diagonal	Yes	H/V diagonal	No
Solarize	Yes	Yes	Yes	Yes	Yes	Yes	No
Posterize	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mosaic tiling	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Programmed sequences	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	1302	1303	1304	1305	1306	1307	1308

⁵ESBus, Model 100, 200 interface.

Manufacturer	Pinnacle Systems	QuesTech	Sony		
Model	PRIZM	Charisma	DME 450 ⁶	DME-5000	DME-9000/System-G
# inputs channels	1 basic	3V 2key 2Z 1Bkgrnd	1 basic	4-channel option	1 (4-ch w/combiner)
# output channels	1 basic	Video/Z-axis/Key	1 basic	4-channel option	4:2:2, YCRCB
# image planes	3	Multiple	1	Multiple	Multiple
Control system	PC compatible	Ctl pnl/proprietary	Prop CPU Ctl pnl	KB, Proprietary	Ctl pnl, mouse, KB
Instruction memory form	FD/HD	1000 keyframe/3.5 FD	ROM >280 effects	...	...
Parameter display	Menu driven	CRT, panel LEDs	LED of effect #	CRT	CRT, Ctl Pnl LEDs
Y/C, S-VHS input, output	No	No	No	...	...
Component input, output	I/O	CCIR PAL	I/O	YCRCB & composite	Yes
Digital input, output	No	Yes	No	Component/composite	10-bit
Dub input, output	No	No	No	...	...
Still store functions	Option	No	No	...	...
TBC functions	No	Int synchronizer	Integral	Int. synchronizer	Integral
Remote protocol	RS-232/422/GPI/ESbus	Yes	...	RS-422, -232C, GPI	RS-422
System S/N ratio	58dB	per CCIR spec	52dB	>50dB	55dB
Differential phase, gain	2°, 2%	...	<3°	<2°, <2%	...
Sample rates, bits	10MHz 8-bit	13.5MHz 8-bit 4:2:2	8-bit 455H sampling	4:2:2	10-bit 4:2:2
Image size variation	0-∞	0-Infinity	...	Infinite	Infinite
Image compression ratio	Infinite	0-Infinity	...	Infinite	Infinite
Image expansion ratio	Infinite	0-Infinity	...	Infinite	Infinite
Rotation around axes	X/Y/Z	X/Y/Z	X/Y/Z	X/Y/Z	X/Y/Z
Image freeze	Yes	Yes	Yes	Inc multifreeze	w/multifreeze
Strobe	Yes	Yes	No	Yes	Yes
Iterative (trails, streamers)	Yes	Yes	No	Yes	Yes
Perspective effects	Yes	Yes	Yes	Yes	Yes
Curvilinear effects	Yes	CLEO	No	Yes	Yes
Picture splits	H/V	Yes	HV	Yes	Yes
Mirror effects	H/V	Yes	HV	Yes	Yes
Push-on, -off	No	Yes	HV	Yes	Yes
Solarize	Yes	Yes	...	Yes	...
Posterize	Yes	Yes	Yes	Yes	Yes
Mosaic tiling	Yes	Yes	Yes	Yes	Yes
Programmed sequences	Yes	Yes	No	T-file from DVS-8000	to 60sec
Reader Service No	1309	1310	1311	1312	1313

⁶With 3-input switcher, title key, dual matte generators, BVS-3000 and editor interface.

Still Store Systems

Magnetic and optical disk image storage systems, primarily used as image libraries, but may also be used in graphics production; HD hard disk, RHD removable hard disk, M-O magneto-optical, ST streaming tape, R-O read-only, WORM write-once, read-many.

Manufacturer	Abekas Video Systems		ALTA Group	Ampex Corporation		ASACA/Shiba-Soku	Aston /Paltex	Dubner Computer Systems
Model	A42	A62 (A64)	Centaurus	ESS-3	ESS-5	ADS-300	Wallet	DSS-4
Storage medium	HD on-line, s-tape	HD	HD, RHD	HD/RHD, ST/Optical	HD, RHD, ST, WORM	Rewritable MO, RHD	44Mbyte RHD	HD, RHD, M-O, R-D
# simultaneous output channels	2	1	1	2	2	2	3	2
Multiple control workstations	No	No	Yes	1-10 users	No	No	1	Yes
Standards	NTSC	NTSC ²	NTSC, PAL	NTSC, PAL	NTSC, PAL	NTSC	NTSC/PAL	NTSC
Stills catalog	Optional library	No	...	Multi-image screen	Proof-sheet	...	Disk directory	...
Integral digital effects	No	Keying	Yes	Yes	No	Options	...	Yes
Edit control port	GPI/RS-422	RS-232/-422/GPI	Yes	...	GPI	VS-422	No	GPI, GVG
Switcher control port	GPI/RS-422	...	Option RS-232/422	...	...	RS-232C	{13.5MHz/8-bit	GPI, GVG
Video response	±0.25 4.2MHz	±0.25 4.2MHz	-3dB 5.5MHz	<5dB to 5MHz	0.5dB 5.9MHz	±0.5 60Hz-5.5MHz	{System uses	0.5dB 5MHz
Y/C _B sample rate	...	D-2 system	14 3MHz	13.5MHz, 4 2.2	13.5MHz	4xFsc, 8-bit	{CCIR 601 4:2:2.4	...
Differential phase, gain	2, 2%	2, 2%	2, 2%	<1, 1%	2, 2%	<2, 2%	{sampling with	1, 1%
Chroma Luma delay	±10ns	...	...	<±10ns	<25ns	...	{processors for	0ns
External TBC required	No	No	Dual TBC/FS	...	No	No	{NTSC/PAL output	No
Composite digital	Yes w/D-2 opt	D-2 interface (CCIR 601)	Y/C 3 58 (S-VHS)	No	...	No	...	D-2
Component digital	...	...	...	No	D-1	No	RGB/YUV	...
Integral input A/D conversion	Yes	Yes	Yes	Yes	Yes	...	Yes	Yes
Integral output D/A conversion	Yes	Yes	Yes	Yes	Yes	...	Yes	Yes
Storage per disk	700 fields, 350 frame	50s or 100s	170 fields 85 frames	80-800 frames	80-100 frames	3200 fields/1600 frames	39-42	1,000 images
# of drives maximum	3	1 or 2	4	25 in network	4 HD, 7 SCSI	14	2	14
Worst case access time	750ms	Instantaneous	2.1s/frame	<0.8s	1.5s	<1.7s	≤2s	1ms
Sequence, loop programming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	1240	1241	1242	1243	1244	1245	1246	1247

¹ Optional smaller disk drive for 200 fields/100 frame ² I/O of A62 is composite RS170A with optional RGB out. A64 I/O is Y/C_B, RGBS, CCIR 601. A60 has 25s-50s 525/60 capacity with CCIR 601 I/O, 4 2:2 processing

Manufacturer	Harris Video Systems		Leitch Video	Rank Cintel		Sony		TEAC
Model	HarrisVws 5000 (1000)	IRIS II Plus	Still File	Pocket	Slide File	DNS-1000 ser	LVR/LVS-5000 ⁴	LV-250HC ⁵ 1
Storage medium	Floppy& (Winchester)	W/R-W	HD, ST, MO, RO	HD, RHD	HD, streaming tape	WORM (or M-O)	12 CAV videodisc	Recordable optical
# simultaneous output channels	2 (1)	to 72	4 I/O	2	to 4	Dual channel	1	One only
Multiple control workstations	Yes	Yes	Yes	No	Yes	6 in network	No	No
Standards	NTSC	NTSC	NTSC	NTSC/PAL	NTSC, PAL	NTSC, PAL	NTSC, PAL	NTSC
Stills catalog	20 field database	Data list	Data list/3x3 ³	Title list/index	Polyphoto/index	Directory	No	...
Integral digital effects	Option (No)	Option	Yes	Yes	Yes	Key channel	No	No
Edit control port	Option	Yes	Various protocol	Proprietary	Auto Preview A/B	Yes	RS-232C/-422	RS-232
Switcher control port	Option	Yes	Various Protocol	No	A/B tally	...	...	...
Video response	0.4(0.5) to 4.2MHz	0.4 to 4.2MHz	±0.15dB 4.5MHz	8-bit sampling	CCIR 601	6MHz RGB	4.5MHz	>400 lines
Y/C _B sample rate	...	...	N A	13.5MHz/6 75MHz	13.5MHz/6 75MHz	15.5MHz Y/R-Y/B-Y	...	...
Differential phase, gain	<2, 2% (n a)	<2, 2%	<1, 2%	CCIR-601 arch	8-bit sampling	<2, 2%	...	8-bit sampling
Chroma Luma delay	5ns (ns)	5ns	<±10ns	...	...	...	...	...
External TBC required	No (Yes)	No	Integral synch	No	No	...	...	VY-250
Composite digital	...	...	D-2	No	No	No	{Analog RGB or	No
Component digital	D-1 ()	D-1	N A	D-1	D-1	Serial	{Composite	No
Integral input A/D conversion	Yes	Yes	Yes	Yes	Yes	Yes	...	...
Integral output D/A conversion	Yes	Yes	Yes	Yes	Yes	Yes	...	...
Storage per disk	748 (422) frames	200 fields	1500/3000/5000 fields	40 frames	400 frames	1 800 (or 500)	43,500 frames	5400 frames
# of drives maximum	25	32	4 for 10,000 frames	2	1	7 per mainframe	1	1
Worst case access time	1.9s	1s	0.6s	1.7ms	1	3s (or 2s)	0.5s	<1.5sec
Sequence, loop programming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	1248	1249	1250	1251	1252	1253	1254	1255

³ Integrated management system, 2 users/station, Ethernet networking, color frame storage playback. P mode with 8kbyte RAM and 150-step programming ⁴ LVA-7000 as play-only companion unit ⁵ LV-210 series includes A model with record and

Video Processing Systems

This product group contains signal encoders, format translators, color correction, signal correction products.

Manufacturer	A.C.E./Midwest Communications			Accom		ALTA Group	Ampex Corp.
Model	205N ¹ (204N)	660JN ²	ACC200	D-Bridge 122 ³	DIE-125 ⁴	Celeris	DST-300
Standards conversion	Encoder	Color corrector	Color correction	Encoder	Enhancer	Format converter	Format converter
Supports NTSC	Yes	Yes	No	Yes	Yes	Yes	Yes
Supports PAL	No	No	No	Yes	No	No	Yes
Supports SECAM	No	No	No	No	No	No	No
Format conversion	No	No	Yes	Yes	Yes	Yes	Yes
Supports Y/C-3.58	No	No	No	No	No	Yes	No
Supports Y/C-688	No	No	No	No	No	Yes	No

Video Processing Systems

Manufacturer	A.C.E./Midwest Communications			Accom		ALTA Group	Ampex Corp.
	205N ¹ (204N)	660JN ²	ACC200	D-Bridge 122 ³	DIE-125 ⁴	Celeris	DST-300
Model	205N ¹ (204N)	660JN ²	ACC200	D-Bridge 122 ³	DIE-125 ⁴	Celeris	DST-300
Supports RGB	Yes	Yes	Yes	Yes	Yes	No	No
Supports YCrCb	Yes	Yes	Yes	Yes	Yes	No	No
Supports D-1 CCIR 601	No	No	No	Yes	Yes	No	Yes
Supports D-2	No	No	No	Yes	No	No	Yes
Dubbing applications	No	Yes	Yes	Yes	Yes	Yes	Yes
Production applications	Yes	Yes	Yes	Yes	Yes	Yes	Yes
On-air applications	Yes	Yes	Yes	Yes	Yes	No	Yes
Enhancement	Yes	No	...	No	Yes	No	No
Noise reduction	No	No	...	No	Yes	No	No
Color correction	No	Yes	...	Yes	No	L/C delay	No
Contrast correction	No	Yes	...	Yes	No	No	No
Sync regeneration	Yes (No)	No	...	Yes	Yes	Yes	Yes
Full proc amp control	Yes (No)	No	...	Yes	No	No	No
Programmable system	No	NO	...	Yes	Yes	No	No
Time code control	No	Yes	...	No	No	No	No
RS-232/-422 control	No	No	...	Yes	Yes	No	No
Composite encoder	Yes	No	...	Yes	No	Yes	Yes
Improved NTSC encoding	No	No	...	Yes	No	No	Yes
Video bandwidth	6MHz	5 MHz	6MHz	to 5.75MHz	to 5.75MHz	-3dB 6MHz	10-bit data
Video S/N ratio	60dB	65dB	60dB	65dB	54dB	56dB	...
Envelope delay	110ns	450ns	30ns	5ns	5ns	Adjustable	...
Differential phase, gain	0.5	0.5%	...	...	0.2, 0.2%	0, 0%	...
Reader Service No	1256	1257	1258	1259	1260	1261	1262

¹Model 205N provides genlock feature. ²600JN is similar unit providing color correction for component video. ³D-Bridge 221 is companion decoder unit. ⁴Designed for reduction of noise and grain in film-to-tape transfer operations.

Manufacturer	Broadcast Systems Design			Broadcast Video Systems			BTS
	Model 300 (305 ⁵)	Model 310	#100, 300 ⁶	#734/#735	#740, 750	EN300/350/450	CNR7
Model	Model 300 (305 ⁵)	Model 310	#100, 300 ⁶	#734/#735	#740, 750	EN300/350/450	CNR7
Standards conversion	Color processor	Transcoder	Format converter	Translator	Component translator	Encoders	Noise reduction
Supports NTSC	Yes	Yes	...	#743 for	#740 RGB to	Yes	Yes
Supports PAL	No	No	...	[RGBS to	[YCrCb	EN300	Yes
Supports SECAM	No	No	...	[YCrCb	No	No	...
Format conversion	...	...	Yes	#735 for	Yes	350, 450	Yes
Supports Y/C-3.58	No	Yes	Yes	[YCrCb	#750 RGB from	350, 450	Yes
Supports Y/C-688	No	Yes	Yes	to RGBS	[YCrCb	No	Yes
Supports RGB	No	...	...	Yes	Yes	Yes	Yes
Supports YCrCb	No	...	Yes	Yes	Yes	350, 450	Yes
Supports D-1 CCIR 601	No	No	No	No	No	No	...
Supports D-2	No	No	No	No	No	No	...
Dubbing applications	No	No	Yes	Yes	Yes	350, 450	Yes
Production applications	...	...	Yes	Yes	Yes	Yes	Yes
On-air applications	...	...	No	No	No	Yes	Yes
Enhancement	Yes	Yes	No	No	No	No	Yes
Noise reduction	...	...	No	No	No	No	Yes
Color correction	I/Q axes adj	I/Q axes adj	No	Yes	No	No	Yes
Contrast correction	...	...	No	Yes	No	No	Yes
Sync regeneration	Yes	Yes	No	Yes	Yes	350, 450	TBC
Full proc amp control	Yes	Yes	No	Partial	Yes	No	Yes
Programmable system	No	No	No	No	No	No	...
Time code control	No	No	No	No	No	No	No
RS-232/-422 control	No	No	No	No	No	No	...
Composite encoder	Yes	Yes	No	No	No	Yes	Yes
Improved NTSC encoding	...	...	No	No	No	No	...
Video bandwidth	6.4MHz	10MHz	6MHz	...	10MHz	5/5.5/6MHz	-3, +0.5dB 4MHz
Video S/N ratio	58dB	58dB	46dB	...	46dB	45/45/60dB	...
Envelope delay	...	...	...	...	4ns Δ	±15/15/10ns	Adjustable
Differential phase, gain	1.5°, 1.5%	1.5°, 1.5%	...	...	...	...	...
Reader Service No	1263	1264	1265	1266	1267	1268	1269

⁵#305 includes chroma level and phase and luminance setup adjustment; both have luminance EQ control. ⁶#100 Y-C to YCrCb; #300 YCrCb.

Manufacturer	BTS	CEL Electronics	Central Dynamics	Faroudja Laboratories			For-A
	DNR7	P164	STAGE ☆1 E-NTSC	CTE-2	LD-1	VHP-N/P	CT-600
Model	DNR7	P164	STAGE ☆1 E-NTSC	CTE-2	LD-1	VHP-N/P	CT-600
Standards conversion	Noise reduction	Enhancement	Encoder	Encoder	Line doubler	Enhancer	Format conversion
Supports NTSC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supports PAL	Yes	Yes	No	No	No	Yes	Yes
Supports SECAM	Yes	Yes	No	No	No	Yes	...
Format conversion	Yes	No	Yes	Yes	Yes	No	No
Supports Y/C-3.58	No	Yes	Yes	Yes	No	No	Yes
Supports Y/C-688	No	Yes	...	No	No	No	Yes
Supports RGB	Yes	No	Yes	Yes	Yes	No	Yes
Supports YCrCb	Yes	Yes	Yes	Yes	Yes	No	No
Supports D-1 CCIR 601	Yes	Yes	Yes	No	No	No	No

Manufacturer	BTS	CEL Electronics	Central Dynamics	Faroudja Laboratories			For-A
Model	DNR7 ⁷	P164	STAGE 11 E-NTSC	CTE-2	LD-1	VHP-N/P	CT-600
Supports D-2	No	No	Yes	No	No	No	Yes
Dubbing applications	Yes	Yes	Yes	Yes	No	Yes	Yes
Production applications	Yes	Yes	Yes	Yes	Yes	Yes	Yes
On-air applications	...	Yes	Yes	Yes	No	Yes	No
Enhancement horizontal	...	Yes	Yes	Yes	Yes	Yes	No
Enhancement vertical	...	Yes	Yes	Yes	Yes	Yes	No
Noise reduction	CL	No	No	No	Yes	No	No
Color correction	Yes	Yes	No	No	No	No	No
Contrast correction	... L	Yes	No	No	Yes	Yes	No
Sync regeneration	per CCIR	Yes	Yes	Yes	Yes	No	Yes
Full proc amp control	Yes	Yes	No	Yes	No	No	Yes
Programmable system	...	No	Yes	No	No	No	No
Time code control	...	No	No	No	No	No	No
RS-232/-422 control	...	No	Yes	No	No	Yes	No
Composite encoder	Yes	Yes	Yes	Yes	No	No	No
Improved NTSC encoding	...	No	Yes	Yes	No	No	...
Video bandwidth	per CCIR	5.5MHz	5.5MHz	6MHz	9MHz	4.2MHz	5MHz
Video S/N ratio	...	56dB	>60dB	>60dB	...	>60dB	>60dB
Envelope delay	...	Adj	<10ns	<25ns	...	<20ns	...
Differential phase, gain	...	2', 2%	...	1', 1%	...	2.5', 2.5%	1', 1%
Reader Service No	1270	1271	1272	1273	1274	1275	1276

⁷ Integration into various production configurations with CD7 encoder, DC7 decoder; D-1.

Manufacturer	Fougerolle Video			I-DEN	Leitch Video	Sierra Video Systems	Sony
Model	MPV 2000 series	MPV 2000 series	MPV 3200 series	IVS-3 (-4/-5)	VPA-330/331 (310P)	Delta Series	BVX-D10
Standards conversion	Translators	Encoders	Translators	Translator	Signal processor	Format conversion	Format translation
Supports NTSC	No	No	No	No	Yes	No	Yes
Supports PAL	Yes	No	Yes	3 RGB to YCrCb	310P	No	Yes
Supports SECAM	Yes	#2040/#2045	Yes	4 YCrCb to RGB	No	No	No
Format conversion	...	No	...	to RGB	No	Yes	Yes
Supports Y/C-3.58	No	No	No	No	No	No	...
Supports Y/C-688	No	No	No	No	No	No	...

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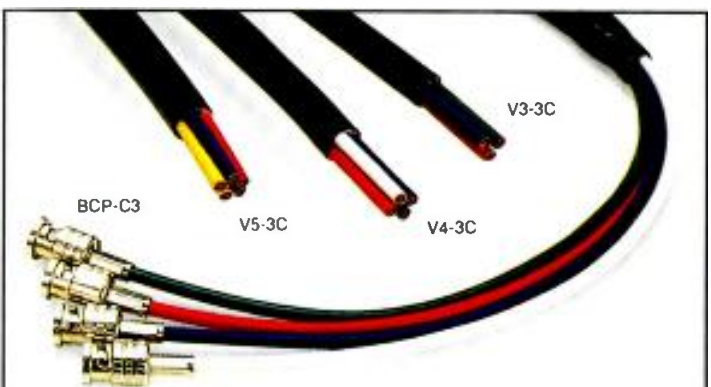
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Manufacturer	Fougerolle Video			•DEN	Leitch Video	Sierra Video Systems	Sony
Model	MPV 2000 series	MPV 2000 series	MPV 3200 series	IVS-3 (-4/-5)	VPA-330/331 (310P)	Delta Series	BVX-D10
Supports RGB	Output	Yes	Output	Yes	No	Yes	Digital
Supports YCrCb	Output	Yes	Output	Yes	No	Yes	Digital
Supports D-1 CCIR 601	No	No	No	No	No	No	Yes
Supports D-2	No	No	No	No	No	No	Yes
Dubbing applications	Yes	Yes	Yes	Yes	Yes	No	Yes
Production applications	Yes	Yes	Yes	Yes	Yes	No	Yes
Dn-air applications	Yes	Yes	Yes	No	Yes	No	No
Enhancement	[#2050 PAL/SECAM	No	[#2050 PAL/SECAM	No	No	No	No
Noise reduction	[to SECAM	[MPV 2020 PAL	[to SECAM	[-5 converts	No	No	No
Color correction	[#2060 PAL/SECAM	[& SECAM auto	[#2060 PAL/SECAM	[CTDM & CTCM	Yes	No	[Gamma
Contrast correction	[to PAL	[select decoder	[to PAL	[component to	Yes	No	[Setup of RGB
Sync regeneration	[#2080 PAL/SECAM	[companion unit	[#2080 PAL/SECAM	[YCrCb	Yes	No	No
Full proc amp control	[to SECAM	No	[to SECAM	No	Yes	No	Yes
Programmable system	[#2070 PAL/SECAM	No	[#2070 PAL/SECAM	No	No	No	No
Time code control	[to PAL & SECAM	No	[to PAL & SECAM	No	No	No	No
RS 232 /422 control	No	No	No	No	No	No	RS-422 comm
Composite encoder	Yes	Yes	Yes	No	No	No	...
Improved NTSC encoding	No	No	No	No	No	No	No
Video bandwidth	3MHz	...	3MHz	-3dB 5.5MHz	±0.1dB 5MHz	20MHz	13.5MHz Y
Video S/N ratio	...	...	[#3300 translates	58dB	>60dB	60dB	...
Envelope delay	...	...	[RGB-YUV	...	...	5ns	...
Differential phase gain	...	...	[bidirectionally	...	<0.2 . 0.5%	...	...
Reader Service No	1277	1278	1279	1280	1281	1282	1283

Manufacturer	Thomson Video Equipment	Vistek Electronics		
Model	COLDRADD*	V1010 series	V4000 series	V4130 series
Standards conversion	Color correction	Format conversion	Transcoder	Encoders
Supports NTSC	No	...	Yes to PAL-M	3 58/4 43
Supports PAL	No	YUV	I, G, B, N	I/B/G/M/N
Supports SECAM	No	No	Yes	No
Format conversion	No	Yes	No	No
Supports Y/C-3.58	No	No	No	No
Supports Y/C-688	No	No	No	No
Supports RGB	Digital	Yes	Yes	Yes/YUV
Supports YCrCb	No	Yes	No	Yes
Supports D-1 CCIR 601	Yes	No	No	No
Supports D-2	No	No	No	No
Dubbing applications	Yes	Yes	Yes	Yes
Production applications	Yes	Yes	Yes	Yes
Dn-air applications	No	No	Yes	Yes
Enhancement	No	No	...	...
Noise reduction	...	No	[4021 PAL	[encoding and
Color correction	Yes	No	[4022 NTSC	[re-encoding of
Contrast correction	...	No	[decoder units	[original or
Sync regeneration	No	[Models for	[Units for	[decoded RGB
Full proc amp control	Yes	[conversion	[conversion	[or YCrCb
Programmable system	Yes	[among RGB	[between NTSC	[signals to a
Time code control	Yes	[RGSB, and	[& PAL-M or	[composite output
RS-232/-422 control	Yes	[YCrCb	[PAL-I/B/G/N	...
Composite encoder	No	No	[to SECAM	Yes
Improved NTSC encoding	No	No	No	...
Video bandwidth	per CCIR 601	<0.1 5.5MHz	±1 5.5MHz	±0.2 5.5MHz
Video S/N ratio	per CCIR	>66dB	...	>64dB
Envelope delay	...	...	<20ns	<10ns
Differential phase gain	...	...	...	<0.1dB, <0.5°
Reader Service No	1284	1285	1286	1287

Cable Lengths vs. time delays and NTSC/PAL subcarrier degrees of phase

Cable length (feet)	Delay time (ns)	Degrees of phase NTSC	Degrees of phase PAL	Cable length (meters)	Delay time (ns)	Degrees of phase NTSC	Degrees of phase PAL
1	1.54	1.99	2.46	1	5	6.45	7.99
2	3.08	3.97	4.92	2	10	12.89	15.97
3	4.62	5.96	7.38	3	15	19.34	23.96
4	6.15	7.93	9.82	4	20	25.79	31.94
5	7.69	9.91	12.28	5	25	32.23	39.93
6	9.23	11.90	14.74	6	30	38.68	47.91
7	10.77	12.89	17.20	7	35	45.13	55.90
8	12.31	15.87	19.66	8	40	51.57	63.89
9	13.85	17.86	22.12	9	45	58.02	71.87
10	15.38	19.83	24.56	10	50	64.46	79.86
20	30.77	39.67	49.14	20	100	128.93	159.72
30	46.15	59.50	73.71	30	150	193.39	239.57
40	61.54	79.34	98.29	40	200	257.86	319.43
50	76.92	99.17	122.85	50	250	322.32	399.29
60	92.31	119.01	147.43	60	300	386.79	479.15
70	107.69	138.84	172.00	70	350	451.25	559.01
80	123.08	158.69	196.58	80	400	515.72	638.86
90	138.46	178.52	221.14	90	450	580.18	718.72
100	153.85	198.36	245.72	100	500	644.64	798.58

Extreme Measures

-110.0
-115.0
-120.0
-125.0
-130.0
-135.0
-140.0
-145.0
-150.0

High-performance Audio Testing With System One + DSP

DESIGNING, MANUFACTURING and MAINTAINING high-performance analog & digital audio equipment places extreme demands on your test equipment. Your test set must have extremely low residual noise and distortion as well as extremely high accuracy... and the variety of systems under test calls for extremely flexible test set-up and control.

System One + DSP from Audio Precision is the solution. The trace below is a System One + DSP FFT spectrum display showing the residual distortion performance of our generator and analyzer. 2nd harmonic distortion of the sine wave is 125dB below the 1kHz fundamental level before nulling. The 3rd, 5th & 7th are all even lower!

This self test is typical of the high-performance, high-accuracy measurement capability of System One + DSP.

System One + DSP features include:

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- Waveform Capture – Acquire and display signals on the PC screen for analysis in time domain “digital storage oscilloscope” mode.
- Harmonic Analysis – Perform harmonic analysis such as measurements of individual distortion components, with automatic tracking to 9th harmonic.
- Processing Power – Dual high-speed 24 bit internal DSPs and precision 16 bit analog I/O conversion.
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0.0 5.00k 10.0k 15.0k 20.0k

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Circle (95) on Reply Card

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Circle (96) on Reply Card

Audio Products

Audio Mixers, On-Air

These audio consoles are desired primarily for radio with some TV applications; in general, the major need for control is that of level and L-R channel balance with little use of equalization and HP or LP filtering.

Manufacturer	AMEK Systems & Controls	Arrakis Systems	ATI/Audio Technologies	Broadcast Audio Corp.	Broadcast Electronics		Dorrough Electronics	EELA Audio
Model	BC II	15.000 (12000)	Vanguard BC8 (BC12)	Series VI	250A (350) ¹	MixTrak 90	Model 700	S-120 (SRM)
Modular system	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Cue amp	Yes	Yes	Yes	Yes		Yes	Yes	Option
Automation port	Option	No	Opt	Yes	No	Limited	No	Opt (No)
Digital control	No	No (...)	Yes	No		No	No	No
Mono mix output	Yes	Yes	Yes	Yes	Opt	Yes	No	Opt
Telephone hybrid	No	No (...)	No	Opt	Option	No	No	Yes
Solid-state bus switching	...	Yes	Yes	Yes	No (Yes)	Yes	No	Yes
VCA gain control	Option	Yes	Yes	No	No	Yes	No	Yes
Compressor/limiter	Option	...	No	No		No	No	Yes
Pan pots	Yes	...	Yes	Option		No	No	Yes
Machine starts/stops	Yes	Yes	Option	Yes	No	Yes	No	Yes
Talkback circuitry	Yes	Yes	No	Yes		Yes	No	Yes
Speaker muting	Yes	...	Yes	Yes		Yes	Yes	Yes
Tone oscillator	Yes	...	No	Opt	No	...	No	Opt
Patch points	Yes	Yes	No	Yes		No	No	Opt
# of inputs (total)	12 (20/28)	8/18/28(56)	16-32	24 (72)	20 (22)	2x position	18	8-24
# of mixing positions	16 (24/32)	8/18/28(28)	8-12	8 (24)	10	12/18/21	7	8-24
# of mixing buses	6	3 (6)	4	2 (4)	2	2	3 Mono	8
Fader type	Slider	P&G slider	Rotary/slider	Slider	Rotary (Slider)	Slider	Rotary	P&G slider
Meter type	VU/PPM	VU/PPM	VU/PPM	VU/LED peak	VU		VU	VU/PPM
Filters	Option	...	...	...	...	...	...	HP
Input connection	A/TB 1.2k/20kΩ	AB	AB 20kΩ	A/TB 150/20kΩ	AB	1.5k/10kΩ	AB 150/UB 10kΩ	AB 2k/13k (1.7k)
Input range	+26dBu	20dB	-60/4dBu	-60/10dBv	-65/20dBv	-60/8dB	Mic/line	-55/20 (-72/22)
Output connection	A/TB >50Ω	AB	AB 400Ω	TB 150Ω	TB 600Ω	Bal <100Ω	600Ω	TB <40Ω
Output level max	26dBu	27dB	24dBm	28dBm	18dBm	+29dB	26dBm	21dB (6dB)
AF response dB/Hz-kHz	-1 20-20k	±0.5 20-20k	±0.25 20-20k	±0.5 20-20k	-1 30-20k	-0.25 20-20k	...	-1 20-20k
THD % +dB Hz	0.02	0.006 (0.01)	0.15	0.007	0.5 (0.075)	<0.05%	...	<0.03
S/N Mic EIN/Line dB	-128/81	-126/85(75)	-124/95	80dB	-120/68	>90dB	...	85dB (80dB)
Crosstalk (worst case)	<-90	<-75dB 20kHz	-74dB 10k	-80dB 15k	...	>80db	...	<-60dB 20-20k
Reader Service No	1022	1023	1024	1025	1026	1027	1028	1029

¹ Other models available including 150 series with 5 and 8 mixing positions.

Manufacturer	EELA Audio	Hallikainen & Friends	Harris Broadcast	ITAME	Logitek	LPB Inc	MBI Broadcast Systems	McCurdy Radio
Model	S-240 (-90/-50)	TVA series	Medalist (AV)	Sierra 13S	TR2	SIGNATURE III	Series 24	Series S
Modular system	Yes (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes
Cue amp	Option	...	Yes	Yes	Yes	Yes	Yes	Yes
Automation port	Yes (Opt/No)	No	No	Yes	No	No	Rmt Ctl	...
Digital control	No	No	No	No	No	No	No	Yes
Mono mix output	Opt	Yes	Opt (Yes)	Yes	Yes	Opt	Yes	Yes
Telephone hybrid	Yes	No	No	Yes	No	No	No	Opt
Solid-state bus switching	Yes	...	Yes	Yes	...	No	No	Yes
VCA gain control	Yes	No	Yes	Yes	...	No	Opt	Yes
Compressor/limiter	Yes	No	No	Yes	No	No	Opt	...
Pan pots	Yes	No	No	No	No	No	Yes	...
Machine starts/stops	Yes	No	Opt (Yes)	No	Yes	Yes	Yes	Yes
Talkback circuitry	Yes	No	No	Yes	...	No	Yes	Yes
Speaker muting	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Tone oscillator	Opt	No	No	No	No	No	Yes	...
Patch points	Opt	No	No	No	...	No	Yes	...
# of inputs (total)	28 (17/4)	36 +x6	24-36(36-72)	16	36	18-36	22-46	12-26
# of mixing positions	28 (17/4)	6	8-12 (12)	8	12	6-12	22-46	12-26
# of mixing buses	20 (8/2)	2 mono	2	8	2	2	6	3
Fader type	P&G slider	Rotary	Rot & (Slider)	Slider	Slider	Rotary	Slider	P&G faders
Meter type	VU/PPM/LED Peak	VU	VU	VU/PPM	VU	...	VU/PPM	VU/PPM
Filters	HP	None	None	HP/LP	No	VU	HP	No
Input connection	AB 1.5k/12kΩ	Bal 150/15kΩ	AB 5kΩ	TB	AB 10kΩ	...	Bal	AB 150/20k
Input range	-70/22dB	-58dB mic	-60dBv/8dBm	-30/20dB	-60/23dBu	...	...	-70/8dBu
Output connection	TB <60Ω (50Ω)	Bal 600Ω	AB 20Ω	TB	AB 60Ω	TB 600Ω	Bal 600Ω	Bal 60Ω source
Output level max	20 (6/12)dB	+22dBm	24dBm	15dB	+23dBu	22dBm	+26dBu	28dBm
AF response dB/Hz-kHz	-1 20-20k	±1 20-20k	-0.5 20-20k	0.1 30-20k	±0.25 20-20k	1 20-20k	±0.25 40-20k	±0.5 20-20k
THD % +dB Hz	<0.03	<0.25%	0.05	0.1	0.006%	0.05	<0.1%	<0.1
S/N Mic EIN/Line dB	85dB	74dB	-127dBm	75dB	90dB	75dB	>80dB	<-125/>90
Crosstalk (worst case)	<-70dB 20-20k	-82dB	-85dB 15k	80dB 400Hz	...	-61dB 1kHz	<-75dB	>65B 20-20k
Reader Service No	1030	1031	1032	1033	1034	1035	1036	1037

Audio Mixers, On-air

Manufacturer	Pacific Recorders & Engineering			POWER/COMEL	Radio Systems	Solid State Logic	Sonosax Switzerland	Sony
Model	AMX	BMX II (III)	Stereomixer	PR1705	RS-6 (12/18)	SL 4000G	SX-V	MXP-2900
Modular system	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Cue amp	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Automation port	No	No	No	No	No	Yes	Opt	Opt
Digital control	No	No	No	No	Yes	Yes	Opt	No
Mono mix output	Option	Option	No	Yes	Yes	Yes	Yes	...
Telephone hybrid	No	No	No	w/dial	No	No	No	No
Solid-state bus switching	Yes	No (Yes)	Yes	Yes	Yes	No	No	Yes
VCA gain control	No	No	No	Yes	Yes	Yes	Option	...
Compressor/limiter	Opt	No	No	No	No	Yes	Yes	...
Pan pots	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Machine starts/stops	Yes	Yes	Yes	Option	Yes	Option	Option	Yes
Talkback circuitry	Yes	Yes	Yes	Yes	Yes	Yes	Option	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Tone oscillator	Yes	No (Opt)	Yes	No	No	Yes	Yes	Yes
Patch points	Yes	Yes	Yes	...	Yes	Yes	Yes	Yes
# of inputs (total)	20-68	10-26(-34)	16	2x positions	12-36	24 to 96	10	2x positions
# of mixing positions	10-34	10-28	8	18	6-18	...	...	8-36
# of mixing buses	3	2 (3)	1	5	3	4	3	3
Fader type	Slider		Rotary	Slider	Slider	Slider	Slider	Slider
Meter type	VU/PPM	VU (& PPM)	VU	VU	VU; LED Peak	VU/PPM/bargraph	VU; LED peak	LED
Filters	HP/LP	...	HP/LP	HP; LP	...	HP/LP	HP	HP
Input connection	AB 40k Ω			200/600 TB	A 10k Ω	T/AB 1k/10k Ω	AB 10k Ω	TB 1.2k/10k
Input range	-10/8dBv	-40/8dBv(-10/8)	-10/8dBv	-60/+20dB	-60/10dBm	-80/24dBu	-85/6dBu	-62/24dBs
Output connection	AB 30k Ω		AB 80k Ω	TB	AB 100k Ω	A 75k Ω	AB 50k Ω	TB <100k Ω
Output level max	+28dBm	+26dBm	24dBm	+26dBm	22dBm	29dBu	24dBu	+24dB
AF response dB/Hz-kHz	-0.8/0 20-20k		-0.7 20-20k	\pm 0.5 20-20k	\pm 0.25 20-20k	\pm 0.5 20-20k	\pm 0.5 30-20k	-1.5 20-20k
THD % \pm dB Hz	<0.008%	<0.01 (<0.008)	<0.01	0.1%	0.02	0.2	0.01	0.1%
S/N Mic EIN/Line dB	-127/88		-126/88	-126dB EIN	-124/88	-127.5dBm	-129.2dBm	-122/85
Crosstalk (worst case)	-85dB	-80dB 1kHz	-70dB 1kHz	...	<-75dB 20kHz	-70dB 1kHz	80dB 20k	69dB 16kHz
Reader Service No	1038	1039	1040	1041	1042	1043	1044	1045

Manufacturer	Soundcraft	Sluder	Ward-Beck	Wheatstone Corporation		
Model	SAC 200 (2000)	Sluder 970	Series R	A-20/32	A-50	TV-500
Modular system	Yes	Yes	Yes	Yes	Yes	Yes
Cue amp	No	Yes	Yes	No	Yes	Yes
Automation port	Yes	...	Opt	No	No	No
Mono mix output	Yes	Yes	Yes	Yes	Yes	Yes
Telephone hybrid	Opt	...	Opt	No	No	No
Solid-state bus switching	No	Yes	Yes	No	No	No
VCA gain control	Yes	...	Yes	No	No	Option
Compressor/limiter	Yes	Yes	Option	No	No	No
Pan pots	Yes	Yes	Yes	No	No	Yes
Machine starts/stops	Yes	Yes	Yes	Yes	Yes	Yes
Talkback circuitry	Yes	Yes	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	Yes	Yes	Opt	No	Opt	Yes
Patch points	Yes	Yes	Opt	Yes	Yes	Yes
# of inputs (total)	32-48	18/exp x9's	...	2/position	2/position	3/position
# of mixing positions	16-24	Various	14-22	10/16	8-12	24-56
# of mixing buses	3	Pgm; Aux	...	2	4	3
Fader type	Slider	Slider	Slider	Slider		
Meter type	VU/PPM	VU/Peak LED	VU/PPM	VU	VU/custom	
Filters	HP/LP	HP/LP	HP	No	None	LP/HP
Input connection	AB 1k/10k Ω	A/TB >1.6k/10k Ω	Act 20k Ω	...	AB	A/BR; X1mr
Input range	-80/30dBu	-60/21dBu	-60/15dBm	28dBu max	27dBu max	Mic/line
Output connection	AB	TB <40k Ω	Act	AB	AB	AB
Output level max	26dBu	6.15dBu	...	27dBu	...	30dBu
AF response dB/Hz-kHz	\pm 0.5 20-20k	-1/5 4.5-45k	\pm 0.5 20-20k	-0.25 20-20k	\pm 0.5 20-20k	\pm 0.25 10-40k
THD % \pm dB Hz	0.02	<0.03	0.005	<0.003%	...	<0.007
S/N Mic EIN/Line dB	-128dBm	<-125/>95	-127/90	-128/88	...	...
Crosstalk (worst case)	-58dB 10kHz	>80dB	>90dB 30-15k	-65dB	-85dB 1Hz	-86dB 20k
Reader Service No	1047	1048	1049	1050	1051	1052

Editor's Note:

Information in this section of the *Broadcast Engineering Equipment Reference Manual* does not include every manufacturer, nor does it include every product by a manufacturer. The material included in this issue is derived from spec sheets provided by the manufacturers who responded to requests for most current information. Unfortunately, space considerations ruled out more detailed information on each product.

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Audio Mixers, Portable

Small mixing systems from ENG mic mixing to smaller production applications. Many can be carried by one person. Most allow use of mic and line level inputs either through switched or separate input circuits. AB active balanced; TB transformer balanced; UB unbalanced; HP high pass/low cut; LP low pass. When no model in a group includes a particular feature, that feature is not given for the group. Some include peripheral transport start/stop controls.

Manufacturer	Audio Services-Corp./ASC	Audio-Technica	Barco EMT	Broadcast Audio	Comrex	Fostex		Furman Sound
Model	MX-4-S	AT4462	EMT MM standard	System 6RM ¹	STLX/SLX ²	1240/1840/2440	280 Multitracker ³	MM-4AB (MM-8AB)
Modular system	No	No	Yes	Yes	No	Yes	No	Yes
Cue amp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Mono mix output	Yes	Yes	Opt	No	Yes	No	Yes	Yes
Telephone hybrid	No	No	No	No	Yes	No	No	No
Solid-state bus switching	No	No	Yes	No	No	No	...	No
VCA gain control	Yes	No	Opt	No	No	No	No	No
Compressor/limiter	Yes	Yes	Limit	No	AGC	No	Option	No
Pan pots	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Talkback circuitry	Yes	No	Yes	No	No	No	No	...
Speaker muting	No	No	Opt	Yes	No	No	No	...
Tone oscillator	Yes	Yes	Yes	No	...	No	No	No
Patch points	No	No	Yes	Yes	No	No	No	No
# of inputs (total)	4	4	60	12	4M/2L	12/18/24	8	4M/1S (11)
# of mixing positions	...	4	...	6	4	12/18/24	8	(4)
# of mixing buses	2	L/R	18	2	1 mono	4	4	3
# of groups/subgroups	...	No	16/6	...	...	4	4	...
Fader type	Rotary	Rotary	Slider	Rotary	Slider	Slider	Slider	Rotary
Meter type	...	VU	Bar graph	VU	VU	LED	LED	(LED)
EQ types	Swept	No	...	...	None	Parametric	3-band	...
Filters	HP	HP/Low cut	...	...	None	Shelving	HP/LP	HP
Input connection	AB 173 Ω	Bal 1.5k/47k Ω	2k Ω /10k Ω	AB/TB	Bal 150/500 Ω	3k Ω /16k Ω	10k/20k Ω	A (600 Ω)
Input range	...	-15/+22dB	-66/24dBm	-67/+10dBv	-70/+8dBm	-10/+25dBV	-60/-10dBV	-75/18dBV(-60/18)
Output connection	AB	Bal >10 Ω	<35 Ω	TB	Bal 600	UB 10k Ω	UB >10k Ω	A (200 Ω)
Output level max	...	+22dB	+20dBm	+28dBm	+24dB clip	+15dBV	-10dBV	23dBV (21)
AF response (\pm dB Hz)	...	-3, 1 20-20k	-1, 0.5 30-15k	\pm 0.5 20-20k	\pm 0.5 50-15k	-1.5, 1 20-20k	20-20k	-3 20-20k
THD	0.03% 1kHz	<0.1%	0.08%	0.1%	0.5%	0.05%	<0.05%	0.02%
S/N (Mic EIN/Line) dB	...	<-127dBm	-126dBm/85dB	80dB	-127dBm/80dB	-125/48	70-80dB	-126/-118dBV
Crosstalk (worst case)	...	65dB L-R	-70dB	-80dB	...	65dB	60dB	-40dB 20kHz
Weight (portable) lb	12 lbs	>5 lb	61.6 lbs	25 lbs	18 lbs	53/70/88	11	6 lbs
Power source (portable)	48Vdc	12-18Vdc/2-9V bat	90Vac	115Vac	Vac or Nicad	33W/37W/45W	22W	115/230Vac
Reader Service No	1053	1054	1055	1056	1057	1058	1059	1060

¹May configure for on-air use. ²STLX includes 2-line frequency extender; SLX 1-line frequency extender. ³Includes 4-track cassette ATR.

Manufacturer	MBI Systems	Neve Electronics	Pacific Recorders & Eng.	Panasonic/RAMSA		Shure Brothers		Sonosax
Model	Series 12	542 range	Newsmaker	WR-133	WR-S208 (212/216)	FP32 (FP31)	FP51 (FP42)	SX-PR series
Modular system	No	Yes	Yes	No	No	No	No	Yes
Cue amp	Yes	Yes	Yes	No	Yes	No	Yes	No
Automation port	Rmt Ctl	No	No	No	No	...	No	No
Mono mix output	Yes	Yes	Yes	Yes	Yes	No (Yes)	Yes (No)	No
Solid-state bus switching	...	No	Yes	No	No	No	No	No
VCA gain control	Yes	No	No	No	No	Yes	Yes	No
Compressor/limiter	Yes	...	Opt	No	No	Yes	Yes	Yes
Pan pots	No	Yes	No	Yes	Yes	Yes (No)	No (Yes)	Yes
Talkback circuitry	Yes	...	Yes	No	Yes	No	...	Yes
Speaker muting	Yes	Yes	Yes	No	No	...	...	No
Tone oscillator	No	Yes	Yes	No	Yes	No (Yes)	Yes	Yes
Patch points	Yes	Yes	Yes	No	Yes	No	Yes	No
# of inputs (total)	12	Various config.	16	8+3	8 (12/16)	3	4	2 to 6
# of mixing positions	8	...	8	8	8	3	4	...
# of mixing buses	3	4	2	4	5	2 (1)	1 (2)	2
# of groups/subgroups	...	...	...	2/2	2 G/3 S	...	...	...
Fader type	Opt pack	Slider	Rotary	Slider	Slider	Rotary	Rotary	Rotary
Meter type	VU/PPM	...	VU	VU	LED	VU	VU	VU/LED peak
EQ types	None	Presence	Param/Swept	Fixed bass/treble	Swept	...	...	...
Filters	None	LP/HP	HP/LP	...	...	HP	HP	HP
Input connection	T/AB 1k/10k Ω	1.2k/10k Bal	AB 40k Ω	AB	A 5k	TB 1k Ω	TB 1k Ω	AB >10k
Input range	Mic/line	40dB headroom	-10/8dBv	-50/0dBu	-60/10dBu	Mic/line	Mic/line	-98/6dBu
Output connection	TB 75 Ω	50 Ω Bal	AB 80 Ω	TB	50 Ω	330 Ω (TB 150)	TB 185 Ω	AB <50 Ω
Output level max	22dBu	>20dBu	+24dBm	+20dBu	20dBu	+18dBm	+18dBm	21dBu
AF response (\pm dB Hz)	0, -1 20-20k	\pm 0.5 30-20k	-0.7 20-20k	-2, +0.5 20-20k	-1, 5dB 20-20k	-3, +1(\pm 2) 30-15k	\pm 2(-3, 1) 30-20k	\pm 0.5 30-20k
THD	0.5%	<0.8%	<0.01%	0.1%	0.03%	0.25%	0.4%	0.01%
S/N (Mic EIN/Line) dB	>78dB	-125dBu	-126dBm/88dB	-129dBm	-128dBm	-129dBm EIN	-129dBm EIN	-129.6
Crosstalk (worst case)	<-62dB	<-70dB	-80dB 1kHz	-45dB/10kHz	-60dB 1kHz	45dB 1kHz	(-50dB/1kHz)	80dB
Weight (portable) lb	...	...	...	22 lbs	33 lbs	2.5 lbs (2.2)	6 lbs	4.88 lbs
Power source (portable)	110-240Vac	...	...	120Vac 14W	120Vac	18Vdc	Vac/27Vdc	3Vdc
Reader Service No	1061	1062	1063	1064	1065	1066	1067	1068

Manufacturer	Sony				Stellavox		Studer	
	Sonosax							
Model	SX-S6 (8/10)	MX-P42	MX-P61VU/PK	MXP-210 (290)	AMI 48	961/962	C279 Compact	Studer A779
Modular system	Yes	No	Yes	No	Yes	Yes	No	No
Cue amp	No	...	Yes	Yes	Yes	Yes	Yes	Yes
Mono mix output	Yes	...	...	L or R	...	Yes	No	...
Solid-state bus switching	No	No	...	(-290)	No	...	Yes	Yes
VCA gain control	No	No	No	(-290)	...	...	Yes	Yes
Compressor/limiter	Yes	Yes	Yes	No	Yes	Yes	No	No
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Talkback circuitry	Opt	No	Yes	Yes	No	Yes	Yes	Yes
Speaker muting	No	No	...	Yes	No	Yes	Yes	...
Tone oscillator	Yes	Yes	Yes	Yes	Yes	Yes	Option	No
Patch points	Yes	No	No	...	Expansion	Yes	Yes	Yes
# of inputs (total)	6/8/10	6	17	9	5	18	12	6
# of mixing positions	...	4	12	4	5	18	6	1
# of mixing buses	3	L/R	3	L/R	1	6	4	2
# of groups/subgroups	...	...	...	...	None	4-main 2-aux	No	No
Fader type	Slider	Rotary	Slider	Slider	Slider	Slider	Slider	Slider
Meter type	VU/LED peak	VU	VU/PPM	LED	Analog meter	VU or PPM	LED w/peak	LED peak
EQ types	Swept	No	3-band	3-band	No	Yes	Swept	Swept
Filters	HP	HP	LP/HP	HP	Baxandall	HP	LP/HP	HP
Input connection	A 10k	Bal	Bal/Unbal	Bal 6k/47k Ω	200 Ω bal	1.6k/10k	1.2k/47k	A/T >47k
Input range	-85/6dBu	Mic/line	Mic/line	-60/24dBs	0.15m-12V	-69/21dBu	-66/10dBv	-66/10dBv
Output connection	A/T <50 Ω	Bal	Bal/Unbal	Bal 600 Ω /10k Ω	200/600 Ω	<40 Ω	<50 Ω / Ω <1k Ω	A/T <50 Ω
Output level max	24dBu	Mic/line	...	15dBs	1V	24dBm	24dBv	24dBv
AF response (\pm dB Hz)	\pm 0.5 30-20k	\pm 1 30-20k	\pm 0.5 30-20k	-1.5, .5 20-20k	30-20k	-1, 0.5 4.5-45k	\pm 1 20-20k	\pm 1 20-20k
THD	0.01%	...	...	<0.3%	<0.2%	<0.03%	<0.03%	0.03%
S/N (Mic EIN/Line) dB	-129.2	...	...	-126/80dB	...	<-125/>95	-125/>86	-65/86
Crosstalk (worst case)	-80dB 20kHz	...	...	<-70dB	0.1%	<-90dB	...	...
Weight (portable) lb	14.8lbs	...	...	16.5 lb	9.9 lb	55-75 lbs	24.2 lbs	24.2 lbs
Power source (portable)	9-15Vdc	9Vdc; 12Vdc	110/220Vac	24W ac	12V	110/220Vac	100-240Vac	110/220Vac
Reader Service No	1069	1070	1071	1072	1073	1074	1075	1076

Manufacturer	TASCAM				Unitronic	Vortex Comm.	Yamaha Music Corporation	
	M-106	M06 ST	M208 (M216/M224)	M308 (M312/M320)	Remote mixer	PFM-312	M406	MR1642 (1242/842)
Cue amp	No	No	No	No	Yes	Yes	No	Yes
Mono mix output	No	No	No	No	Yes	Mono only	No	Yes
Telephone hybrid	No	No	No	No	Yes	No	No	No
Telephone dial	No	No	No	No	Yes	No	No	No
Compressor/limiter	No	No	No	No	Yes	1/channel	No	No
Pan pots	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Talkback circuitry	...	No	No	...	...	No	No	Yes
Tone oscillator	No	No	No	No	Yes	1kHz	No	No
# of inputs (total)	6	6	8 (16/24)	8 (12/20)	3; expandable	3	6	16 (12/8)
# of mixing positions	6	No	8 (16/24)	8 (12/20)	3	3	...	16 (12/8)
# of mixing buses	4	No	4	...	1; expandable	1 mono	2	4 [2]
# of groups/subgroups	...	No	4/2	...	...	...	2	4/2 [2/5]
Fader type	Slider	Slider	Slider	Slider	Slider	Rotary	Rotary	Slider
Meter type	VU	VU	VU/Peak LED	VU/Peak LED	VU	LED bargraph	VU/LED peak	VU/LED peak
EQ types	Swept	Swept	Swept	Swept	...	None	...	Swept
Filters	...	...	...	...	...	None	...	...
Input connection	UB 100k	UB 100k	A 2.8k/22k	A 2.8k/22k	Bal floating	1k/6k	3k Ω	10k [4k]
Input range	-70/4dBV	-70/4dBV	-70/24dBV	-70/24dBV	...	-14/+22dBm	-60/24dB	-60/20dBV
Output connection	UB 100 Ω	UBb 220 Ω	100 Ω	100 Ω	Bal floating	50	150 Ω	150 Ω
Output level max	18dBV	0dBu	20dBV	20dBV	[Mixer and	+16 to 600 Ω	24dB	24dBV
AF response (\pm dB Hz)	-2, 1dB 20-20k	-2, 1 20-20k	-2, 1 20-25k	-2, 1 20-25k	[expansion	\pm 1 20-20k	-3, 0 20-20k	-3, 1 20-20k
THD	0.01%	0.025%	0.025%	0.025%	[slave units	<0.02%	0.1%	0.1%
S/N (Mic EIN/Line) dB	70dB	51dB (78dB)	83dB	83dB	[packaged in	...	95dB	90dB [92dB]
Crosstalk (worst case)	<-60dB	<-60dB	<-60dB	<-60dB	[brief case	...	-60dB/1kHz	-60dB
Weight (portable) lb	15.4 lbs	5.73 lbs	18.75 lbs	18.75 lbs	[or suitcase	2 lbs	21 lbs	...
Power source (portable)	110/220Vac	110/220Vac	110/220Vac	110/220Vac	ac/dc	2x9Vdc	120Vac	...
Reader Service No	1077	1078	1079	1080	1081	1082	1083	1084

Audio Mixers, Studio Production/Recording

Manufacturer	Allen & Heath			AMEK Systems & Controls	AMS/Calrec	Arrakis Systems	Auditronics	
	SABER series	SIGMA series	System 8 series	Classic	EDIT 1	Virtual console	10,000 series ¹	310 series ²
Modular system	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Cue amp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automation port	Yes	Yes	No	Yes	for editor	Yes	Yes	Yes
Digital control	Yes	Yes	No	Opt	Yes	Yes	Yes	No
Digital processing	No	No	No	No	[Digitally	[Digitally	No	...
Mono mix output	Yes	Yes	No	Yes	[assignable	[assignable	Yes	...

Audio Mixers, Studio Production/Recording

Manufacturer	Allen & Heath			AMEK Systems & Controls	AMS/Calrec	Arrakis Systems	Auditronics
Model	SABER series	SIGMA series	System 8 series	Classic	EDIT 1	10,000 series ¹	310 series ²
Solid-state bus switching	No	No	No	No	[99 setup	[memories	Yes
VCA gain control	No	Opt	No	Opt	[memories.	Yes	Yes
Compressor/limiter	No	No	No	Opt	Yes	Yes	Yes
Pan pots	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Machine starts/stops	Opt	No	No	Yes	Opt	Opt	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
# of inputs (total)	40 (16, 24, 32)	32 (24, 40, 44)	24 (16)	32 (48, 64)	256 possible	128 (48/72)	48
# of mixing positions	40 (16, 24, 32)	32 (24, 40, 44)	24 (16)	44 (60, 76)	8	32	24
# of direct outputs	40 (16, 24, 32)	32 (24, 40, 44)	24 (16)	40 (56, 82)	...	24 or 32	24
# of mixing buses	16	24	8	28	1 stereo pair	4 stereo	8
# of groups/subgroups	16 G/16 S (8)	In line	8 G/8 S	2ST/8ST	2 aux out	8 (8/16)	8
# of sends/returns	6 S/4 R	32 S/32 R	3 S/2 R	8mono/8stereo	...	24 Sends	4
Fader type	Slider	Slider	Slider	Slider	Rot Lin motorized	Slider	Slider
Solo type	PF, IP	PF, AF, IP	PF	PF, AF, IP	AF, PF, IP	AF, PF, IP	PF, AF
Meter type	VU	VU	VU	LED VU/PPM	Bargraph	VU, PPM	VU, PPM
EQ types	Swept	Parametric	Swept	Parametric	2-/4-band	Parametric	Parametric
Filters	HP	HP	...	HP	LP	LP, HP	LP, HP
Input connection	A 3k Ω	A 3k Ω	A 3k Ω	A 20k Ω	Anal/digital	AB 10k Ω /20k	AB
Input range	-66, 6dB	-66, 6dB	-66, 6dB	-75, 26dB	1500dB range	23dBu max	Mic/line level
Output connection	A 50k Ω	A 50k Ω	A 50k Ω	A/T <50k Ω	Anal/digital	TB 600k Ω	AB
Output level max	27dBu	27dBv	21dBv	26dBu	...	22dBu	+27dBV
AF response \pm dB Hz-kHz	-1 20-20k	+1 20-20k	\pm 1 20-20k	\pm 1 20-20k	...	0.5 20-20k	0.5dB 20-20k
THD	<0.02%	<0.02%	0.05%	0.03%	...	0.02%	0.01% +18 20kHz
S/N mic EIN/line dB	-127dBm	-127dBm	-125dBm	-127dBm/85dB	...	-126dBm/80dB	-127dBm/75dB
Crosstalk (worst case)	-65dB 1kHz	-70dB	60dB	System dependent	...	...	-75dB 20Hz 20dB
Reader Service No	861	862	863	864	865	866	867

¹ Available in on-air formats. ² Expands in groups of 8.

Manufacturer	Auditronics		Barco EMT	Broadcast Audio	Broadcast Electronics	For-A	Fostex
Model	400 series	900 series	EMT MM40	Series IV ³	350A	Mix Trak-90	AFV-500
Modular system	Yes	Yes	Yes	Yes	No	Yes	Yes
Cue amp	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automation port	Yes	Yes	No	Yes	No	Yes	Yes
Digital control	No	Yes	No	No	No	Yes	Yes
Digital processing	No	...	No	No	No	No	No
Mono mix output	Yes	...	Opt	Yes	Opt	Opt	Yes
Solid-state bus switching	Yes	Yes	Yes	Yes	Yes	No	...
VCA gain control	Yes	Yes	Opt	No	No	Yes	...
Compressor/limiter	Yes	Yes	Yes	No	No	No	No
Pan pots	Yes	Yes	Yes	Opt	No	Yes	Yes
Machine starts/stops	Yes	Yes	Yes	Yes	No	Opt	...
Talkback circuitry	Yes	Yes	Yes	Yes	Yes	Opt	...
Speaker muting	Yes	Yes	Opt	Yes	Yes	Yes	Yes
Tone oscillator	Yes	Yes	Yes	Opt	No	No	Yes
Patch points	Yes	Yes	Yes	Yes	No	Yes	Opt
# of inputs (total)	18-24	32	60	18-48	22	24-48	8
# of mixing positions	...	...	...	6-16	10	12-24	8
# of direct outputs	18-24	...	1/channel	3-7	0	3	2
# of mixing buses	4 or 8	4, 8	32	2-4	2	6	2
# of groups/subgroups	...	4 groups	24 G/6 S	User defined	...	...	...
# of sends/returns	2 S/2 R	...	12 S/8 R	2R/Defined sends	...	...	...
Fader type	Slider	Slider	Slider	Slider	Slider	Slider	...
Solo type	In-place	In-place	...	PF	...	...	...
Meter type	VU, LED peak	VU	Bargraph	VU, peak LEDs	VU	VU, PPM, LED	VU
EQ types	Swept	Swept	...	Swept	...	Parametric	...
Filters	LP, HP	LP, HP	...	...	...	HP, LP	...
Input connection	A 1k/50k Ω	A 1k/50k	2k/10k Ω	AB/TB 150/20k Ω	A	AB >10k Ω	A 600k Ω
Input range	-65, 8dBu	...	...	-60, 10dBm	...	-65, 13dBu	-12, 24dB
Output connection	A 60k Ω	A 60k Ω	<35k Ω	TB 150k Ω	T	A <100k Ω	...
Output level max	24dBm	+24dBv	20dBm	28dBm	18dBm	26dBu	0, 24dB
AF response \pm dB Hz-kHz	0.5 20-20k	-0.5 20-20k	-1, +5 30-15k	\pm 0.5 20-20k	-1 30-20k	-0.25 20-20k	...
THD	0.05%	0.05%	0.08%, +6dBm, 1kHz	0.007% +28dBm	0.5% +18 20-20k	0.05% 0 20-20k	0.15% +20 15kHz
S/N mic EIN/line dB	-127.5/84	-129/84	-126dBm/85dB	80dB	-120dBm/68dB	-128dBm/90dB	>90dB
Crosstalk (worst case)	-65dB 20kHz	-65dB 20kHz	-70dB/15Hz/+6dB	-80dB 1.5kHz +8dBm	...	<-80dB 20-20k 0dB	\hat{a} -20dB 30Hz
Reader Service No	869	870	871	872	873	874	875

³ Usable in on-air applications.

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Audio Mixers, Studio Production/Recording

Manufacturer	Graham-Patten Systems	Grass Valley Group	ITAME	LPB Inc	McCurdy Radio Industries	Neve	Pacific Re- corders & Eng.
Model	ESAM series ⁴	AMX-170S ¹	Sierra 19S	CITATION II	SS 8800E ⁵	51 ser/V-Post	ABX ⁶
Modular system	Yes	No	Yes	Yes	Yes	Yes	Yes
Cue amp	No	No	Yes	Yes	Yes	Opt	Yes
Automation port	To editor	Yes	Yes	No	No	Opt	No
Digital control	Yes	Yes	No	No	No	Opt	No
Digital processing	...	No	No	No	No	No	No
Mono mix output	Yes	No	Yes	Yes	Yes	Yes	Opt
Solid-state bus switching	Yes	Yes	Yes	No	Yes	No	No
VCA gain control	...	Yes	Yes	No	No	No	No
Compressor/limiter	No	No	Yes	No	Opt	Opt	Opt
Pan pots	No	No	No	No	Yes	Yes	Yes
Machine starts/stops	...	No	No	Yes	Yes	Opt	Yes
Talkback circuitry	No	No	Yes	No	Yes	Yes	Yes
Speaker muting	No	Yes	Yes	Yes	Yes	Yes	Yes
Tone oscillator	No	Yes	No	No	Opt	Yes	Yes
Patch points	Yes	No	No	No	Opt	Opt	Yes
# of inputs (total)	12-16	8, 16	26	30	20-48	24-60	36-68 ⁶
# of mixing positions	12-16	1	14	10	10-24	1-4	18-34
# of direct outputs	12-46	...	26	6	...	24-60	18-34
# of mixing buses	2	4	14	2	6	2-8	12 (3)
# of groups/subgroups	...	2	1	...	...	48G (4/8)	9 (...)
# of sends/returns	...	4	2	1	...	8S/8R (4, 4)	4/2 (2/1)
Fader type	Slider	Slider	Slider	Slider	Slider	Slider	Slider
Solo type	...	...	IP	...	...	PF, AF, IP	PF, AF
Meter type	VU analog	VU, PPM, LED	VU, PPM	VU	VU, PPM, LED	VU, PPM, LEO	VU, PPM
EQ types	Programmable	Fixed freq	Parametric	...	Param, Swept	Parametric, swept	Param/Swept
Filters	No	LP, HP	HP, LP	...	LP, HP	HP, LP	HP, LP
Input connection	Opt TB >20kW	A Hi-Z	TB	TB	AB 150/20kΩ	AB/TB 10kΩ	AB 40kΩ
Input range	...	-40, 8dBu	-30, +20dB	-65, -10dBm	-70, +10dBu	-10, 10dB	-10, 8dBv
Output connection	3/2 20kΩ	A 60Ω	TB	TB	AB 600Ω	AB/TB 30kΩ	AB 30kΩ
Output level max	+80dB max nom.	20dBm	+15dB	+22dBm	+24dBm	+26dBm	+28dBm
AF response ±dB Hz-kHz	±0.5 20-20k	-0.3 20-20k	0.1dB 30-20k	1.0dB 20-20k	±0.5 30-15k	...	-0.8, 0dB 20-20k
THD	<0.1% 16dBu	0.03% +4 20-20k	0.1%	0.03% 8dBm	<0.1% +18 20-20k	...	<0.008% 28 20-20k
S/N mic EIN/line dB	...	89dB	75dB	75dB	-125dBm/90dB	...	-127dBm/88dB
Crosstalk (worst case)	<-82dB 15kHz	-75dB/20kHz/+4dB	-80dB/400Hz/12dB	-65dB/1kHz/8dB	-65dB 15k +18dB	...	-85dB 1kHz 28dB
Reader Service No	877	878	879	880	882	883	884

⁴Editing suite mixer system. ⁵Available in on-air format. ⁶Inputs vary from 20 to 68 in groups of 8 with 2 inputs per fader.

Manufacturer	Pacific Re- corders & Eng.	Panasonic/RAMSA		Scantex	Solid State Logic		Sonosax Switzerland	Sony
Model	STX	WR-M10A	WR-T820B	AFDM-208 AEM	SL 5000M ser ⁷	SL 6000G ser ⁷	SX-T ⁷	MXP-2000
Modular system	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Cue amp	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Automation port	No	No	No	Yes	Yes	Yes	Opt	via editor
Digital control	No	No	No	Yes	Yes	Yes	Opt	Yes
Digital processing	No	No	No	No	No	No	No	No
Mono mix output	Opt	Yes	Yes	Yes	Yes	Yes	Opt	Yes
Solid-state bus switching	Yes	No	No	Yes	Yes	No	Yes	No
VCA gain control	No	No	No	Yes	Yes	Yes	Opt	Yes
Compressor/limiter	Option	Yes	No	No	Yes	Yes	Opt	Yes
Pan pots	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Machine starts/stops	Yes	Yes	No	No	Opt	Opt	Yes	Yes
Talkback circuitry	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Speaker muting	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Tone oscillator	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Patch points	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	156-252	4+8	20+20	16	to 96	24 to 96	10-32	16-36
# of mixing positions	26-42	6	20	16	1 to 3	One	...	16-36
# of direct outputs	...	3	20+10	16	1 per channel	Option	8-16	16-36
# of mixing buses	15	2	14	4	32	6	8-16	4+2
# of groups/subgroups	...	2 G/1 S	8 G/4 S	2	Variable	1-32/1-32	8	4+2-G, 4R
# of sends/returns	12/1	1 S/1 R	4+20 S/8+20 R	...	8 S/# of channels	6 S/8 R	2	4S, 4R
Fader type	Slider	Slider, rotary	Slider	Slider	Slider	Slider	...	Slider
Solo type	...	...	AF	None	PF, AF, IP	PF, AF, IP	PF, AF, IP	PF, AF
Meter type	VU, PPM	LED Peak	VU, LED peak	VU	VU/PPM, LCD	VU PPM, Plasma	VU	LED peak
EQ types	...	Fixed Base, Treble	Swept	None	Parametric	Parametric	Swept	Swept
Filters	HP/LP	...	HP	None	HP, LP	HP, LP options	HP	HP
Input connection	AB 40kΩ	AB 5kΩ	AB 5kΩ	600/10kΩ	T/AB 10kW	TB/AB 1k/10kW	...	A/TB 10kΩ
Input range	-15/10dBv	-60, -6dBu	-60, +10dBu	+24dBu	-80, +16dBu	-80, +24dBu	-85, +6dBu	+27dBm max
Output connection	AB 30kΩ	TB 50kΩ	AB 50kΩ	40kΩ	AB 30kΩ	AB 75kΩ	AB/TB	A/TB 50kΩ
Output level max	28dBm	+4dBu	+20dBu	+25dBm	+28dBu	+29dBu	+24dBu	+25dBm
AF response ±dB Hz-kHz	-0.9 20-20k	-1, +0.5 20-20k	-0.8, +0.5 20-20k	±0.1 20-20k	±0.5dB 20-20k	±0.5dB 20-20k	±0.5 20-20k	±0.5dB 30-20k
THD	<0.1	0.1% +18 20-20k	0.08% +18 20-20k	0.03%	0.08% +24 1kHz	0.02% +8 1kHz	0.01% 6 20-20k	0.05% 20dB 1kHz
S/N mic EIN/line dB	-127/88	-125dBm EIN	-128dBm EIN	75dB	-125 dBm	-127.5dBm	-129.2dBm	-126dBm EIN
Crosstalk (worst case)	-80dB 1kHz	-65dB	-60B 1kHz	-70dB 15kHz	-80dB/15kHz/+4dB	-70dB/1kHz/+4dB	-80dB/20k/0dB	60dB 15kHz
Reader Service No	885	886	887	888	889	890	891	892

⁷Configures for on-air operations.

Manufacturer	Sony	Soundtracs Pic	Studer	TASCAM
Model	VSP-8000	ERIC series	900 series ⁹	M-3500
Modular system	Yes	Yes	Yes	Yes
Cue amp	Yes	No	Yes	Yes
Automation port	from editor	No ^a	Yes	...
Digital control	Yes	Yes	Yes	No
Digital processing	Yes	No	No	No
Mono mix output	[48, 44.1	Yes	Yes	Yes
Solid-state bus switching	[or 44.056kHz	Yes	Yes	Yes
VCA gain control	[32-bit sampling	No	Yes	...
Compressor/limiter	Yes	No	Yes	No
Pan pots	Yes	Yes	Yes	Yes
Machine starts/stops	...	Yes	Yes	No
Talkback circuitry	...	Yes	Yes	Yes
Speaker muting	...	Yes	Yes	Yes
Tone oscillator	...	Yes	Yes	Yes
Patch points	Yes	Yes	Yes	...
# of inputs (total)	16 or 32 dig	32-48	48 (36)	28
# of mixing positions	16 or 32	...	41	24-60
# of direct outputs	...	32-48	48 (36)	24
# of mixing buses	4 out dig	8-24	32	24
# of groups/subgroups	...	8-24	32 in line	8
# of sends/returns	...	8	8 S	Various config.
Fader type	Slider	Slider	Slider	Slider
Solo type	...	PF, AF, IP	PF, AF, IP	AF
Meter type	201-seg plasma	LED peak	LED Peak	VU
EQ types	4-band	Parametric	Parametric	Parametric
Filters	HP/LP	Swept HP	HP	HP
Input connection	XLR-3-31	AB 710k Ω	AB	T/A $\geq 1.6k/\geq 10k\Omega$
Input range	Per AES/EBU	-60, +10dB	-60, +10dB	-70, +20dBu
Output connection	XLR-3-32	AB <75 Ω	AB	TB $\leq 50k\Omega$
Output level max	...	+24dBV	+26dBV	+24dBm
AF response \pm dB Hz-kHz	-1, +0.5 20-20k	-2, 0dB 20-20k	-2, 0dB 20-20k	-1, +0.5 30-20k
THD	...	0.008% 0dB 1kHz	0.008% 0dBV 1kHz	$\leq 0.1\%$
S/N mic EIN/line dB	...	-127.5dBm	-127dBm	-125dBm/>100dB
Crosstalk (worst case)	...	-82dB/1kHz/0dB	-82dB/1kHz/0dB	<-85dB
Reader Service No	893	894	895	896

^aERIC III offers moving faders. ⁹Custom configurations available.

Manufacturer	TASCAM	Trident Audio	Ward-Beck	Wheatstone	Yamaha Music Corporation
Model	M600 (M700)	Vector 432	ST ser. (ST2442)	SP-5	MC2404 series
Modular system	Yes	Yes	Yes	Yes	Yes
Cue amp	No	Opt	Yes	No	Yes
Automation port	Yes	Yes	Opt	No	No
Digital control	No	No	Yes	No	No
Digital processing	No	No	No	No	No
Mono mix output	No	Opt	Yes	Opt	Yes
Solid-state bus switching	No	Yes	No	No	No
VCA gain control	No	Opt	Opt	No	No
Compressor/limiter	No	Yes	Opt	No	No
Pan pots	Yes	Yes	Yes	Yes	Yes
Machine starts/stops	No	Yes	Yes	No	No
Talkback circuitry	Yes	Yes	Yes	Yes	Yes
Speaker muting	No	Yes	Yes	Opt	Yes
Tone oscillator	Yes	Yes	Yes	Yes	Yes
Patch points	Yes	Yes	Yes	Yes	Yes
# of inputs (total)	162 (40)	40-4	24-48	...	12-24
# of mixing positions	32	1-4	24-48	12-56	12-24
# of direct outputs	32	40-64	20	Per # mono inputs	12-24
# of mixing buses	16	4-8	23	1 stereo/1 mono	10
# of groups/subgroups	16 (32)	32 G/32 S	4 stereo sub-master	8 M/4 S groups	2/2
# of sends/returns	4/6 (8/8)	8 S/8 R	2-mono, 2 stereo	4/4	4/4
Fader type	Slider	Slider	Slider	Slider	Slider
Solo type	PF, AF, IP	PF AF IP	IP	PF	AF, PF, IP
Meter type	VU, LED peak	VU, PPM, Peak LEDs	VU/PPM per req.	VU, Custom	VU, LED peak
EQ types	Swept	Parametric, swept	Parametric, swept	Swept	Swept
Filters	... (HP, LP)	HP, LP	...	HP	...
Input connection	AB 2k/100k Ω	AB/TB >10k Ω	AB 20k Ω /TB 1.5k Ω	AB 20k Ω	AB
Input range	-68, +8dBm	-20, +70dB dBu	-60, +15dBm	Mic, line	-60, +26dBV
Output connection	AB 100k Ω	AB/TB 600k Ω	AB <100k Ω	AB	AB
Output level max	+28dBm	+28dBu	+30dBm	+28dBu	+22dBV
AF response \pm dB Hz-kHz	± 1 dB 20-20k	± 0.5 dB 10-50k	± 0.5 dB 20-20k	± 5 dB 20-20k	-3, +1dB 20-20k
THD	0.015% 1kHz	0.03%	0.05% +24 20-20k	$\leq 0.01\%$ 20-20k +18	0.1% 4 20-20k
S/N mic EIN/line dB	88dB unwt'd	-128dBm/+70dB	-127dBm EIN/90dB	-129dBm/90	86dB
Crosstalk (worst case)	<-60dB 1kHz	<-80dB/0dB	>90dB 30-15k	-90dB 1kHz	-60dB/1kHz/4dB
Reader Service No	901	902	903	904	905

Audio Processors, Dynamics Control

Signal processing in this category include compression, limiting and expansion to maintain audio signal levels between controlled limits to avoid overdriving of subsequent equipment along the signal chain. **AB** indicates actively balanced; **TB** transformer balanced; **GR** indicates gain reduction; **B/Unb** denotes balanced or unbalanced.

Manufacturer	Apex Systems		ATI Audio Technologies Inc	Audio Animation	Barco EMT		CRL Circuit Research Labs
Model	Compellor ¹	Dominator 700	EM1000 Emphasizer	paragon	Compact line ³	EMT 266X (277)	Audio Signature
Compression	Yes	Yes	Yes	Yes	Yes	No (Yes)	Yes
Expansion	No	No	Yes	Yes	Yes	No (Yes)	...
Peak limiting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asymmetric limiting	No	No	No	Yes	No	No (Yes)	No
AGC	Yes	No	Yes	Yes	Yes	Yes	Yes
Loudness control	Yes	Yes	Yes	Yes	No	No	... [Width
Stereo system	(#300 only)	Yes	No	Yes	Yes	Yes (No)	Yes [ctl
Digital processing	No	No	No	Yes	No	No	...
Programmable	No	No	Yes	Yes	No	... (Yes)	w/memory
Multiband processing	No	3-band	No	4-band	No	No	4-band
Metering	VU GR In/Out	Pk GR	Peak GR Output	GR; In/Out	GR	GR	LED I/O; band
Input connector	AB 80kΩ	AB 160kΩ	AB/TB 38k/30kΩ	Act bal 600kΩ	TB 10kΩ	TB 5kΩ	AB 600/10kΩ
Output connector	AB 65kΩ	AB 20kΩ	AB/TB 150kΩ	Act bal 600kΩ	TB <40kΩ	TB 40kΩ	AB <50kΩ
Input level range	-30/+27dBm	-30/+24dB	-60/+24dB	-40/+20dB	-10/+6dB	-20/+15dB	-10/+20dB
Output level maximum	+27dBm	+20dBu	+24dBm	+20dBm	+21dB	+22dB	+20dB
AF response (±dB; Hz-kHz)	-0.2 5-100k	±0.2 20-50k	±0.25dB 30-20k	±0.25 5-20k	±0.5 40-15k	±0.3 30-15k	±1 50-15k
Distortion	0.002% in op	<0.01% in op	0.5% ²	0% bypass	<0.5% in op	0.2% (.25%) ops	0.05%
S/N ratio	-87dB	80dB below peak	80dB	144dB	73dB RMS	92dB (72dB)	>70dB
Reader Service No	1085	1086	1087	1088	1089	1090	1091

¹ Models 300, 301. ² 10dB compression, 30-20kHz; bypass 0.2% +22dB out. ³ EMT-257 limiter; EMT-260 filter/limiter; EMT-261 compressor/limiter.

Manufacturer	CRL Circuit Research Labs					dbx/AKG Acoustics	
Model	BAP-2000	MBL-100	PMC-450 ⁴	SEC-800 (SGC-800)	SMP-850	165A (166)	903
Compression	Yes	Dual band	Yes	Yes (No)	Yes	Yes	Yes
Expansion	No	...	No	No	...	No	No
Peak limiting	Yes	Tri band	Yes	No	Yes	Yes	Yes
Asymmetric limiting	No	Yes	Yes	No	No	...	...
AGC	Yes	Yes	Yes	Yes	Yes	...	...
Loudness control	No	Yes	No	No	No	...	...
Stereo system	No	[For short	No	Yes	Yes	Yes	No
Digital processing	No	[wave brdcast	No	No	No	No	No
Multiband processing	2-band	Yes	3-band	4-band (2-)	2-band	No	No
Metering	Peak GR Out	GR/Out/Overload	Peak/In	Peak/In	Peak/In	LED	LED
Input connector	AB/TB 600/10kΩ	AB 600/10kΩ	AB600/10kΩ	AB 600/10kΩ	AB 600/10kΩ	B/Unb 11k/22kΩ	B/Unb 18.5k/25kΩ
Output connector	AB/TB 100kΩ	AB 100kΩ	AB 200kΩ	AB 200kΩ (100kΩ)	AB 100kΩ	Unb 47kΩ (22kΩ)	Unbal 22kΩ
Input level range	-20/+20dB	-20/+20dB	-10/+20dB	-30/+20dB	-10/+20dB	+24dBu max	+24dBu max
Output level maximum	+20dB	+20dB	+20dB	+20dB	+20dB	+24dBu (+21)	+21dBu max
AF response (±dB; Hz-kHz)	±1 50-15k	±0.5 60-5.82k	-3/0.5 50-9.5k	±0.1 (.5) 50-20k	±1 50-15k	±0.5 20-20k	±0.5 20-20k
Distortion	0.15% in op	<0.25%	0.25%	0.25% (.15%)	0.25%	<0.2%	<0.2%
S/N ratio	75dB	70dB in op	65dB	70dB (80dB)	80dB	...	...
Reader Service No	1092	1093	1094	1095	1096	1097	1098

⁴ Meets NRSC specifications.

Manufacturer	Dorrough Electronics	Eventide	Furman Sound	Gentner Electronics	Inovonics		
Model	610-A ⁵	Omnipressor	LC-6B	Audio Prism	222 NTSC	255	260 (250)
Compression	Yes	Yes	Yes	Yes	No	Yes	Yes
Expansion	Yes	Yes	Yes	Yes	No	No	No
Peak limiting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asymmetric limiting	No	...	No	No	Yes	No	No (Yes) ⁶
AGC	Yes	...	Yes	Yes	No	Yes	Yes
Loudness control	Yes	...	No	Yes	No	No	No
Stereo system	Yes	...	Yes	Option	No	Yes	Yes
Digital processing	Yes	...	No	No	No	No	No
Programmable	No	Yes	No	Yes	No	No	No (Yes)
Multiband processing	3-band	...	No	4-band	No	3-band	No (5-band)
Metering	VU GR I/O	I/O Gain	GR (& I/O)	Peak GR	GR	GR	GR
Input connector	AB 10kΩ	AB/TB opt	AB 20kΩ	AB 600/10kΩ	AB 10kΩ	AB 10kΩ	AB 10kΩ
Output connector	AB 30kΩ	UB/TB opt	AB 100kΩ (400)	AB 600kΩ	AB 600kΩ	AB 600kΩ	AB 600kΩ
Input level range	-25/+24dB	+20dBm max	-40(-60)/18dB	0/+12dB	-20/+10dB	-15/+15dB	-20/+10dB
Output level maximum	+22dB	+18dBm max	+23dBV	+10dB	+20dB	+24dB	+24dB
AF response (±dB; Hz-kHz)	±0 15-15k	-0.5 20-15k	±0.5 20-20k	-3, +2 20-18k	-1, 0.5 10-10k	±0.5 20-20k	±0.5 10-15k
Distortion	0.005% in ops	0.5%	0.1% (0.15%)	<0.1% in op	1% in op	1% in op	0.5% in op
S/N ratio	75dB	90dB	115dB (110)	-80dB	70dB	70dB	70dB (75dB)
Reader Service No	1099	1100	1101	1102	1103	1104	1105

⁵ Models available for AM, FM, TV and HF/SW broadcast. ⁶ Asymmetric for AM version only.

Manufacturer	ITAME	JBL/JREI			Kahn Communications	Klark-Teknik	Lectrosonics
Model	90A	1176LN/1178	7110	LA-4	GLN-86-ST	DN500 (DN504)	Model CL1
Compression	Yes	No	Yes	Yes	Yes	Yes	Yes
Expansion	Yes	No	No	No	Yes	Yes (No)	...
Peak limiting	Yes	Yes	Yes	No	Yes	Yes (No)	Yes
Asymmetric limiting	Yes	No	No	No	Yes	No	...
AGC	Yes	No	No	No	...	No	Yes
Loudness control	No	No	...	No	...	Yes	...
Stereo system	Yes	1178	No	w/2 units	GLN-86-ST	Yes (Yes ⁷)	No
Digital processing	No	No	No	No	No	No	No
Programmable	No	No	Adj	No	No	No	No
Multiband processing	3-band	No	No	No	No	No	No
Metering	VU I/O Pk	VU	LED	VU	No	LED (GR I/O)	LEDs
Input connector	TB 600Ω	AB 10k/20kΩ	Bal 20kΩ	Bal 40kΩ	Bal 600Ω	AB 20kΩ	Bal 20kΩ
Output connector	TB 600Ω	TB 600/150Ω	TB 600Ω	TB 150Ω	Bal 600Ω	Unb/Ximr <60Ω	Bal 100Ω
Input level range	-20/+18dB	+20dBu max	+22dBu	+20dB max	+10dB	...	+20dB max
Output level maximum	+20dB	+24dBm	+22dBm	+24dBm 600Ω	+10dB	+21dBm	+20dB max
AF response (±dB; Hz-kHz)	±1 50-15k	±1 20-20k	±0.5 20-20k	...	1 50-15k	±0.5 20-20k	20-20k
Distortion	0.7%	<0.5%	...	<0.25% 30-15k	<1% bypass	... (<0.03%)	<0.1%
S/N ratio	70dB	>81dB threshold	...	-90dB EIN	>50dB	<-94dBm	82dB
Reader Service No	1106	1107	1108	1109	1110	1111	1112

⁷Quad or two stereo pairs.

Manufacturer	Orban				Orban Pro		
Model	4000A	8100A/XT2	8185A ⁸	Optimod-AM	412A (414)	422A (424A)	464A (787A)
Compression	Yes	No	Yes	Yes	Yes	Yes	Yes
Expansion	...	No	No	No	No	No	No
Peak limiting	Yes	Yes	Yes	Yes	Yes	Yes	Yes (opt)
Asymmetric limiting	...	No	No	Yes	No	No	No (...)
AGC	Yes	No	Yes	Yes	No	No	Yes (...)
Loudness control	No	Yes	Yes	Yes	No	No	No (...)
Stereo system	Option	Yes	Yes	Yes	No (Yes)	No (Yes)	Yes (Opt)
Programmable	No	No	No	No	No	No	No (Yes)
Multiband processing	2-band	6-band	3-band	6-band	No	No	No
Metering	LED	VU GR	VU GR I/O	VU GR I/O	GR	GR/Out/peak	GR Out Peak
Input connector	AB 10kΩ	[Accessory	AB 10kΩ	AB 10kΩ	AB >10kΩ (<19kΩ)	AB >10kΩ	AB >10kΩ
Output connector	AB/TB 10kΩ	[for 8100A	AB 370kΩ	AB 290kΩ	AB 100kΩ	AB 100kΩ	AB 93kΩ (30kΩ)
Input level range	-30/+10dBu	[Optimod-FM	-30/+10dB	-30/+10dB	-15/+21dB	-15dB	-10/+23dB
Output level maximum	>+20dBm	[processor &	+21dB	+20dB	+20dBm	+26dBm	+20dBm
AF response (±dB; Hz-kHz)	±0.25 30-15k	±1 30-15k	±0.75 50-15k	±1 50-9.5k ⁹	±0.25 20-20k	±0.25 20-20k	±0.25 20-20k
Distortion	<0.035%	0.15% in op	0.25% bypass	0.2% bypass	<0.05% in op	<0.03% in op	<0.03% (<0.1%)
S/N ratio	>87dB	70dB	75dB	75dB	85dB	85dB	85dB
Reader Service No	1113	1114	1115	1116	1117	1118	1119

⁸Audio processing portion of BTSC TV stereo generator. ⁹per NRSC-1 specification; values in "proof mode."

Manufacturer	ProTech Audio	Solid State Logic	Symatrix				Valley Int'l
Model	663CL/CL1	Logic FX G384	#525 gated	#544 Quad Gated	501 Peak-RMS	528	#400 mic processor
Compression	Yes	Yes	Yes	No	Yes	Yes	Yes
Expansion	No	No	Yes	Yes	No	Yes	Yes
Peak limiting	Yes	No	No	No	Yes	No	No
Asymmetric limiting	...	No	No	No	No	No	No
AGC	...	No	No	No	No	No	Yes
Loudness control	No	No	No	No	No	No	Yes
Stereo system	No	Yes	Yes	No	Option	No	No
Multiband processing	No	No	No	No	...	No	No
Metering	VU	GR	GR	Gain Reduction	GR	VU GR In/Out	GR VU I/O
Input connector	TB/Unb 600Ω	AB 20kΩ	AB >40kΩ	>40kΩ	AB >10kΩ	AB 3k/10kΩ	AB >40kΩ
Output connector	TB 600Ω	AB 75kΩ	Unb <100kΩ	100kΩ	AB/TB 200kΩ	AB 100kΩ	AB 50kΩ
Input level range	+27dBm max	-11/+19dBu	-50/+20dB	-40/+20dB	-40/+10dB	-80/+18dB	-40/+26dB
Output level maximum	+27dBm	+29dBu	+18dBm 600kΩ	+19dBm 600kΩ	+24dBm 600kΩ	+24dBm 600kΩ	+26dB
AF response (±dB; Hz-kHz)	0.25 20-20k	±0.2 20-20k	-1 20-20k	-1dB 20-20k	-1 20-20k	-1 20-20k	±0.5dB 20-20k
Distortion	0.5% 6dB comp	0.005%	0.025% in op	0.025% in op	0.025% in op	0.35% in op	<0.01% in op
S/N ratio	78dB	94dB	85dB	86dB	85dB	>86dB	82dB ref QdB
Reader Service No	1120	1121	1122	1123	1124	1125	1126

Manufacturer	Valley International						Wheatstone
Model	#430 (#440)	#610	#810 (#817)	#811 GainBrain II	Leveller (816)	Model DDP (DCE)\10	1202A
Compression	Yes	Yes	No (Yes)	No	No	Yes	Yes
Expansion	Yes	Yes	Yes	No	No	Yes	No
Peak limiting	Yes	Yes	No	Yes	Yes	Yes	Yes
Asymmetric limiting	No	No	No	No	No	No	No
AGC	Yes	Yes	No (Yes)	No	No	Yes	No
Loudness control	Yes	Yes	No (Yes)	Yes	Yes	Yes	...
Stereo system	Yes	Yes	No	No	No	Yes	Yes
Digital processing	No	No	No	No	No	Yes	No
Programmable	No	No	No	No	No	Yes	No
Multiband processing	No	No	No	No	No	8 (No)	No

Audio Processors, Dynamics Control

Manufacturer	Valley International					Wheatstone	
	#430 (#440)	#610	#810 (#817)	#811 GainBrain II	Leveller (816)		Model DDP (DCE) ¹⁰
Model	GR (VU I/O)	GR	GR	GR	GR VU I/O	VU GR I/O	1202A
Metering	GR (VU I/O)	GR	GR	GR	GR VU I/O	VU GR I/O	VU/GR/Out
Input connector	AB 94k Ω (100k Ω)	AB >90k Ω	AB 100k Ω	AB 150k Ω	AB 75k (100k)	Digital	AB 20k Ω
Output connector	AB 40k Ω	AB 2k Ω	AB 20k Ω (50k Ω)	AB 40k Ω	AB 50k Ω	Digital	AB 10k Ω
Input level range	-40/+21dB	-40/+24.5dB	-40/+24.5dB	-44/+24dB	-10(-16)/24dB	[16-bit	-20/+26dB
Output level maximum	+21dB (24dB)	+24dB	+21dB (24)	+21dB	+24dB	[PCM	+22dB
AF response (\pm dB; Hz-kHz)	\pm 0.5 20-20k	\pm 0.5 20-20k	\pm 0.5 20-20k	\pm 0.5 20-20k	\pm 0.5 20-20k	\pm 0.5 20-20k	\pm 0.5 20-50k
Distortion	<0.05% in op	<0.05% in op	<0.05% (<0.4%)	<0.025% in op	0.04% in op	...	0.04%
S/N ratio	82dB ref 0dB	82dB ref 0dB	83dB ref 0dB	83dB ref 0dB	83dB ref 0dB	94dB ref 0dB	90dB
Reader Service No	1127	1128	1129	1130	1131	1132	1133

¹⁰DDP Digital Dynamics Processor; DCE Digital Compressor Expander.

Audio Cartridge Recorders, Reproducers

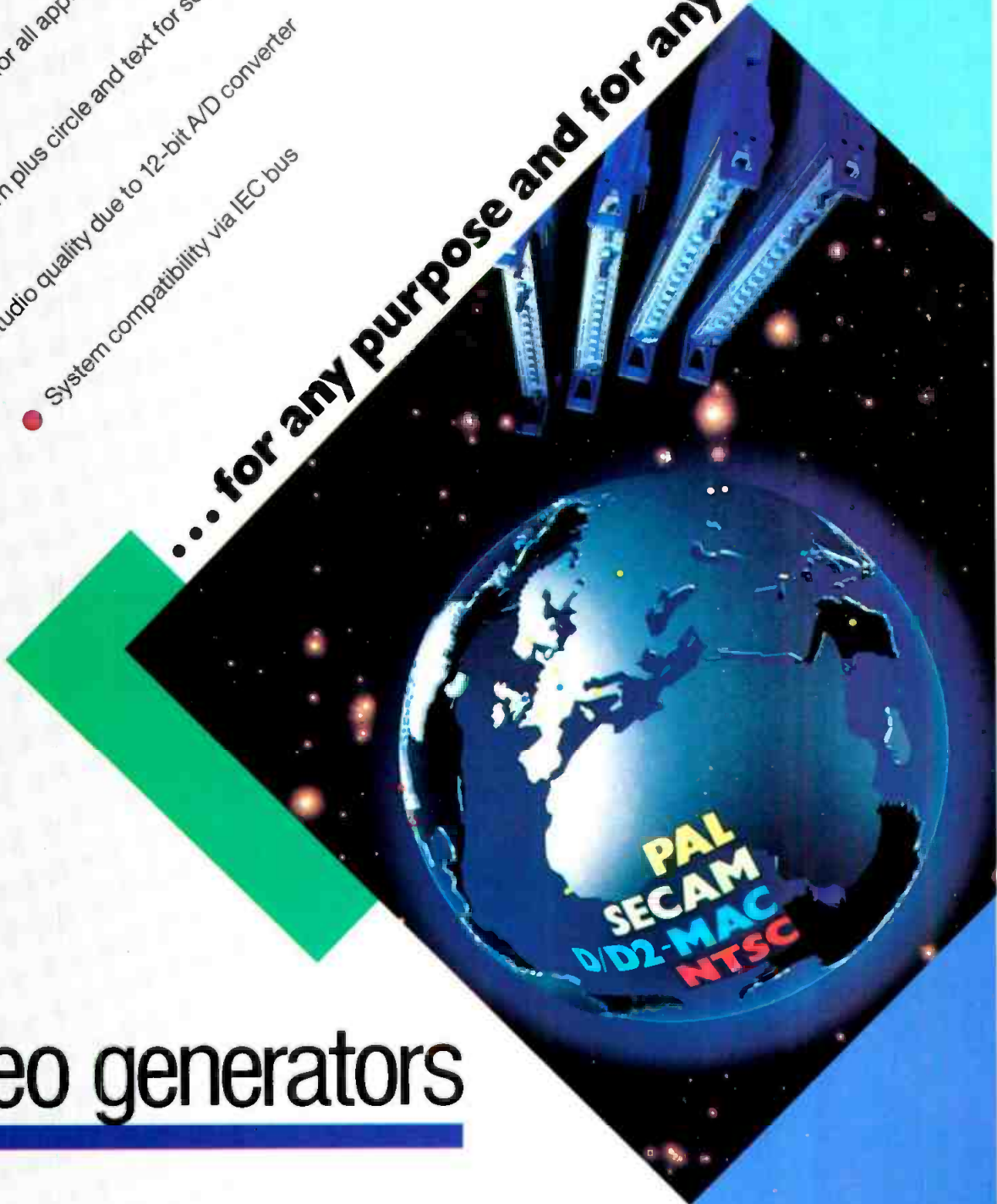
Manufacturer	Audi-Cord Corporation			Broadcast Electronics			
	"S" Series	DL series	2100C	5300C series	5400C/5410C ¹	DT-90 series	PT-90 series
Deck control logic	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Remote control type	Simple remote	Simple remote	Simple remote	96-pin D	96-pin D	48-pin D	48-pin D
Replay inhibit	Yes	Yes	No	Yes	Yes	Yes	Yes
Record timer	Yes	Yes	No	No	No	No	Yes
Secondary tone	Yes	Yes	Yes	Option	Yes	Yes	Yes
Tertiary tone	Yes	Opt	No	Option	Yes	Yes	Yes
Phase correction	No	No	PhaseLok V	PhaseLok V	PhaseLok V	PhaseLok V	PhaseLok V
Capstan motor	AC hysteresis	AC hysteresis	AC synch	AC synch	AC synchronous	AC synch	DC servo
Capstan drive	Direct	Direct	Direct	Direct	Direct	Direct	Direct
Play speed	7.5ips	7.5ips	7.5	7.5	7.5	7.5 (3.75 opt)	7.5/3.75/15/var.
Sec/Tert cue outputs	Solid-state	Solid-state	Relay closure	Relay closure	Relay closure	Relay closure	SS
Meter types	VU	VU	VU taut-band	VU taut-band	VU taut-band	LED bar graph	LED bar graph
Monaural model	S-21	DL-RM	2100CRP/-CP	5301C/2C-09C	5403C/5409C	-90RP/-90P	PT-90P
Play only model	S-11	DL-PM	2100CPS	5303/04C-10C	5400C	-90PS	PT-90PS/-RPS
Multideck model	None	DL-DM	None	3-spot	3-cart	None	None
Input connection	TB 5k Ω	TB 5k Ω	Act bal	Xfmr bal	Act bal	Act bal	Act bal
Input impedance	5k Ω	5k Ω	75k Ω	50k Ω	50k Ω	600 Ω	10k Ω
Input level range	-12/+10dBm	-12/+10dBm	-20/+20dBm	-20/+20dBm	-70/+20dBm	-18/+20dBm	-18/+20dBm
Output connection	TB 150 Ω /600 Ω	TB 150 Ω /600 Ω	Act bal	Xfmr bal	Xfmr bal	Non-Xfmr	Act bal
Output impedance	150 Ω /600 Ω	150 Ω /600 Ω	600 Ω	600 Ω	600 Ω	75 Ω source	600 Ω
Output level max	+18dBm	+18dBm	+10dBm	17dBm clip	17dBm	+20dBm	+24dBm clip
AF response \pm dB, Hz-kHz	\pm 2dB 50-15k	\pm 2dB 50-15k	\pm 2dB 50-15k	\pm 2dB 40-16k	\pm 2dB 40-15k	\pm 2dB 40-16k	\pm 2dB 40-16k
referred to nWb/m	160nWb/m	160nWb/m	250nWb/m	250nWb/m	250nWb/m	250nWb/m	250nWb/m
S/N ratio	+52dB	+52dB	42dB stereo	56dB stereo	56dB	52dB stereo	58dB ²
Crosstalk L-R	-50dB	-50dB	<-50dB	<-50dB	-50dB	<-50dB	<-50dB
Crosstalk Pgm-Cue	-50dB	-50dB	<-50dB	<-50dB	-50dB	<-50dB	<-50dB
Distortion	0.5%	0.5%	<2%	<2%	2%	1.5% system	<1%
Wow	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
Reader Service No	1001	1002	1003	1004	1005	1006	1007

¹5500 series similar to 3-cart model with five slots. ²Dynafex noise reduction permits 80dB S/N ratio in stereo operation.

Manufacturer	Cartridge Technology	Fidelipac			ITC/International Tapetronics		
		CTR-10 series	CTR-100 series	CTR-90 series ⁴	99B series	DELTA series	Series 1
Model	CT-1001 ³	CTR-10 series	CTR-100 series	CTR-90 series ⁴	99B series	DELTA series	Series 1
Deck control logic	CMOS	CMOS	CMOS	CMOS	μ P	μ P	CMOS
Remote control type	Yes	D-connector	D-connector	D-connector	50-pin D	50-pin D	50-pin D
Replay inhibit	...	Yes	Yes	Yes	Yes	Yes	Yes
Record timer	Yes	No	No	No	No	No	No
Secondary tone	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tertiary tone	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Phase correction	...	No	No	No	ELSA	No	...
Capstan motor	dc servo	AC servo	dc servo	dc servo	DC servo	DC servo	dc servo
Capstan drive	Direct	Direct	Direct	Direct	Direct	Direct	Direct
Play speed	7.5ips	7.5ips	3.75/7.5	7.5ips	3.75/7.5/15	3.75/7.5/15	3.75/7.5/15
Sec/Tert cue outputs	Solid-state	Relay closure	Relay closure	Relay closure	S-S/relay close	S-S/relay close	S-S/ relay close
Meter types	PPM; VU opt	LED bar graph	LED bar graph	LED bar graph	VU/taut-band	VU Taut-band	LED ladder
Monaural model	...	CTR-11 P/CTR-13 R	CTR-111/-123	CTR-91P/-93R	Yes	DELTA I/III/IV	Available
Play only model	Available	CTR-12 P/CTR-14 R	CTR-111/-112	CTR-91P/-92P	Yes	DELTA I/III	Available
Multideck model	No	None	[MAXTRAX option]	CTR-30 series	No	DELTA III	None
Input connection	Act; Xfmr opt	AB 10k Ω	Act bal	Act bal	Act/Xfmr bal	Act/Xfmr bal	Xfmr bal
Input impedance	30k Ω	10 k Ω	10 k Ω	10 k Ω	20k Ω	20k Ω	20k Ω
Input level range	-10/0dBm	-17/+20dB	-17/+20dBm	-17/+20dB	-20/+10dBm	-18/+ 18dBm	-18/+ 18dBm
Output connection	Xfmr bal	AB 440 Ω	Act bal	Act bal	Xfmr bal	Act Xfmr bal	Xfmr bal
Output impedance	<150 Ω source	440 Ω	\leq 60 Ω	\leq 60 Ω	600 Ω	600 Ω	80 Ω source
Output level max	0dBm typical	20dB	20dBm	20dB	+25dBm	+18dBm	+18dBm

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Circle (111) on Reply Card

Audio Cartridge Recorders/Reproducers

Manufacturer	Cartridge Technology	Fidelipac			ITC/International Tapetronics		
		CTR-10 series	CTR-100 series	CTR-90 series ⁴	99B series	DELTA series	Series 1
Model	CT-1001 ³						
AF response \pm dB, Hz-kHz	\pm 2dB 20-16k	\pm 2dB 50-16k	\pm 2dB 50-16k	\pm 2dB 50-16k	\pm 2dB 50-16k	\pm 1dB 31.5-16k	\pm 2dB 50-16k
referred to nWb.m	200nWb/m	250nWb/m	250nWb/m	250nWb/m	250nWb/m	250nWb/m	250nWb/m
S/N ratio	50dB	+55dB	>60dB	>60dB	58dB	62dB	>55dB
Crosstalk L-R	...	-50dB	-50dB	-50dB	-50dB	-50dB	<-50dB
Crosstalk Pgm-Cue	...	...	<50dB	<-50dB	-50dB	-50dB	<-50dB
Distortion	<1.5%	0.1%	0.1%	0.1%	0.8%	1.5%	<0.2% OdBm
Wow/flutter	<0.12% DIN	<0.12% DIN	0.12%	0.12%	0.12%	0.15% R/P max	0.15% R/P
Reader Service No	1008	1009	1010	1011	1012	1013	1014

³MAXTRAX headoption available. ⁴MAXTRAX format head option available.

Manufacturer	Otari Corporation	Pacific Recorders & Engineering	Radio Systems	Sonifex Ltd			
				CTM-10S series	Micromax ⁵	TOMCAT ⁶	RS-CART 2000	CQ 20 R	HS 200 R.X2	Micro HS 200R
Model	CTM-10S series	Micromax ⁵	TOMCAT ⁶	RS-CART 2000	CQ 20 R	HS 200 R.X2	Micro HS 200R
Deck control logic	μ P	CMOS	μ P	...	CMOS	CMOS	CMOS
Remote control type	Yes	Simple remote	Simple remote	Yes	Yes	Yes	Yes
Replay inhibit	Yes	Yes	Yes	...	No	Yes	No
Record timer	Yes	No	No	Yes	No	Yes	No
Secondary tone	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tertiary tone	Yes	Yes	Yes	Yes	No	Yes	Yes
Phase correction	None	No	No	Yes	No	No	No
Capstan motor	DC servo	DC servo	DC servo	dc servo	DC servo	DC servo	DC servo
Capstan drive	Direct	Belt	Direct	Direct	Belt	Belt	Belt
Play speed	3.75/7.5/15	7.5ips	7.5/15	3-speed	7.5	7.5	7.5
Sec/Tert cue outputs	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Meter types	VU/peak LED	VU	VU	LED ladder	LED bar graph	VU	VU
Monaural model	CTM-10M	Yes	No	Available	CQ 10 R	HS 200 X-2	Micro HS 100R
Play only model	CTM-10	Yes	Yes	Available	CQ 10; CQ 20	HS 200 X-2	HS100; HS200
Multideck model	None	No	No	None	None	None	None
Input connection	AB 10k Ω	Act bal	Act bal	Act bal	Unbal	Xfmr bal	Act bal
Input impedance	10k Ω	40k Ω	20k Ω	...	10k Ω	10k Ω	10k Ω
Input level range	+26dBv max	0-8dBv	-13/+9dBv	...	-22/+22dBv	-22/+22dBv	-22/+22dBv
Output connection	AB 5 Ω	Act bal	Act bal	Act bal	Unbal	Xfmr bal	Act Bal
Output impedance	5 Ω	150 Ω	>95 Ω	...	50 Ω	50 Ω source	50 Ω source
Output level max	+26dBv into 200 Ω	+24dBm max	+25dBm	...	+20dBv	+22dBv	+22dBm
AF response \pm dB Hz-kHz	2dB 20-20k	\pm 2dB 20-16k	\pm 1dB 40-16k	\pm 1dB 40-16k	...	\pm 2.5dB 40-16k	\pm 1.5dB 40-16k
referred to nWb.m	...	250nWb/m	250nWb/m	...	160nWb/m	160nWb/m	160nWb/m
S/N ratio	53dB	56dB MAXTRAX	62dB A wtd	...	>51dB unwtd	55dB ⁷	61dB
Crosstalk L-R	<48dB 1kHz	45dB separation	<-50dB	...	<-50dB	<-50dB	<-50dB
Crosstalk Pgm-Cue	<48dB 1kHz	<-55dB	<-50dB	...	<-50dB	<-50dB	<-50dB
Distortion	<0.8% 1kHz	0.9% system	0.9%	...	<0.2%	<1.5% 1kHz	0.8%
Wow/flutter	<0.15% 7.5ips	<0.15% 7.5ips	0.08%	0.1%	...	<0.12%	0.06%
Reader Service No	1015	1016	1017	1018	1019	1020	1021

⁵Models with standard NAB or MAXTRAX heads. ⁶Uses MAXTRAXheads. ⁷63dB with noise reduction.

Audio Recorders, Reel-to-Reel

Open-reel audio recording systems, 2-track to multi-track equipment, rack-mounted and portable units.

Manufacturer	Fostex			Lyrec Manufacturing a/s			Nagra Kudelski
	E16 (E22)	E2	R8 (E8)	FRIDA	P-4400 Loopmaster	TR 533	NAB T-Audio TC
Model	E16 (E22)	E2	R8 (E8)	FRIDA	P-4400 Loopmaster	TR 533	NAB T-Audio TC
# of tracks	16 (2)	2	8	2	4	24	2+1 TC
Tape width	1/2	1/4	1/4	1/4	1/2	2"	1/4"
Time code track	No (Yes)	Yes	No	No	No	No	Yes
Deck control logic	μ P	μ P	μ P	μ P	μ P	TTL	μ P/TTL
Edit control interface		Synchronizer & Autolocator		Rmt Ctl	None	Rmt Ctl; Autolocator	RS-422/Rmt Ctl SMPTE/Sync/Autoloc
Recording timer	Min/sec	Min/sec	Min/sec	Min/sec	Tape counter	Min/sec	Min/sec; counter
Cue track	No (Yes)	Yes	No	No	No	No	No
Phase correction	No	No	No	Yes	No	Yes	Yes
Capstan motor; drive	Direct (dc servo)	DC servo/Direct	DC servo (Direct)	DC servo; belt	DC servo; direct	DC servo; direct	DC servo
Reel motors	DC servo	DC servo	DC servo	DC servo	DC servo	AC servo	DC servo
Tape speeds	15ips (& 7.5)	7.5/15ips	15ips	3.75/7.5/15	480ips	15/30	3.75/7.5/15/30
# of heads; type	2 (3) Permalloy	3 Permalloy ferrite	2 Permalloy ferrite	3 metal	2 ferrite	3 metal	5 ¹
Metering types	LED bar (VU)	VU	Bargraph/Peak LED	LED bar graph	VU	VU	VU/Peak LED
Equalization	NAB	NAB1	IEC1 (NAB)	NAB/AES/CCIR	NAB	NAB/AES/CCIR	NAB/AES/CCIR
Input connection	Unb 30k Ω (40k)	Bal/Unbal 40k Ω	Unbal 30k Ω	AB 10k Ω	Playback only	TB 8k Ω	TB 10k Ω
Input level range	...	...	...	...	...	-6/+24	-390mV/+4.4V
Output connection	Unbal 10k Ω	Bal/unbal 10k Ω	Unbal 10k Ω	AB 40 Ω	Unb 5 Ω	TB 40 Ω	TB 30 Ω
Output level maximum	...	...	...	+26dB	...	+24	+24VdBm
AF response \pm dB; Hz-kHz	\pm 3dB 40-18k(30-30k)	\pm 3dB 30-20k	\pm 3dB 40-18k	-2/+2 30-28k	-2/+2 2k-1280k	-2/+2 50-20k	\pm 1 30-20k
S/N ratio	80dB (74dB)	74dB	78dB (80dB)	+69dB	+60dB	+63dB	+70dB tape dep.

Manufacturer	Fostex				Lyrec Manufacturing a/s			Nagra Kudelski
	E16 (E22)	E2	R8 (E8)	FRIDA	P-4400 Loopmaster	TR 533	NAB T-Audio TC	
Model	E16 (E22)	E2	R8 (E8)	FRIDA	P-4400 Loopmaster	TR 533	NAB T-Audio TC	
Distortion	<1%	<1	1%	0.1%	0.1%B	<0.1%	1-5% ²	
Crosstalk Pgm-Pgm	-55dB (-80)	-80dB	-70dB (-55dB)	-40dB	-80dB	-46dB	-88	
Crosstalk Pgm-Cue	(-77dB)	-77dB	...	...	...	...	...
Wow-flutter	0.05% 15ips (30)	0.05% 15ips	0.06 (05)% 15ips	0.06% 15ips	0.06% 480ips	0.04% 15ips	0.025% 15ips	
Reader Service No	716	717	718	719	720	721	722	

¹ 2-audio, 1-TC, 2-erase, opt. Neopilot. ² 3rd harm. max peak level 510nWb/m.

Manufacturer	Nagra Kudelski			Otari Corporation			Sony
	Nagra 4.2	Nagra IV-SJ	ARS-1000 DC-DS	MX-50	MX-55 series ³	APR-24	APR-5002W (5003W)
Model	Nagra 4.2	Nagra IV-SJ	ARS-1000 DC-DS	MX-50	MX-55 series ³	APR-24	APR-5002W (5003W)
# of tracks	1	2+1 TC	4	2	1/2/2TC/4	24	2 (3)
Tape width	1/4	1/4	1/4	1/4	1/4	2"	1/4
Time code track	w/Neopilot	Yes	No	No	MX-55TM	Yes	No (Yes)
Deck control logic	...	No	...	TTL	μP	μP	μP
Edit control interface	...	No	...	None	...	RmtCtl; SMPTE	RmtCtl
	...	Min/meter counter	...	...	...	Synch; Autolocator	Autolocator
Recording timer	Min/meters	counter	FM modulation	...	Yes	Yes	Min/sec; counter
Cue track	No	No	No	Search 0 + 1 cue	Search 0/cue/3-cue	SMPTE	No (Yes)
Phase correction	No	No	No	No	No	Yes	No (Yes)
Capstan motor; drive	DC servo	DC servo	Synchronous	DC servo	belt	DC servo/belt	DC servo
Reel motors	Belt drive reel	Belt drive reels	Induction	AC synchronous	Induction torque	DC servo	DC servo
Tape speeds	3.75/7.5/15	1.5/3.75/7.5/15	3.75/7.5	3.75/7.5/15/var	3.75-30ips	15/30	7.5/15/30
# of heads; type	4	4	...	4 ERP	ERP/P	3 amorphous	3 amorphous (4)
Metering types	VU	Modulometer	[Playback	VU/peak LED	VU w/peak LED	VU/LED/bargraph	VU
Equalization	NAB	CCIR	NAB	CCIR	[only system	NAB/IEC	NAB/IEC
Input connection	UB 100kΩ; Bal opt	UB 100kΩ	...	AB >10kΩ	AB >10kΩ	AB 10kΩ	Bal 10kΩ
Input level range	-0.37/+127V	-10mV min	...	-20/+10dBm	-10dBV/+4dBm nom	Variable	Variable
Output connection	Bal 600Ω	UB 600Ω	UB 600Ω	AB <5Ω	AB 200Ω load	AB 120Ω	AB 120Ω
Output level maximum	0dB-4.4V	1V	+4dBm nominal	+22dBm 600Ω load	+26dBm max bal.	+24dBs	+24dBm
AF response ±dB; Hz-kHz	±2 30-15k	±2 25-35k	±2 50-18k	±2dB 20-20k	±2dB 30-20k	-3/0.75 25-24k	-3/+0.75 50-28k
S/N ratio	71dB	62dB	63dB 7.5ips	>54dB	71dB 7.5ips	+66dB	70dB 30ips
Distortion	1.5%	2%	<0.15% 250nWb/m	<0.3%	<0.3% 1kHz	0.15%	0.35% 30ips
Crosstalk Pgm-Pgm	...	...	<-50dB 1kHz	-55dB 1kHz 0VU	<-55dB 1kHz	...	...
Crosstalk Pgm-Cue	...	...	N.A	<-55dB 1kHz	<-55dB 1kHz	...	...
Wow-flutter	0.07% 7.5ips	0.05% 15ips	0.06% 7.5ips	0.06%	<0.08% 7.5ips	0.03% 30ips	0.025% 30ips
Reader Service No	723	724	725	726	727	728	729

³MX-55N, MX-55NM, MX-55TM operate 3.75-7.5 or 7.5-15 ips; MX-55N-HS 7.5-15 or 15-30 ips.

Manufacturer	Sony	Stellavox Digital Audio			Studer Revox		
	PCM-3202 (3402)	SP 9 Pro ⁵	TD 9N ⁶	A820 series	Revox C270 ⁹	Revox PR99 Mk III	Studer A807
Model	PCM-3202 (3402)	SP 9 Pro ⁵	TD 9N ⁶	A820 series	Revox C270 ⁹	Revox PR99 Mk III	Studer A807
# of tracks	2	2	4 (2) [2]	2-24	2 (4)	8)	2
Tape width	1/4	1/4"	1/2"-1/4"	1/4"	1/4" (1/2")	1/4"	1/4"
Time code track	Yes	Yes	Yes (No)	Yes	C270 TC	No	[A807 TC ver.]
Deck control logic	μP	Mechanical	μ	μP/TTL/CMOS	μP	μ	μP
Edit control interface	SMPTE autolocator	synch	None	RS-232/422	RS-232/422; SMPTE autoloc (& synchro)	RS-232/timecode	via rmt ctl Autolocator
Recording timer	Min/sec	Tape counter	Min/sec	Min/sec	Min/sec	Min/sec	Min/sec
Cue track	Y	Yes	Yes (No)	SMPTE ⁷	No	No	No
Phase correction	...	Yes	Yes	Yes	Yes	No	Yes
Capstan motor; drive	DC servo	DC servo	direct	DC servo belt	DC servo brushless	1 dc servo	ac servo
Reel motors	DC servo	...	DC servo	DC servo	2 ac servo	ac servo	DC servo
Tape speeds	15 (& 7.5)	3.75/7.5/15	3.75-30	3.75-30±7 semitones	3.75/7.5/15	7.5/15	3.75/7.5/15 30
# of heads; type	4 ⁴	4/ERP	3/ERP	3 or 4 (3)	3 Revox metal	3 Revox metal	3 amorphous
Metering types	Peak LED	VU	Per request	VU	VU (LED bargraphs)	VU	Peak LED
Equalization	DASH	Any	All	NAB/CCIR	NAB	NAB	NAB/CCIR
Input connection	AB 10kΩ	TB 10kΩ	TB 10kΩ	NAB TB >10kΩ	TB >5kΩ (AB)	TB >5kΩ	TB >10kΩ
Input level range	-6,+10dBs	-7/+6dBm	22dBm	+24dBu max	±10dB	±10dBv	-30/+12dBu
Output impedance	120Ω	10Ω	9Ω	50Ω	<Ω (150kΩ)	50Ω	2Ω
Output level maximum	+24dBs	+13dBm	+25dBm	+24dBm	+22dBm	+22dBm	+24dBm
AF response ±dB; Hz-kHz	-1,+0.5dB 20-20k	±2 30-18k	±2 30-20k	±2 30-16k ⁸	±2 30-22k	-3/+2 30-22k	±2d 30-20k
S/N ratio	90dB	67dB	69dB (71dB)	>65dB	64dB (61dB)	66dB	68dB
Distortion	0.05%	<2%	<1%	<0.5% 1kHz	<1% 0.8%	0.3%	<1.0%
Crosstalk Pgm-Pgm	-80dB	-55dB	-55dB	<-55dB 1kHz	>50dB (>55dB)	...	...
Crosstalk Pgm-Cue	...	-80dB	-80dB	...	...	...	...
Wow-flutter	...	0.07% 19ips	0.04% 15ips	0.06%	0.05% 15ips	<0.06% 15ips	0.05% 15ips
Reader Service No	730	731	732	733	734	735	736

⁴ Digital Rec. P/E Analog R/P. ⁵ Portable unit. ⁶ Includes models with 4-tr+cue, 2-tr+cue, 3-tr+cue. ⁷ Also five Locstart memories available. ⁸ Values for 7.5ips tape speed. ⁹ Models C274 4-track, C278 8-track; also time code control.

Manufacturer	Studer Revox	TASCAM division/Teac of America					
	Studer A827-24	3030	ATR 60-16	ATR 80-24	MSR 16 (-24)	Series 30	TSR 8
Model	Studer A827-24	3030	ATR 60-16	ATR 80-24	MSR 16 (-24)	Series 30	TSR 8
# of tracks	24-track	2	16	24	16 (24)	2 (4)	8
Tape width	2"	1/4	1/4-1"	2/E	1/2E-1E	1/4E	1/2
Time code track	No	No	Yes	...	No	No	No
Deck control logic	μP	TTL	μP	μP	μP	μP	μP

Audio Recorders, Reel-to-Reel

Manufacturer	Studer Revox	TASCAM division/Teac of America					
Model	Studer A827-24	3030	ATR 60-16	ATR 80-24	MSR 16 (-24)	Series 30	TSR 8
Edit control interface	RS-232/422/SMPTE Autoloc/Synchro	None	SMPTE synchronizer autolocator	SMPTE synchronizer autolocator	SMPTE synchronizer autolocator	SMPTE synchronizer autolocator	SMPTE synchronizer autolocator
Recording timer	Min/sec	Min/sec	Min/sec	...	...	...	Min/sec; tape ctr
Cue track	No	Yes	Yes	RTZ/STC	RTZ/STC	RTZ/STC	Yes
Phase correction	Yes	No	No	No	No	No	No
Capstan motor; drive	DC servo brushless	DC servo	DC servo	DC servo direct	DC servo direct	DC servo direct	DC servo belt
Reel motors	DC servo	DC servo	DC servo	DC servo	DC servo	2 DC servo	DC servo
Tape speeds	7.5/15/30	7.5/15 ips	7.5-30ips	30 ips	t5 ips	7.5-15ips	15 ips
# of heads; type	3 amorphous metal	3	3	3	2	2	2
Metering types	VU	VU/LED peak	VU/LED peak	VU/Peak LED	Bargraph	Bargraph	LED bar graph
Equalization	NAB/CCIR/IEC 1/AES	NAB/IEC1	NAB/IEC1/CCIR	NAB/IEC1/CCIR	IEC1/CCIR	IEC1/CCIR	IEC1/CCIR
Input connection	TB >10k Ω	AB or AU	AB	AB	Unbal	Unbal 10k	Unbal
Input level range	+24dBu	-72/+4dB	to 28dBm	-10/+4dB	...	-60/+18dBV	...
Output Impedance	...	100k Ω	20k Ω	...	...	...	100k Ω
Output level maximum	+26dBm	...	+28dBm	+28dB	-10dBV	+18dBV	-10dBV
AF response \pm dB; Hz-kHz	\pm 2 50-20k	\pm 2 40-22k	\pm 3 50-15k	\pm 2dB	\pm 3 40-20k	\pm 3 40-22k	\pm 3 40-20k
S/N ratio	64dB 30ips	68dB	72dB	69dB	>65dB	>66dB	68dB
Distortion	<1.0% 510nWb/m	0.6%	0.8%	0.8%	0.8%	0.8%	0.8%
Crosstalk Pgm-Pgm	-60dB	<-55dB	<-55dB	-55dB	-80dB	-50dB	-62dB
Crosstalk Pgm-Cue	...	...	...	...	...	...	...
Wow-flutter	0.04% 30ips	<0.07%	0.05% 15ips	0.05%	<0.06%	<0.07%	0.08%
Reader Service No	737	738	739	740	741	742	743

Wireless Microphone Systems

Matched transmitter receiver systems, primarily for in-studio or limited area use.

Manufacturer	AKG Acoustics	Audio-Tech-nica US	beyerdynamic		Comtek		HM Electronics	
Model	WMS wireless	ATW1031/ATW1032	SEM 186	TS 190	Model 180	Model 182	515 (525)	System 55 (50)
RF spectrum	174-216MHz	169-216 MHz	170-240MHz	130-240MHz	169-216MHz	169-216MHz	169-216MHz	169-216MHz
Modulation control	...	Compression	Limiting	...	Compression	Compression	Compression	Compression
Companding function	...	2:1	Low noise	Low noise	2:1	2:1 companding	Dynamic expansion	
System AF response	...	\pm 1 40-16k	\pm 3 50-15k	\pm 3 50-15k	\pm 2 50-15k	\pm 2 80-15k	\pm 3 100-15k	\pm 3 100-15k
System S/N ratio	...	95dB	85dB	85dB	95dB	95dB	NRX II	NRX II
System distortion	...	0.5%	<1%	<1%	0.05%	0.5%	1%	1%
Transmitter Model:	T 185	ATW-T31UniPak¹	SEM186	TS-190	M-72	M-182	TX550 (555)	TX555
Transmitter packaging	Handheld	Pocket unit	Handheld	Pocket unit	Pocket	Handheld	Body-Pac (HH)	Body-pac
RF output	25-35mW	30mW	<50mW	>30mW	35mW	50mW	>50mW	>50mW
FM deviation	...	\pm 15kHz	\pm 12kHz	\pm 12kHz	\pm 30kHz	\pm 30kHz	15kHz max	15kHz max
Microphone support	Electret; dynamic	AT831A/ATM73A ²	Electret	ribbon ⁴	Electret ⁵	Elect Dynam Rib	Electret	1.5-5k Ω (dynamic)
Auxiliary line input	Yes	Yes	No	No	Possible	No	...	No
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	3-AA	9Vdc	9Vdc
Operating weight	13.6	3.2	160g	160g	4	11	4.7	10
Receiver Model:	SR 185.10 (185.11)	ATW-R10	NE 185/US	NE 185-11	MR-180	MR-182	RX522	RX520
RF sensitivity/quieting	...	1 μ V/60dB	1 μ V/55dB	12V/55dB	1 μ V/45dB	1 μ V/45dB	1 μ V/30dB	1 μ V/30dB
Spurious rejection	...	60dB	85dB	>85dB	80dB	>90dB	>50dB	>60dB
Antenna types	Whip	Whip furnished	Whip/Dipole	Whip Dipole	Whip dpl multiel acc	Whip dpl multiel acc	Whip BNC	Whip BNC
Diversity reception	Dption	Yes	Yes	Yes	No	No	No	Yes
Multichannel	No	No	No	Dption	No	No	No	No
AF output level	-20,+6dBm	-8dBV Unbal ³	-20/+6dBm	-20/+6dBm	+9dBm	+10dBm	-4dBV	-4dBV
Power requirement	15-27dc/117V	120ac/12-18dc	15-26dc/110ac	15-27dc/110Vac	6-12dc 50hr	ac/dcV 8W	120ac/12-16dc	120ac/12-16dc
Metered parameters	AF/RF/V	AF/RF	AF/RF/V	AF/RF/V	AF/V	AF/RF/V	Vdc/RF	Vdc/RF/AF
Metering types	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs
Reader Service No	1329	1330	1331	1332	1333	1334	1335	1336

¹ ATW-T32 Handheld. ² Also AT857Ama or any low-Z mic; -T32 uses dynamic only. ³ -20dB balanced. ⁴ MCE81 or M500, element applicable. ⁵ MCE 5, 6, 10; ECM 50, 55, 66, 77; MKE 2; SM 83, 84.

Manufacturer	Lectrosonics				Micron Audio Products			Nady Systems
Model	Pro-STD-T (-L)	PRO-4-Mini	PRO-DIV-L(-T)	PRO-Mini-L (-H)	CTR 501 /M	MDR530-SH	MDS-2	Model 101/201
RF spectrum	150-216MHz	150-216MHz	150-216MHz	150-216MHz	169-216MHz	150-216MHz	150-216MHz	170-216MHz
Modulation control	Compression	Compression	Compression	Compression	Limiting	Limiting	Limiting	Compression
Companding function	2:1	2:1	2:1	2:1	CNS type	CNS type	CNS type	Yes
System AF response	\pm 1 50-15k	\pm 1 50-15k	50-15k	\pm 1 50-15k	\pm 2 50-15k	\pm 2 50-15k	\pm 2 50-15k	\pm 0.3 25-20k
System S/N ratio	96dB A wtd	96dB A wtd	96dB A wtd	96dB A wtd	>115dB	>115dB	115dB	...
System distortion	0.7%	0.7%	0.7%	0.7%	<0.3% THD	<0.3% THD	<0.3% THD	0.3%
Transmitter Model:	T185 (M185)	M185/M185	M185 (T185)	M185 (H185)	TX-501 (503)⁸	TX-503	TX-501 (503)	HT/LT/GT
Transmitter packaging	Handheld (Pocket)	Handheld/plugon	Pocket (HH)	Pocket (Plug-on)	Pocket (HH)	Handheld	Pocket (HH)	HH; Lav; Instr
RF output	50mW	50mW	50mW	50mW	50mW	50mW	50mW	50mW
FM deviation	\pm 15kHz	\pm 15kHz	\pm 15kHz	\pm 15kHz	\pm 15kHz	\pm 15kHz	\pm 15kHz	...
Microphone support	SM58 (Electret ⁶)	Electret or dynamic	Electret (& dynamic)	Electret	dynamic	Electret	dyn.	AKG element
Auxiliary line input	No (Yes)	...	Yes (No)	Yes (No)	Yes	No	Yes (No)	Yes
Power requirement	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc

Manufacturer	Lectrosonics				Micron Audio Products			Nady Systems
	Pro-STD-T (-L)	PRO-4-Mini	PRO-DIV-L(-T)	PRO-Mini-L (-H)	CTR 501 /H	MDR530-SH	MDS-2	Model 101/201
Model	13.2 (5.3)	...	5.3 (13.2)	5.3 (0.7)	8.5 (11)	11	8.5 (11)	8.5
Operating weight	13.2 (5.3)	...	5.3 (13.2)	5.3 (0.7)	8.5 (11)	11	8.5 (11)	8.5
Receiver Model:	R185	CR185/CDM4	DR185	CR185	MR-510 (110)⁶	MDR-530¹⁰	MDR-540 (-4)¹¹	101/201
RF sensitivity/quieting	0.5µV/20dB	0.6µV/20dB	0.5µV/20dB	0.6µV/20dB	>5µV >100dB S/N	2µV/60dB	2µV/60dB	...
Spurious rejection	>100dB	>100dB	>100dB	>100dB	>80dB	>80dB	>80dB	60dB
Antenna types	Whip furnished ⁷	Whip furnished	Whip furnished	Whip furnished	Whip furnished	Whips furnished	Dipole	Furnished
Diversity reception	No	No	Yes	No	No	Yes	Yes	201 only
Multichannel	No	4-channel	No	No	No	No	Yes	Yes
AF output level	-65.0dBm	-65.0dBm	-65.0dBm	-65.0dBm	-53dBV/0dBV	-53dBV; 0dBV line	0dB line	...
Power requirement	12dc/120ac	9-16dc/120ac	12dc/120ac	9-16dc/120ac	12-30dc	12-18dc/Vac	10-22dc/120ac	12dc
Metered parameters	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	AF/RF/Vdc	RF
Metering types	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs	LEDs
Reader Service No	1337	1338	1339	1340	1341	1342	1343	1344

⁶ M185 also supports dynamic mic units. ⁷ Dipole antenna available as an added accessory. ⁸ 501H includes TX-503 handheld transmitter. ⁹ Model 110 does not include Complementary Noise Suppression. ¹⁰ MDR-550 mobile diversity receiver offers similar characteristics in portable compact dc-powered package. ¹¹ 4 model does not include Complementary Noise Suppression; multiple element accessory available.

Manufacturer	Samson Technologies				Sennheiser Electronics				
	Broadcast STD	Concert TD	MR-1 system	UHF 1B (1H)	UHF 2B (2H)	UHF 2E8 (2EH)	VHF 1B-90 (1H) ¹	VHF 2B-90(2H-90)	
Model	174-199MHz	174-199MHz	174.46-199.6MHz	450-960MHz	450-960MHz	450-960MHz	174-216MHz	174-216MHz	
RF spectrum	174-199MHz	174-199MHz	174.46-199.6MHz	450-960MHz	450-960MHz	450-960MHz	174-216MHz	174-216MHz	
Modulation control	...	...	...	Compress (limit)	Compress (limit)	Compress (limit)	Compress (limit)	Compress (limit)
Comanding function	NRS dbx I/II	NRS dbx I/II	NRS dbx II	Hi-Dyn	Hi-Dyn	Hi-Dyn	Hi-Dyn	Hi-Dyn	
System AF response	±3 30-18k	±3dB 30-18k	±3dB 60-12k	±3 40(70)-20k	±3 40(70)-20k	±3 40(70)-20k	±3 40(70)-20k	±0.3 40-20kHz	
System S/N ratio	>115dB	>100dB	95dB IHF	94dB	94dB	94dB	+92dB A wtd (94)	+92dB A wtd	
System distortion	<0.5% 400Hz	<0.5% 1kHz	...	<2%	<2%	<2%	<2%	<2%	
Transmitter Model:	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-TV(SKM 4031)	SK-2012-90(4031-90)	SK 2012-90(SKM-4031)	
Transmitter packaging	Handheld (Belt)	Handheld (Belt)	Handheld (Belt)	Pocket (handheld)	Pocket (handheld)	Pocket (handheld)	Pocket (handheld)	Pocket (handheld)	
RF output	50mW	50mW	50mW	20mW	20mW	20mW	30mW	30mW	
FM deviation	±15kHz	±15kHz	±15kHz	±40kHz	±40kHz	±40kHz	±40kHz nom.	±40kHz nom.	
Microphone support	Various ¹²	Various ¹³	Various ¹⁴	Electret MKE-2/-40	MKE-2/-40	MKE-2/-40	MKE-2/-40	MKE-2/-40	
Power requirement	9Vdc	9Vdc	9Vdc(6-8 hr)	4.5V 3-AAA cells	4.5V 3-AAA cells	4.5V 3-AAA cells	4.5Vdc 3-AAA	4.5Vdc 3-AAA	
Operating weight	13 (4.2)	13 (4.2)	7.8 oz (5.1)	7 oz (9 oz)	7 oz (9 oz)	7 oz (9 oz)	7 oz (9 oz)	7 oz (9 oz)	
Receiver Model:	BR-3	CR-2	MR-1 Micro	EK-2012-TV¹⁵	EM 2003-TV	EM-2003-TV¹⁶	EK-2012-90¹⁷	EM-2003-90¹⁸	
RF sensitivity/quieting	15µV/60dB S/N	15dB/µV/60dB S/N	t5-45dBu	<20µV/40dB	<10µV/40dB	<10µV/40dB	<20µV/40dB	<10µV/40dB	
Spurious rejection	60dB ±60Hz	60dB ±60Hz	60dB ±60kHz	>70dB	>80dB	>80dB	>70dB	>100dB	
Antenna types	Dual whips	Dual whips	7" Flex whip	Whip furnished	Whip furnished	Whip furnished	Whip furnished	Whip	
Diversity reception	Yes	Yes	No	No	Yes	Yes	No	Yes	
Multichannel	10	1 of 10	1 of 10	Dption	Yes	Option	No	No	
AF output level	Bal/unbal 8dBm	Bal/unbal 8dBm	Bal/unbal 0dBv	-26/+6dBm	-28/+12dBm	-28,+12dBm	-26,+26dBm	-28/+12dBm	
Power requirement	110/220ac	110/220Vac	9V	4.5Vdc 3-AAA cells	12-24Vdc 117Vac	12Vdc	4.5Vdc	117Vac	
Metered parameters	Vdc/RF A-B Ch/AF	Vdc RF A/B	Vdc	RF	None	AF/RF	RF/AF/Vdc	None	
Metering types	LEDs	LEDs	LEDs	...	LEDs	LEDs	...	LEDs	
Reader Service No	1345	1346	1347	1348	1349	1350	1351	1352	

¹² Various mic possibilities include: AKG, Audio-Technica, E-V, Sennheiser, Shure, Sony. ¹³ Various mic include AKG, Audio-Technica, E-V, Sennheiser, Shure, Sony. ¹⁴ Supports various mics from all major manufacturers in dynamic and condenser types. ¹⁵ Camera mounted receiver. ¹⁶ Includes ENG 2003 carrying case, antenna system, NiCad battery. ¹⁷ VHF camera mount receiver. ¹⁸ EM-2003-90 offers diversity reception; EK-2012-90 is a camera mount receiver.

Manufacturer	Shure Brothers		Sony		Swintek	Telex Comm.	VEGA/Mark IV	
	L-series	W-series	UHF systems	VHF systems	MK50A Hi-Fi-S ³	ENG Wireless	Pro Plus	Pro Series
Model	L-series	W-series	UHF systems	VHF systems	MK50A Hi-Fi-S ³	ENG Wireless	Pro Plus	Pro Series
RF spectrum	169-216MHz	150-216MHz	400 (900)MHz	176-215MHz	49-470MHz	165-216MHz	150-216MHz	150-216MHz
Modulation control	...	...	Limit/compress	Compression	Limit/compression	...	...	...
Comanding function	Yes	Yes	Switchable ²⁰	Yes	Selectable	Dynex III	Dynex III	Dynex II
System AF response	±2 50-15k	±1dB 50-15k	±1.5dB 75-15k	±2.5dB 100-15k	±3dB	60Hz-20kHz	±1dB 100-15k	40-15kHz
System S/N ratio	...	...	57dB linear A-wtd	>60dB	80dB	104dB companded	110dB	104dB
System distortion	0.3%	0.5%	0.3% linear	<0.7%	1%	<1%	<0.2%	<0.2%
Transmitter Model:	L1	W15HT (W10BT)	WRT-28L (H)	WRT410/420	MK50A HiFi	WT-400	77/DIII (T-81)	T-37 (T-36/38)
Transmitter packaging	Pocket	Handheld (pocket)	Pocket	Handheld	pocket	Pocket	Belt-pack	Body (handheld)
RF output	50mW	50mW	6mW (30mW) ²¹	50mW	50mW	50mW	50mW	50mW
FM deviation	±15kHz	±12kHz	±2.4kHz ²²	±1.9kHz 94dB SPL	±20kHz	±12kHz	...	...
Microphone support	Electret 839W	Dynam & (elec) ¹⁹	Elec Dyn ECM-77BC	Elec Dyn ECM-77BC	Electret: dynamic	Electret	Various ²⁴	Various ²⁵
Auxiliary line input	No	No	No	No	Yes	...	No	No
Power requirement	9Vdc	9Vdc	3Vdc	3Vdc	9Vdc	9Vdc	9V alk	9V alk
Operating weight	5.5oz	16 (6)	4.6 oz	14 oz	5 oz	5.5 oz	7 (9-13.5)	6 (10)
Receiver Model:	L3 (L4)	W20R (W25DR)	WRR-28/37	WRR410/WRR420	QOC Hi-Fi	ENG-4	R-42A	R-32 (R-31B)²⁶
RF sensitivity/quieting	0.35(.45)µV/12dB	0.5µV/12dB	10dBµ	>65µV/20dB	1µV/12dB	0.5µV/12dB	1.3µV 50dB SNR	2µV 50dB SNR
Spurious rejection	75dB	>80dB	>70dB	<-70dB	80dB	70dB	...	...
Antenna types	Whip furnished (2)	Whip furnished	Whip	Whip	Whip	L/4 rubber ducky	Dual whips	Dual whips
Diversity reception	L4 only	W25DR only	WRR-37	Option	0	No	Yes	R-32 only
Multichannel	No	No	Yes	Yes	0	Yes	No	No
AF output level	0dBm	0dBV (M/L switch)	-58dBs 600Ω	-58dB mic level	56dBm,+10dBm	-7,-21dBm	Line level	Line level
Power requirement	12-18Vdc	13.5Vdc	3/10-17Vdc	9Vdc 6-AA cells	9Vdc	...	ac/dc	ac/dc
Metered parameters	AF/RF/V(Div)	AF/RF/V	AF/RF	AF/RF	AF/RF/V	AF/RF/V	A/B: RF/AF	A/B: RF/AF
Metering types	LEOs	Meter (2 meters)	LEDs	LEDs	Meter	Meter	Meter	meter
Reader Service No	1353	1354	1355	1356	1357	1358	1359	1360

¹⁹ W15HT uses SM58 dynamic or SM87 electret; W10BT uses WL83 electret. ²⁰ Linear or companded; >60dB SNR w/companding; 0.7% distortion w/companding. ²¹ 1WP-27 amplifier gives 500mW. ²² per 1kHz linear mode; ±9.4kHz/1kHz companded. ²³ Video camera system. ²⁴ T-series includes elements such as E-V N/D457, Shure SM-58, SM-85, SM-87. ²⁵ T-36, E-V BK-1 element; T-38, E-V N/D457 element. ²⁶ 31B non diversity.

Shotgun Microphones

Hypercardioid is abbreviated to HC.

Manufacturer	AKG Acoustics			Audio-Technica			
	Model	Model	Model	Model	Model	Model	Model
Model	C568	CK8X capsule	ST205	AT4071	AT7403	AT877	AT4073
AF response Hz-kHz	20-20k	30-18k	...	30-20k	30-20k	60-14k	30-20k
Polar pattern(s)	HC/directional	HC/directional	Variable ¹	Lobar	Narrow dir	Unidir	Nar. dir.
Output impedance Ω	600	...	...	250 B	250 B	350 B	250
Output level (mV/Pa)	...	...	...	62mV	52mV	10mV	52mV/Pa -25.7dBm
Maximum SPL dB; % dist.	128dB 0.5%	137dB 0.5%	140dB 0.5%	127dB	129dB	120dB	129dB 1%
Output noise	18dB DIN 45412-A	15dB	20dB per pattern spc	12dB A-wtd	14dB	...	16dB
S/N ratio	76dB	79dB	...	...	...	>70dB	>75dB
Mic capsule type	Electret	Electret	...	Capacitor	Capacitor	Condenser	Ext polarized cap.
Stereo design	No	No	M/S or L/R	No	No	No	No
Power source	9-45Vdc	...	48Vdc or ac	12-48V	12-48V	1.5V	12-48Vdc
Filters	...	...	Bass rolloff	...	HP	...	High-pass
Weight	6.2gm	4.2gm	...	5.8 oz	4.2 oz	>6 oz	4.2oz
Reader Service No	647	648	649	650	651	652	653

¹ Patterns from omni through cardioids to Figure-eight.

Manufacturer	Audio-Technica US		beyerdynamic			Electro-Voice	
	Model	Model	Model	Model	Model	Model	Model
Model	AT815a	AT835	MC 736-PV	MC 737-PV	MCE 86 S	OL42 ²	RE45N/D ³
AF response Hz-kHz	40-20k	40-20k	40-20k	40-20k	50-18k	50-12k	150-15k
Polar pattern(s)	Narrow directional	Narrow directional	Cardioid lobe	HC/lobe	HC/lobe	HC	Card.-line
Output impedance	600	600	150	150	190	150	600
Output level (mV/Pa)	9.0mV/Pa -44.5dBm	9.0mV/Pa -45.5dBm	25mV/Pa	22mV/Pa -30dBV	4.2mV/Pa -47dBm	-50dB	5mV/Pa 1kHz
Maximum SPL dB; % dist.	120dB 3%	115dB 3%	128dB	122dB	138dB 0.7%	...	...
Output noise	18dB	17dB	4.5μVS	4.5μVS	3.8μVS	-125dBm hum	130dBm hum pickup
S/N ratio	>70dB	>70dB	74dB	74dB	61dB	...	...
Mic capsule type	Fixed-charge cond.	Fixed-charge cap.	RF condenser	RF condenser	Electret	Dynamic	Dynamic
Stereo design	No	No	No	No	No	...	No
Power source	1.5Vdc AA-cell	1.5Vdc	AA cell	12Vdc	12-48Vdc	8-48Vdc	Not required
Filters	High-pass	High-pass	Bass rolloff	Bass rolloff	...	...	...
Weight	9.2oz	7.5 oz	4 oz	7 oz	2.5 oz	13 oz	7.5 oz
Reader Service No	654	655	656	657	658	659	660

² Windscreen, case, coiled cord, handle. ³ Shock mount, case, handle, clamp, attenuator.

Manufacturer	Georg Neumann†		Sennheiser Electronics				Shure Brothers
	Model	Model	Model	Model	Model	Model	Model
Model	KMR8 1i(KMR821) ⁴	RSM190i MS-stereo ⁵	MKH 416 P48 ⁶	MKH 60 P48	MKH 70 P48	MKH 816 P48 ⁷	SM89
AF response Hz-kHz	40-18k (40-20k)	40-18k	40-20k	50-20k	±2 70-20k	40-20k	60-20k
Polar pattern(s)	HC	HC/fig-8	Sup card./lobe	Sup card./lobe	Sup card. lobe	Ultra dir./lobe	HC; LOBAR
Output impedance	150	50	10	130	150 bal	10	100 source
Output level (mV/Pa)	18mV/Pa (21mV/Pa)	23mV/Pa	1.25	1.3V	40mV/Pa	1.2V	2.2mV/Pa -53dBV
Maximum SPL dB; % dist.	>128dB	134mV/Pa	128dB	125dB	124dB	124dB	127dB 0.5% dist
Output noise	...	...	17dB	9dBa	10dB/DIN 45500	15Ba	16dB A wtd
S/N ratio	82dB	78dB M/72dB S	>77dBa	>85dBa	...	>78dBa	79dB
Mic capsule type	...	...	RF condenser	RF condenser	RF condenser	RF condenser	Electret
Stereo design	No	Yes	No	No	No	No	No
Power source	48Vdc±4V	48Vdc±4V	48V	48V	48Vdc	48Vdc/8	11-52Vdc
Filters	...	...	...	Low cut	hi boost	Low cut	Highpass
Weight	145 g	300 g	6.25 oz	5.25 oz	6.5 ozams	13.4 oz	6.9oz
Reader Service No	661	662	663	664	665	666	667

⁴ Windscreen, case, mounting accessories. ⁵ MTX 190i matrix amp ⁶ MKH 416 TU3 12Vdc. ⁷ MKH 816 6 TU3 12Vdc. †Available in US from Gotham Audio.

Telephone Bandwidth Extender

Manufacturer	Comrex Corporation				Gentner Electronics		
	Model	Model	Model	Model	Model	Model	Model
Model	2XP/2XR	3XP/3XR	LX/T; LX/R	PLXmicro/TH-X	EFT-1000A ¹	EFT-100 ¹	EFT-3000
System type	2-line	3-line	1-line	1-line duplex	1-line	1-line	3-line duplex
Offset line 1 Hz	250/2k	250/2k/2k	250	250	250	250	320/2.82k/5.32
Translation error	±0.02Hz	±0.02Hz	±0.02Hz	±0.02Hz	±0Hz	±0Hz	±0Hz
Processing analog/digital	Analog	Analog	Analog	Analog	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
Compression/expansion	...	Auto lvl ctrl	Yes	...	Yes	Yes	No
System transmitter	2XP	3XP	LX-T	PLX micro	EFT-1000A	EFT-100	EFT-3000
Packaging	Portable	Portable	Rack/Table	Portable	Portable	Rack/Table	Rack/Table
AF input impedance	600Ω	600Ω	600Ω	150Ω/10kΩ	600 Ω	>10kΩ	150/600Ω
AF input level dBm	+4	+4	-20; +8	-60; +0	-55; 0	-10; 0	10
Mic input	...	...	...	Bal	Bal	...	Bal
Line input	Bal	Bal	Yes	Bal	Bal	Bal	Bal
Output connection	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Ext hybrid	Xfmr bal
Output impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
Output level	-9dBm	-9	-9	-9dBm	-15	-2	-10

Manufacturer	Comrex Corporation				Gentner Electronics		
Model	2XP/2XR	3XP/3XR	LX/T; LX/R	PLXmicro/TH-X	EFT-1000A ¹	EFT-100 ¹	EFT-3000
Power requirement	120/240Vac	120/240Vac	120Vac	120Vac; ±15Vdc	117/234Vac; dc	117/234Vac	117/234Vac
System receiver	2XR	3XR	LX-R	TH-X	EFT-1000A	EFT-100	EFT-3000
Packaging	Rack mount	Rack mount	Rack/Table	Rack-mount	Portable	Rack/Table	Rack/Table
Power requirement	...	120/240Vac	...	...	117/234Vac	117/234Vac	117/234Vac
Telco connection	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal	Ext hybrid	Xfmr bal
Telco input level	-40; +8	-40; +8	-40; +8	-40; +8	-30; +17	-20; 0	0
Telco impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
AF output connection	Act bal	Act bal	Act bal	Act bal	Act bal	Act bal	Act bal
AF output impedance	600Ω	...	600Ω	600Ω	600Ω	600Ω	600Ω
AF output level dBm	0	0	0	0dBm	0	-10; 0	10
Reader Service No	855	856	857	858	859	860	943

¹ Transceiver.

Manufacturer	Gentner Electronics	Kahn Communications	Rood Megatronics BV			
Model	EFT-900A ¹	LPGP-1	BAX 110	BAX 111 ²	BAX 112	BAX 2010 ³
System type	1-line	2-line	2-line	1-/2-line duplex	1-line	2-line
Offset line 1 Hz	250	...	350/2.1k	350/2.1k	350	350/2.1k
Translation error	±0Hz	0%	±0.5Hz	±0.5Hz	±0.5Hz	±0.5Hz
Processing analog/digital	Digital	Analog	Anal & Dig	Anal & Dig	Anal & Dig	Anal & Dig
AF response dB/Hz	0.5 50-3.5k	50-5k	1.50-4.95k	1.50-4.95k	1.50-3.05k	1.50-4.95k
Compression/expansion	Yes	Yes	Yes	Yes	w/auto EQ	Yes
System transmitter	EFT-900A	LPGP-1-T	BAX 110/m	BAX 111/m	BAX 112/m	BAX2010
Packaging	Portable	Portable	Rack/Table	Rack/Table	Portable	Attache case
AF input impedance	150/600Ω	600Ω bal/unbal	600/10kΩ	600/10kΩ	600/10kΩ	600/12kΩ
AF input level dBm	-55; 0	0dBm	±6	±6	±6	±12
Mic input	Bal	Bal/unbal	Bal/unbal	Bal/unbal	10kΩ unbal	Bal/unbal
Line input	Bal	...	Bal	Bal	Bal 600Ω	Bal
Output connection	Xfmr bal	Bal/unbal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal
Output impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
Output level	-15	0dBm	±12	±12dB	-6	12
Power requirement	117/234Vac; dc	115/230Vac	110/220Vac	110/220Vac	6Vdc (4-D)	110/220Vac

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Circle (101) on Reply Card

Telephone Bandwidth Extender

Manufacturer	Gentner Electronics		Kahn Communications		Rood Megatronics BV	
	Model	EFT-900A ¹	LPGP-1	BAX 110	BAX 111 ²	BAX 112	BAX 2010^{3}
System receiver	EFT-900A	LPGP-1-R	BAX 110/d	BAX 111/d	BAX 112/d	BAX 110/d
Packaging	Portable	Rack-mount	Rack/Table	Rack/Table	Rack/Table	Rack/Table
Power requirement	117/234Vac	115-230Vac	110/240Vac	110/240Vac	110/240Vac	110/240Vac
Telco connection	Xfmr bal	Bal/unbal	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr bal
Telco input level	-35; +4	-20dBm	-30; +17	-30; +17	-30; +12	-30; +17
Telco impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
AF output connection	Act bal	Bal/unbal	Act bal	Act bal	Act bal	Act bal
AF output impedance	600Ω	600Ω	600Ω	600Ω	600Ω	600Ω
AF output level dBm	-60; 0	0dB	0; +12	+12	0; +12	0; +12
Mixer feature	...	No	...	...	...	2M/1L
Mixing channels	...	No	...	...	...	3
Reader Service No	944	945	946	947	948	949

²BAX 114/m transmitter offers similar characteristics in a portable configuration operating on 90-270V, 40-400Hz. ³Includes 2-mic, 1-line mixing capability

Audio Distortion Measurement Equipment

Manufacturer	Amber Electro Design		ASACA ShibaSoku			Audio Precision
	Model 3501	Model 5500 ²	AD60A	AD725C	AM508	System One
Auto level set	Yes	Yes	...	Yes	...	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes	Yes
μP-control	No	Yes	Yes	No	Yes	Yes
Auto ranging	No	Yes	Yes	Yes	Yes	Yes
X-Y display output	No	Option	...	No	...	No
Printer-plotter output	No	Option	Option	No	Option	Yes
Automation bus port	No	Yes	GP-IB	Yes	GP-IB	Yes
Audio recorder tests	Yes	Yes	CD spec	No	...	Yes
Transmit-receiver units	Yes	Yes	No	Opt	No	Yes
Portable unit	Yes	Yes	No	No	No	No
AF range (fundamentals)	10-100k	10-100k	10-120kHz	5-110kHz	10-109kHz	10-200kHz
Range (on harmonics)	10-300k	10-500k	...	5Hz-110kHz	to 330kHz	10Hz->500kHz
Input level range	-30/+40dBm	-30/+40dBm	1mV-100Vrms	0.1V-100V	-26.8/+42.2dBm	-90dBu/-140Vrms
Input impedance	100kΩ	100kΩ	200kΩ/100kΩ	100kΩ	2-ch 600Ω	100Ω
Input connection	AB/AU	AB/AU	2-ch Bal/unb	UB	Bal/unb	Bal/Unbal
Fundamental rejection	>100dB	>100dB	>115dB	120dB	>85dB	...
THD minimum	0.0008%	0.001%	<-110dB	0.001% f.s.	0.2%-100%	0.0004% 20-20k
THD accuracy	±1%	±1%	...	...	...	0.5dB
IMD measurements per	SMPTE ¹	SMPTE ¹	...	...	...	SMPTE ³
IMD accuracy	±2%	±1%	...	...	...	±1dB
IMD minimum	0.003%	0.001%	...	...	...	10mV
AC voltage range	<3μ-100V	10μ-100V	30μV-100V	110V-230V±10%	200μV-100V	300μV-160Vrms
Audio noise range	<1μ-100V	<1μ-100V	...	...	-80dB	75μ-160Vrms
Signal generator range	<-60/+28dBm	<-80/+30dBm	No	...	Yes	10Hz-204.775kHz
Generator output	TB/TU	TB/TU	...	...	Bal/unb	Bal/Unbal Xfmr
Frequency counter range	10Hz->500kHz	to 500kHz	Yes	5Hz-500kHz	Yes	10Hz->500kHz
Meters-displays	Mechanical	LED	Dual analog	LED	7-seg LEDs	CRT
Reader Service No	987	988	989	990	991	992

¹ Also per DIN 45045 & CCIF specifications. ² AudioCheck package allows control from PC for automated measurement system. ³ IMD also per DIN 45045/45043; measurements also per CCIR IEC 2683 IHF A202.

Manufacturer	Neutrik			Panasonic	Rohde & Schwarz	
	A1 System	Audiograph 33375	IT402A	VP-7722P	SUN-2 system	UPA analyzer
Auto level set	Yes	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes	Yes
μP-control	Yes	Yes	Yes	Yes	Yes	Yes
Auto ranging	Yes	Yes	Yes	Yes	Yes	Yes
X-Y display output	Yes	Yes	Yes	No	Yes	Yes
Printer-plotter output	Yes	3302 mainframe	Yes	Yes	Yes	Yes
Automation bus port	RS-232	Yes	-488/-232	Yes	Yes	Yes
Audio recorder tests	Possible	Possible	Possible	NA	Yes	Yes
Transmit-receiver units	No	No	No	No	No	No
Portable unit	Yes	Yes	Yes	...	Yes	Yes
AF range (fundamentals)	20Hz-40kHz	20Hz-40kHz	19Hz-21kHz	10-110k	10-100k	10-100k
Range (on harmonics)	to 130kHz	to 200kHz	to 200kHz	to 10th harmonic	...	300k
Input level range	10mV-200V	20mV-200V	30μV-100V	0.05-110Vrms	-84/+32dB	12mV-400V
Input impedance	100kΩ	100kΩ	2 100kΩ	100kΩ	1MΩ	600Ω/10kΩ
Input connection	Act bal	Bal	Bal A/B	BNC floating	TB/unbal	Bal/unbal
Fundamental rejection	...	...	...	>140dB	>65dB	...
THD minimum	0.0025%	<0.005%	<0.01%	0.001%	0.06%	-90/0dB range
THD accuracy	...	±0.5dB	±1.5%	<±2%	±0.1dB	±1dB to 100kHz
IMD measurements per	...	SMPTE, DIN	Options	per SMPTE	DIN method	No
IMD accuracy	...	...	...	±1dB	...	...
IMD minimum	...	<-74dB	...	0.01%	...	...

Manufacturer	Neutrik			Panasonic	Rohde & Schwarz	
Model	A1 System	Audiograph 3337S	TT402A	VP-7722P	SUN-2 system	UPA analyzer
AC voltage range	10 μ V-200V	10 μ V-200V	30 μ V-100V	0.316mB-100V \pm 2%	Yes	10 μ V-300V unbal
Audio noise range	-111dBu residual	Yes	<-106dB min	0-130dB SNR	Yes	0-120dB SNR
Signal generator range	Yes	Yes	Yes	10-110k	SUN-2/S 10-100k	UPA-B6 opt 10-100k
Generator output	<0.2 Ω bal	Bal	Bal	BNC floating	Telco jack	Bal
Frequency counter range	...	Yes	Yes	Yes	...	8-250k
Meters-displays	LCD	LCD	Multi-LED	VU	7-seg LEDs	LED displays
Reader Service No	993	1134	1135	1136	1137	1138

⁵3302 mainframe is required for operation.

Manufacturer	Schmid Telecom- munications	Sound Technology			Tektronix	
Model	SIAT SZ 346/3166	1510A ⁷	1530A analyzer	3200B/3100B ⁹	AA5001	AA501
Auto level set	Yes	Yes	Yes	Yes	Yes	Yes
Auto null set	Yes	Yes	Yes	Yes	Yes	Yes
μ P-control	Yes	Yes	Yes	Yes	Yes	Yes
Auto ranging	Yes	Yes	Yes	Yes	Yes	No
X-Y display output	...	Yes	Yes	Opt	Yes	No
Printer-plotter output	Thermal printer	Yes	Yes	Yes	Yes	No
Automation bus port	RS-232	Opt	Opt	Yes	Yes	No
Audio recorder tests	Possible	Yes	No	Yes	No	No
Transmit-receiver units	Xmt 316/Rcv 346	Yes	Opt	Yes	No	No
Portable unit	Yes	Yes	Yes	Yes	No	No
AF range (fundamentals)	30Hz-20kHz	20-40kHz	20-40kHz	1-102.39kHz	10-100kHz	10-100kHz
Range (on harmonics)	...	315Hz-1kHz	100Hz-5kHz	10Hz-300kHz	to 300kHz	to 300kHz
Input level range	-44dBm/+21dBm	100 μ V-40V	100 μ V-40V RMS	10mV-100V	60mV-200V 100k Ω	60mV-200V 100k Ω
Input impedance	600/10k Ω	100k Ω	100k Ω	100k Ω	100k Ω	100k Ω
Input connection	2 bal	AB	AB	...	AB	AB
Fundamental rejection	...	...	...	...	10dB ¹⁰	10dB ¹⁰
THD minimum	>0.1%	0.05%	0.05% ⁸	0.001%	0.0025%	0.0025%
THD accuracy	...	5%	5%	10%	\pm 10%	\pm 10%
IMD measurements per	Opt SMPTE	..	SMPTE	SMPTE	CCIF/DIN/SMPTE	CCIF/DIN/SMPTE

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Circle (102) on Reply Card

Audio Distortion Analyzers

Manufacturer	Schmid Telecommunications	Sound Technology			Tektronix	
Model	SIAT SZ 346/316 ⁶	1510A ⁷	1530A analyzer	3200B/3100B ⁹	AA5001	AA501
IMD accuracy	...	...	5%	1.0%	±10%	±10%
IMD minimum	...	...	0.1%	0.002%	0.0018%	0.0018%
AC voltage range	-70dBm/+21dBm	300µV-40V	100µV-40V	30µV-100V	-108/+48dBm ±2% fs	-108/+48dBm ±2% fs
Audio noise range	-70dBm/+1dBm	-92/-10dBV	-92/-10dBV	<4µV	-108dBm	-108dBm
Signal generator range	Yes	-80,+30dBm	-80/+30dBm	-90/+30dBm	10-100k 28dBm	10-100k 28dBm
Generator output	Bal<5/600Ω	AB	AB	AB	28dBm Bal	28dBm Bal
Frequency counter range	...	20Hz-40kHz	20Hz-40kHz	10Hz-500kHz	No	No
Meters-displays	LEDs	CRT	CRT	LED	LED displays	LED displays
Reader Service No	1139	1140	1141	1142	1143	1144

⁶SIAT "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. ⁷Audio signal and recording test system; measures 2nd, 3rd harmonics separately. ⁸Measures 2nd, 3rd harmonics separately. Includes precision 10.396Hz for Bessel Null adjustment. ⁹Two-unit package for programmable transmission path tests; transmission package is 3100B programmable generator with LED metering displays. ¹⁰Value is below specified residual THD & noise or actual THD, whichever is greater.

CD Players

Manufacturer	Barco EMT		Denon America	Panasonic Pro Audio		Pioneer
Model	EMT 980	EMT 981	DN-950FA	SL-4300	SL-4700	PD-4300/4350
Configuration	Single player	Single	Single player	Single	6-disc cap.	Single player
Player trays	...	...	1	1	1	1
Programmable events	None	4-event	None	20-event	36 event	Yes
Output connection	Balanced	Balanced	Balanced	Unb	UN	Unbal
Output level	+6dB	+6dB	+4dB	-10dBu	-10dB	1.8V
Digital output	No	Yes 44.1kHz	No	No	No	Coaxial & optical
Digital resolution	16-bit	16-bit	16-bit	16-bit	16-bit	18-bit
Oversampling factor	x2	x4	x4	x4	x4	x4
AF response ±dB Hz-kHz	±0.5 20-19.8k	±0.2dB 40-20k	20Hz-20kHz	±0.5 2Hz-20kHz	±0.5 2Hz-20kHz	-1, +0.5 4-20k
Distortion	0.03%	0.04%	<0.01%	0.003%	0.003%	...
Dynamic range	90dB	98dB	92dB A wtd	94dB	94dB	90dB
Crosstalk (worst case)	-60dB	<-75dB	...	...	...	95dB separation
S/N ratio	+94dB RMS	+105dB RMS	92dB	96dB	96dB	102dB
Access time (worst)	4s	3.5s	3s	...	...	...
Reader Service No	401	402	403	404	405	406

Manufacturer	Pioneer	Studer Revox		TASCAM	
Model	PD-7300 (6300)	A727	A730	CD 401/501	CD 701
Configuration	Single player	Single	Single	Single player	Single player
Player trays	1	1	1	8 or 12mm	8 or 12mm
Programmable events	Yes	No ¹	3-event ¹	via Rmt Ctl	RC-701 unit
Output connection	Unbal	Bal/UB <50xΩ	Bal/UB <50xΩ	Bal XLR	Bal XLR
Output level	2.0V	+15dBm	15dBm	+4dBm	+18dBm max
Digital output	Optical & (coaxial)	Yes	Yes	Yes	Yes
Digital resolution	18-bit	16-bit	16-bit	16-bits	16-bit
Oversampling factor	x8	x4	x4	18-bit x4	16-bit 4x
AF response ±dB Hz-kHz	±0.5 4-20k	±0.1 20-20k	±0.1 20-20k	±3 5-20k	-1 20-20k
Distortion	0.0025% (0.0035%)	0.006%	<0.006%	0.008%	0.008%
Dynamic range	98dB	>100dB	>100dB	96dB	...
Crosstalk (worst case)	106dB separation	<-90dB	<-90dB	92dB	90dB
S/N ratio	110dB (104dB)	>100dB	>100dB	96dB	96dB
Access time (worst)	...	<3s	<3s	<2sec	2s
Reader Service No	408	409	410	411	412

¹A729 CDS series controller may be used with 4 A727 or A730 units for multiple event program.

Intercom Systems, Matrix

Manufacturer	Audio Visual Systemes	Clear-Com Intercom Systems	Heikki Malkki Ltd	HM Electronics		McCurdy Radio Industries	
Model	S70 (\$69)	Matrix Plus	ODDS-Intercom	RP753 station	RP755 station	CS9400+	CS9500
Matrix size range	12 (8-16) sets	50x50	11x11-100x100	6x12	6x12	2x2-25x40	2x2-50x50
# of stations standard	12 max (16 max)	2 expand to 50	30 expand to 300	64 w/call, 200 w/o	64 w/call, 200 w/o	expand >640x640	to >150x150
Status display	None	LCD panel	LEDs	Switch position	Switch position	CRT, LEDs	CRT, LEDs
Party line function	No	Yes	Yes	Yes	Yes	80 lines	16 lines
Programmable grouping	No	Yes	Yes	Yes	Yes	48 lists	6 lists
Configuration storage	No	Yes	Yes	No	No	HD, bus ctrls	EEPROM HD FD MT
Simultaneous conversations	12 (16)	25	110-9000	6	6	Unlimited	Unlimited
System control	...	µP, PC/compatible	µP, PC, terminal	Manual	Manual	HP 9000 #310 32-bit	Integral
	Yes	Yes	Not needed	No	No	3-level	3-level
Station priority	Keyboard	Keypad, keyboard	Keypad/station	Y-Y button	Y-Y button	...	...
Station selection	Keyboard	Keypad, Keyboard	Keypad/station	X-Y button	X-Y button	X-Y/k.pad/kboard	X-Y/k.pad/kboard

Manufacturer	Audio Visual Systems	Clear-Com Intercom Systems	Heikki Maikki Ltd	HM Electronics		McCurdy Radio Industries	
Model	S70 (S69)	Matrix Plus	ODDS-intercom	RP753 station	RP755 station	CS9400+	CS9500
Channel selection	4-wire	Star, twisted pair	Star shielded pair	wire/channel, shielded pair	wire/channel, shielded pair	4-wire, star, 3 pair per station	4-wire, star, 3 pair per station
Wiring (matrix)	...	2-4-wire	...	...	...	...	...
Wiring (party line)	...	Wire/channel Daisy chain Star Shld 2-w	Star shielded pair	Daisy chain, shielded pair	Daisy chain, shielded pair	...	...
Wiring (control)	...	Star	Star shielded pair	...	...	...	...
	...	twisted pair 2-wire	...	...	...	...	...
	Analog	Analog & digital	Analog	Analog	Analog	Analog & digital	Analog & digital
Voice processing	Indirect	Direct/indirect	Indirect	Indirect	Indirect	Direct 4-wire	Direct 4-wire ¹
Camera interface	...	Direct/indirect	Direct	Indirect	Indirect	Direct	Direct
Wireless interface	...	Direct/indirect	Indirect	Indirect	Indirect	Option	Dpton
Telco interface	...	Direct/indirect	Direct	Direct	Direct	80 circuits	24 circuits
IFB interface	...	Direct/indirect	Direct	Indirect	Indirect	48 w/TX ctl lines	8 w/TX ctl lines
2-way radio interface	No	Option	Yes	Yes	Yes	Yes	Yes
Program audio	No	Yes	Not needed	No	No	Yes	Yes
Call waiting	No	Yes	Option	No	No	Yes	Yes
Caller tally	...	...	...	...	...	-wired user stations	-Wired user stations
Reader Service No	416	417	418	419	420	421	422

¹ Controlled 16-camera ISO optional.

Manufacturer	PESA	Philip Drake Electronics		RTS Systems		Ward-Beck Systems	
Model	TB-8000 series	PD 6000 series	PD 8000 series	810-AA (810)	848A	MicroCom II	MiniCOM
Matrix size range	8x8-64x64	16x16-128x128	4x4-24x24	2x2-10x10	2x2-24x24	48x48-960x960	24x36
# of stations standard	Multiples of 8	16 expand to 128	4 expand to 12	2 expand to 10	2 expand to 24	960 max	24 max
Status display	LEDs on panel	LEDs, LCD panel	LEDs	Lighted button	VDT	CRT dot matrix	CRT dot matrix
Party line function	Yes	Yes	Yes	No	Yes	Option	Option
Programmable grouping	Yes	Yes	Yes	No	Yes	Yes	Yes
Configuration storage	Yes	Yes	No	No	Yes	Yes	Yes
Simultaneous conversations	Multiple	As # of stations	Per # of stations	5	14	1/2 matrix inputs	12
System control	Multi-μP, PC	μP PC/compatible	Pin-patch program	.	μP, PC, modem	Integral μP ²	μP, PC/compatible

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Manufacturer	PESA	Philip Drake Electronics		RTS Systems		Ward-Beck Systems	
Model	TB-8000 series	PD 6000 series	PD 8000 series	810-AA (810)	848A	MicroCom II	MiniCOM
Station priority	Panel switch	Keypad, X-Y	X-Y buttons	X-Y button	...	Keyboard, keypad	Keyboard, keypad
Station selection	Panel switch	Keypad, X-Y button	X-Y buttons	X-Y button	...	Keypad	Keypad
Channel selection	Ribbon cable	Star, twisted pair, Wire/channel twisted	Wire/channel twisted	Wire/channel twisted	4-wire	4-wire	
Wiring (matrix)			4-wire	pair, 4-wire	pair	pair	
		Star, twisted pair, Wire/channel twisted	...	Wire/channel	Shielded pair	Shielded pair	
Wiring (party line)	...	4-wire	pair	4-wire	...	shielded pair	...
	Ribbon cable	Star, twisted pair, Wire/channel twisted	...	Shielded pair	2-wire	Shielded pair	
Wiring (control)	...	4-wire	pair	...	...	...	...
Voice processing	Adapter	Direct	Direct	Indirect	Indirect	Direct	indirect
Camera interface	Adapter	Direct	Direct	Indirect	Indirect	Direct	Direct
Wireless interface	Adapter	Indirect	Indirect	Indirect	Indirect	Direct	Direct
Telco interface	Adapter	Direct	Direct	Indirect	Indirect	Direct/indirect	Direct/indirect
IFB interface	Adapter	Direct	Direct	Indirect	Indirect	Direct	Direct
2-way radio interface	Adapter	Yes	Yes	No	No	Option	Yes
Program audio	...	Yes	No	No	Yes	Yes	Yes
Call waiting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reader Service No	423	424	425	425	427	428	429

²System is PC-compatible.

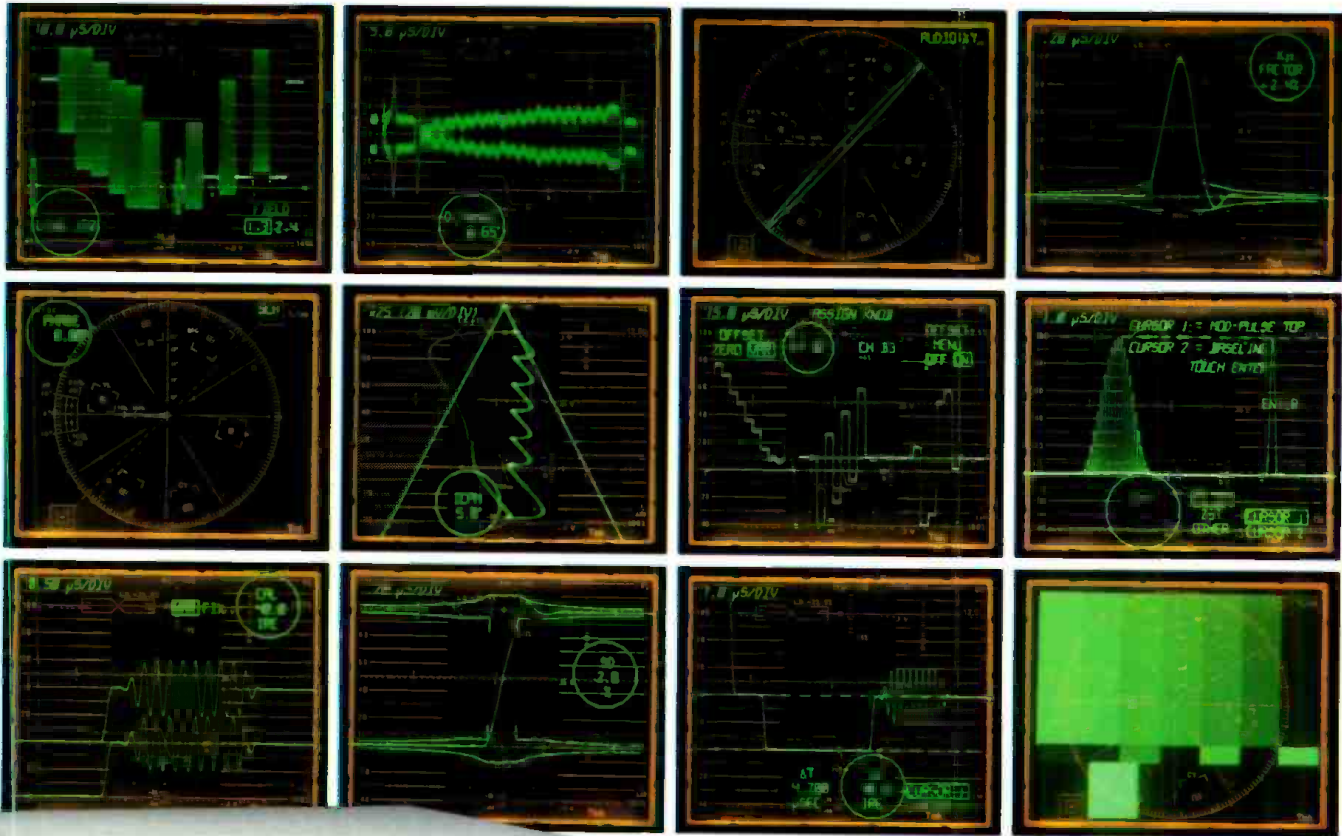
Intercom Systems, Party Line/Conference

Manufacturer	Clear-Com	HM Electronics		Philip Drake	RTS Systems	
Model	Party line series	RP733 (RP735 ²)	RP743 power station	PD 5001	802	810-CL/810-5CTL
Communications line	3-wire shielded Unba	3-wire unbalanced	3-wire unbalanced	4-wire balanced	2-/4-wire balanced	2-wire balanced
Maximum cable length	1 mile	...	...	500 ft	5000 ft	5000 ft
# of stations maximum	100	32 w/call (100 w/o)	64 w/call (200 w/o)	12	30	30
# of channels	Unlimited	2	4	12	12	10
Full duplex capability	Yes	Yes	Yes	Yes	Yes	Yes
AF response Hz/kHz	100Hz-12kHz	120-12k	120-12k	50Hz-8kHz	100Hz-10kHz	100Hz-10kHz
Variable sidetone	Yes	Yes	Yes	...	Yes	Yes
Visual signalling	dc powered	dc powered	dc powered	Yes	ac powered	No
Slate-stage announce	Yes	No	No	Option	Yes	Yes
Selectable program feed	Yes	Yes	Yes	No	Yes	No
Microphone type	Dynamic ¹	Dynamic/electret	Dynamic/electret	Dynamic	Carbon/dynamic	Carbon/cynamic
Remote mic mute	Yes	No	No	No	Yes	Yes
Mic control	PTT/footxch/latch	Latch	Latch	PTT, latch	PTT/latch/footxch	PTT/latch/footxch
Volume control	Conf line/Pgm	Program	Program	Conference line	Conf line/Pgm	Conference line
Camera interface	Option	No	No	Option	Option	No
IFB cue interface	Option	No	No	Yes	Option	No
Telco interface	Option	No	No	Option	Option	No
Wireless interface	Option	No	No	Yes	Option	No
2-way radio interface	Option	No	No	Option	Yes	No
Speaker stations	Yes	Yes	Yes	Yes	Yes	Option
Belt packs	1-/2-channel	1-/2-channel	1-/2-channel	2-channel	...	...
Belt pack weight	0.5 lb	0.69 lbs	0.69 lbs	1 lb	...	...
Reader Service No	431	432	433	434	435	436

¹Electret and carbon options. ²RP735 includes a speaker in the power station.

Manufacturer	RTS Systems			Telex Communications	Ward-Beck Systems
Model	824	Series 17	TW Intercom	IC-2 MAX (BP-1/BP-2)	M8220/PH-2
Communications line	2-wire balanced	2-/3-wire shielded	2-wire unbalanced	2-wire, shielded	2-wire, shielded
	...	unbalanced	...	balanced	unbalanced
Maximum cable length	5000 ft	500 ft	5000 ft	5280 ft	1000 ft
# of stations maximum	50	30	75	50	15
# of channels	24	1	...	...	2
Full duplex capability	Yes	Yes	Yes	Yes	Yes
AF response Hz/kHz	100Hz-10kHz	100Hz-10kHz	100Hz-10kHz	200Hz-20kHz	250Hz-5kHz
Variable sidetone	Yes	Yes	Yes	BP-1/BP-2 units	Yes
Visual signalling	No	No	ac powered	ac powered	No
Slate-stage announce	No	No	Yes	Yes	Yes
Selectable program feed	No	No	Yes	...	No
Microphone type	Carbon/dynamic	Dynamic	Carbon/dynamic	Dynamic/electret	Dynamic
Remote mic mute	No	No	Yes	Yes	No
Mic control	PTT/Latch/footxch	Latch	PTT/latch/footxch	Latch	...
Volume control	Conference line	Conference line	Conf line/Pgm	...	Conf line/Pgm
Camera interface	No	Option	Yes	No	Yes
IFB cue interface	No	No	Yes	No	Yes
Telco interface	Option	Option	Yes	No	Yes
Wireless interface	Option	Option	Yes	No	No
2-way radio interface	Option	Option	Yes	No	No
Speaker stations	Yes	No	Yes	Option	Option
Belt packs	...	1-channel	1-/2-channel	1-/2-channel	2-channel
Belt pack weight	...	0.25 lb	0.75 lb	1 lb	3 lbs
Reader Service No	437	438	439	440	441

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525/59.94/2:1	•	•		
525/59.94/1:1	•	•		
787/59.94/1:1	•			
1050/59.94/2:1	•	•		
1050/59.94/1:1	•	•		
1125/60/2:1	•		•	
625/50/2:1	•			•
625/50/1:1	•			•
1250/50/2:1	•			•
1250/50/1:1	•			•
GBR	•	•	•	•
Y. Pb. Pr	•	•	•	•
Analog	•	•	•	•
Parallel Digital	•	•	•	•

The TSG 1050, TSG 1125 and TSG 1250 generate signals in HDTV as well as lower line rate interlaced formats.* With an optional RAM or PROM board and the SDP 1000, signals can be generated in a wide range of line and field rates. Plus, a programmable zone plate generator is included in the TSG 1001 and is available as an option with the rest of the family.

All in all, once you get the full story from your nearest Tek representative, we think you *will* think again about looking anywhere else!

*TSG 1125 excepted.

RF Transmission & Test/measurement equipment

AM/SW Radio Transmitters

These transmitters use amplitude modulation for standard broadcast (550-1650kHz) or international shortwave (3-30MHz) frequencies. Models with tube-type IPAs are noted with a dagger (†); Units with a separate power supply are indicated with a double dagger (‡). Auto recycling is standard on models rated greater than 1kW. A 50Ω monitor port is available on all systems.

Manufacturer	CCA Electronics			Continental Electronics				
	Model	AM-25000 FHF†	AM10000F ¹	315-R1‡	316F-1	317C-3‡	419F-2 ² ‡	420B ⁴ †‡
Band of service	1.5-10MHz	0.5-22MHz		Broadcast			Shortwave	Shortwave/SSB
RF output	25kW	10kW	5kW	10kW	50kW	250kW ³	500kW	
RF output connection	...	...	1 1/8"	1 5/8"	3 1/8"	75W/300Ω	9" 75Ω/300Ω
Carrier stability	±10Hz	5Hz		±5Hz			±1x10 ⁻⁶ Hz	
Carrier shift	...	3%	2%	<2% 100% mod	<2%	...	<5%	
Modulation maximum	100% 125% pk	125%		125%			100%	
Audio input connection	Bal 600Ω	600Ω		Act bal			Bal/Unbal	
Audio response (dB Hz)	1 50-10k	1.5 50-10k	±1 20-7.5k	1.5 10-15k	±0.5 20-7.5k		±1 50-7.5k	
Audio distortion	<3%	95%	<3% 95% mod	<2% 100%	<3% 100% 50-10k	<2% 100%	<3% 95%	
AM noise figure	60dB	55dB		<60dB unwt'd		<-55dB residual	<-55dB unwt'd	
Final amplifier	4CX20000A	4CX15000A	3CX3000F7	4CX15000A	4CX35000C	4CV250000C	4CV250000B	
Modulator final		4CX5000A	3CX3000F7	Solid-state	3CX3000A	3CW20000A7	2-4CV250000B	
Input AC power	220-440V 3φ	208-380V 3φ		208-250Vac 3φ		460 3φ	4160Vac 3φ	
Power consumption	53kW 95% mod	...	12.8kVA	28.4kW	118kVA	568kW	1075kVA	
Power factor	>0.9 min	...	0.95	0.93	0.95	>0.95	0.9	
System efficiency	...	...	>55%	53%	60%	65-70%	60%
Stereo capable	...	...	...	Yes		...	No
Fault logic	...	Relay	...	Relay		Relay	μP system	
Fault diagnosis	...	No	...	No		...	No	
Floor space used (in.)		76x34	35x34	67x26	144x54	400x72	42m ²	
Reader Service No	1400	1401	1402	1403	1404	1405	1406	

¹Models available at 5kW and 15kW. ²418D-2 rated 100kW has similar characteristics. ³In SSB option, output power is 500kW PEP. ⁴3CW20000A7 with solid-state driver stage as IPA.

Manufacturer	Continental Electronics	Harris Broadcast		ITAME	LPB Inc	Marconi Comm.	
	Model	DX-50 ⁵	Gates Five ⁶	SX-5A ⁷	TAURD S 10 ⁸ †	AM-100P ⁹	B 603B
Band of service	Broadcast		Broadcast		Broadcast	Broadcast	Broadcast
RF output	1kW (10kW)	50kW	500-5.6kW	5.6kW	10kW	100W	1kW
RF output connection	N (1 1/8")	3 1/8 50Ω	7/8"	7/8" 50Ω	1 5/8"	SD-239 UHF 50Ω	6 1/8" 50Ω
Carrier stability	±5Hz	±2Hz typical	±4Hz	±10Hz PLL	±5Hz	±10Hz	±10Hz
Carrier shift	0.5% (2%)	<1%		<2% 100%	<3%	<2%	<5%
Modulation maximum	125%	145% 50kW	130% peak	125%	125% PDM	±125%	100%
Audio input connection	Act bal		600Ω bal		Bal 600Ω	600Ω	Bal 600Ω
Audio response (dB Hz)	±1 20-12k	-0.9, 1 30-10k	±0.5 20-10k	-1.5, 5 20-12.5k	±1 20-10k	±1.0 20-15k	±2 40-10k
Audio distortion	<2% 100%	≤1% 95% mod	<0.8% 95% mod	<1% 95%	<2% 99%	<2%	95% mod
AM noise figure	<-60dB unwt'd	65dB		>60dB	60dB	-55dB	-50dB
Final amplifier	MOSFET modules		MOSFET		3CX10000A7	Solid-state	Solid-state
Modulator final	Solid-state	AM digital		Polyphase PDM	4CX15000A	Solid-state	Solid-state
Input AC power	220Vac 1φ (3φ)		220Vac 3φ	240Vac 3φ	220/380Vac	117Vac 3φ	230Vac 3φ
Power consumption	2.6kW (17kW)	59kW	7.7kW	11.6kW	11kW	400W	3.5kVA
Power factor	...	0.98	...	...	...	0.9	0.9
System efficiency	>57% (75%)	85%	65%	>65%	40%	25%	48%
Stereo capable	Yes		Yes		Yes	Yes	No
Fault logic	Digital	Relay	Solid-state	Relay	μP	Solid-state	relay
Fault diagnosis	Option	Yes	"ColorStat"	μP	Yes	No	Yes
Floor space used (in.)	22x26	120x33	28x30	28x30	45x37	Wall-mount	32x22
Reader Service No	1407	1408	1409	1410	1411	1412	1413

⁵Similar models using digital modulation include: DX-25U at 25kW, DX-10 at 10kW, DX-100 at 100kW. ⁶Gates One 1kW; Gates Two 2.5kW. ⁷Model SX-2.5A at 2.5kW; SW-1A at 1kW. ⁸Systems available at 7kW, 5kW and 2kW available featuring similar characteristics. ⁹Units rated at 5W through 60W available.

Manufacturer	Marconi Communications			Nauteq			
	Model	B6040†	B6126 (6127)	B6140 series ¹¹	AMPFET ND 10 (5)	AMPFET ND1	AMPFET ND50 (25)
Band of service		Broadcast		Shortwave		Broadcast	
RF output	50kW ¹⁰	5W/10kW	300kW (500kW)	3kW	10kW (5kW)	1kW	50kW (25kW)
RF output connection	50Ω/300Ω	50Ω unb	50Ω/300Ω	50Ω unbal	1 5/8± 50Ω	50Ω UB 7/8	3 1/8± 50Ω
Carrier stability	<1 ppm/year	±10Hz		<1 ppm/year		±5Hz	
Carrier shift	<2.5%	<5%	<2.5%	...		<1%	
Modulation maximum	125%	100%		100%	125% at 10kW	125% PDM	125% at 50kW
Audio input connection		Bal 600Ω		Bal 600Ω		Bal 600Ω	
Audio response (dB Hz)	±1 50-6k	±1 50-6k	±1 50-6k	-2, +1 60-6k		±0.5 30-10k	
Audio distortion	4% 90% mod	3% 90% mod	4%	90% mod	2.5% 90%	<1% 95% mod	<1% 95% mod
AM noise figure	<-56dB	-55dB	<-56dB	-55dB		60dB	
Final amplifier	Tetrode	2 4CX5000A	TH 537 (TH 558)	Power tetrode		Modular Solid-state	

Manufacturer	Marconi Communications				Nautek		
Model	B6034 ¹⁰	B6040†	B6126 (B127)	B6140 series ¹¹	AMPFET ND 10 (5)	AMPFET ND1	AMPFET ND50 (25)
Modulator final	Tetrode	Solid-state	TH 555 (TH 581)	Solid-state	IRF 140	IRF 130	TRF 130
Input AC power	230Vac 2φ	380/415Vac 3φ	11kVac 3φ	110-440Vac 3φ	208Vac 3φ	240Vac 1φ	480Vac 3φ
Power consumption	...	30kVA	429kW (...)	...	20kVA	2.14kVA	100kVA
Power factor	...	...	0.9	...	0.98	0.82	0.98
System efficiency	...	...	64%	...	75%	>70%	75%
Stereo capable	Yes	...	No	...	Yes	Yes	Yes
Fault logic	Solid-state	Relay	...	Solid-state	Relay	MOS TTL/Relay	Solid-state
Fault diagnosis	...	...	Yes	...	Yes	Yes	Yes
Floor space used (in.)	3.65x1.54m ²	65x33	72(85)m ²	59x28 (118x40)	48x24	23x24	159x24
Reader Service No	1414	1415	1416	1417	1418	1419	1420

¹⁰ B6035 rated 100kW, B6036 rated 150kW and B6037 rated 200kW are combinations of the B6034 system. ¹¹ B6140 rated 3kW; B6141 rated 7.5kW; B6142 rated 12.5kW

Manufacturer	Nautek	Radio Systems	RF Dynamics	TELEFUNKEN Sendertechnik	
Model	AMPFET P400	TR-20	A-710	S4005 ^{12†}	S4006 ^{13†}
Band of service	Broadcast	Broadcast (LP)	0.1-10MHz	Shortwave	Broadcast/MW
RF output	0.4kW	20W	10kW	500kW	600kW
RF output connection	Type N 50Ω	50Ω	UHF SO-239; ...	50Ω ¹⁰⁰ 230	50Ω ⁸⁶ 152
Carrier stability	±5Hz	±0.002%	±10Hz	...	0.5x10 ⁻⁶ Hz/yr
Carrier shift	<1%	2%	...	...	<3% 1kHz
Modulation maximum	125%	100%	100% 125% pk	...	100%
Audio input connection	600Ω bal	Bal 600Ω	Bal 600Ω	...	600Ω Bal
Audio response (dB Hz)	±0.5 30-10k	1 20-15k	1 50-10k	...	±1 40-4.5kHz
Audio distortion	1% 95% mod	2% 99% mod	2%	<3% 80% mod	<2% 80% mod
AM noise figure	60dB	-60dB	55dB	...	>55dB unwt'd
Final amplifier	TRF 140	Solid-state	4CX5000A	...	TH558
Modulator final	TRF 130	Solid-state	4CX5000A	...	TH558
Input AC power	115Vac	100Vac 1φ	220-440V 3φ	...	400V
Power consumption	0.92kVA	0.1kVA	22kW 95% mod	1103kVA	1253kVA
Power factor	0.8	...	>0.9 min	...	>0.9
System efficiency	65%	27%	...	68%	73%
Stereo capable	Yes	Yes	...	...	No
Fault logic	Solid-state	...	Relay; TTL	...	Solid-state
Fault diagnosis	Yes	No	...	...	Yes
Floor space used (in.)	10.75± in rack	Wall-mount	76x34	...	5.5x5.6m
Reader Service No	1421	1422	1423	1424	1425

^{12, 13} Models S4004, S4003 rated 300kW; S4002, S4001 rated 100kW; TH 573 and TH-555 devices are used; all models use PDM/PANTEL modulation and DAM volume-dependent carrier control for improved efficiency.

FM Exciters & LPFM Transmitters

These units are all designed for 87.5-108MHz operation, each using direct carrier frequency modulation. LPFM units included in this list are those transmitters rated at less than 1kW output.

Manufacturer	BEXT		Broadcast Electronics	C.T.E. Int'l	CCA Electronics	Continental Electronics	Harris Broadcast	ITAME
Model	PTX30 (TEX20)	PTX80	FX-50	S20	FM 20G	802A ²	THE-1	Europa series
Power output range	2-30W	5-80W	3-50W	30W	5-20W	5-50W	3-15W; 3-55W	100-600W
Output connector; Z	50Ω N	50Ω N	50Ω BNC	50Ω type N	50Ω Type N	BNC 50Ω	BNC 50Ω	50Ω Type N
Carrier stability Hz	±500Hz	±500Hz	±300Hz	<0.5ppm var	±500Hz	±250Hz	±300Hz	1.0ppm
Modulation capability	>75kHz	>75kHz	±350kHz	>±75kHz	±150kHz	±200kHz	±200kHz	>±75kHz
Asynchronous S/N	65dB	...	80dB	>65dB	>60dB	73dB	73dB	>65dB
Synchronous S/N	55dB	...	60dB	>60dB	>55dB	65dB	55dB	>65dB
Composite input Z	10kΩ	5kΩ	10kΩ/50Ω	10kΩ	...	5kΩ B/Ub	2kΩ	1kΩ unbal
Composite input level	2.2V _{p-p}	3.5V _{p-p}	3.5V _{p-p}	1V _{p-p}	...	1.25VRMS	1Vrms	3.5V _{p-p}
Composite THD	<0.05% (<0.1)	...	≤0.005%	<0.4%	<0.25%	0.08%	0.08%	<0.5% 30-15k
Composite IMD	<0.05%	...	<0.005%	...	...	0.08%	0.02%	0.02%
Composite response	30-100k ¹	...	±0.025%	...	±1dB 50-100k	±0.1 20-100k	±0.1 30-53k	±0.5 40-15k
Phase response	...	...	±0.1°	...	...	±0.5°	-1, +0.5°	...
Composite group delay	...	...	125ns	...	...	±25ns	...	...
Stereo separation	>45dB (>40)	>40dB	52dB to 15kHz	>45dB	...	50dB	to 50dB	55dB
SCA inputs	3	...	3 unbal BNC	...	...	Two	Bal	...
SCA input Z	10kΩ	...	100kΩ	...	...	15kΩ	600Ω	...
SCA inputs level	2.2V _{p-p}	...	3.5V _{p-p}	...	...	1.25V RMS	10dBm	...
Amplitude response	40k-100k ¹	...	±0.2dB	...	...	40k-100k	±0.5 30-15k	...
Stereo generator	Ext.	TDSS2 opt	FS-30	CS/300; COD250	Available	External	Option	Integral
SCA generator	Ext.	...	FC-30	...	Available	External	Option	...
Reader Service No	1477	1478	1479	1480	1481	1482	1483	1484

¹ 0.8dB for same frequency range for TEX20 unit. ² Model 813A rated 500W LPFM using 802 exciter.

Manufacturer	ITAME	Itelco	QEI Corporation			Rohde & Schwarz		Rood Megatronics
Model	FM900 ³	T 241	#695	BBT500	Model 675 ⁴	SU115	SU155R2	FM-200
Power output range	5-25W	25W	5-20W	600W LPFM	5-20W	10W	50W	2V into 50Ω
Output connector; Z	50Ω Type N	Type N 50Ω	50Ω Type N	50Ω	BNC 50Ω	BNC 50Ω	BNC 50Ω	50Ω
Carrier stability Hz	±250Hz	<±100Hz	±200Hz	±200Hz	±300Hz	...	±1kHz	±300Hz TCXO
Modulation capability	±200kHz	>±75kHz	100%	150kHz pk dev	150kHz pk	>±75kHz	>±75kHz	±200kHz
Asynchronous S/N	>65dB	>60dB	>55dB	>60dB	>55dB	>56dB	>56dB	...
Synchronous S/N	>65dB	>52dB	>55dB	>60dB	>55dB	...	...	...
Composite input Z	>1kΩ unbal BNC	Bal 600/5kΩ	10kΩ	10kΩ	10kΩ	>3kΩ	>3kΩ	Bal/Unbal 22kΩ



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Manufacturer	ITAME	Itelco	QEI Corporation			Rohde & Schwarz		Rood Megatronics
Model	FM90D ³	T 241	#695	BBT500	Model 675 ⁴	SU115	SU155R2	FM-200
Composite input level	3.5Vp-p	-4,12dBm	3.5Vp-p	3.5Vp-p	3.5Vp-p	-6,9,5dBm	-6,9,5dBm	+6dBm
Composite THD	0.09%	<0.07%	0.025%	0.025%	0.25%	≤0.6%	≤0.6%	<0.05%
Composite IMD	...	...	0.025%	...	...	≤0.15%	≤0.15%	...
Composite response	±0.2 30-55k	0.2dB to 100kHz	±0.15 30-75k	±0.5 30-15k	±1 30-15k	≤0.3 to 75kHz	≤0.3 to 75kHz	...
Phase response	...	...	±0.1°	...	...	...	...	...
Stereo separation	>55dB	>50dB to 15kHz	60dB	>60dB	>40dB	>43dB	>43dB	>55dB
SCA inputs	2	Also RDS	3 inputs	3	2	Available	Available	Yes
SCA input Z	>1kΩ	600Ω unb	10kΩ	10kΩ	10kΩ	≥2k unb	≥2k unb	...
SCA inputs level	3.5Vp-p	-10,12dBm	1Vp-p	1Vp-p	1Vp-p	...	...	...
Stereo generator	GE90A	Integral	Any	#772F	Model 772	Integral	GC001	GC003
SCA generator	...	Integral	Any	...	...	Integral	Integral	Option 8
Reader Service No	1485	1486	1487	1488	1489	1490	1491	1492

³Model 20DTA includes stereo generator in stereo version. ⁴675T300 rate 300; 67T150 rated 150W.

Manufacturer	Telefunken Sendertechnik	TEM/Comad	Thomson-LGT		TTC/Television Technology		Varian TVT	Vector Technology
Model	S3233	7P10EZ18	FMT series	FMT100 Ramsès	FM-300J	Model X	1248	FMT-03
Power output range	2-20W	to 1kW LPFM	4W	30-100W LPFM	150-275	1-30W	15-100W	8-30W
Output connector; Z	Type N	7/8" 50Ω	50Ω N	50Ω N	50Ω Type N	50Ω type N	50Ω	50Ω N
Carrier stability Hz	<300Hz	±0.2PPM TXCD	±200Hz/yr	±200Hz/yr	±100Hz	±100Hz	±150Hz	±250Hz
Modulation capability	±120kHz	±75kHz	±150kHz	±150kHz	±500kHz	±500kHz	±150kHz	150kHz
Asynchronous S/N	≥58dB unwt'd	>70dB	>80dB	>80dB	>60dB	80dB	58dB	55dB
Synchronous S/N	≥50dB unwt'd	>70dB	>74dB stereo	>74dB	>60dB	80dB	46dB	...
Composite input Z	600Ω/2kΩ	600Ω bal/unbal	15kΩ bal	15kΩ bal	BNC	10kΩ	...	5kΩ
Composite input level	-4,+9.4	-8	+15dBm	...	6dBm	...	3.5Vp-p	...
Composite THD	≤0.3%	≤0.4%	<0.15%	<0.3%	0.01%	≤0.01%	<0.3%	0.35% mono
Composite IMD	<0.1%	≤0.2%	...	...	0.01%	≤0.01%	<0.3%	...
Composite response	≤0.3dB 75kHz	±0.1 30-30k	±0.3 to 75kHz	±0.3 to 75kHz	±0.5 25-100k	±0.05 20-100k	±0.5% 30-100k	0.1 30-15k
Phase response	...	0°; ±0.02°	...	...	...	...	±0.3°	...
Stereo separation	>40dB	>50dB	>50dB	>50dB	...	...	40dB	50dB 30-15k
SCA inputs	Option	...	Yes	and RDS	...	5 BNC	Yes	3
SCA input Z	...	...	...	15kΩ	...	10kΩ	...	5kΩ
SCA inputs level	...	...	...	6dBm	...	1Vp-p	...	1Vp-p
Stereo generator	Option	Model 7182	Integral	Integral	...	...	Yes	External
SCA generator	Option	...	Option	Option	...	...	Yes	External
Reader Service No	1493	1494	1495	1496	1497	1498	1499	1500

FM broadcast transmitters

These systems are rated power outputs of 1kW or greater. Additional parameters of operation may be found by looking in the chart for the suggested exciter model. All provide a 50Ω output. Models not indicating integral automatic power control are designated with a dagger (†). Those without an integral harmonic filter are designated with a double dagger (‡).

Manufacturer	BEXT	Broadcast Electronics			C. T. E. Int'l	CCA Electronics	
Model	T5000 (15000)	FM-100 (-250) ²	FM-35A (-35B) ³	FM-5A (-5B) ⁴	S 2000 ⁵	FM-1000G ⁶ †	FM-2750G ⁷ ‡
Exciter suggested	TEX20	FX-30	FX-30	FX-30	S20	FM-20G	FM-20G
Output power range	5kW (15kW)	100W (250W)	10-38.5kW	5kW	2kW	5-10.5kW	12.5-30kW
Output connector	1 5/8" (3 1/8")	Type N	3 1/8"	1 5/8"	LC type	1 5/8"	3 1/8"
Typical VSWR	...	1.1:1 max	1.8:1 max	1.8:1 max	Protected	...	...
Auto modulation control	...	...	...	...	Yes	No	No
Integrated remote control	Yes	Yes	Yes	Yes	Yes	No	No
µP diagnostics	No	...	Yes	Yes	Yes	No	No
PA device or	3CX3000A7 ¹	Solid-state	4CX20000C or	4CX3500A	Solid-state	3CX10000A7	3CX20000A7
Tube complement	...	...	8990 tetrode	-tetrode	2-160W and	triode	triode
PA circuit type	Grounded-Grid	...	Folded 1/2-λ cavity	Folded 1/2-λ cavity	8-250W modules	Grounded-grid	Grounded-grid
IPA device	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	3CX800A7	3CX1500A7
Floor space (in.)	23x28	24x31	91x32	35x38	27x20	38x34	38x34
Input ac power needed	240-380Vac 3φ	194/266V	208Y/240D	208Y/240D	220Vac	240V 3φ	240V 3φ
Power consumption (PF) efficiency	<9kVA (24.5)	524W (830W)	51kW (.94PF) 68%	8.3kW (.92PF) 60%	3.9kW 51%	...	...
Reader Service No	1439	1440	1441	1442	1443	1444	1445

¹3CX15000A7. ²FM-300A, 300W. ³FM-20A, 22kW; FM-30A, 20kW; -B models include extended metering; integral envelope detector for measurement of synchronous AM noise. ⁴FM-1.5A, 1.5kW; FM-3.5A, 3.5kW; -B models include extended metering; integral envelope detector for measurement of synchronous AM noise. ⁵VL 5000, 5kW. ⁶FM-1000G, 1.5kW; FM-2500G, 3kW; FM-4000G, 4.8kW; FM-5000G, 5.6kW. ⁷FM-12000G, 13kW; FM-20000G, 22kW; FM-25000G, 30kW; FM-27500G, 30kW.

Manufacturer	Continental Electronics					Harris Broadcast	
Model	814C	814R-1 ⁸	816A	816R-4B ⁹	817A	817R-5B ¹⁰	FM 1FM ¹¹
Exciter suggested	802A	802A	802A	802A	802A	802A	THE-1
Output power range	3.8kW	2.5kW	11kW	27.5kW	to 60kW	70kW	1kW
Output connector	1 5/8"	1 5/8"	3 1/8"	3 1/8"	6 1/8"	6 1/8"	7/8"
Typical VSWR	1.2:1 max	2:1 max	2:1 max	2:1 max	2:1 max	2:1 max	1.5:1
Auto modulation control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated remote control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
µP diagnostics	...	Yes	Yes	...	8-bit	8-bit	...
PA device or	Multiple 700W	5CX1500A	Tetrode	4CX15000A	4CX40000G	9019/YC130	FET modules
Tube complement	Solid-state	...	...	Tetrode	Tetrode	2-tetrodes in	...
PA circuit type	modules.	1/4-λ-cavity	...	Grounded Screen	Class C GS	90° hybrid	...
IPA device	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor space (in.)	38x34	35x24	45x34	72x28	128x40	160x28	23x25



25000J
FM Transmitter

300J
FM Transmitter

Model X
FM Exciter

UHF
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UHF
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1000W UHF
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Manufacturer	Continental Electronics						Harris Broadcast
Model	814C	814R-1 ⁸	816A	816R-4B ⁹	817A	817R-5B ¹⁰	FM 1FM ¹¹
Input ac power needed	220Vac	220Vac	220Vac 3φ	220Vac 3φ	220Vac 3φ	220Vac 3φ s.ps.	220Vac
Power consumption	10.5kW	4.9kW	18.45kW	42kW	94.4kW	108kW	2.9kW
Reader Service No	1446	1447	1448	1449	1450	1451	1452

⁸ 815A system offers similar characteristics with 4CX3500A tetrode final; 5kW output with 9.8kW consumption. ⁹ 816R-2B rated 21.5kW; 816R-3B rated 25kW; using the 816B units in tandem results in 817R-2B 40kW; 817R-3B 50kW; 817R-4B 55kW; all other characteristics are similar. ¹⁰ 816R-5B rated 35kW uses a single 9019/YC130 tetrode with similar characteristics. ¹¹ HT 500FM 500W and HT 250FM 250W available.

Manufacturer	Harris Broadcast			ITAME SA			ITELCO
Model	HT 10FM ¹² ‡	HT 35FM ¹³ ‡	ES-2000 (-1000)	Tauro Mod 10 ¹⁴	Tauro Mod 30 ¹⁶	TFM-3000 (1000)	S233
Exciter suggested	THE-1	THE-1	20W	10W	15W	W	T 241
Output power range	5-10kW	10-35kW	2kW (1kW)	5-10kW	10-30kW	3kW (1kW)	2kW
Output connector	3/8"	3/8"	1/8" (7/16)	1/8"	3/8"	1/8" (7/16)	...
Typical VSWR	1.7:1 max	1.7:1 max	...	Protected	Protected	Protected	...
Auto modulation control	No	...	...	...	...	...	Yes
Integrated remote control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
μP diagnostics	Yes	Yes	...	...	...	...	...
PA device or Tube complement	4CX7500A	4CX20000D	Solid-state V-MOS; 600W modules	4CX-7500A ¹⁵	4CX-20000C	4CX-3500A	Solid-state four 500W FET modules
PA circuit type	1/4-λ cavity	1/4-λ cavity	...	...	...	...	...
IPA device	300W S-S	600W S-S	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor space (in.)	33x34	34x34	24x36	45x38	68x38	31x33	22x30
Input ac power needed	220-380 3φ	220-380 3φ	220Vac	220-380 3φ	220-380 3φ	220Vac	380Vac 3φ
Power consumption (PF)	15.7kW (0.95PF)	52kW (0.95PF)	<4.5kW (<2.3kW)	18kW	43kW	7kW (3kW)	4.5kVA
Reader Service No	1453	1454	1455	1456	1457	1458	1459

¹² Similar models include HT 3.5FM at 4kW; HT 5FM at 5kW; HT 7M at 7kW. ¹³ Similar models include HT 30FM at 30kW; HT 25FM at 25kW; HT 20FM at 20kW. ¹⁴ Tauro 5 at 5kW; Tauro 3 at 3kW; Tauro 1 at 1kW. ¹⁵ Thomson TH341, Philips YL 1631. ¹⁶ Philips YL 1530 also available.

Manufacturer	ITELCO	Marconi	QEI Corporation		RF Dynamics	Rohde & Schwarz	
Model	T224 (T254)	B6526 (-25)	FMO-10000B ¹⁷ ‡	FMO-30000B ¹⁸ ‡	F-712 ¹⁹ ‡	NR 350 T1 ²⁰	NU411 ²¹
Exciter suggested	T 241	Integral	#695 or #675	#695 or #675	FE180 int	SU115/SU155	SU155 R2
Output power range	15kW (30kW)	20kW (10kW)	10kW	10-30kW	1.5-11.5kW	5kW	10kW
Output connector	3/8"	3/8"	1/8"	3/8"	1/8"	1/8"	Dezifix D
Typical VSWR	...	1.4:1	...	...	...	1.5:1 max	≤1.8:1
Auto modulation control	Yes	...	Automod	Automod	...	Yes	Yes
Integrated remote control	Yes	Option	ARC-27 opt	ARC-27 opt	Yes	Yes	Yes
μP diagnostics	Yes	C-MOS logic	Option	Option	...	Yes	Yes
PA device or Tube complement	4CX12000 (4CX20000C)	9011 (8986) Coaxial tetrode	YU148 Triode	3CX15000A7 Triode	YU148 triode	Four VU315 1.5kW PA modules	RS2024CL tetrode
PA circuit type	FET modules	Class C	Grounded-grid	Grounded-grid	Grounded-grid	Solid-state	Grounded cathode
IPA device	Solid-state	200W S-S	Solid-state	3CX3000A7	Opt Tube-type	Solid-state	Solid-state
Floor space (in.)	32x43	42x40	24x30	72x30	38x34	23x40	23x29
Input ac power needed	208/380V 3φ	380-415V 3φ	208-240V 3φ	208-240V 3φ	208 3φ	220/380V 3φ	220/380V 3φ
Power consumption	22 (43)kVA	33kW (17kW)	17kW	50kW	17.2kW	8.86kW	21kVA
Reader Service No	1460	1461	1462	1463	1464	1465	1466

¹⁷ MQ-3500 at 3.5kW; FMO-5000 at 5kW; both include internal low-pass filter. ¹⁸ FMO-20000B at 20kW. ¹⁹ 710 to 10kW; F-550 to 5kW; F-510 to 5kW. ²⁰ NR330 rated 3kW uses 2 modules; NR315 rated 1.5kW uses 1 module. ²¹ Other connectors available upon request. Model NU351 rated 5kW also uses Siemens RS 2024CL tetrode.

Manufacturer	Telefunken Sendertechnik			TEM Technologie Electroniche	Thomson LGT	TTC/Television Technology Corp	
Model	S3185 ²²	S3206	S3217	7P10E218	FMT 2000 S	FM-2500J ²³	FMS-8000 ²⁴
Exciter suggested	S3161	S3161	S3161	07A960 10/14	Integral	Model X	Model X
Output power range	1.5kW	5kW	3kW-10kW	1kW	2kW	15-25kW	8kW
Output connector	...	...	1/8"	7/8"	7/8"	3/8"	1/8"
Typical VSWR	...	...	...	...	1.4:1 max	...	2.1 max
Auto modulation control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated remote control	Yes	Yes	Yes	Yes	Yes/RS-232C	Option	Option
μP diagnostics	Yes	Yes	MCSG5364	...	Yes	...	...
PA device or Tube complement	Multiple SV3169	Four SV3206	RS2032CL	Solid-state	Solid-state	4CX15000A	Solid-state
PA circuit type	500W modules	13kW modules	Single tetrode	500W modules	modules	tetrode	...
IPA device	Solid-state	Solid-state	Grounded cathode	...	Solid-state	...	...
Floor space (in.)	24x24	24x40	24x40	22x25	19x27	35x38	46x31
Input ac power needed	220Vac 47-70Hz	380Vac 3φ	220/380Vac 3φ	220V	220V	240V 3φ	240V
Power consumption	2.5kW	9kW	19kVA	<2.5kVA	4kW	38kW	13kW
Reader Service No	1467	1468	1469	1470	1471	1472	1473

²² S3175 rated 1kW; uses S3169 500W modules. ²³ M-5000J to 6kW; FM-10000J to 11kW. ²⁴ FMS-4000 to 4kW.

Manufacturer	Varian TVT Ltd		Vector Technology
Model	1239 ²⁵ *	1242-1247 ²⁶ †	FMT-3/FMT-5‡
Exciter suggested	1248	1248	FMT-03
Output power range	1kW	1.5kW-10kW	3kW-5kW
Output connector	Type N	1/8"	1/8"
Typical VSWR	...	...	2:1
Auto modulation control	No	No	No
Integrated remote control	Yes	Yes	Yes
μP diagnostics	No	No	No
PA device or Tube complement	Solid-state	Solid-state	3CX3000A7
PA circuit type	330W modules	MRF141G FET modules	Grounded-grd

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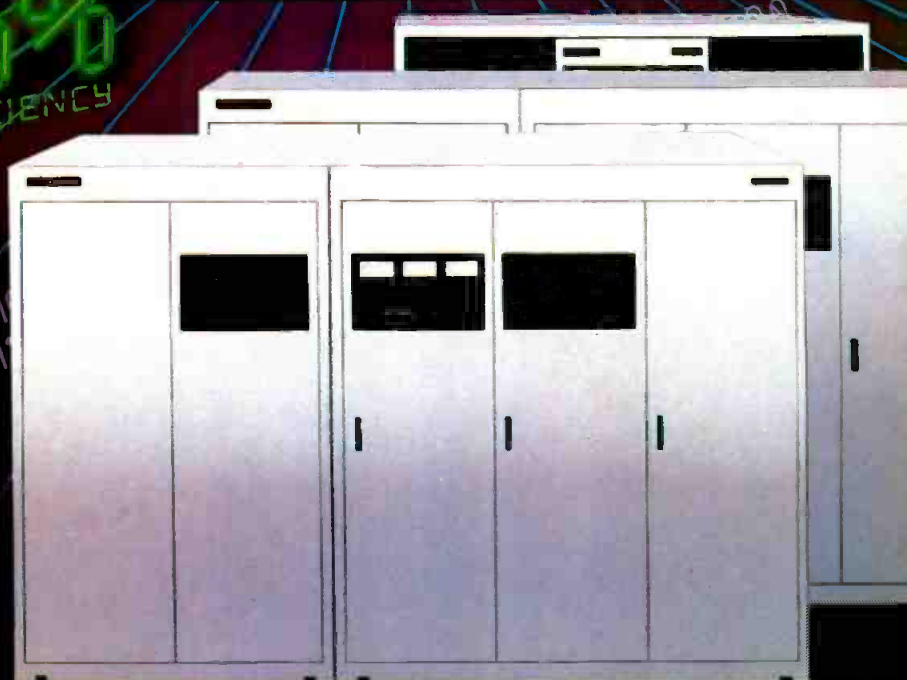
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Manufacturer	Varian TVT Ltd	Vector Technology
Model	1239 ²⁵	1242-1247 ²⁶ †
IPA device	Solid-state	Solid-state
Floor space (in.)	23x29	43x43
Input ac power needed	380/415Vac	190-415Vac 3 ϕ
Power consumption	2.34kVA	3.2kW-21kW
Reader Service No	1474	1475

²⁵1238, 0.5kW; 1237, 300W. ²⁶Six models cover powers 1.5kW, 2.5kW, 3.5kW, 5kW, 7kW and 10kW.

UHF Television Transmitters

These systems are operable on any UHF CCIR IV/V band. All models not marked with a dagger (†) accommodate BTSC stereo aural transmissions; applicability to other systems should be discussed with the manufacturers.

Manufacturer	Acrodyne Industries			BEXT	Comark Communications			Harris Broadcast
	TL series	TR series	TRU/1000 ²	NS 1000†	Klystrode equipped (10kW-360kW)	S-series 10kW-360kW	Solid-state 1kW	TV-UM series
Visual peak power	1kW (100W)	25kW (10/5) ¹	1kW	1kW	2%	3%	5%	60kW (120kW) ³
Carrier level regulation	...	3%	3%	...	...	...	...	3%
Modulation capability	...	3%	...	...	...	97%	...	0%
Response vs brightness	...	±0.75dB	...	...	...	±0.75dB	...	± 0.75dB
Low frequency linearity	...	0.45dB	...	...	...	1.0dB	...	< 1.0dB
ICPM uncorrected	...	±2'	...	...	...	2'	<2'	±2.0'
Diff phase/gain	...	±1.5'/5%	...	<2'/2%	...	±3'/5%	...	3'/<0.5dB
S/N ratio	...	1%	...	70dB	...	55dB	...	55dB
K factor for 2T/12.5T	3%	2%/5%	...	...	...	2%/5%	...	2%/3%
Harmonics below visual	...	-60dB	...	-60dB	...	-60dB	≤-60dB	-60dB
Visual PA device	Solid-state	Tetrode	Solid-state	YL1057	Klystrode	Klystron ext	Solid-state	Klystron MSDC
Aural output power	...	10% of visual	100W	100W	...	10% of visual	100W	12kW (24)
Carrier deviation	...	100kHz	...	...	±25kHz	±75kHz	...	±120kHz
Audio response	...	±0.1 50-50k	...	±0.5 30-15k	...	±0.5 30-15k	...	±0.5 to 110k
Harmonic distortion	1%	0.5%	...	<0.4%	...	0.5%	...	0.5%
AM/FM noise	...	-50dB/-60dB	...	65dB	...	-50dB/-60dB	...	-55dB/-60dB
Aural PA device	Solid-state	Common to visual	Solid-state	Multiplexed	Klystrode	Klystron ext	Solid-state	Klystron MSDC
Cooling method	Forced air	Water (5kW air)	Forced air	Forced air	...	Forced air/water	Forced air	Vapor phase
Input AC power	120Vac (120/230)	208Vac	230Vac	220V	...	480Vac 3 ϕ	230Vac	480Vac ±5% 3 ϕ
Power consumption	4.4kVA (1.2kVA)	46kVA (26/16)	4.4kVA	3.6kVA	...	>70% efficient	...	137kVA (253)
Reader Service No	1376	1377	1378	1379	1380	1381	1382	1383

¹TRU/25k 10kV available with 1kW solid-state driver; 10KVC model uses 400W solid-state driver. ²TLU/1000T available with TCU frequency converter for translator use. ³TV-240UM rated 240kW also available.

Manufacturer	Information Transmission Systems			Marconi Communications	PESA	Rohde & Schwarz	Technologix Midwest	Television Technology
	ITS-220 ⁴	ITS-230 ⁵	ITS-242(-235)	B7540 series ⁶	TT5000 series	NT UHF series ⁷	TX series	Silverline ⁸
Visual peak power	100W	1kW	10kW (5kW)	10kW-60kW	1W-20kW	100W-40kW	30kW-300kW	60-240kW
Carrier level regulation	5%	2%	2%	±1%	≥1%	<0.3dB	±2%	3%
Modulation capability	...	1%	...	3%	1% of sync	>75%	1%	2%
Response vs brightness	±0.7dB	±0.5dB	...	±0.5dB	<5%	<0.3dB	±1dB	1dB
Low frequency linearity	10%	5%	...	95%	<5%	...	10%	0.8dB
ICPM uncorrected	±3'	±2'	...	±4'	...	...	...	3'
Diff phase/gain	±3'/5%	±2'/5%	±1'/5%	3'/0.95	<±3'/<5%	≤3'/5%	±3'/5%	4'/5%
S/N ratio	...	55dB	...	60%	>60dB	>63dB	55dB	50dB
K factor for 2T/12.5T	2%/5%	2%/4%	...	2% for 2T	2%	<2% 20T	2%/5%	2%/2%
Harmonics below visual	-70dB	-60dB	...	-60dB (20mW)	-60dB	≤-60dB	≤-60dB	-65dB
Visual PA device	Solid-state	9017 tetrode	TH582 (382)	Klystron Ext	SS or tube	Per power ⁷	Klystron ext	MSDC Klystron
Aural output power	5W	100W	1kW (500W)	1kW to 6kW	Adjustable	1/10-1/20 visual	Per request	10% of visual
Carrier deviation	...	±75kHz	...	±50kHz	±25kHz/±50kHz	<50kHz	25kHz	±25kHz
Audio response	...	±0.5dB 30-50k	...	±1dB 30-15k	±1dB 30-15k	±0.3 to 60kHz	±0.5dB 30-15k	1 30-15k
Harmonic distortion	...	0.5%	...	0.5%	≤1% 30-15k	<0.4% ±50kHz	<0.5%	1%
AM/FM noise	...	-50dB/-60dB	...	-50dB/-60dB	-55dB/52dB unwt'd	≥46dB/≥56dB	≤-50dB/≤-60dB	-55dB/-55dB
Aural PA device	S-S Int Diplex	Int Diplex	...	SS/Ext Klystron	SS or tube	Per power ⁷	Klystron ext	MSDC Klystron
Cooling method	Convection	Forced air	Vapor & (Air)	Vapor	Forced air	Per PA type	Water/glycol	Vapor
Input AC power	117Vac	208/240Vac 1 ϕ	208/240Vac 1-3 ϕ	380-415Vac 3 ϕ	Per output	220-380Vac 3 ϕ	460-500Vac 3 ϕ	480Vac
Power consumption	0.75kW	5kW 50% APL	26kW (19)	38kW-129kW	...	1.8kVA-119kVA	Per model	100kVA
Reader Service No	1384	1385	1386	1387	1388	1389	1390	1391

⁴ITS-222 available as 100W translator; ITS-210/-212 are 10W transmitter and translator. ⁵Available as ITS-232 1kW translator; ITS-1230 1kW model all solid-state model. ⁶B7545 10/15kW; B7546 20/30kW; B7547 30/45kW; B7548 55/60kW. PAs use solid-state, tetrode or klystron devices, based on power level. ⁷UHF-60S rated 60kW; UHF-120S rated 120kW; UHF-240S rated 240kW.

Manufacturer	Television Technology Corp./TTC			Thomson-LGT	Varian TVT Division			
	UHF-10MA	UHF-30SK	XL 1000U ⁹	EUHF10000 ¹⁰	1740 series ¹¹	1790 series ¹²	Type 1781	VISTA series ¹³
Visual peak power	10kW	30kW	1kW	10kW	10-30kW	60-240kW	10kW	60-240kW
Carrier level regulation	...	3%	...	...	...	...	±2%	...
Modulation capability	...	2%	...	...	...	...	to 0.5%	...
Response vs brightness	...	1dB	...	...	...	...	±1.0dB	...
Low frequency linearity	...	0.8dB	...	5%	...	...	≤0.8dB	...
ICPM uncorrected	...	3'	...	<3'	...	...	≤±3'	...
Diff phase/gain	...	4'/5%	...	±3'/95%	...	...	≤±3'/0.4%	...
S/N ratio	...	>55dB	...	...	...	...	60dB	...
K factor for 2T/12.5T	...	2%/2%	...	±1.5%	...	...	<2%/<2%	...

Manufacturer	Television Technology Corp./TTC			Thomson-LGT	Varian TVT Division			
	UHF-10MA	UHF-30SK	XL 1000U ⁹	EUNF1000 ¹⁰	1740 series ¹¹	1790 series ¹²	Type 1781	VISTA series ¹³
Model								
Harmonics below visual		-65dB		-60dB				-70dB
Visual PA device	Klystron	Klystron ext	TH-347 tetrode	Solid-state	Klystron external cavity		TH382 tetrode	VKP 7990
Aural output power		10% of visual		1kW	1-3kW	6-24kW	1.0kW	6.6-24kW
Carrier deviation	±120kHz		±25kHz	50kHz				>100kHz
Audio response	±0.5 30-15k		1dB 30-15k	±0.5dB 40-20k			0.5dB 30-15k	
Harmonic distortion	0.5%		1%	0.5%			0.5%	
AM/FM noise	-55dB/-60dB		-55dB/-55dB	-50dB			-50dB/-60dB	
Aural PA device	Multiplexed	Klystron ext	Multiplexed	Solid-state	Klystron external cavity		TH327 tetrode	VKP7990 ¹⁴
Cooling method		Forced air		Forced air	Air/vapor		Forced air	Air/water
Input AC power	480Vac	480Vac	230Vac	380Vac	380/415Vac	480Vac	380Vac or 415Vac	480Vac
Power consumption	27kVA	81kVA	4.8kVA	34kVA	28-70kW	140-553kVA	25kVA	76-296kW
Reader Service No	1392	1393	1394	1395	1396	1397	1398	1399

⁹ Available with VHF or UHF inputs for translator; XL 100U rated 100W visual uses MOS devices. ¹⁰ EUNF 5000 rated at 5kW visual; RUHF 500S rated 500W; RUHF 100S rated 1kW with provisions for translator operation. ¹¹ 1740 rated to 30kW; 1741 rated to 15kW; 1472 rated 20-25kW. ¹² 1790 rated 60kW; 1791 rated 120kW; 1792 rated 240kW. ¹³ 1890 rated 60kW; 1891+1890 120kW; 1891+3x1890 240kW; all use MSDC type klystrons. ¹⁴ PT5080 standard klystron may be used in aural service.

VHF Television Transmitters

These systems are designed for use on VHF (CCIR I/III) bands as indicated. Models restricted to Band III are designated with a dagger (†).

Manufacturer	Acrodyne Industries		Harris Broadcast			ITELCO	LDL/LARCAN
	TR series		Platinum HT-LS series			T134 (383A) ^{4†}	TTS22M/TTP44M ⁵
Visual peak power	30kW (20)	10kW (5)	1kW-5kW ¹	10kW-30kW ²	45kW-60kW ³	20kW (5kW)	22kW (44kW)
Carrier level regulation	3%	3%		3%		...	2%
Modulation capability	3%	3%		0%		...	0%
Response vs brightness	±0.75dB			±0.75dB		0.5dB	±0.75dB
Low frequency linearity	0.45dB			<0.5dB		0.5dB	0.5dB
ICPM uncorrected	±2'			±1.5'		...	±1'
DIII phase/gain	±1.5'/3%			1'/3%		≤±3'/4%	±1'/±3%
S/N ratio	1%			55dB		>50dB	55dB
K factor for 2T/12.5T	2%/5%			1.5%/3%		...	1%/3%
Harmonics below visual	-60dB			-70dB		<1mW	-80dB
Visual PA device	Tetrode		Solid-state modules			TH 371 tetrode	MOSFET SS
Aural output power	10% of visual		10% (20% opt)			1/10: 1/20	2.2kW (4.4kW)
Carrier deviation	100kHz		±200kHz			±50kHz	±200kHz
Audio response	±0.1 50-50k		±0.5 to 110k			0.5 40-15k	±0.5dB
Applicable to stereo	BTSC		Yes			...	Yes

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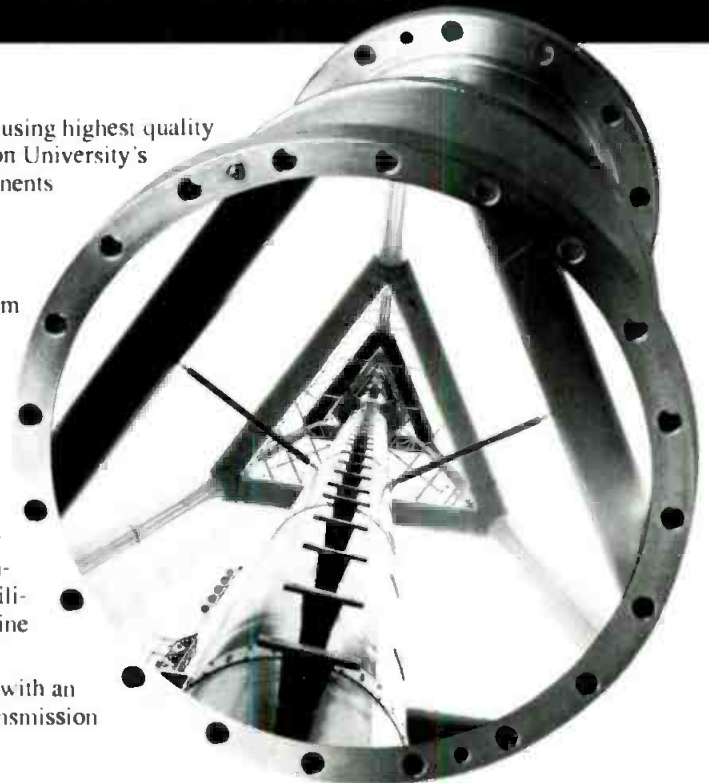
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Manufacturer	Acrodyne Industries			Harris Broadcast		ITELCO	LDL/LARCAN
Model	TR series			Platinum HT-LS series		T134 (383A) ⁴	TTS22M/TTP44M ⁵
Harmonic distortion	0.5%			0.25%		<0.3%	0.05%
AM/FM noise	-50dB/-60dB			-55dB/-70dB		>50dB/>60dB	-60dB/-62dB
Aural PA device	Common to visual			Solid-state modules		Solid-state	MOSFET SS
Cooling method	Forced air			Forced air		Air	Forced air
Input AC power	208Vac			280-415Vac 3φ		380Vac 3φ	208-242Vac 3φ
Power consumption	68kVA (39)	31kVA (21)	5.5-13.2kW	24.4-69kW	93-120kW	41.5kVA	36kW (80kW)
Reader Service No	1361	1362	1363	1364	1365	1366	1367

¹Power levels include: 1LS/IHS 1kW; 2LS/2HS 2kW; 5LS/5HS 5kW. ²Power levels include: 10LS/10HS 10kW; 15LS/15HS 15kW; 20LS/20HS 20kW; 30LS/30HS 30kW. ³Power levels include: 45LS/45HS 45kW; 60LS/60HS 60kW. ⁴T383A high-band with common amplification of visual and aural carriers. ⁵TTS30M rated 30kW, TTS3M rated 3kW.

Manufacturer	LDL/LARCAN	Marconi Communications		PESA	Rohde & Schwarz	Thomson-LGT	Toshiba Corp.
Model	TTS6M/TTS12M	B7530 series ⁶ †	B7530 series ⁷ †	TT5000 series	NT VHF series†	EVHF20000 ⁸	Series 2000
Visual peak power	6kW (12kW)	1kW (2kW/5kW)	10kW (25/30kW)	1W-20kW	100W-20kW	20kW	To 64kW
Carrier level regulation	2%	±1%		≥1%	≤0.3dB	...	≤±2%
Modulation capability	0%	3%		1% of sync	>75%	...	12.5%±2%
Response vs brightness	±0.75dB	±0.5dB		<5%	<0.3dB	...	...
Low frequency linearity	0.5dB	90%		<5%	...	5%	<10%
(CPM uncorrected)	±1'	±4'		...	...	<3'	±2%
Diff phase/gain	±1'±3%	±3'/0.95dB		<±3'/<5%	≤3'/5%	±3'/5%	±3%/±5%
S/N ratio	55dB	60dB		>60dB	>63dB	...	>50dB
K factor for 2T/12.5T	1%/3%	2% for 2T		2%	<2% 20T	±1.5%	<1.5%
Harmonics below visual	-80dB	60dB		-60dB	≤-60dB	-60dB	<-60dB
Visual PA device	MOS FET	Solid-state & tetrode		Solid-state or tube	Solid-state or tetrode	Solid-state	RF MOSFET array
Aural output power	600W (1.2kW)	0.1kW (.2/5kW)	1kW (2.5/3kW)	Adjustable	1/10-1/20 visual	2kW	10%-20% visual
Carrier deviation	±200kHz	±50kHz		±25kHz±50kHz	≤50kHz	50kHz	±100kHz
Audio response	±0.5dB	±1 30-15k		±1dB 30-15k	±0.3dB to 60kHz	±0.5dB 40-20k	±0.5dB 30-15k
Applicable to stereo	BTSC	Yes		Dual carrier	Qual carrier	Yes	BTSC
Harmonic distortion	0.05%	0.5%		≤1% 30-15k	≤0.4% ±50kHz	0.5%	<0.5% 30-15k
AM/FM noise	-60dB/-62dB	-50dB/-60dB		-55dB/52dB unwt'd	≥46dB/≥56dB unwt'd	-50dB	>50dB/>60dB
Aural PA device	MOSFET	Solid-state & tetrode		Solid-state or tube	Solid-state or tetrode	Solid-state	RF MOSFET array
Cooling method	Forced air	Forced air		Forced air	Per PA type	Forced air	Forced air
Input AC power	380-440Vac 3φ	380-415Vac 3φ		Per output	220-380Vac 3φ	380Vac	220Vac 3φ
Power consumption	9.5kW (17.5kW)	4.9 for 1kW	59.5kW for 30kW	...	1kVA-52kVA	36kVA	...
Reader Service No	1368	1369	1370	1371	1372	1373	1374

⁶All units high-band; B7530 1kW; B7531 2kW; B7532 5kW. ⁷All units high-band; B7533 10kW; B7536 25/30kW. ⁸EVHF 5000S rated 5kW; EVHF 10000S rated 10kW.

Vectorscope

Transmission standards are abbreviated N NTSC, P PAL, S SECAM; variants of the standards are noted, for example, "PAL-N".

Manufacturer	Electronic Visuals ¹	Hamlet Video ²	Hitachi	Leader Instruments			Magni Systems
Model	EV4021	HVI 203 VIDEO ³	V-069 (-069)	5850C	5851V	5854	VS 530/531
Display size	8x10cm	128 linesx8.5μs	6" (3.5")	8x10cm	8x10cm	2.75" diagonal	4x3.25
Graticule	Internal	Electronic	Internal	Int/ext	Internal	Internal	Internal
Waveform mode	No	Yes	No	No	No	No	No
Standards	NTSC; PAL-M	N; P; S	N; PAL avail.	NTSC	PAL	NTSC	NTSC; PAL
Function control	Manual	Manual	Manual	Manual	Manual	Manual	Man, WFM530/560
Integral calibrator	No	Yes	Yes	Yes	Yes	No	Test mode
# composite inputs	A	B	2	2	...	2	2
Subcarrier reference	Yes	A/B/Black	A/B/ext.	A/B/Black	A/B/Black	A/B	A/B/C/ Black
Sync reference	A/B/Black/Composite	A/B/Black	A/B/ext.	A/B/Blackburst	A/B/Blackburst	A/B	A/B/C/ Blackburst
Display reference	A/B/Ext	A/B/Ext	A/B/Ext.	A/B/Ext	A/B/Ext	A/B	A/B/C /External
Diff phase/gain measurements	2'/2%	1'/1%	±1' phase	1'/1%	1'/1%	1'/1%	2'/2%
VITS line select (range)	No	Full line range	No	Yes ⁴	Yes ⁴	No	Yes w/WFM 530/560
Luminance measurements	No	Yes	No	No	No	No	No
Reader Service No	1187	1188	1189	1190	1191	1192	1193

¹Represented in US by Broadcast Video Systems. ²Represented in US by BPI Group/Brabury PortaPattern. ³Unit displays vectorscope and waveform patterns on standard video monitor; freeze, store functions; dual standard opt.; outputs can be recorded or transmitted; expanded mode to 512 linesx34μs. ⁴Determined by companion line select waveform monitor.

Manufacturer	Magni Systems	Philips Test & Measuring/BTC		Systems Video	Tektronix	Videoetek
Model	VS 560/561	PM5667	PM5668	1255	1720 series	VSM-60
Display size	4x3.25"	8x10cm	8x10cm	10x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	Internal	Internal	Internal	Internal etched
Waveform mode	No	Vector; δφ	Vector; δφ; SC/H φ	No	Stereo audio phase	Vector only
Standards	NTSC, PAL	N, P-G/-M/-N	N, P-G/-M/-N	N, PAL-M	N, P	N, P/-M
Function control	Man/WFM530/560	Manual; remote	Manual; remote	μP control panel	μP control	Manual
Integral calibrator	Test mode	Yes	Yes	Yes	Yes	Yes
# composite inputs	6 composite ⁵	A/B	2	A/B	A/B	2
Subcarrier reference	A/B/C /Black	A/B/Blk CompSync	A/B/Blk/CompSync	A/B/Ext Int	Ext ref	A/B/Sync
Sync reference	A/B/C /Blackburst	A/B/Blk CompSync	A/B/Blk/CompSync	A/B/Ext Int	Yes	...
Display reference	A/B/C/Ext	A/B/External	A/B/External	A/B/Ext Int	Int; Ext	A/B/Ext
Diff phase/gain measurements	<1'/<1%	0.2'	0.2'	to 0.05'/0.05% ⁶	2'/2%	±10'/±10%
VITS line select (range)	w/WFM530/560	from 5665 WFM		...	From 1730 WFM	No
Luminance measurements	No	No	No	No	No	No
Reader Service No	1194	1195	1196	1197	1198	1199

⁵Or component inputs. ⁶With 1407 δφ/δG measurement option.

Waveform Monitors

Units with a dagger (†) are capable of indicating audio stereo phase.

Manufacturer	Electronic Visuals ¹			Hamlet Video ²	Hitachi	Leader Instruments			Magni
Model	EV4042 (EV4031)	EV4050 Component	EV4061 combo	HVI 204 ³	V-079 (-099)	5860C (5860H)	5864 (5865)	5870 (5871) ⁵	WFM 530
Display size	8x10cm	8x10cm	8x10cm	128 linesx8.5µs	6" (3.5")	8x10cm	2.75" (8x10cm)	8x10cm	4x3.25"
Graticule	Int. Illum	Internal	illuminated	Internal	Internal	Int illuminated	int (illuminated)	Int illuminated	Int illuminated
Standards supported	N, P/-M, S	N, P, S	N, P/-M, S	N, PAL/-M, S	N, PAL avail.	NTSC	NTSC	N, (PAL)	N, P, S
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes	No (Yes)	Yes	Y
Vertical response	Chroma, LP, 8G, Linearity, Flat	Chroma, LP, Flat Linearity.	Chroma, LP, Flat, 8G	Chroma, LP, Flat, 8G	Flat, IRE, Chroma, 8G	Chroma, LP, Flat, 8G, Linearity ⁴	LP, Flat, (Chroma, 8G)	Chroma, LP, Flat, 8G	Chroma, LP, Flat
Time bases	H 2H 2Hx V 2V 2Vx	H 2H 3H V 2V 3V	H 2H 2Hx V 2V 2Vx	H 2H 2Hm 3H V Vm	2H 2V	H 2H 2Hm V 2V 2Vm	2H 2V (H 2Hm V 2Vm)	H 2H 2Hm V 2V 2Vm	H 2H 2Hm 2V 2Vm
Time base magnification	1µs; 200µs/div	x5; x50	Yes	x3	2V Mag; 1µs/div	x10 H; x20V	(x10 H; x20V)	x10 H; x20V	x10 (H/2H) x25(2V)
RGB-YRGB displays	Yes (No)	Yes	Yes	Also YUV; YC	Yes/YRGB opt.	Yes	No (Yes)	Yes	Yes
DC restore	Back porch	Back porch	Back porch	Back porch	Yes	Back porch	Back porch	Back porch	Back porch
VITS line select	7-22 (No)	No	No	2-line	Yes	No (Yes)	No (Yes)	Yes	Yes
Programmable	No	No	No	No	No	No	No (Yes)	Yes	Yes
Remote control	No	No	No	Yes	...	No	No	Yes	Yes
Composite inputs	Yes	Yes	A/B	Yes	A/B	Yes	Yes	Yes	Yes
Component inputs	No	YCrCb	No	Yes	RGB	No	No	No	Yes
Line strobe pulse	No	No	No	...	...	No (Yes)	No (Yes)	No	No
Vectorscope function	No	Component	Yes	Yes	No	No	No	Yes	No
Waveform comparison	No	Superimposed	No	Yes	No	No	No	Yes	Yes
Reader Service No	1200	1201	1202	1203	1204	1205	1206	1207	1208

¹Represented in US by Broadcast Video Systems. ²Represented by BPI/Brabury PortaPattern. ³Generates waveform and vectorscope patterns for display on standard video monitor; expanded 512 linesx34µs. ⁴5860H does not include Linearity response or 1-line H or 1-line V timebase. ⁵Also performs SC/H measurement, simultaneous A/B signal displays and full line select; model 5872 uses same specifications as 5870, 5871 but without SC/H measurement, simultaneous A/B display and full line select.

Manufacturer	Magni Systems		Philips Test & Measuring/BTC ⁶			Systems Video ⁹	Tektronix		
Model	WFM 560/561	WV 560/561	PM5661 Combo (5662)	PM5664 Component	PM5665	1258	1480 series	1710B series†	1730 (1730-HD/D2) ¹⁰
Display size	4x3.25"	4x3.25"	8x10cm	8x10cm	8x10cm	10x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal illuminated		Internal	Internal electronic	Internal	Internal	Int	Ext	Internal
Standards supported	N, P, S	NTSC, PAL	NTSC, PAL	RGB, YCrCb, YIO ⁷	NTSC, PAL	N, P/-M	N, P/-M, S	N, P	N, P (multistd)
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Circle (116) on Reply Card

Manufacturer	Magni Systems			Philips Test & Measuring/BTC ⁶			Systems Video ⁹	Tektronix	
Model	WFM 560/561	WV 560/561	PM5661 Combo (5662)	PM5664 Component	PM5665	1258	1480 series	1710B series†	1730 (1730-HD/D2) ¹⁰
Vertical response	Chroma, LP, Flat	Chroma, LP, Flat, 8G	Chroma, LP, Flat, 8G, 8ø Linearity	LP, Flat	Chroma, LP, Flat, 8G, Linearity	Flat, LP, Chroma, Linearity	Flat, chroma, LP, IRE, 8G	LP, Flat	Flat, LP, chroma, (30MHz, 2-trace filter)
Time bases	H 2H 2Hm 2V 2Vm	H 2H 2Hm 2V 2Vm	H 2H 2Hx V 2V 2Vx	H 2H 3H V 2V 2Vx	H 2H 2Hx V 2V 2Vx	H/V 2H/V 5H/V 10H/V	H 2H 2Hm V 2V 2Vm	2H 2Hm 2V 2Vm	H 2H 2Hm 2V 2Vm/2
Time base magnification	x10 (H/2H); x25 (2V)	x10 (H/2H), x25 (2V)	x10; x20	x10; x25	x10; x20	...	x5 10 20 25 50	x10	x10; 20, 25
RGB-YRGB displays	Yes	Yes	Yes	RGB only	Yes	Yes	Yes	No	Yes
DC restore	Back porch	Back porch	Back porch/ sync	Back porch/black	Back porch/sync	Yes	Back Porch, Sync	Back porch	Back porch
VITS line select	Yes	Yes	Any line	Any line	Any line	Yes	1L & 15L	None	Any (& 14-line)
Programmable	Yes	Yes	No	Yes	No	Yes	No	No	Yes
Remote control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Composite inputs	Yes	Yes	Yes	No	Yes	A/B	A/B/Aux	A/B	A
Component inputs	Yes	Yes	No	Yes	No	...	...	No	3 each/A/B
Line strobe pulse	No	No	Yes	No	Yes	...	Yes	No	Yes
Vectorscope function	Yes	Yes	Yes (w/SC-H ø)	Yes ⁹	No	No	No	Burst phase	No
Waveform comparison	Yes	Yes	Yes	Overlay	Yes	Overlays	Overlay/parade	No	Parade/overlay
Reader Service No	1209	1210	1211	1212	1213	1214	1215	1216	1217

⁶Represented in US by BTC Test & Measurement Inc. ⁸Star mode, Gamut, RGB out. ⁹Represented in US by A.F. Associates ⁷Also accepts Betacam and M-II inputs. ¹⁰D-2 model for digital D-2 signals; 10ns/div and 1-/2-/3-line rates included for -HD.

Manufacturer	Tektronix				Videotek		
Model	1740 series	1750 series combo	1780R series combot	WFM 300A	TSM-50	TSM-60	TVM-620
Display size	8x10cm	8x10cm	2 8x10cm	8x10cm	8x10cm	8x10cm	8x10cm
Graticule	Internal	Internal	Ext/Int/elec	Elect 1% accuracy	Internal	Internal	Internal
Standards supported	NTSC; PAL-M	NTSC, PAL	N, P	525/60 625/50 RGB	N, PAL-M	NTSC, PAL-M	NTSC; PAL-M
Internal calibrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vertical response	Flat, IRE, Luma, Chroma		Chr, LP, Flat, Luma, 8-step ¹	Lightning, Bowtie, LP	Chroma, LP, Flat	Chroma, LP, Flat, 8G	Chroma LP Flat
Time bases	H 2H 2Hm: V 2V 2Vm		H 2H 2Hm V 2V 2Vm	H 2H 2V 2Vm 8-step	2H 2Hm 2V 2Vm	H 2H 2Hm 2V 2Vm	
Time base magnification	x10 20	x2 10 20 50	x5 10 20 25 50 100	x20	x20	x20	x5V, x10H
RGB-YRGB displays	Yes	Yes	Yes	Yes	No	Yes	Yes
DC restore	Back porch: sync tip	Back porch: sync tip	Back porch Sync tip	Back porch	Back porch	Back porch	Back porch
VITS line select	Internal jumper set	8-23; 6-21; 319-334	1H or 15H	Any line	No	Yes	No
Programmable	All functions	All functions	Yes	...	No	No	Yes
Remote control	Yes	Yes	RS-232/-422	Yes	No	No	No
Composite inputs	A/B	A/B	A/B1/B2/B3 ¹²	Yes	Yes	Yes	3
Component inputs	No	No	A/B1 B2 B3	RGB; YCrCe ¹³	No	No	No
Line strobe pulse	...	Yes	Yes	Any 2; any 15	No	No	Yes
Vectorscope function	ø in R-Y mode	w/SC/H ø	Yes	Yes	No	No	Yes
Waveform comparison	Parade display	Overlay Vctr/Wfm	Overlay & Parade	Overlay & parade	No	No	Yes
Reader Service No	1218	1219	1220	1221	1222	1223	1224

¹¹SCW polar display, Diff Phase, Diff Gain. ¹²Auxiliary in/out. ¹³Transcoders for YIQ, YCrCe available.

Television Demodulators

Manufacturer	Barco Industries	Hans Plisch	Philips T&M/BTC	Rohde & Schwarz	Tektronix	Telemet	Videotek
Model	VSD 1000 ¹	FME 488/499 ²	PM 5560 ³	EMFT	1450-1	5401-B series	DM-141S
Serviceband	VHF, UHF	VHF	UHF	VHF, UHF, IF, CATV	VHF UHF IF	V/UHF IF CATV	IF
CCIR designations	CCIR I-IV	III	IV/V	CCIR I-V	Band I/III/IV/V	CCIR I-V	CCIR I/III/IV/V
Channel select	Xtal or PLL	PLL	PLL synthesized	Xtal, PLL, D/C	Fixed & tunable	Xtal, converter	Synthesized
RF input impedance	75, 50 opt.	50Ω	50Ω	50/75Ω	50Ω	50/75Ω	75Ω
Direct input range	-30/+30dBmV	...	3V max	0.5-100mV	80μV-5V	500mV	...
Offair input range	300μV-30mV	30-126μV	>100mV	0.5-100mV	80mV-5V	5-50mV	100μV-630mV
IF input range	0-40dBmV	...	70mV ±3dB	5-100mV	80μV-22mV	N.A	...

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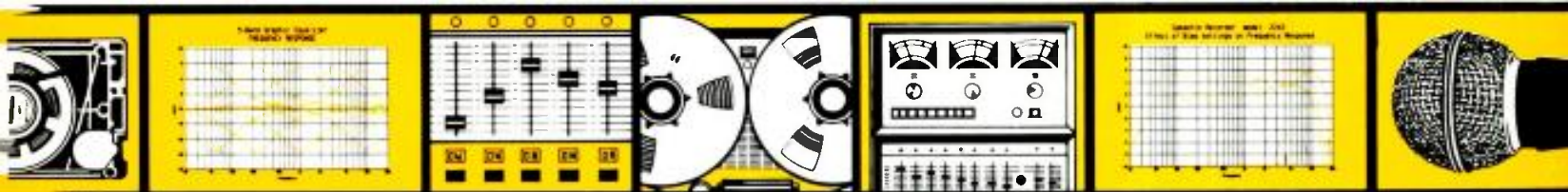
Circle (118) on Reply Card

Manufacturer	Barco Industries	Hans Plisch	Phillips T&M/BTC	Rohde & Schwarz	Tektronix	Telemet	Videotek
Model	VSD 1000 ¹	FME 488/499 ²	PM 5560 ³	EMFT	1450-1	5401-B series	DM-141S
Input level indicator	4-LED ladder	LED	Analog meter	Yes	LED display	Meter	No
Inter-carrier input	...	...	Yes	Yes	50Ω	No	...
Split carrier mode	...	...	Yes	Yes	Yes	Yes	Yes
Zero-carrier reference	Yes	...	In/Ext	Internal	Int	ext	Internal
Envelope detector	Yes	Yes	Yes	Yes	Yes	Nes	No
Synchronous detector	Yes	Yes	No	Yes	Yes	Yes	Yes
Quadrature detection	...	...	Yes	Yes	Yes	Yes	No
Aural signal reject	Yes	...	Yes	Yes	Yes	Yes	No
SAW filter design	Yes	Yes	No	Yes	Yes	μP	Yes
# video outputs	2	1	3	1	2 75Ω	Yes	2
Aural deviation out	Yes	Yes	75kHz	±25kHz	50mV/kHz 600Ω	75kHz	No
Audio line out	2-line	+6dBm±0.5dB	0-6dBm var.	Yes	...	+3dBm	+4dBm
Speaker out	2-speaker	Yes	...	Yes	Yes	No	Yes
Video clamp position	...	Sync	back porch	Backporch/sync	Backporch	Sync	blank
Carrier failure alarm	Yes	...	Yes	Yes	...	Yes	No
Modulation fail alarm	Yes	...	No	Yes	...	Yes	No
Stereo audio type	Dual channel	Dual carrier	BTSC/dual aural/Nica	BTSC & dual sound	BTSC system	BTSC	BTSC
Reader Service No	792	793	794	795	796	797	798

¹ Available for I and BG (dual carrier stereo). ² Base unit contains picture CRT; modules permit measurement of TELETEXT; for G/B/I standards. ³ Accepts BTSC dual aural and Nica type signals form stereo audio.

AM Modulation Monitors

Manufacturer	Belar Electronics Laboratory		Broadcast Electronics	Harris/Broadcast Division	ITAME	Motorola	TFT Inc
Model	AMM-2B (-3)	AMM-3V	AS-10	AM-90	Mod AM 90A	1410 AM/Stereo	753/755A
Frequency range	200k-160MHz		530-1620kHz	450kHz-30MHz	530k-4MHz	530-1620kHz	500kHz-4MHz
Off-air RF range	100μV-300mV w/RFA2	...	500mV-15V RMS	Uses ext RF amp	1-10Vrms	...	100μV-10V
Direct input range	5-10Vrms		...	1-10Vrms	...	500mV-15V RMS	1-10V 50Ω
Input attenuator range	Continuous		0-30dB+AGC	0/+50dB 10dB steps	0-50dB	0-30dB 5 steps	0/+50dB 10dB steps



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Circle (120) on Reply Card

Manufacturer	Belar Electronics Laboratory		Broadcast Electronics	Harris/Broadcast Division	ITAME	Motorola	TFT Inc
Model	AMM-2B (-3)		AS-10	AM-90	Mod AM 90A	1410 AM/Stereo	753/755A
Modulation range	0-133%		0-133%	0-140%	0-133%	-0	+133%
Peak modulation indicator	Adjust (Program)	Programmable	Autoranging	Adjustable	LEDs	Adjustable	Adj & 100%/125%
Peak flasher accuracy	2% (1%)	1%	...	±1%	...	2%	±10%
Audio output level	+10dBm 600Ω		2.45VRMS	+10dB 600Ω	10dBm	10dBm 600Ω	0dBm
Audio output connection	Unbal active	Bal Xfmr	600Ω bal	Bal	600Ω bal	Active balanced	Bal/Unbal
AF response (mono) ±dB Hz-kHz	±0.5dB 20-25k		...	0,-0.5dB 20-20k	±0.5 20-25k	±2dB	30-20k
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		Analog meters	Neon bar graph	Analog meter	Analog meter	Analog meter
Oscilloscope test output	Yes	Yes	Possible	Yes	...	Yes	No
Remote metering output	Yes	Yes	Possible	Yes	...	Yes	Yes
Failure alarms	Carrier off; modulation opt.	±30% carrier; modulation opt.	...	Carrier off; modulation low	Carrier fail.	...	Carrier off; Modulation low
Reader Service No	1225	1226	1227	1228	1229	1230	1231

FM Modulation Monitors

Manufacturer	Belar	QEI	TFT Inc	
Model	FMM-2	Model 691	844A	884
RF channel selection	Xtal (Opt presets)	PLL	Preselector	Preselector
Off-air RF range	50μV-300mV	3.16-80mV	250μV-100mV	50μV - 100mV
Direct input range	1V-10V	1mW-50W	100mV-10V	0.5mV-100mV
Input attenuator range	Continuous	...	0/-50dB 10dB sterep	
AGC circuitry	Yes	...	Yes	Yes
Modulation range	0-133% on meter	0-133%	0,+133%	
AF response (meter) ±dB Hz-kHz	±0.1 10-100k	0.2 30-75k	±0.25 50-15k	
Peak mod. adjustment range	199%	0-199%	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 (out) ±dB Hz-kHz	±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 (mono)	90dB	>75dB	75dB	70dB
Composite output V	1.5Vrms 75kHz dev	1V p-p	5Vrms 75kHz dev	50Vrms 75kHz
Meter display types	Analog	Dual analog	Analog meter	Analog meter
Modulation alarms	Yes	Yes	Yes	Yes
Stereo monitor	Options	...	Yes	No
SCA monitor	FMS-2, 4-channel	Integral	Dual TFT 845	
Reader Service No	1232	1233	1234	1235

TV Aural Monitors

Manufacturer	Belar	Tektronix	TFT Inc	
Model	TVM-101 (TVM-100)	751 BTSC	701 (Mono) ²	850
RF range-channel	Any per request	Any US TV channel	Ch 2-83 (UHF/VHF)	Ch2-38 UHF/VHF
Off-air RF range	200μV-1V 50Ω	from 1450-1 demod	250μV-5mV 75Ω	200μV-5mV 50Ω
AGC circuitry	Yes	per Demod	Yes	Yes
Modulation range	0-133% on meter ¹	100% 73kHz max	0/133%	0/133%
AF response (meter) ±dB Hz-kHz	±0.1dB 10-100k	±0.7kHz 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 Hz-kHz	±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	1.5V 75Ω 75kHz dev	No	...	1.5V 75Ω
Meter display types	Analog (& digital)	EL bar graph	...	Analog meter
ATS compatible	Yes	...	No	Yes
Oscilloscope output	Yes	...	No	Yes
Carrier alarms	Low level	Loss/unlocked pilot	Off frequency	Low level/lost of lock
Modulation alarms	Mod loss option	Stereo phase reverse	Loss of modulation	Loss of modulation
Stereo monitor	TVM-210	Integral	No	Integral
SCA monitor	SCM-2 4-channel	SAP/PRO integral	Single	Option TFT855 for
PRO/SAP monitors	PRO SAP opt	...	...	SAP & PRO
Reader Service No	1236	1237	1238	1239

¹ RF frequency counter, intercarrier freq error measurements, remote meter. ² Switched for mono-BTSC stereo. Integral residual AM, FM noise meter; split sound, quasi-parallel detection.


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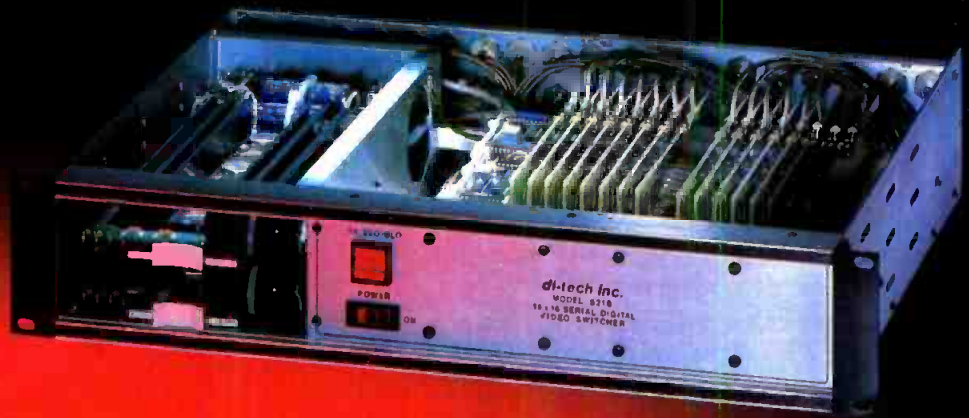
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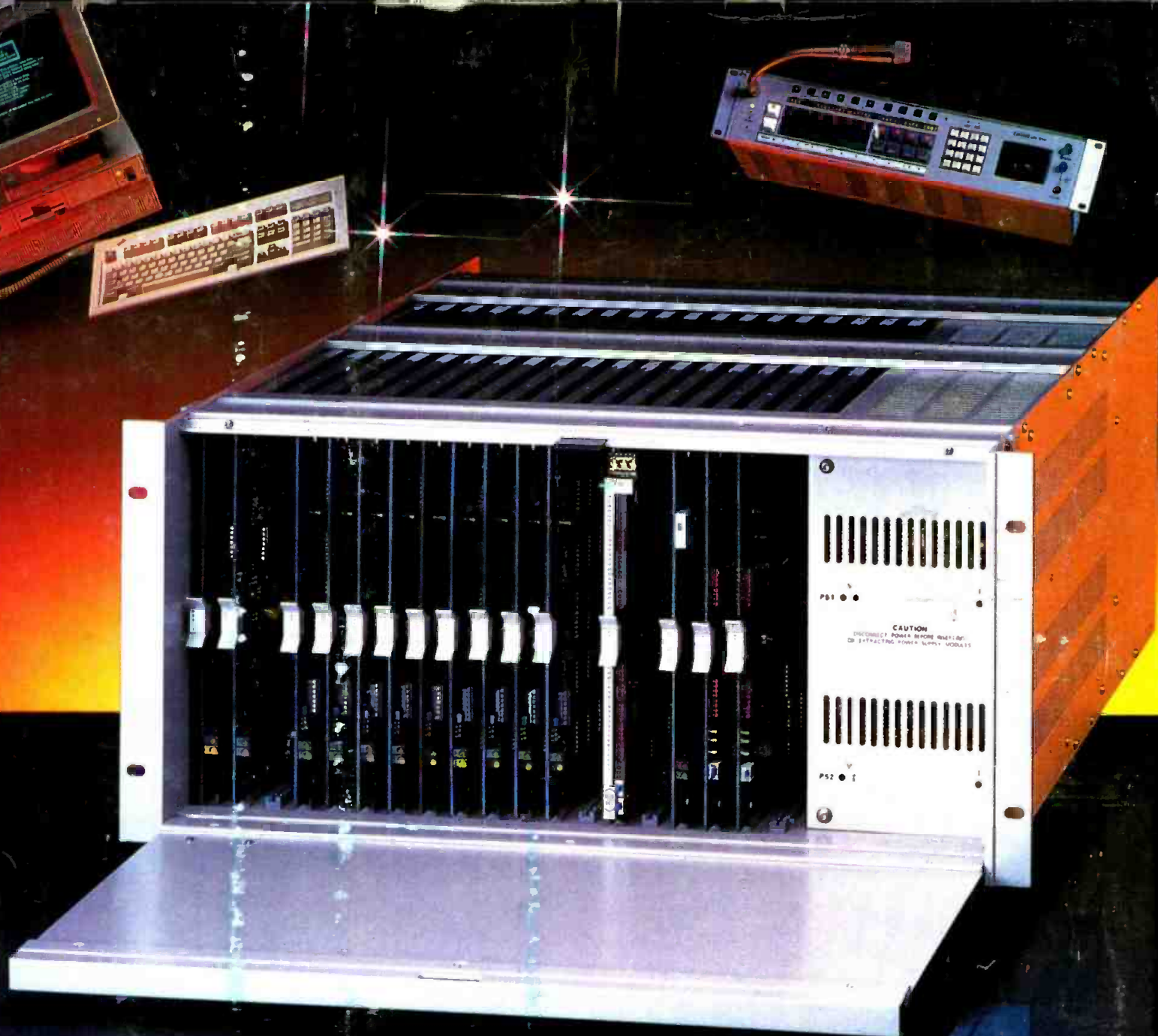
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