BROADCAST ENGINEERING'S

December 15, 1984/$15

A.
AF Response T-R ..... ± 1dB/50Hz-15kHz
Line Input 220kΩ
Sensitivity ..... 1μV, 60dB SINAD
Operating Weight 8.5oz

B.
Access Time (Worst) 165msec
Character Resolution 31.25nsec
On-line Fonts ..... 4 loaded from disc
Page Format C/L ..... 40C/21L at 18TVL

C.
MOD Area (mm) 54x41
Zoom Range 9-126mm
Clear Aperture Rear 29.5mm
Widest Aperture f/1.7

D.
S/N Ratio ..... – 128dBv EIN
Fader Type ..... P&G slider
AF Response (± dB/Hz) 1/20-20k
Harmonic Distortion 0.1%/1kHz/18dBm

E.
Capstan Motor Type ..... dc servo
Tape Timer ..... Electronic
Audio Response R/P ..... ± 2dB/30Hz-24kHz
Distortion R/P 0.8%
250nWb/m + 0VU

F.
AM Noise Figure ..... – 55dB
Power Consumption 8.9kW
Harmonic Distortion ..... <0.2%
Harmonic Suppression ..... – 80dB

G.
Resolution ..... 650 TVL
S/N Ratio (NTSC) 57dB
Registration (1/2/3) 0.1, 0.2, 0.4%
Sensitivity 186fc, f/4

H.
S/N Ratio ..... – 125dB EIN
Fader Type ..... P&G slider
Harmonic Distortion 0.1%/50-10k/18dBm
EQ & Filtering ..... 3-/4-band EQ/hi-pass

I.
Audio Response 1.5dB/50Hz-12.5kHz
Audio LIne Input 600Ω
Sensitivity ..... 0.5μV 20dB quieting
Operating Weight ..... 20 lb

J.
Dynamic Range 96dB
AF Response (± dB/Hz) 0.6/20-20k
Crosstalk ..... >90dB overall
Distortion ..... <0.06%, 20-20k

K.
Audio Response ..... ± 1.5dB/40Hz-15kHz
Video Response ..... ± 0.25dB to 5MHz
Power Required 115/230Vac,
12/32Vdc
Audio Distortion 1%/0dBm/1kHz

L.
Visual Power Peak 55kW
Harmonic Radiation ..... – 60dB
Audio Response (± dB/Hz) 1/30-15k
Phase/Gain Rating ..... 3°/0.95dB

M.
S/N Ratio ..... – 129dBm EIN
Fader Type ..... Slider
AF Response (± dB/Hz) 0.1/20-20k
Crosstalk Worst Case ..... <70dB/20kHz/4dBm

N.
Resolution ..... 550 TVL
S/N Ratio (NTSC) 58dB
Registration (1/2/3) 0.1, 0.2, 0.5%
Sensitivity 200fc, f/3.5, 60%R

O.
AM Noise Figure ..... – 60dB
Frequency Stability ..... ± 5Hz
Distortion ..... <3%
AF Response ..... ± 1.5dB/20Hz-10kHz

I
.....3.75ips
.....50dB luma/46dB color
.....>48dB
.....50Hz-15kHz

C
.....< – 52dB
.....7.2kVA
.....<0.2%
.....– 80dB

R
.....4H-3V
..... ± 6dB
.....R-Y/B-Y
.....To 1.3MHz

S
.....80.2x60
.....9-162mm
.....82.8mm
.....f/1.7

SPEC BOOK '84

ecial 13th issue of Broadcast Engineering uring specifications for radio &TV equipment

T.
Wow/Flutter Rating ..... <0.2% peak unwtd
Video Response ..... – 3dB/to 3.6MHz
Audio Response ..... ± 2dB/50Hz-15kHz
S/N Ratio (Video) ..... 46dB luma/46dB color

U.
Sensitivity (Dual) ..... 20μV 60dB S/N
AF Response (Comp) ..... ± 0.1dB/30Hz-53kHz
Bandwidth Comp Mux 110kHz-185kHz
RF Power Output 10W

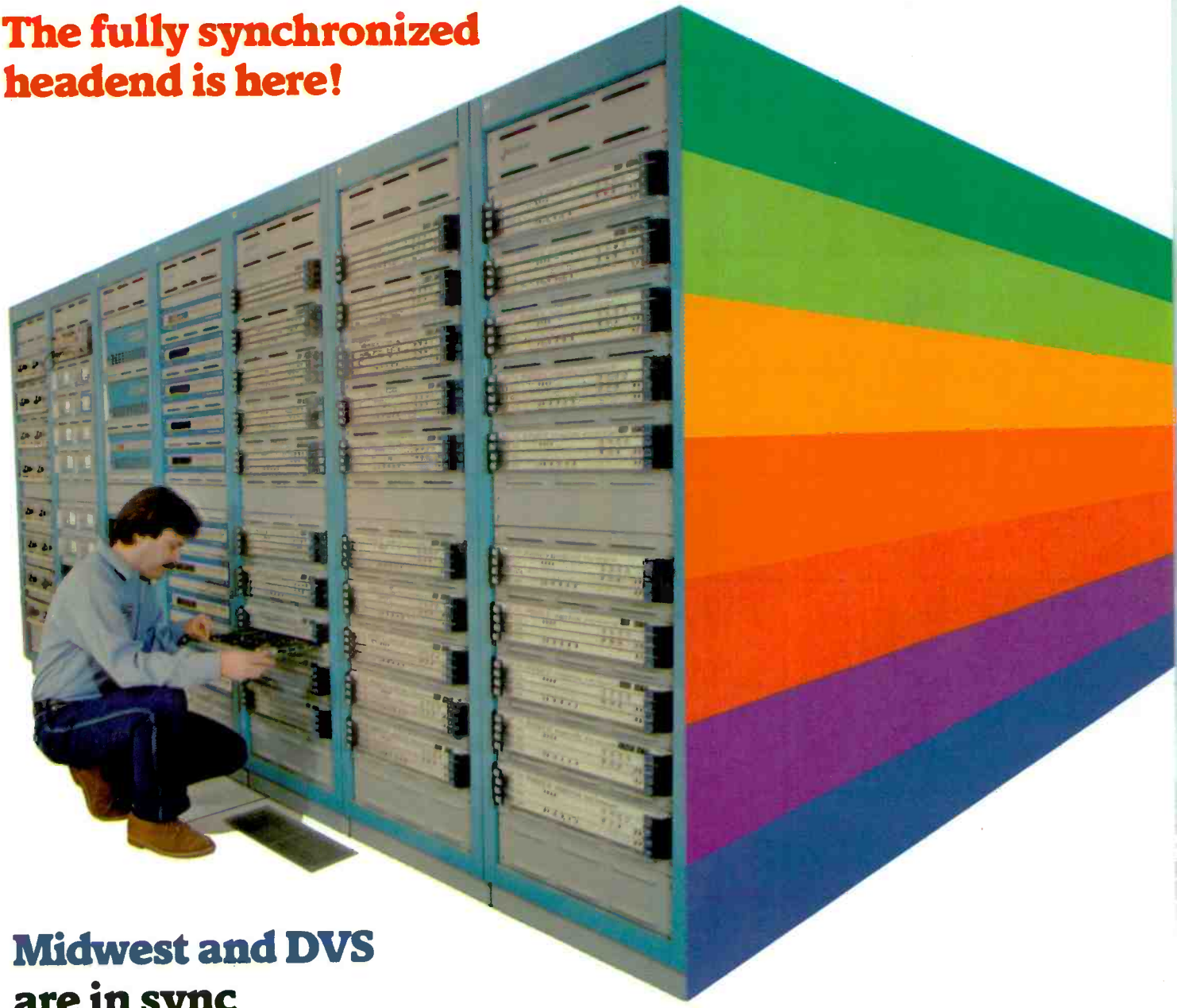
V.
S/N Ratio ..... < – 125dBu
Fader Type ..... Slider
AF Response (± dB/Hz) ..... 0.5, – 1/20-20k
Crosstalk ..... < – 70dB/15kHz/20dBm

W.
Video Response ..... ± 0.2dB to 4.2MHz
S/N Ratio 60dB
K Factor (2T) ..... <1%
Worst Access Time ..... <0.1s

X.
Video Response ..... ± 0.5dB/to 4.2MHz
Audio Distortion 1%, 0dBm, 1kHz
Phase/Gain Rating ..... 4°/4%
Chroma/Luma Delay 25ns

Y.
Audio Input Level ..... – 4, + 10dBm
Audio Output Level ..... + 8, – 10dBm
AF Response (± dB/Hz) 0.5/50-15k
Frequency Offset ..... 250Hz, – 2kHz

The fully synchronized headend is here!



Midwest and DVS are in sync with your needs

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- Synchronizes all incoming signals
- Provides total system timing
- Allows one character generator to feed all channels
- Makes commercial insertion easier
- Permits multiple headend locks
- Provides end user with smooth channel changes
- Allows full control of video signals
- Provides color bars when incoming signal is lost

Midwest maintains an indepth inventory of DVS products and can ship the equipment you want from stock, or deliver a completely wired, fully assembled, working headend system. It's more affordable than you think. For further information, call toll free today 800-543-1584.

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Circle (1) on Reply Card

Rudy Dolinsky uses SONEX a little differently...

and so do thousands of others.

Just listen—1. Rudy Dolinsky takes SONEX everywhere: it deadens sound in the multi-image and recording studio, in the projector room, and in school gyms where he mounts it in the girders for better sound. He's with Potomac Media Productions of the Seventh Day Adventists in Staunton, Virginia.

2. "As you can see, THERE IS SONEX EVERYWHERE!" says Tom Hannaford, of Dixieland Productions in Atlanta, Georgia.

3. "Fantastic! SONEX eliminates reverberant frequency in front half of the control room ceiling." Joe Hudek, TSI Recording Studio, Newton Falls, Ohio.

4. For Scharff Communications' (New York) video music truck, SONEX cuts down early reflection, flutter from high frequency drivers and tightens the stereo prospective, says Bob Aldridge. "It's excellent." He designed the acoustics for the truck, which has been used for the RCA Red Seal 32-track digital recording of "Live from Lincoln Center" television productions.

5. "Thanks to SONEX, our studio never sounded better, and our control room is very accurate." Pat Costa, Eastern Sound Studios, Methuen, Massachusetts.

Pictures do speak louder than words.*

When we asked our customers to show us how they used SONEX, we weren't surprised to hear that it did the job. We knew that this patented acoustic foam with a specially sculptured anechoic design absorbs sound successfully. What really amazed us was the number of different applications they showed us. And what you're looking at here are just five responses out of the hundreds we've received. Even so, you can see (and hear) for yourself: Wherever sound is the problem, SONEX is the solution.

SONEX is manufactured by Illbruck/usa and distributed exclusively to the pro sound industry by Alpha Audio. Get all the facts by calling or writing:

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*SUBMITTED BY THIRD ROUND OF SONEX PHOTO CONTEST WINNERS.

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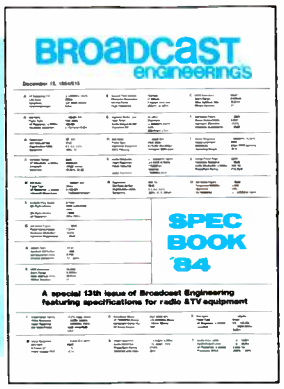

About the Cover

The cover design of this issue serves a dual purpose. First, it identifies the type of information that will be found in **Spec Book.** Second, the information on the cover could mean a great deal to you personally. Look closely at all of the excerpts of specification information, taken from this issue, then turn to the rules of our contest on page 1 & 2. GOOD LUCK!

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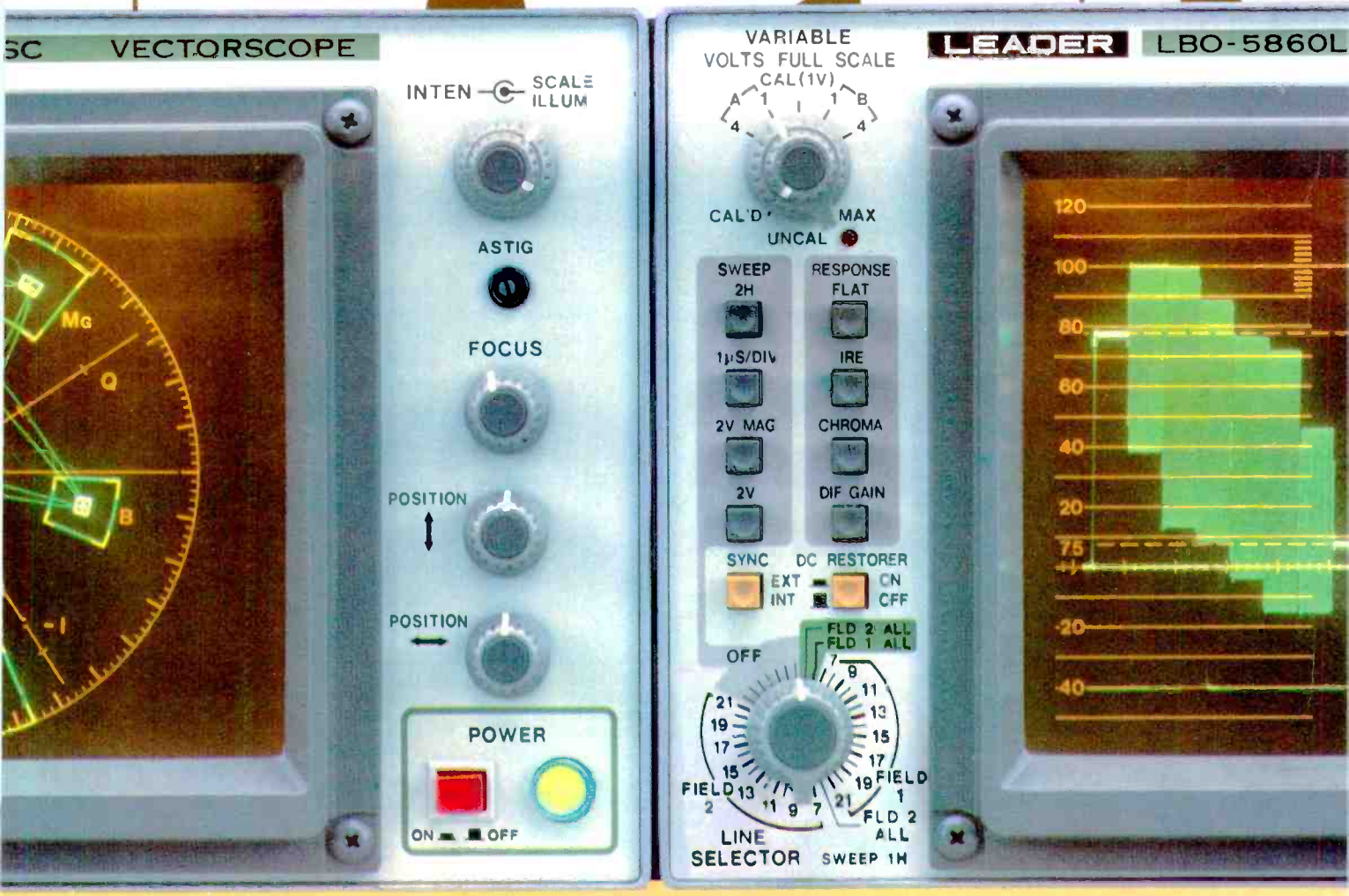
LEADER



ACTUAL SIZE

Two Leaders with an important following.

Check the racks of the industry's leaders, and you'll find Leader instruments. At ABC, Sony Broadcast, Reeves, Zenith, HBO, RCA, A.F. Associates, Group W, ATC, Midwest Corporation, and NBC, to name a few...where quality is paramount, Leader has been their choice.

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For product demonstration Circle 4 on Reply Card For production information Circle 5 on Reply Card

*patent pending

Spec Book IV

You are looking at the 4th annual **Broadcast Engineering** *Spec Book*. If you are a new user of this reference volume, you will find it different from anything you've ever tried before. If you've used *Spec Book* before, you know that it contains a wide range of facts about many types of broadcast equipment. You also know that it presents these facts for side-by-side comparisons between similar products.

Spec Book is *not* intended as the final step in making equipment purchases, but rather as the first place to go. From it you can get an idea of equipment that is available. With the Reader Service Numbers associated with each listing, you may quickly get information from the manufacturer on those products in which you are interested by circling that number on the cards bound into the back of this issue. No purchase should ever be made without finally directing the essential, pointed questions to the manufacturer. This book, however, can start you in the right direction.

Creating *Spec Book* is an interesting, but difficult, assignment. First comes the decision as to what equipment categories should be included. The choices are made on the basis of various surveys that asked what types of equipment were of most interest for near future purchases. Basically, the same categories have appeared in all four issues of *Spec Book*, because that's where the interest has been.

Then comes the problem of deciding which products will actually be listed. There are many fine products available for the broadcast industry. Listing all of them in this format is impossible. For that reason, questionnaires were provided to the manufacturers, asking for information on those products that seem to be of most interest and/or are their latest items. The responses are then weeded down further into a realistically sized volume.

Technical specifications, as you know, are not always directly comparable without references. Where possible, some references have been given to simplify comparisons. Abbreviations have occasionally been used to get the maximum information into the available space. The result is an answer to some of your questions on more than 800 products in more than 30 product categories.

It is our feeling that the 1984 *Spec Book* will be useful to you, just as the previous issues have proved to be to many users. As a special project from **Broadcast Engineering,** we are pleased to be able to offer it to you as a part of your regular subscription.

Before you get too involved in facts and figures on products of interest, however, look through the special insert page just inside the front cover. Then, as you check for information on possible purchases, you could become one of our 2nd Annual Spectacular contest winners. Best of luck in making good purchasing decisions as well.

Respectfully,

Carl Bentz

Carl Bentz
Spec Book Editor
BE Television Editor

BROADCAST ENGINEERING

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BROADCAST ENGINEERING is edited for corporate management, engineers/technicians and other station management personnel at commercial and educational radio and TV stations, teleproduction studios, recording studios, CATV and CCTV facilities and government agencies. Qualified persons also include consulting engineers and dealer/distributors of broadcast equipment.

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COMPACT DISC PLAYERS

Laser-based compact disc audio reproducers.

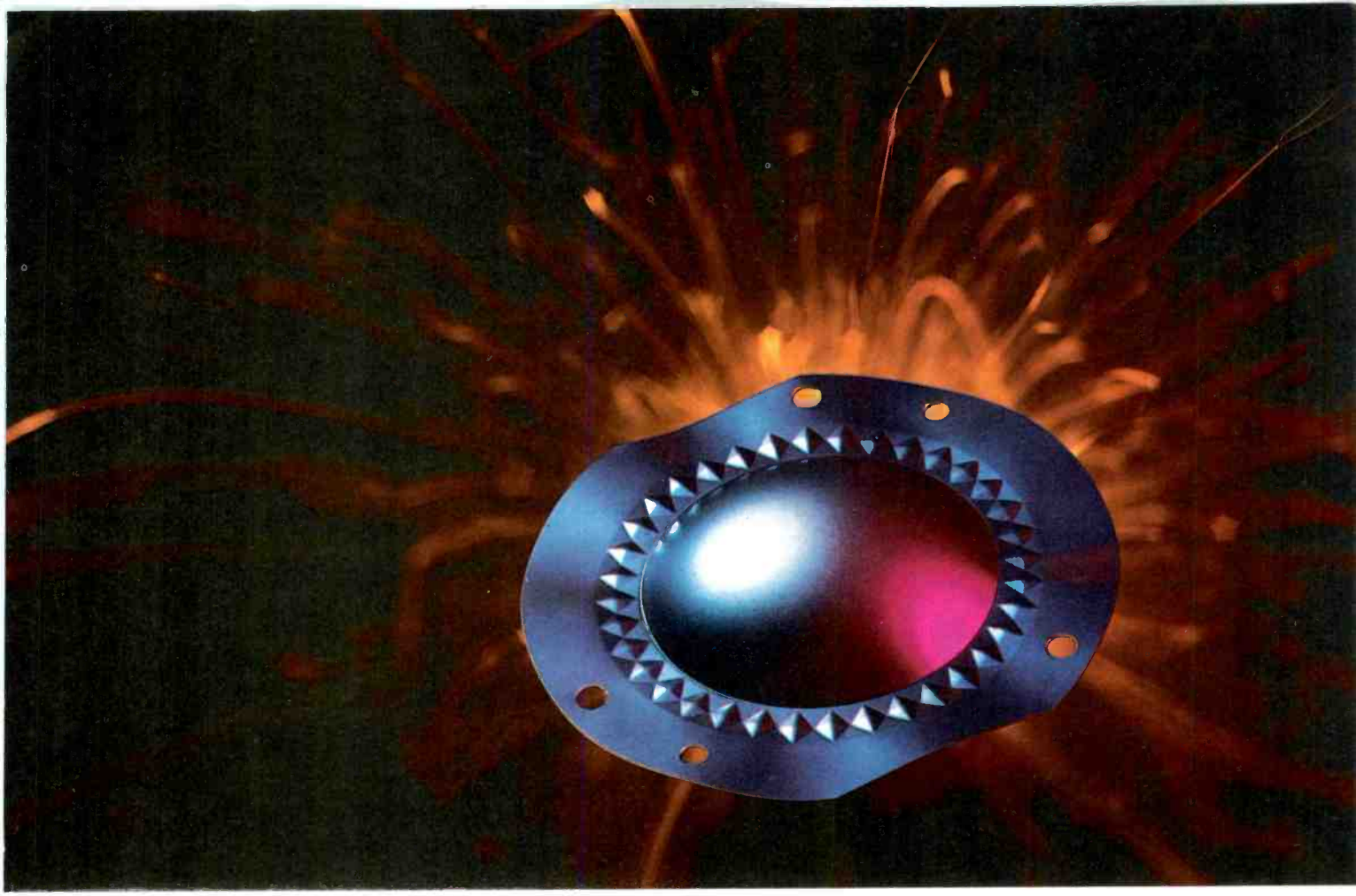
Manufacturer	Philips/Pye TVT	Sony/Pro Audio		Studer Revox America	Technics	
Model Number	LHH-2000	CDP(CDS)-3000	CDP-5000	B225	SL-P50P	SL-P15
System Configuration	Single or multiple	Multiplayer	Single player	.....	Single player	Multiplayer
Number Players Max	3 per controller	2 per controller	1 per controller	.....	1 per controller	50/expandable
Programmable	Yes	Yes	Yes	Yes	Yes	Yes
Random Access	Yes	Yes	Yes	Yes	Yes	Yes
Sequential Events	3 events	8 events	10 events	19	Yes	Yes
AF Output Connection	600Ω balanced	Balanced	600Ω balanced	Unbalanced	600Ω balanced	600Ω balanced
Typical Output Level	+6dBm	+4dBm	+4dBm	2Vrms	+4dBm or −10dBm	+4dBm or −10dBm
AF Response (±dB/Hz)	0.5/20-20k	+0.8, −1dB/20Hz-20kHz	0.5, −1/20-20k	0.6/20-20k	0.5/20-20k	0.05/4-20k
Distortion	<0.01%, 20Hz-20kHz	0.01%, 20Hz-20kHz	0.01%, 20Hz-20kHz	<0.06%, 20-20k	<0.01%	0.003% at 1kHz
Wow/Flutter	Unmeasurable	Unmeasurable	Unmeasurable	Unmeasurable	Unmeasurable	Unmeasurable
Dynamic Range	>90dB	94dB	>94dB	96dB	>96dB	>96dB
Crosstalk	80dB	90dB 1kHz/70dB 20kHz	90dB 1kHz/70dB 20kHz	>90dB overall	>90dB	>90dB
Access Time Worst	2s	2s	2s	3s	<6s	<6s
Reader Service Number	**331**	**332**	**333**	**334**	**335**	**336**

AUDIO MIXERS, ON AIR

Audio mixing desks designed for use in radio or TV master control applications.

Manufacturer	ADM Technology		Allen-Heath/Brenell	Ampro-Scully/TTC	
Model/Series Number	ST Series (ST-240)	S/TV for Stereo TV	MBI 24A Series	Microtouch	6/8/10/12
Modular System	Yes	Yes	Yes	.....	No
Number of Mixing Channels	24	To 24	Unlimited	5 or 8	6/8/10/12
No. of Inputs (Mic/Line)	2 per channel	12 mic/12 line	Unlimited	14 or 20 selectable	24 to 48
Mixing Buses	Pgm/Aud/Aux/Mono	Pgm/2-submaster/Aux	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue	Pgm/Aud/Cue
Stereo System	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider to VCA	Slider to VCA	Slider	Slider or rotary	Slider
Bus Switching Type	Push-button	Push-button	Push-button	Push-button	Keyswitch
FET Switching	No	No	No	Yes	No
Machine Controls	Yes	Yes	Yes	No	Yes
Talkback System	Yes	Yes	Yes	No	Yes
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	Yes	No	Yes	Yes
Internal Amplifiers	Cue	Cue	Monitor	Pgm/Mon/Cue	Pgm/Mon/Cue
Input/Output Connections	Xfmr bal	Xfmr bal	Xfmr bal	Xfmr	Xfmr
AF Response (±dB/Hz)	1/20-20k	1/20-20k	.....	1/20-20k	1/20-20k
Distortion	<0.15% at +24dBm	<0.15%/+24dBm	0.02%/1kHz/+8dBm	1%/1kHz/18dBm	1%/1kHz/18dBm
S/N Ratio	80dB	80dB	−127dB EIN	70dB	70dB
Crosstalk Worst Case	72dB/100Hz-10kHz	82dB/100Hz-10kHz	.....	−50dB/1kHz/18dBm	50dB/1kHz/18dBm
RF Shielding	Not required	No	Yes	No	No
Related Models	ST-100/ST-160 ST-240	.....	Series 12	.....	.....
Reader Service No.	**377**	**378**	**379**	**380**	**381**

Manufacturer	Ampro-Scully/TTC	Arrakis Systems	Auditronics	Audix Ltd.	Autogram Corporation
Model/Series Number	AC Series	2000SC	200 Series	MXT-1200	AC-6
Modular System	No	No	Yes	Yes	Yes
Number of Mixing Channels	6/8/10/12	12	.....	To 24	6
No. of Inputs (Mic/Line)	24 to 48	24	24 mic/24 line	.....	Combinations to 23
Mixing Buses	Pgm/Aud/Cue	Pgm/Aud/Aux/Cue	Pgm/Aud/Cue	3	Pgm/Aud/Cue
Stereo System	Yes	Yes	Yes	Yes	No
Fader Type	Rotary	Slider	R&G slider	Slider	Rotary
Bus Switching Type	Keyswitch	Push-button	Push-button	Push-button	Keyswitch
FET Switching	No	Reed relay	Yes	No	No
Machine Controls	Yes, 6-8 machines	Yes	Yes	Option	Yes for 12 machines
Talkback System	Yes	Yes	Yes	.....	No
Cueing Circuit	Yes	Yes	Yes	Option	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	No	Yes	Yes	No
Internal Amplifiers	Pgm/Mon/Cue	Pgm/Mon/Cue	Pgm/Cue	Pgm/Cue/Mon	Pgm/Mon/Cue
Input/Output Connections	Xfmr	Active	Xfmr active bal	Xfmr bal	Xfmr bal
AF Response (±dB/Hz)	1/20-20k	0/20-20k	0, −1/20-20k	0.5/20-20k	1/20-20k
Distortion	1%/1kHz/18dBm	0.02%/1kHz/18dBm	0.01%/1kHz/24dBm	0.1% overall 18dBm	0.1%/1kHz/24dBm
S/N Ratio	70dB	75dB	−128.5dBv EIN	−125dB EIN	−120dBm EIN
Crosstalk Worst Case	−50dB/1kHz/18dBm	−75dB/16kHz/18dBm	−85dB/1kHz	−75dB to 15kHz	68dB/15kHz/18dBm
RF Shielding	No	Yes	.....	No	Yes
Related Models	.....	150SC/500SC/2100SC	.....	.....	AC-8/IC-10
Reader Service No.	**382**	**383**	**384**	**385**	**386**



JBL's unique titanium diaphragm and "Diamond Surround" bring new purity and consistency to high frequency response.

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Perfecting titanium technology is just one of innumerable ways in which JBL science is re-shaping the quality of sound. From driving your studio monitors in a demanding final production mix, to critically evaluating in detail actual on-air signal quality, JBL audio systems are focused on the most exacting demands of the broadcast professional. To find out which system is designed to meet your specific requirements, contact your authorized JBL professional products dealer today.

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JBL

Circle (6) on Reply Card

AUDIO MIXERS, ON AIR

Manufacturer	BFE	Broadcast Audio	Broadcast Electronics		
Model/Series Number	BC-20 12/4	System-12	4M50/4S50	10M250/10S250	10M150/10S150
Modular System	Yes	Yes	No	No	No
Number of Mixing Channels	10	12	4	10	10
No. of Inputs (Mic/Line)	10 mic/12 line	36 mic/36 line	4 mic/4 line	20 mic/20 line	20 mic/20 line
Mixing Buses	Pgm/Aud/Cue	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue	Pgm/Cue/Aud	Pgm/Aud/Cue
Stereo System	Yes	Yes	4S50	10S250	10S150
Fader Type	Slider	Slider	Rotary	Rotary	Rotary
Bus Switching Type	Push-button	Push-button	Keyswitch	Keyswitch	Keyswitch
FET Switching	No	Yes	Yes	Yes	Yes
Machine Controls	Yes for 10 machines	Yes to 10 machines	No	No	No
Talkback System	Yes	Yes	No	No	No
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	No	Yes	Yes	Yes
Internal Amplifiers	Pgm/Mon/Cue	Pgm/Cue	Pgm/Mon/Cue	Pgm/Mon/Cue phones	Pgm/Mon/Cue phones
Input/Output Connections	Xfmr active bal	Xfmr	.....	Xfmr	Xfmr
AF Response (± dB/Hz)	0.5/20-20k	0.1/20-20k	0.5/20-20k	0.5/20-20k	0.5/20-20k
Distortion	0.2%/1kHz/27dBm	0.05%/1kHz/28dBm	0.1%/400Hz/18dBm	0.05%/400Hz/18dBm	0.05%/400Hz/18dBm
S/N Ratio	– 126dB EIN	– 125dB EIN	70dB	70dB	70dB
Crosstalk Worst Case	80dB/15kHz/6dBm	70dB/1kHz/8dBm	.....	.....	.....
RF Shielding	Yes	Yes, ground plane	.....	Yes	Yes
Related Models	BC-20 series	Sys-8/Sys-16/Sys-14	4R50 rack-mount	8M250/8S250	8M150/8S150
	.....	Sys-20	.....	5M250/5S250	5M150/5S150
Reader Service No.	387	388	389	390	391

Manufacturer	EELA Audio	Hallikainen & Friend	Harris Broadcast	Harrison Systems	Howe Radio
Model/Series Number	S150 (S300) Series	TVA142/TVA132	Medalist 12	AIR-7	7512A
Modular System	Yes	Yes	No	Yes	No
Number of Mixing Channels	.....	6 expands to 36	12	16	12
No. of Inputs (Mic/Line)	To 14 (to 30)	To 36 mic/36 line	12 mic/24 line	4 mic/12 line	10 mic/12-22 line
Mixing Buses	Pgm/Aux/Cue (Aud)	Pgm/Aud/Cue	Pgm/Aud/Cue	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue
Stereo System	Yes	No	Yes	Yes	Yes
Fader Type	Slider	Rotary	Slider or rotary	Slider	Slider
Bus Switching Type	Push-button	Keyswitch	Push-button	Push-button	Push-button
FET Switching	Yes	No	Yes	Yes	Yes
Machine Controls	Fader start	No	Option for 36	Yes	Yes
Talkback System	Yes	No	Yes	Yes	Yes
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Option (Yes S300)	No	Yes	Yes	Yes
Internal Amplifiers	Cue on S300	Pgm/Mon/Cue	Pgm/Aud/Cue/Phone	Cue	Pgm
Input/Output Connections	Xfmr bal	.....	Active	Active res bal	Active bal
AF Response (± dB/Hz)	0, – 1/20-20k	1/20-20k	0, – 0.25/20-20k	– /20-20k	0.1/20-20k
Distortion	<0.1%/1kHz/6dBm	0.25%/1kHz/22dBm	0.05%/20-20k + 8dBm	.....	0.025%/1kHz/4dBm
S/N Ratio	– 126dB EIN	– 115dB EIN	– 127dBv EIN	.....	– 129dBm EIN
Crosstalk Worst Case	80dB/16kHz/6dBm	82dB/1kHz/0dBm	85dB/30-12k/8dBm	.....	<70dB/20kHz/4dBm
RF Shielding	Per IRT specs option	.....	Yes	Yes	Yes
Related Models	CH15/CH21	.....	Medalist-10	.....	7012/7012A
	(CH27/CH36)	.....	Medalist-8	.....	.....
Reader Service No.	392	393	394	395	396

Manufacturer	Interface Electronics	ITAME SA	Logitek		LPB
Model/Series Number	Custom Modular	Series 80R CE6	Perfectionist	Custom Audio CAS10S	Signature II S-20
Modular System	Yes	No	No	Yes	No
Number of Mixing Channels	Unlimited	6	8	10	10
No. of Inputs (Mic/Line)	Unlimited	15 total	4 mic/32 line	10 mic/20 line	3 m/27 I standard
Mixing Buses	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue	Pgm/Aud/Cue	Pgm/Aud/Cue	Pgm/Aud/Mon/Mono-mix
Stereo System	Yes	Yes	Yes	Yes	Dual stereo
Fader Type	Slider	Rotary	Slider or rotary	Slider	Stepped rotary
Bus Switching Type	Custom switching	Keyswitch	Push-button	Push-button	Keyswitch
FET Switching	Yes	No	Yes	Yes	No
Machine Controls	Yes	.....	Yes to 32	Yes to 20	Contacts available
Talkback System	Yes	Yes	Possible	No	Yes
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	.....	Yes	Yes	Yes
Internal Amplifiers	Pgm/Mon/Cue	Mon	Pgm/Cue/Mon phones	Pgm/Cue/Mon phones	Cue/Pgm/Aud/Mon
Input/Output Connections	Xfmr or active	.....	Active	Xfmr active	Xfmr bal
AF Response (± dB/Hz)	0.5/20-20k	1/30-20k	0.25/20-20k	0.5/20-20k	1/20-20k
Distortion	<0.1%/10kHz/20dBm	0.5%/18dBm	0.01%/5kHz/22dBm	0.07%/5kHz/22dBm	0.2%/18dBm overall
S/N Ratio	– 129dBv EIN	– 120dBm EIN	– 124dBm EIN	– 122dBm EIN	– 124dBm EIN
Crosstalk Worst Case	>70dB/1kHz/18dBm	70dB	Below noise	Below noise	Below noise
RF Shielding	Yes	.....	Yes	Yes	Yes
Related Models	.....	.....	.....	CAS10M CAS8S/M	S-12/S13C stereo
	.....	.....	.....	CAS6S/M	S-21/S15A dual mono
Reader Service No.	397	398	399	400	401

AUDIO MIXERS, ON AIR

Manufacturer	LPB		McMartin Industries		Micro-Trak
Model/Series Number	**Citation C-10SL**	**M-8SL Monogram II**	**B502**	**Model 1082**	**6510-DBS**
Modular System	No	No	No	Yes	Yes
Number of Mixing Channels	10	8	2	8	10
No. of Inputs (Mic/Line)	6 m/24 l standard	2 m/18 l standard	4 mic/6 line	26	1 mic/9 line
Mixing Buses	Pgm/Aud/Mon/Cue/ Mono	Pgm/Aud/Mon/Cue/ Mono	Pgm/Aud/Cue/Aux	4	Pgm/Option Aud/Cue .....
Stereo System	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider (C-S rotary)	Slider (M-S rotary)	Rotary	Slider & rotary	Rotary
Bus Switching Type	Push-button	Push-button	Keyswitch	Keyswitch	Keyswitch
FET Switching	No	No	No	No	No
Machine Controls	Yes	Yes	For 1 machine	Yes	No
Talkback System	Yes	.....	No	Yes	No
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	Yes	Yes	Yes	Yes
Internal Amplifiers	Pgm/Aud/Cue/Mon/ Mono	Pgm/Aux/Mon/Cue Mono	Pgm/Mon/Cue	Mon/Cue/Pgm	Pgm/Mon/Cue .....
Input/Output Connections	Xfmr bal	Xfmr bal	Xfmr active bal	Bal	Xfmr bal/unbal
AF Response (± dB/Hz)	1/20-20k	– 0.5/20-20k	1/20-20k	0.5/30-15k	2/20-20k
Distortion	0.1%/18dBm overall	0.2%/18dBm overall	0.75%/1kHz/8dBm	<1%/20-20k/18dBm	0.5%/1kHz/0dBm
S/N Ratio	– 124dBv EIN	– 129dBm EIN	62dB	92dB	60dB
Crosstalk Worst Case	Below noise	< – 70dB	60dB/1kHz/0dBm	– 65dB/1kHz/0dBm	– 55dB/1kHz
RF Shielding	Yes	Yes	Yes	Yes	Yes
Related Models	C-10S/C-8S rotary C-8SL slider	M-8S/M-5S/M-5M	B501/B503/B502-5A	1081/1052	6509-DBS 6510-DBM 6509-DMB
Reader Service No.	**402**	**403**	**404**	**405**	**406**

Manufacturer	Rupert Neve	Pacific Recorders	Quantum Audio Labs	Radio Systems	Russco Electronic
Model/Series Number	**5322**	**BMX-18**	**QM22 Series oa**	**ESA-10**	**505 Series**
Modular System	Yes	.....	Yes	Yes	No
Number of Mixing Channels	16	18	20	10	5
No. of Inputs (Mic/Line)	2-32 mic/1-16 line	.....	20 mic/20 line	30 mic/30 line	4 mic/5 line
Mixing Buses	Pgm/Aud/Cue/4-Aux	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue/Aux	Pgm/Aud/Cue	Pgm
Stereo System	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider	Slider	Slider	Slider	Rotary
Bus Switching Type	Push-button	Push-button	Push-button	Push-button	Push-button
FET Switching	Yes	No	Yes	Yes	Yes
Machine Controls	Yes to 16 machines	1 each input	For 20 machines	Yes to 10 machines	No
Talkback System	Yes	Yes	Yes	No	No
Cueing Circuit	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Internal Cue System	Yes	Yes	No	Yes	Yes
Internal Amplifiers	Cue	Pgm/Cue	Cue	Pgm/Cue	Pgm/Mon/Cue
Input/Output Connections	Xfmr bal	Any type available	Xfmr active	Active	Xfmr bal
AF Response (± dB/Hz)	0.5/20-20k	– 1/20-20k	0.5/20-20k	0.1/20-20k	1/20-20k
Distortion	0.05%/1kHz/19dBm	0.015%/1kHz/28dBm	0.1%/1kHz/24dBm	0.02%/20-20k/22dBm	0.5%/1kHz/8dBm
S/N Ratio	– 124dBv EIN unwtd	84dB	>80dB	– 90dB	– 60dB (w/ – 50dB in)
Crosstalk Worst Case	< – 70dB/10kHz/19dBm	75dB/20kHz/28dBm	< – 80dB/1kHz/24dBm	– 100dB/20-20k/22dBm	– 60dB/1kHz/8dBm
RF Shielding	Yes	Yes	.....	Yes dc/VCA control	Yes
Related Models	.....	.....	22/8 22/14 22/20	.....	505 mono
Reader Service No.	**407**	**408**	**409**	**410**	**411**

Manufacturer	Sonosax	Soundcraft	UREI	Ward-Beck Systems
Model/Series Number	**SX-B/SX-B Radio**	**Series 400**	**1653**	**R1200/R2000**
Modular System	No	Yes	No	Yes
Number of Mixing Channels	.....	System dependent	5	12/20
No. of Inputs (Mic/Line)	8 mic/8 line	48 mono/24 stereo	2 mic/8 line	Any mix to 12/20
Mixing Buses	.....	Multiple	Pgm/Aud	Pgm/Aud/Cue/Aux
Stereo System	Yes	Yes	Yes	Yes
Fader Type	Slider	Slider	Slider	Rotary
Bus Switching Type	Keyswitch	Push-button	Push-button	Push-button
FET Switching	No	Yes	Yes	Yes
Machine Controls	Yes	Yes	Yes	As required
Talkback System	Yes	Yes	No	Yes
Cueing Circuit	No	Yes	Yes	Yes
Speaker Muting	Option	Yes	Yes	Yes
Internal Cue System	Yes	No	Yes	Yes
Internal Amplifiers	Pgm/Mon	Pgm/Mon/Cue	Mon/Cue/Phones	Pgm/Cue
Input/Output Connections	Xfmr and active	Xfmr active bal	Active in/xfmr out	Xfmr/active bal
AF Response (± dB/Hz)	0.2/20-20k	1/20-20k	1/20-20k	0.5/20-20k
Distortion	0.02%/10kHz/20dBm	<0.015%/1kHz/4dBv	0.25%/24dBm	0.1%/50-10k/18dBm
S/N Ratio	– 128dBm EIN	– 127.8dBv	90dB	– 125dB EIN
Crosstalk Worst Case	70dB/10kHz/20dBm	– 58dB/1kHz	70dB/1kHz/24dBm	– 80dB/50-10k/18dBm
RF Shielding	.....	.....	Yes	Yes
Related Models	....	....	1651/1652 1681/1682/1683	....
Reader Service No.	**412**	**477**	**478**	**479**

AUDIO MIXING CONSOLES, Portable

Smaller audio mixing systems, available in ENG or mobile units, including mic mixers.

Manufacturer	Allen-Heath/Brenell		Audio Developments	Audix	BFE
Model/Series Number	**System 8 Series**	**SR Series**	**AD062 Multimixer**	**MXT500**	**BC10 Series**
Modular System	No	No	Yes	Yes	Yes
No. of Mixing Channels	12-16-24 models	8-16-24 models	8	7	2 or 4
No. of Inputs (Mic/Line)	12-16-24/22-26-34	8-16-24/14-22-30	4 mix/16 line	7	10 or 12
No. of Mixing Buses	10	2 or 6	5	2	2 or 4
No. of Mono Outputs	None	1	1	2	2 or 4
No. of Stereo Outputs	3	3	1	None	1 or 2
Fader Type	Alps or P&G slider	TBM slider	P&G slider	Slider	P&G slider
VCA Level Control	No	No	No	No	No
EQ & Filtering	Swept/shelving/peak	4-band/peak/shelving	Shelving/peak/hi-pass	Yes	Yes
Panpots	Yes	Yes	Yes	Yes	Yes
Internal Compressor/Limiter	No	No	Yes	No	Option
Telephone Interface	No	No	No	No	No
Tone Oscillator	Yes	No	Yes	Yes	Yes
Cueing System	Yes	Yes	Yes	No	Yes
Talkback System	Yes	No	Yes	Yes	Yes
Echo/Foldback System	Yes	Yes	Yes	Yes	Yes
Metering Type	VU	LED	VU, PPM	VU, PPM	VU, PPM, LED
Phantom Power	Yes	Yes	Yes	Option	Option
Battery Power	No	No	12Vdc int battery	24Vdc ext	15Vdc or battery
AC Powering	110Vac	110Vac	110/240Vac	240Vac	110/220Vac
System Weight	.....	.....	26 lb w/ batteries	38 lb	.....
Input/Output Connections	Active	Active/unbal output	Xfmr	Xfmr bal	Xfmr active bal
AF Response (± dB/Hz)	1/20-20k	1/20-20k	1/20-20k	0.5/20-20k	0.5/20-20k
Harmonic Distortion	<0.05%/20-20k/4dBm	<0.05%/20-20k/4dBm	0.05%/1kHz/0dBm	0.1%/18dBm	0.2%/1kHz/27dBm
S/N Ratio	– 125dBv EIN	– 125dBv EIN	– 126dB EIN	– 125dB EIN	– 126dB EIN
Crosstalk	>60dB/30-10k/4dBm	<60dB/30-10k/4dBm	– 75dB/1kHz/0dBm	76dB/15kHz	80dB/15kHz/6dBm
Related Systems	128/168D/248D 1616D/2416D	SR-8/SR-16/SR-24 SR-416/SR-424	AD145 Pico mixer AD160 ENG mixer	.....	.....
Reader Service No.	**414**	**415**	**416**	**417**	**418**

AUDIO MIXING CONSOLES, Portable

Manufacturer	Calrec Audio	Comrex	EELA Audio		Electro-Voice
Model/Series Number	**M Series**	**SLX Sports Extender**	**S22 Reportophone**	**850 Reportomix**	**ELX-1**
Modular System	Yes	No	No	Yes	No
No. of Mixing Channels	To 16	4	2	4	4
No. of Inputs (Mic/Line)	To 16 mic/16 line	4 mic/2 line	1 mic/1 line	4 mic/4 line	4 mic/5 line
No. of Mixing Buses	2 with 4 aux	1	1	3	1
No. of Mono Outputs	1	4	1	2	4
No. of Stereo Outputs	1	None	None	1	None
Fader Type	P&G slider	Plastic slider	Rotary	P&G slider	Alps/Noble rotary
VCA Level Control	No	No	Master	Master	No
EQ & Filtering	Yes	No	Telephone EQ	Hi-pass	Hi-pass
Panpots	Yes	No	No	Switched routing	No
Internal Compressor/Limiter	Yes	Yes	Yes	Yes	Yes
Telephone Interface	No	For 3 phone lines	For 2 dial lines	No	For 1 line
Tone Oscillator	Yes	Yes	No	Yes	Yes
Cueing System	Yes	Yes	Yes	Yes	No
Talkback System	Yes	Yes	No	Yes	No
Echo/Foldback System	Yes	No	No	No	No
Metering Type	VU/PPM	VU/peak	LED	PPM/LED	LED PPM
Phantom Power	Yes	No	No	Yes	Yes
Battery Power	16Vdc	Ext battery	18Vdc int	12Vdc int/ext	3-9Vdc int
AC Powering	110/220Vac	110/220Vac	No	With adapter	110Vac
System Weight	38 lb for 8-channel	15 lb	4 lb	6 lb	5.5 lb
Input/Output Connections	Xfmr & active bal	Bal	Xfmr bal	Xfmr bal	Bal/xfmr output
AF Response (± dB/Hz)	0.5/20-20k	0.5/50-15k	0, – 2/20-20k	0, – 1/20-20k	0, – 1.5/20-20k
Harmonic Distortion	0.5%/1kHz/20dBm	0.5% overall	<0.1%/1kHz/6dBm	<0.1%/1kHz/6dBm	<0.15%/20-20k/4dBm
S/N Ratio	– 127.5dBu EIN	– 127dBm EIN	70dB	– 125dBm EIN	– 129dBu EIN
Crosstalk	– 70dB/10kHz/20dBm	Below noise	.....	80dB/15kHz/6dBm	.....
Related Systems	.....	.....	S20 Reportophone	.....	.....
Reader Service No.	**419**	**420**	**421**	**422**	**423**

AUDIO MIXING CONSOLES, Portable

Manufacturer	Enertec/Schlumberger	Harrison Systems	Interface Electronic	LTM Corp. of America	
Model/Series Number	UPS-6104	Pro-7	200B	A230-LTM	A97-LTM
Modular System	Yes	Yes	Yes	No	No
No. of Mixing Channels	10	16	To 24	6	3
No. of Inputs (Mic/Line)		16 mic/16 line	24 mic/24 line	6 mic	2 mic/1 line
No. of Mixing Buses	5	2	4	2	1
No. of Mono Outputs		2	1	2	1
No. of Stereo Outputs	2	2	1	2	0
Fader Type	Slider	P&G slider	P&G slider	Rotary	Rotary
VCA Level Control	No	Yes	Option	No	Yes
EQ & Filtering	Yes	Yes	Yes	Lo/Hi-pass	Hi-pass, parametric
Panpots	Yes	Yes	Yes	No	No
Internal Compressor/Limiter	Yes	No	Yes	No	No
Telephone Interface	No	No	Yes	No	No
Tone Oscillator	Yes	Yes	Yes	Yes	Yes
Cueing System	Pre-listen	Yes	Yes	No	No
Talkback System	Yes	Yes	Yes	No	No
Echo/Foldback System	Yes	Yes	Yes	No	No
Metering Type	VU	VU/PPM/LED	VU or PPM	VU	VU
Phantom Power		Yes	Yes	Yes	Yes
Battery Power	Ext dc	No	Or 12Vdc ext	24 AA cells	10 AA cells
AC Powering	Yes	110/220Vac	110Vac with adapter	Ext adapter	Ext adapter
System Weight	50 lb	60 lb	22 lb	6.5 lb	.....
Input/Output Connections	Bal	Active bal	Xfmr or active	Xfmr bal	Xfmr bal
AF Response (± dB/Hz)	0.5, – 1/30-20k	.....	1/20-20k	– 3/40-20k	– 3/40-20k
Harmonic Distortion	0.2%/12dBm overall	.....	0.1%/1kHz/18dBm	<1%	<1%
S/N Ratio	– 125dBm EIN	.....	– 128dBv EIN	– 126dBm EIN	– 126dBm EIN
Crosstalk		.....	– 68dB/1kHz/18dBm	.....	.....
Related Systems		.....	.....	.....	.....
Reader Service No.	**424**	**425**	**426**	**427**	**428**

AUDIO MIXING CONSOLES, Portable

Manufacturer	Logitek	McMartin Industries	Micro-Trak		Rupert Neve
Model/Series Number	Audiorack	BR-400	Telefile II	Sport IV (III)	5422
Modular System	No	No	No	No	Yes
No. of Mixing Channels	6	4	4	4 (2)	8
No. of Inputs (Mic/Line)	6 mic/5 line switch	4 mic/4 line	4 mic/4 line	4 mic/1 line (2/1)	8 mic/8 line
No. of Mixing Buses	2	1	1	1	2
No. of Mono Outputs	4 per bus	1	3	2	1 w/ 2 aux
No. of Stereo Outputs	0	0	0	No	1 pair
Fader Type	A/B plastic rotary	Rotary	Rotary plastic	Rotary	Slider
VCA Level Control	No	No	No	No	Option for channels
EQ & Filtering	No	No	No	No	4-band/peak/hi-pass
Panpots	No	No	No	No	Yes
Internal Compressor/Limiter	No	No	Yes	No	No
Telephone Interface	No	Yes	Yes	1 line/dial	No
Tone Oscillator	Yes	Yes	No	No	Yes
Cueing System	Yes	No	No	Yes	Yes
Talkback System	Yes	Yes	Yes	Yes	Yes
Echo/Foldback System	No	No	No	No	Yes
Metering Type	VU & Peak LEDs	VU	VU	VU	VU, optional PPM
Phantom Power	No	No	No	No	Yes
Battery Power	Ext 12Vdc	9 D cells/12Vdc ext	Yes	Yes	28.8 or 15Vdc
AC Powering	110Vac	110Vac	220Vac adapter	110/220Vac	110Vac adapter
System Weight	20 lb	7 lb	4 lb	.....	40 lb
Input/Output Connections	Active	Xfmr/resistive bal	Xfmr bal	Xfmr bal	Xfmr bal
AF Response (± dB/Hz)	0.3/20-20k	1/20-20k	2/20-20k	Tailored to telephone	0.5, – 1/20-20k
Harmonic Distortion	0.07%/1kHz/4dBm	0.5%/1kHz/0dBm	0.1%/1kHz/0dBm	0.5%/1kHz/8dBm	<0.02%/1kHz/20dBm
S/N Ratio	– 124dB EIN	60dB	60dB	60dB	< – 125dBu
Crosstalk	Below noise	.....	.....	.....	< – 70dB/15kHz/20dBm
Related Systems	.....	.....	.....	.....	.....
Reader Service No.	**429**	**430**	**431**	**432**	**433**

AUDIO MIXING CONSOLES, Portable

Manufacturer	RAMSA	Richmond Sound Design	RTS Systems	Shure Brothers	
Model/Series Number	**WR-500**	**M82 Series**	**HPM-41**	**M267**	**FP31**
Modular System	No	Yes	No	No	No
No. of Mixing Channels	8	8 to 24	1	1	1
No. of Inputs (Mic/Line)	8 mic/12 line	1 mic/2 line/channel	4 mic/2 line	4 mic/4 line	3 mic/3 line
No. of Mixing Buses	3	14	1	1	1
No. of Mono Outputs	3	2	1	2	2
No. of Stereo Outputs	1	1	0	0	0
Fader Type	Slider proprietary	Slider	Bourns rotary	Rotary	Rotary
VCA Level Control	No	Channel/group/master	No	No	No
EQ & Filtering	2-band fixed	3-band swept/peak	Hi-pass	Hi-pass	Hi-pass
Panpots	Yes	Yes	No	No	No
Internal Compressor/Limiter	No	No	Yes	Yes	Yes
Telephone Interface	No	No	No	No	No
Tone Oscillator	No	Yes	Yes	Yes	Yes
Cueing System	Yes	Yes	No	No	Yes
Talkback System	No	Yes	No	No	No
Echo/Foldback System	Yes	Yes	No	No	No
Metering Type	VU	VU	VU	VU	VU
Phantom Power	No	Option	Yes	Yes	Yes
Battery Power	Int/ext 12Vdc	Ext 30Vdc	18Vdc ext	27Vdc	18Vdc int
AC Powering	Yes	110Vac	110Vac	110/220Vac	11-18Vdc ext
System Weight	22 lb	>25 lb	10.1 lb	5.1 lb	2.2 lb
Input/Output Connections	Xfmr active	Xfmr active bal	Xfmr	Xfmr	Xfmr
AF Response (± dB/Hz)	0.5, – 2/20-20k	1/20-20k	– 3/7-40k	2/20-20k	2/20-20k
Harmonic Distortion	0.3%/20-20k/18dBm	0.5%/1kHz/4dBm	0.038%/1kHz/20dBm	0.35%/30-20k/15dBm	0.5%/50-20k/4dBm
S/N Ratio	– 128dB EIN	– 128dBm EIN	90dB	– 129dB EIN	– 125dB EIN
Crosstalk		– 60dB/1kHz/4dBm			
Related Systems	WR-130				
Reader Service No.	**434**	**435**	**436**	**437**	**438**

AUDIO MIXING CONSOLES, Portable

Manufacturer	Sonosax SA	Sony/Pro Audio Div.			Studer Revox America
Model/Series Number	**SX-S8 (SX-S6)**	**MX-P42 Automatic**	**MX-P61VU/PK**	**MX-P21**	**169**
Modular System	Yes	No	Yes	No	Yes
No. of Mixing Channels	8 (6)	4	12	8	10
No. of Inputs (Mic/Line)	8 mic/8 line (6/6)	4 mic/4 line	12 mic/12 line	8 mic/8 line	10 mic/10 line
No. of Mixing Buses	5	2	6	2	4 & 2 aux
No. of Mono Outputs	5	2	2	2	1
No. of Stereo Outputs	1	1	2	2	1
Fader Type	P&G slider	Rotary	Slider	Slider	Studer slider
VCA Level Control	No	Auto-level	Auto-level	Auto-level	No
EQ & Filtering	4-band swept/shelving	Lo-, hi-pass	Shelving/peak/hi-, lo-pass	Shelving/peak/hi-pass	Shelving/peak/hi-pass
Panpots	Yes	Yes	Yes	Yes	Yes
Internal Compressor/Limiter	Yes	Adj recovery time	Adj recovery time	Adj recovery time	Yes
Telephone Interface	Option	No	No	No	Yes
Tone Oscillator	Yes	Yes	Yes	Yes	Yes
Cueing System	No	No	Yes	Yes	Yes
Talkback System	No	No	Yes	Yes	Yes
Echo/Foldback System	Yes	No	Yes	Yes	Yes
Metering Type	VU,PPM,LED	VU	VU,PPM	PPM,LED	VU or PPM
Phantom Power	Yes	Yes	Yes	Yes	Yes
Battery Power	10-15Vdc int/ext	12Vdc int/ext	12Vdc ext	12Vdc ext	12Vdc int/ext
AC Powering	No	No	110Vac	110Vac	Universal
System Weight	17.8 lb (15.4 lb)	9 lb	41 lb	28 lb	55 lb
Input/Output Connections	Xfmr active	Xfmr	Active	Active/resistive bal	Xfmr bal
AF Response (± dB/Hz)	0.5/20-20k (0.8)	1/20-20k	0.8, – 1/20-20k	0.5, – 1.5/20-20k	0.5, – 1/20-20k
Harmonic Distortion	0.01%/1kHz/24dBm	0.1%/1kHz/4dBm	0.1%/1kHz/20dBm	0.3%/1kHz/20dBm	0.1%/1kHz/6dBm
S/N Ratio	– 130.4dBu EIN	– 125dBs EIN	– 125dBs EIN	– 125dBs EIN	83dB
Crosstalk	– 75dB/1kHz/24dBm	– 70dB/10kHz/4dBm	– 70dB/18kHz/20dBm	– 60dB/1kHz/20dBm	– 75dB/60-10k/ – 10dBm
Related Systems					
Reader Service No.	**439**	**440**	**441**	**442**	**443**

AUDIO MIXING CONSOLES, Portable

Manufacturer	Studer Revox America	TASCAM		UREI/JBL	Ward-Beck Systems
Model/Series Number	069	Porta-One Ministudio	M-35 (M-30)	MOD ONE 210	T1202A Transportable
Modular System	Yes	No	Yes	Yes	Yes
No. of Mixing Channels	3	4	6 (6)	10	12
No. of Inputs (Mic/Line)	2 mic/3 line	4 mic or line	20 mic/40 line (8/16)	3 mic/7 line	24 mic/24 line
No. of Mixing Buses	2	2	4	4	4
No. of Mono Outputs	2	.....	6	2	2 mono pgms
No. of Stereo Outputs	0	1	4 (3)	1	1 pr
Fader Type	Studer slider	Slider	Alps slider	Slider	P&G slider
VCA Level Control	No	.....	No	No	No
EQ & Filtering	Peaking/hi-pass	2-band	Yes	No	3-band parametric
Panpots	No	Yes	Yes	Yes	Yes
Internal Compressor/Limiter	Yes	No	No	No	No
Telephone Interface	Yes	4-track cassette	No	No	No
Tone Oscillator	Yes	.....	Not on M-30	Nc	Yes
Cueing System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	No	Not on M-30	Nc	No
Echo/Foldback System	No	No	Yes	No	Yes
Metering Type	VU or PPM	VU	VU & peak LED	VU	VU or PPM
Phantom Power	No	.....	No	No	Yes
Battery Power	12Vdc/8.5-24Vdc ext	Int/ext	24Vdc ext	24Vdc ext	Optional ext
AC Powering	110/220Vac	W/ adapter	110Vac	110Vac	110/220Vac
System Weight	19 lb	>20 lb	61 lb (35.25 lb)	.....	90 lb
Input/Output Connections	Xfmr bal	Unbalanced	Xfmr bal/unbal	.....	Xfmr active bal
AF Response (± dB/Hz)	0.5, – 1/20-20k	20Hz-18kHz	0.5, – 1/20-20k	1/30-20k	0.5/20-20k
Harmonic Distortion	0.1%/1kHz/15dBm	<2%/315Hz overall	0.05%/11kHz/0dBu	0.5%/20dBm	<0.1%/50-10k/18dBm
S/N Ratio	83dB	>63dB wtd overall	– 118dB EIN	70dB below output	– 125dB EIN
Crosstalk	– 78dB/40-15kHz/ – 10dB	< – 50dB/1kHz overall	– 60dB/1kHz/0dBu	– 60dB/10kHz	– 80dB/50-10k/8dBm
Related Systems	.....	.....	.....	.....	.....
Reader Service No.	444	445	446	447	448

AUDIO MIXING CONSOLES, Portable

Manufacturer		Yamaha Int'l./Combo	
Model/Series Number	M1532	M916	M512
Modular System	Yes	No	No
No. of Mixing Channels	32	16	12
No. of Inputs (Mic/Line)	32 mic/32 line	16 mic/16 line	12 mic/12 line
No. of Mixing Buses	13	10	4
No. of Mono Outputs	17	10	4
No. of Stereo Outputs	4	4	2
Fader Type	Yamaha slider	Yamaha slider	Yamaha slider
VCA Level Control	.....	.....	.....
EQ & Filtering	4-band swept/ parametric	3-band mid-parametric	3-band shelving
Panpots	Yes	Yes	Yes
Internal Compressor/Limiter	No	No	No
Telephone Interface	No	No	No
Tone Oscillator	Yes	No	No
Cueing System	Yes	Yes	No
Talkback System	Yes	Yes	No
Echo/Foldback System	Yes	Yes	Yes
Metering Type	VU	VU	VU
Phantom Power	No	Yes	Yes
Battery Power	No	No	No
AC Powering	110Vac rmt supply	Integral	110Vac
System Weight	231 lb	94.5 lb	43 lb
Input/Output Connections	Xfmr bal	Xfmr bal	Xfmr bal
AF Response (± dB/Hz)	– 3/20-20k	– 3/20-20k	1, – 3/20-20k
Harmonic Distortion	<0.1%/50-20k/20dBm	<0.1%/70-20k/20dBm	<0.5%/20-20k/10dBm
S/N Ratio	– 128dBm EIN	– 127dBm EIN	– 127dB EIN
Crosstalk	– 60dB/1kHz	– 60dB/1kHz	– 60dB/1kHz
Related Systems	M1524 24-input M1516 16-input	.....	M508 8-input
Reader Service No.	449	450	451

AUDIO MIXERS, Studio/Production

Audio mixing desks designed for use in the production studio of radio or TV facilities.

Manufacturer	ADM Technologies			Allen-Heath Brenell	AMEX Systems
Model/Series Number	VP Series	BCS Stereo	9000	Syncon Series	M5000
Modular System	Yes	Yes	Yes	Yes	Yes
No. of Mixing Channels	8/12/16	To 32	To 32	8 to 44	24
No. of Inputs Max	2/channel (6 opt'l)	To 224	To 160 mic/64 line	88	To 96
No. of Mixing Buses	6	10 & 9 aux	5 aux/4 PA/3 master	26	24 & 8 aux
No. of Multitrack Outputs	2 direct out/channel	8	8	24	24
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	ADM Slidex slider	ADM Slidex slider	ADM Slidex slider	P&G slider	P&G slider
VCA Level Control	For channel & master	Channel/group/master	Channel/group/master	No	Channel/group/master
EQ & Filtering	4-band EQ/hi-, lo-pass	4-band shelving/peak	4-band EQ/lo-, hi-pass	4-band EQ	4-band swept
Panpots	Yes	Yes	Yes	Yes	Yes
No. of Groups	2 (control A & B)	8	8 submaster	30	11
No. of Echo Send/Returns	1 send/2 rec pre/post	1/1 pre & post	2/2 pre/post	6/8-44 pre-post	8/8 pre/post
Solo Bus	No	Off line	AFL	In-place/PFL/AFL	In-place/PFL/AFL
Cueing System	Yes	Yes	Yes	Yes	Yes
Speaker Muting Circuit	1 system	Programmable	3 systems, programmable	Yes	Programmable
Tone Oscillator	.....	Option	Yes	Yes	Yes
Meter Type(s)	VU, PPM	VU, PPM	VU, PPM	LED	VU, PPM, LED, CRT
Machine Controls	No	For 6 machines	For 6 machines	No	For 8 machines
Automation Ready	Yes, parallel/serial	No	Yes	Yes	Yes
Input/Output Connections	Xfmr active	Xfmr	Xfmr active	Xfmr bal	Xfmr active bal
AF Response (± dB/Hz)	1/20-20k	1/20-20k	1/20-20k	1/20-20k	0.5, – 1/20-20k
Harmonic Distortion	0.07%/1kHz/24dBm	0.15%/100-20k/24dBm	0.15%/100-20k/24dBm	<0.05%/20-20k/4dBm	0.02%/1kHz/10dBm
S/N Ratio	– 125.5dB EIN	80dB	80dB	– 129dB EIN	86dB
Crosstalk Worst Case	– 72dB/10kHz/8dBm	– 72dB/100-20k	– 72dB/100-20k	– 129dBv EIN	86dB
RF Shielding	Not required	Not required	.....	No	Mechanical
Related Models	VP1603/VP1203/VP803	BCS-2443/BCS-32	9024/9032	.....	Angela & M series
Reader Service Number	480	481	482	483	484

AUDIO MIXERS, Studio/Production

Manufacturer	Auditronics		Audix	Autogram	BFE
Model/Series Number	300 Series	700 Series	Assignable Mixer	Microgram	BFE 16/8/2
Modular System	Yes	Yes	Yes	Yes	No
No. of Mixing Channels	.....	.....	To 75	2 to 16	8
No. of Inputs Max	32	48	2 per channel	64	16
No. of Mixing Buses	4 or 8 + 2 + 1	24 + 2 + 1 + 1	As required	3	8
No. of Multitrack Outputs	4 or 8	24	As required	.....	8
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	P&G slider	P&G slider	Slider	Slider	P&G slider
VCA Level Control	Channel/group/master	Group/channel	Group/master/channel	Yes	No
EQ & Filtering	3-band EQ/lo-, hi-pass	3-band EQ/hi-, lo-pass	4-band peak, shelving	.....	3-band parametric
Panpots	Yes	Yes	Yes	No	Yes
No. of Groups	4 or 8	9	As required	.....	8
No. of Echo Send/Returns	4/2 or 4 pre/post	4/4 pre/post	As required	.....	2/2 pre/post
Solo Bus	In-place/PFL/AFL	AFL	No	No	PFL
Cueing System	Yes	No	Yes	Yes	Yes
Speaker Muting Circuit	Programmable	No	Yes	Programmable	2 systems
Tone Oscillator	Yes	Yes	Option	No	Option
Meter Type(s)	VU, PPM, RTW	VU, PPM, RTW	Various options	VU	VU, PPM, LED
Machine Controls	Yes	No	Option	To 64 machines	No
Automation Ready	No	Yes	No	Yes	No
Input/Output Connections	Active bal	Xfmr active bal	Xfmr bal	Xfmr active bal	Xfmr active bal
AF Response (± dB/Hz)	– 0.5/20-20k	1/20-20k	0.5/20-20k	1/20-20k	0.5/20-20k
Harmonic Distortion	0.01%/1kHz/24dBm	0.1%/1kHz/20dBm	0.1%/40-20k/18dBm	0.06%/1kHz/24dBm	0.2%/1kHz/27dBm
S/N Ratio	– 129dBv EIN	– 127dBv EIN	– 126dBm EIN	– 130dBm EIN	– 126dB EIN
Crosstalk Worst Case	– 89dB/1kHz/18dBm	– 76dB/1kHz/4dBm	– 75dB/20-20k	– 67dB/15kHz/18dBm	– 80dB/15kHz/6dBm
RF Shielding	.....	No	No	Yes	Yes
Related Models	.....	.....	Custom systems	.....	BFE 24/8/2
Reader Service Number	485	486	487	488	489

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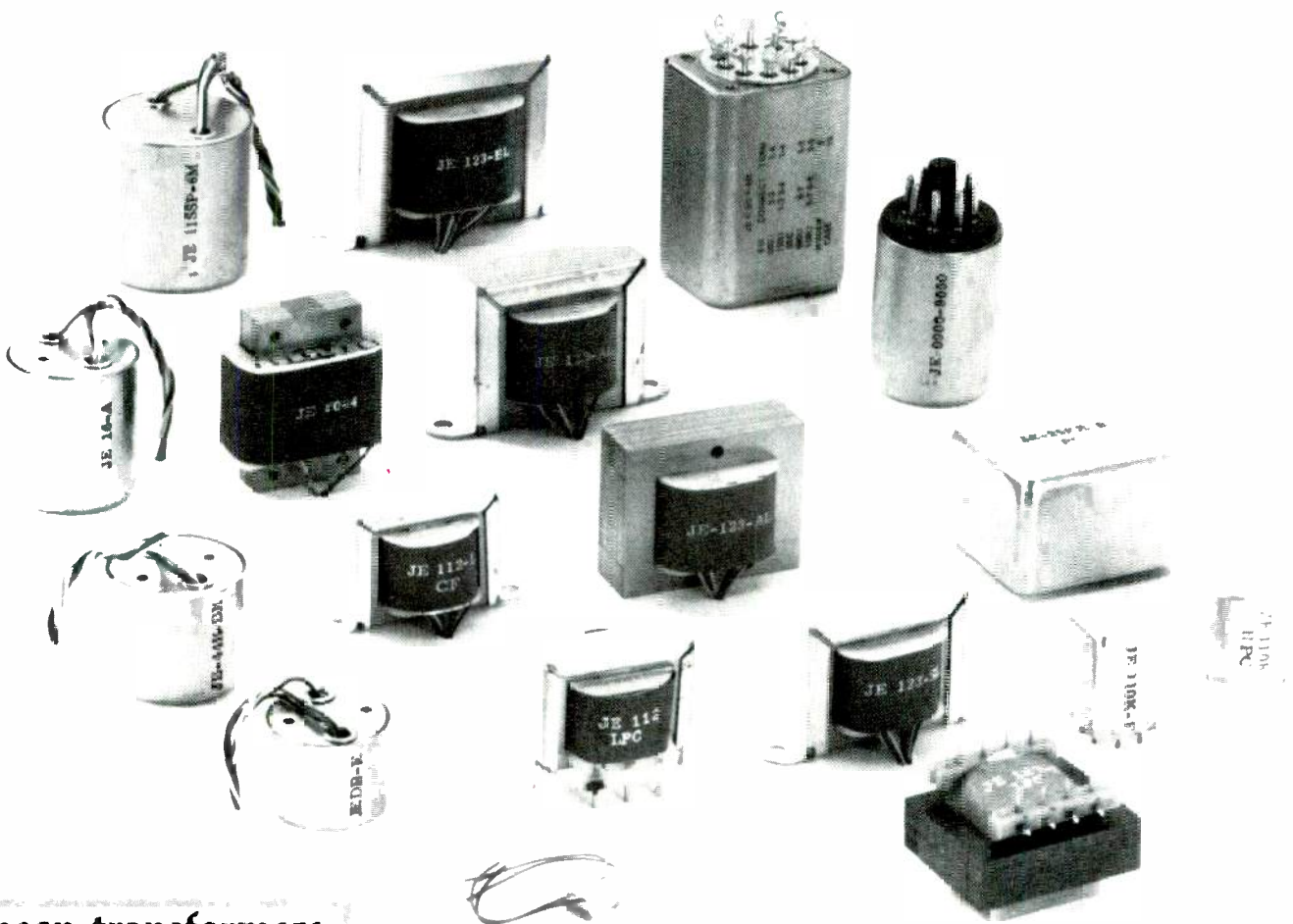

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AUDIO MIXERS, Studio/Production

Manufacturer	Broadcast Audio	Broadcast Electronics	Calrec Audio	Continental Electronics Mfg. Co.	Electro-Voice
Model/Series Number	System R	350 Series 10S350	UA 8000	Rock 10	8000 Series
Modular System		No	Yes	No	No
No. of Mixing Channels	20	10	To 48	10	32
No. of Inputs Max	60	20	3 per channel	30	64
No. of Mixing Buses	3 stereo	4	To 32	2	10
No. of Multitrack Outputs		2	>100	No	4
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	P&G slider	Slider	P&G slider	Rotary	Alps slider
VCA Level Control	No	No	Group/master/channel	No	No
EQ & Filtering	Graphic EQ	No	4-band EQ/hi-, lo-pass	No	3-band shelving/peak
Panpots	Yes	No	Yes	No	Yes
No. of Groups	No	No	To 32	0	4
No. of Echo Send/Returns	No	No	Multiple	0	2/2 pre/post
Solo Bus	No	No	In-place/PFL/AFL	No	PFL/AFL
Cueing System	Stereo	Yes	Yes	Yes	Yes
Speaker Muting Circuit	Yes	Multiple systems	Multiprogrammable	Yes	No
Tone Oscillator	Yes	No	Yes	No	No
Meter Type(s)	VU	VU	VU, PPM, LED	VU	LED
Machine Controls	For 10 machines	No	Yes	Yes	No
Automation Ready	Yes	No	Yes	No	No
Input/Output Connections	Xfmr mic/active line	Xfmr	Xfmr, active bal	Bal	Xfmr act/res bal
AF Response (± dB/Hz)	0.3/20-20k	0.5/20-20k	– 0.5/20-20k	0.5/50-15k	2/20-20k
Harmonic Distortion	0.02%/1kHz/28dBm	0.05%/400kHz/18dBm	0.05%/1kHz/20dBm	0.25%	<0.1%/20-20k/4dBm
S/N Ratio	– 125dB EIN	– 70dB	– 127.5dBu EIN	– 125dB EIN	– 129dBu EIN
Crosstalk Worst Case	– 70dB/20-15k/8dBm	.....	– 70dB/10kHz/20dBm	.....	– 6dB/1kHz
RF Shielding	Yes	Yes	No	Yes	Yes
Related Models	Sys-8/Sys-12/Sys-16	10M350 Mono	.....	Mark 8	8208/8216/8212/8408
	.....	.....	.....	.....	8416/8424/8432
Reader Service Number	**490**	**491**	**492**	**493**	**494**

AUDIO MIXERS, Studio/Production

Manufacturer	EMT-Franz/Gotham	Harris Broadcast	Harrison Systems	Howe Radio	Interface Electronics
Model/Series Number	10.00.02	M90 System	TV-4-16/12/2P	9000 System	Model 550
Modular System	Yes	Yes	Yes	Yes	Yes
No. of Mixing Channels	10	26	14	8 to 22	To 48
No. of Inputs Max	30	70	12	66	To 288
No. of Mixing Buses	2	6	2 stereo	3	To 24
No. of Multitrack Outputs	16	4 or 8	0	2	To 24
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider	P&G slider	P&G slider	Midori slider	P&G slider
VCA Level Control	No	No	Channel/group	Channel	Channel/group/master
EQ & Filtering	3-band EQ/hi-pass	3-band EQ/hi-, lo-pass	3-band EQ	3-band EQ/hi-, lo-pass	EQ & hi-, lo-pass
Panpots	Yes	Yes	Yes	No	Yes
No. of Groups	0	.....	8	0	8
No. of Echo Send/Returns	1/2 pre/post	2/2 pre or post	4 send pre/post	0	4/4 pre/post
Solo Bus	PFL/AFL	In-place/PFL/AFL	PFL/AFL	No	In-place/PFL/AFL
Cueing System	Yes	Yes	Yes	Yes	Yes
Speaker Muting Circuit	No	2 programmable	2 programmable	22 programmable	Yes
Tone Oscillator	Yes	Option	Yes	No	Yes
Meter Type(s)	PPM	VU	Various types	VU, PPM, gas discharge	VU, PPM, LED
	.....	.....	.....		.....
Machine Controls	For 10 machines	No	No	To 66 machines	Yes
Automation Ready	No	No	Yes	Yes	No
Input/Out Connections	Xfmr	Xfmr	Active/res bal	Active bal	Xfmr or active
AF Response (± dB/Hz	0.5/20-20k	1/20-20k	0.2, – 2/20-20k	0.1/20-20k	0.5/20-20k
Harmonic Distortion	0.1%/1kHz/20dBm	0.1%/30-15k/18dBm	.....	0.025%/1kHz/4dBm	0.1%/1kHz/20dBm
S/N Ratio	80dB	– 124dBv EIN	– 129dBm EIN	– 129dBm	– 128dBv EIN
Crosstalk Worst Case	– 70dB/1kHz/20dBm	– 80dB/1kHz/8dBm	.....	< – 70dB/220kHz/4dBm	< – 68dB/1kHz/18dBm
RF Shielding	No	No	Yes	Yes	.....
Related Models	20.16.02/30.16.02	18x4/24x8/32x8	TV-4 series	.....	.....
Reader Service Number	**495**	**496**	**497**	**498**	**499**

AUDIO MIXERS, Studio/Production

Manufacturer	Logitek	McCurdy Radio	Rupert Neve	Pacific Recorders	Quad Eight/Westrex
Model/Series Number	**CAS-12S Custom**	**SS8900**	**51-Series**	**ABX 34**	**Westar Console**
Modular System	Yes	Yes	Yes	Yes	Yes
No. of Mixing Channels	12	To 32	16 to 48	.....	Per request
No. of Inputs Max	28	96	96	34	60 (more per request)
No. of Mixing Buses	2	14	4 to 8	4 stereo	24
No. of Multitrack Outputs	0	8	24 optional	8	24 and direct outs
Stereo Mix Output	Yes	Yes	Yes	Yes	2 stereo mixes
Fader Type	P&G slider	Slider	P&G slider	P&G slider	P&G slider
VCA Level Control	No	No	Channel/group/master	No	Channel/group/master
EQ & Filtering	3-band shelving	3- or 4-band	6-band EQ/hi-, lo-pass	3-band parametric	10-band EQ
Panpots	No	Yes	Yes	Yes	Yes
No. of Groups	0	0	4 or 8	.....	24
No. of Echo Send/Returns	12 send only/post	Possible	4-8/4-8 pre/post	4/4 pre/post	8/4
Solo Bus	No	Yes	In-place/PFL/AFL	In-place/AFL	In-place/PFL/AFL
Cueing System	Yes	Yes	Yes	Yes	Yes
Speaker Muting Circuit	3 programmable	Possible	Programmable	Programmable	Programmable
Tone Oscillator	Option	Yes	Yes	Yes	Yes
Meter Type(s)	VU	VU, PPM	VU, PPM, gas discharge	VU, PPM, gas discharge	VU or PPM
Machine Controls	For 24 machines	Possible	Yes	2 machines/input	Option
Automation Ready	Yes	.....	Yes	No	Yes
Input/Out Connections	Xfmr & active	Bal	Xfmr/active bal	Xfmr/act bal/unbal	Xfmr or active
AF Response (±dB/Hz	0.5/20-20k	1/20-20k	0.5/20-20k	– 1.5/20-20k	0.1/20-20k
Harmonic Distortion	0.07%/5kHz/22dBm	0.5%/18dBm	0.03%/40-15k/20dBm	0.015%/1kHz/28dBm	<0.5%/4dBm/SMPTE
S/N Ratio	– 122dB EIN	– 125dBm EIN	< – 125dBu EIN unwtd	84dB	.....
Crosstalk Worst Case	Below noise	– 65dB/15kHz	< – 70dB/15kHz/20dBm	– 85dBm/1kHz/28dBm	< – 70dB/20kHz/0dBm
RF Shielding	Yes	Yes	Yes	Yes	Yes
Related Models	Custom Audio series	SS8800	.....	ABX 18/ABX 26	.....
Reader Service Number	**500**	**501**	**502**	**503**	**504**

AUDIO MIXERS, Studio/Production

Manufacturer	Ramko Research	RAMSA/Panasonic		Richmond Sound Design	Sonosax SA
Model/Series Number	**DC38-10S**	**WR-T820**	**WR-8616**	**M82 Series**	**SX-T (SX-T3)**
Modular System	No	Yes (groups of 4)	Yes	Yes	Yes
No. of Mixing Channels	10	20	16	8 to 24	8
No. of Inputs Max	40	60	32	72	32
No. of Mixing Buses	2	16	11	4	8
No. of Multitrack Outputs	None	16	16	8	Option
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	Rotary	Proprietary slider	Proprietary slider	P&G slider	P&G slider
VCA Level Control	Yes	No	No	Channel/group/master	Option
EQ & Filtering	No	EQ and hi-pass	3-band EQ/lo-, hi-pass	3-band EQ	4-band EQ/hi-pass
Panpots	No	Yes	Yes	Yes	Yes
No. of Groups	None	8	4	8	3 VCA groups
No. of Echo Send/Returns	No	4 send/2 pre/4 post	2/2 pre/post	2/2 pre/post	4/4
Solo Bus	No	In-place	PFL	PFL	PFL/AFL
Cueing System	Yes	No	Yes	Yes	.....
Speaker Muting Circuit	Yes	Yes	Yes	Multiple	Programmable
Tone Oscillator	Yes	Yes	Yes	Option	Yes
Meter Type(s)	LED	VU, LED	VU, LED	VU	VU or PPM, LEDs
Machine Controls	Option	No	Yes	No	Yes
Automation Ready	No	No	No	Yes	Yes
Input/Out Connections	Bal	Active	Xfmr/active	Xfmr/active bal	Xfmr
AF Response (±dB/Hz	– 2/20-20k	0.5, – 0.8/20-20k	0.5, – 1.4/20-20k	1/20-20k	0.5/20-20k
Harmonic Distortion	0.5%	0.05%/20-20k/18dBm	0.1%/1kHz/20dBm	0.5%/1kHz/4dBm	0.01%/1kHz/24dBm
S/N Ratio	63dB under 8dBm	– 128dB EIN	– 128dB EIN	– 128dBm EIN	– 130dBu EIN
Crosstalk Worst Case	– 70dB/1kHz	– 60dB/1kHz/4dBm	– 60dB/1kHz/4dBm	– 60dB/1kHz/4dBm	– 75dB/1kHz/24dBm
RF Shielding	.....	Yes	Yes	Yes	Yes
Related Models	DC-12 series	WR-T812 12-input	.....	M82A/M82B/M82A-8 M82-4	.....
Reader Service Number	**505**	**506**	**507**	**508**	**509**

AUDIO MIXERS, Studio/Production

Manufacturer	Soundcraft	Sony/Pro Audio Div.	Spectra Sonics	Studer Revox America	TASCAM/Teac
Model/Series Number	1600	JH-600	1020 Series	Model 900	Model 106
Modular System	Yes	Yes	Yes	Yes	No
No. of Mixing Channels	16/24/32	18 to 52	As required	To 56	6
No. of Inputs Max	32	52	32	448	12
No. of Mixing Buses	9	3	24	24	4
No. of Multitrack Outputs	16	24	32	48	4
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	Alps slider	Slider	Proprietary slider	Studer slider	Slider
VCA Level Control	No	Yes	No	Channel/group/master	No
EQ & Filtering	4-band swept shelf	EQ w/ lo-, hi-pass	Graphic/shelving	4-band EQ/hi-, lo-pass	2-band shelving
Panpots	Yes	Yes	Yes	Yes	Yes
No. of Groups	8	8	8	2 to 24 + 10 VCA	4
No. of Echo Send/Returns	8/8 2 pre/2 post	6/8 pre/post	4/4	5/3 pre/post	1/1 post
Solo Bus	PFL/AFL	In-place/PFL/AFL	In-place	In-place/PFL/AFL	No
Cueing System	Yes	Yes	Yes	Yes	Yes
Speaker Muting Circuit	No	Multiple	Multiple	Multiple	No
Tone Oscillator	Yes	Yes	Yes	Yes	No
Meter Type(s)	VU	VU, PPM	VU	VU, PPM, gas discharge	VU
Machine Controls	No	No	Yes	Option	No
Automation Ready	No	Yes	Yes	Yes	No
Input/Out Connections	Active	Xfmr/active bal	Xfmr/active	Xfmr or active bal	Unbal
AF Response (± dB/Hz	1/20-20k	0.3/20-20k	0.1/20-20k	0.5, – 1/20-20k	1, – 1.5/20-20k
Harmonic Distortion	0.005%/1kHz/4dBm		0.01%/1kHz/18dBm	0.1%/31.5-16k/0dBm	0.02%/1kHz/0dBm
S/N Ratio	80dB	– 80dB	87dB	< – 100dB EIN	– 130dB EIN
Crosstalk Worst Case	– 56dB/1kHz/4dBm	– 70dB/20kHz/4dBm	– 75dB/20kHz/18dBm	– 85dB/31-16k/0dBm	– 60dB/1kHz/0dBm
RF Shielding	Yes	Yes	No	Yes	No
Related Models	2400 & 400B series	JH-618/JH-636	1024/1024B/1026		
		JH-652	1032		
Reader Service Number	510	511	512	513	514

AUDIO MIXERS, Studio/Production

Manufacturer	TASCAM/Teac	TASCAM/Teac	UMC Electronics	Ward-Beck Systems	Yamaha Int'l /Combo
Model/Series Number	M-308	M-520	Beau-master BC16-8	M1204B	PM2000-32
Modular System	No	Yes	Yes	Yes	Yes
No. of Mixing Channels	8	20	16	14	32
No. of Inputs Max	16	40	48	26	56
No. of Mixing Buses	4	8	4	8	15
No. of Multitrack Outputs	8	8	3	4	8
Stereo Mix Output	Yes	Yes	Yes	Yes	Yes
Fader Type	Alps slider	Slider	Slider	P&G slider	Yamaha slider
VCA Level Control	No	No	No	No	
EQ & Filtering	3-band EQ	3-band EQ	3-band EQ	3-/4-band EQ/hi-pass	4-band swept, parametric
Panpots	Yes	Yes	No	Yes	Yes
No. of Groups	4	8	1	4	8
No. of Echo Send/Returns	2/2 pre/post	4 send/pre/post	In-place	2/2 pre/post	2/2 pre/post
Solo Bus	PFL/AFL	In-place	Yes	PFL/AFL	In-place/PFL
Cueing System	Yes	Yes	Yes	Yes	Yes
Speaker Muting Circuit	No	1 circuit	Yes	Multiple	
Tone Oscillator	No	Yes	No	Yes	Yes
Meter Type(s)	VU	VU	PPM	VU or PPM	VU
Machine Controls	No	No	For 8 machines	Option as requested	No
Automation Ready	No	No	Yes		No
Input/Out Connections	Active bal	Active bal	Xfmr bal	Xfmr/active bal	Xfmr bal
AF Response (± dB/Hz	2/20-20k	1/20-20k	1/20-20k	0.5/20-20k	– 3/20-20k
Harmonic Distortion	0.025%/1kHz/0dBm	0.025%/1kHz/0dBm	0.07%/1kHz/0dBm	0.1%/50-10k/18dBm	<0.5%/20-20k/20dBm
S/N Ratio	– 128dBm EIN	– 128dBm EIN	– 123dB EIN	– 125dB EIN	– 128dB EIN
Crosstalk Worst Case	– 70dB/1kHz/0dBm	– 70dB/1kHz/0dBm	– 68dB/1kHz/0dBm	– 80dB/50-10k/8dBm	– 60dB/1kHz
RF Shielding	No	No	Yes	Yes	Yes
Related Models	M-312/M-320	M-512	Beau-Pro BC-8-6	Custom systems	PM2000-24/24-input
Reader Service Number	515	516	517	518	519

AUDIO MIXERS, Studio/Production

Manufacturer	Yamaha Int'l /Combo	
Model/Series Number	**RM2408**	**RM804**
Modular System	Yes	No
No. of Mixing Channels	24	8
No. of Inputs Max	24	8
No. of Mixing Buses	8	4
No. of Multitrack Outputs	8	4
Stereo Mix Output	Yes	Yes
Fader Type	Yamaha slider	Yamaha slider
VCA Level Control	.....	.....
EQ & Filtering	3-band EQ	3-band peak, shelving
Panpots	Yes	Yes
No. of Groups	8	4
No. of Echo Send/Returns	2/2 pre/post	1/1 post
Solo Bus	AFL	No
Cueing System	Yes	No
Speaker Muting Circuit	No	No
Tone Oscillator	Yes	No
Meter Type(s)	VU	VU
Machine Controls	No	No
Automation Ready	No	No
Input/Out Connections	Xfmr bal	Xfmr unbal
AF Response (±dB/Hz	–3/20-20k	–3/20-20k
Harmonic Distortion	<0.1%/20-20k/4dBm	<0.1%/20-20k/0dBm
S/N Ratio	–128dB EIN	–127dB EIN
Crosstalk Worst Case	–70dB/1kHz	<–60dB/1kHz
RF Shielding	Yes	Yes
Related Models	RM1608	.....
Reader Service Number	**520**	**521**

AUDIO PROCESSOR, Low Frequency Extender

Equipment designed to extend low frequency response of audio interconnect circuits through frequency shifting. Elimination of low frequency components is a result. System requires a transmitter and receiver unit.

Manufacturer	C N Rood BV		Comrex Corporation	
Model Number	**BAX 114/110**	**BAX 112**	**PLX II**	**SLX**
Frequency Offset	400Hz	–350, –2150Hz	250Hz	250Hz
AF Response (±dB/Hz)	±1/50-4.95k	–/50-5k	0.5/50-15k	0.5/50-15k
Translation Accuracy	.....	.....	0.02Hz	0.02Hz
Transmitter Model	**BAX 114M**	**BAX 112M**	**PLX II Portable**	**SLX Sports mixer**
Audio Input Level	Mic & line	–6, +6dBm	Mic & tape	Mic, line, tape
Audio Input Impedance	600Ω	600Ω	150Ω/10kΩ	150Ω/600Ω/10kΩ
Output Level	–12, +12dBm	–12, +12dBm	–10dBm	+8, –10dBm
Output Impedance	–600Ω, xfmr output	–600Ω, xfmr output	600Ω	600Ω
Packaging	Portable	Portable	Portable	4-channel console
Powering Requirement	110-220Vac, ±15Vdc	110-220Vac, 6Vdc	ac/battery	ac/battery
Receiver Model	**BAX 110D**	**BAX 111D**	**RLX II**	**RLX**
Input Level	–30, +17dBm	–30, +17dBm	–40/–4, +10dBm	–40/–4, +10dBm
Input Impedance	600Ω, xfmr input	600Ω, xfmr input	600Ω	600Ω
Audio Output Level	0, +12dBm	0, +12dBm	+8, –10dBm	+8, –10dBm
Audio Output Impedance	600Ω	600Ω	600Ω	600Ω
Packaging	19" rack-mount	19" rack-mount	Desk top	19" rack-mount
Powering Requirement	110/220Vac	110-220Vac	ac	ac
Reader Service Number	**162**	**163**	**164**	**165**

Manufacturer	Comrex Corporation	Kahn Communications	McCurdy Radio
Model Number	**RTLX/PTLX 2-Line**	**Lines Plus**	**ST1913/1916**
Frequency Offset	250Hz, –2kHz	+300Hz, –2.3kHz	250Hz
AF Response (±dB/Hz)	0.5/50-15k	2/50-5k, notch at 2.7kHz	–/50-10k
Translation Accuracy	0.02Hz	±1Hz	0.002%
Transmitter Model	**PTLX**	.....	**ST1913**
Audio Input Level	–4, +10dBm	0dBm	–60/–20, +8dBm
Audio Input Impedance	600Ω	600Ω	150Ω/600Ω
Output Level	+8, –10dBm	0dBm	–10dBm
Output Impedance	–600Ω	600Ω	600Ω
Packaging	Rack	Portable case	Portable
Powering Requirement	ac	.....	Battery
Receiver Model	**RTLX**	.....	**ST1916**
Input Level	–40, –4, +10dBm	–20dBm	Compensates losses
Input Impedance	600Ω	600Ω	600Ω
Audio Output Level	+8, –10dBm	0dBm	+8dBm
Audio Output Impedance	600Ω	600Ω	600Ω
Packaging	19" rack-mount	Rack-mount	Rack-mount
Powering Requirement	ac	110Vac	ac
Reader Service Number	**166**	**168**	**169**

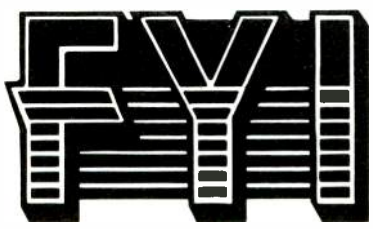
AUDIO PROCESSORS, Level Control

Equipment for general level control of audio signals, including compression, limiting, clipping and expansion function. All systems are available in rack-mount configurations operating from 110Vac. C/L indicates compression and/or limiting.

Manufacturer	Advancing Technology	ANT Communications	Aphex Systems	Audio + Design	
Model/Series Number	DAP III	Telcom c4 #233	Compellor	F760X Compex-limiter	F601 Super-Dynamic
Function(s)		Audio compandor	.....	.....	.....
Compression	Yes	Yes	Yes	Yes	No
Peak Limiting	No	No	Yes	Yes	Yes
Wideband Limiting	No	No	No	Yes	No
Asymmetric Limit	No	No	No	No	Optional
AGC Action	No	No	Yes	Yes	No
Gain Makeup	No	No	.....	Yes	Yes
Expansion	Yes	Yes	Yes	Yes	No
Multiband Control	3-band	4-band	No	No	No
Stereo System	W/ 2 units	#233 is 3-channel	W/ 2 units	Stereo/dual mono	Stereo or dual mono
Sidechain Ports	.....	.....	.....	Yes	Yes
Digital Processing	Yes	No	No	No	Yes
Meter Types	Gas discharge	None	LEDs	Meter & LED	Meter & LEDs
Meter Functions	.....	.....	In, out, gain red	Gain reduction/peak	VU/peak/gain reduced
Time Constants	Adj	.....	Adj/pgm dependent	Adj/pgm dependent	Adj/pgm dependent
Compression Ratio	2:1-30:1	3:2 (33%)	Adj 1.1:1-20:1	1.25:1-30:1	20:1
Expansion Ratio	.....	2:3	Adj	1:1.2-1:20	.....
AF Response (± dB/Hz)	0.5/20-20k	0.5/30-20k	1/5-65k	– 0.5/20-50k	– 0.5/20-20k
Distortion	0.03%/8dBm/10dB L/C	<0.2%	0.1%/4dBm/20dB C/L	0.05%/24dBm/10dB C/L	0.08%/20dBm/6dB C/L
S/N Ratio	84dB	– 94dBm thru system	< – 72dBm	– 100dB ref. + 8dBm	– 90dB
Reader Service Number	**743**	**744**	**745**	**746**	**747**

AUDIO PROCESSORS, Level Control

Manufacturer	Audio + Design		Audio Technologies Inc.	Broadcast Controls	Brooke Siren Systems
Model/Series Number	Scamp Multi-band	Easy-Rider	Emph-a-Sizer	1000A Audio Mate	DPR-402
Function(s)	.....	.....	.....	.....	.....
Compression	Yes	Yes	Yes	Yes	Yes
Peak Limiting	Yes	Yes	No	No	Yes
Wideband Limiting	Yes	Yes	Yes	No	Yes
Asymmetric Limit	No	No	No	No	Yes
AGC Action	Yes	Yes	Yes	No	No
Gain Makeup	Yes	Yes	No	No	No
Expansion	Yes	No	No	No	Yes
Multiband Control	4-band	No	4-band	No	2-band
Stereo System	Possible	Stereo or dual mono	W/ 2 units	No	Stereo tracking
Sidechain Ports	Yes	Yes	No	No	Yes
Digital Processing	No	No	No	No	No
Meter Types	LEDs	LEDs	LEDs	Meter	LEDs
Meter Functions	Peak/gain reduction	Peak/gain reduction	Output, gain red	.....	Peak/G.R./levels
Time Constants	Adj/pgm dependent	Adj/pgm dependent	Adj	Adj	Adj/pgm dependent
Compression Ratio	1:1-20:1	1:1-20:1	1:1-20:1	Adj	Infinite:1
Expansion Ratio	1:1.2-1:20	.....	.....	.....	.....
AF Response (± dB/Hz)	– 0.5/20-20k	– 0.5/20-20k	0.25/30-20k	0.5/10-20k	1/25-20k
Distortion	0.05%/22dBm/10dB C/L	0.1%/18dBm/6dB C/L	0.2%/22dBm	0.25%	<0.05%/10dBm/10dB C/L
S/N Ratio	– 92dBu	82dB	– 110dBm EIN	75dB	< – 86dBv EIN
Reader Service Number	**748**	**749**	**750**	**751**	**752**



Spec Note:
Performance specs are not directly comparable because of variations in references used by manufacturers in determining those specifications' values. Equipment performance should be discussed with the manufacturers' representatives before making final decisions.

WE'RE FLATTERED

The Most Imitated AM Stereo Processor On The Market

We're flattered that America's stereo broadcasters have made the SMP 900 AM Stereo Processor a best seller. There is no need to compromise the quality of their mono sound for the sake of stereo. With CRL you get BOTH . . . outstanding stereo AND improved mono. There is no loss of coverage.

The SMP 900 typically provides 50 db of separation with 30 db or better at 10kHz. CRL developed the stereo enhance control to increase the apparent separation another 6 db. It has been copied by our competitors . . . We're flattered.

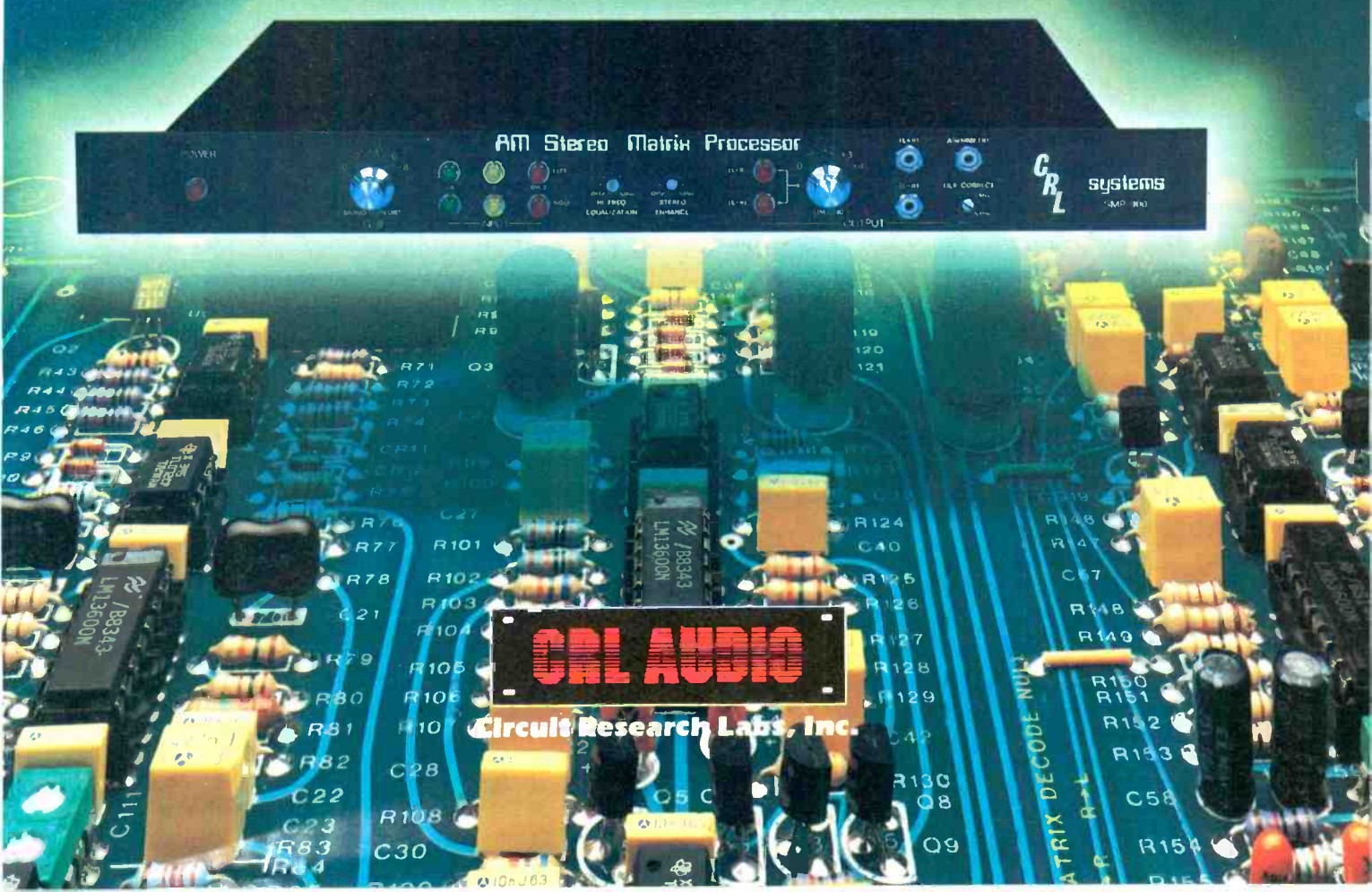
CRL has a patent pending on our single channel negative limiter that prevents single channel information (one channel dead) from creating distortion in the receiver. One of our competitors has copied this idea, but their method produces an instantaneous switch to mono under single channel conditions. This produces a strange "swimming" effect that may upset your stereo listeners.

Another important CRL feature is the continuously variable pre-emphasis control that lets you "fine tune" your sound from the front panel. No plug in modules to fool with. With CRL you decide how you want to sound and adjust accordingly. The decision is yours; not ours.

Call now for more information. Find out why CRL is the processor that the others TRY to copy. Don't just optimize . . . MAXIMIZE with CRL.

Circle (8) on Reply Card

Call Bob Richards at 800-535-7648



AUDIO PROCESSORS, Level Control

Manufacturer	Broadcast Electronics	CRL Audio		
Model/Series Number	**FM601 AGC Limiter**	**PCM-300A**	**SMP-900**	**SEP-400B**
Function(s)	.....	.....	.....	.....
Compression	Yes	No	No	Yes
Peak Limiting	Yes	W/ clipping	W/ clipping	No
Wideband Limiting	No	No	No	No
Asymmetric Limit	No	No	Yes	No
AGC Action	Yes	No	No	No
Gain Makeup	No	No	No	No
Expansion	Yes	No	No	No
Multiband Control	No	2-band	2-band	4-band
Stereo System	Yes	W/ 2 units	Yes	Requires 2 units
Sidechain Ports	No	No	No	No
Digital Processing	No	No	No	No
Meter Types	Meter	LEDs	LEDs	LEDs
Meter Functions	.....	Peak/input level	Peak/input levels	Peak/input levels
Time Constants	Adj	Adj/pgm dependent	Adj/pgm dependent	Adj/pgm dependent
Compression Ratio	30:1	Pgm dependent	Pgm dependent	Pgm dependent
Expansion Ratio	0-20dB	.....	.....	.....
AF Response (±dB/Hz)	0.5/20-20k	−0.5/50-15k	±0 to 7.5/50-15k	1/50-15k
Distortion	0.5%/20dBm/0dB	0.6%/10dBm/6dB	0.5%/10dBm/6dB	1.5%/10dBm/6dB
	C/L	C/L	limit	comp
S/N Ratio	70dB	70dB	65dB	55dB
Reader Service Number	**753**	**754**	**755**	**756**

AUDIO PROCESSORS, Level Control

Manufacturer	dbx Pro Products		Dorrough Electronics	Elcom-Bauer	
Model/Series Number	**#166 Processor**	**903 Processor**	**Model 610**	**AGC Level Guard**	**AP50 InstaPeak II**
Function(s)	.....	.....	.....	.....	.....
Compression	Yes	Yes	Yes	Yes	No
Peak Limiting	Includes peak clip	No	Yes	No	Yes
Wideband Limiting	.....	Yes	No	No	No
Asymmetric Limit	No	No	Yes	No	No
AGC Action	Yes	Yes	Yes	Yes	No
Gain Makeup	No	No	Yes	No	No
Expansion	No	No	Yes	No	No
Multiband Control	No	No	3-band	No	2-band
Stereo System	Stereo or dual mono	W/ 2 units	W/ 2 units	W/ 2 units	W/ 2 units
Sidechain Ports	1 each section	.....	Yes	No	Np
Digital Processing	No	No	Yes	No	No
Meter Types	LEDs	LEDs	LED arrays	Meter	Meter movement
Meter Functions	Gain reduction	.....	VU with peak	VU & gain reduction	VU & gain reduction
Time Constants	Variable	Pgm dependent	Adj	Fixed	Fixed
Compression Ratio	1:1 to infinity	1:1 to infinity	100:1	10:1	3:1
Expansion Ratio	Not applicable	.....	6:1	10:1	.....
AF Response (±dB/Hz)	20-20k	1/20-20k	Flat/20-15k	0.5/50-15k	1/50-15k
Distortion	0.05%/0dBm	0.05%/0dBm	0.025%/16dBm/22dB	0.5%/10dBm/10dB	1%/20dBm/5dB
	.....	.....	C	C/L	C/L
S/N Ratio	>88dB	−88dBm EIN	70dB	70dB	65dB
Reader Service Number	**758**	**759**	**760**	**761**	**762**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Wireless Microphones

AUDIO PROCESSORS, Level Control

Manufacturer	EMT-Franz/Gotham		Eventide	Harris	Inovonics
Model/Series Number	**EMT-266**	**EMT-277**	**2830 OmniPressor**	**MSP-91**	**250 Programmable**
Function(s)	.....	.....	.....	.....	.....
Compression	No	Yes	Yes	Yes	Yes
Peak Limiting	Yes	Yes	Yes	Yes	Yes
Wideband Limiting	No	No	Yes	Yes	Yes
Asymmetric Limit	No	No	No	No	Yes
AGC Action	No	No	Yes	Yes	Yes
Gain Makeup	No	No	.....	No	Yes
Expansion	No	No	Yes	No	No
Multiband Control	2-band	2-band	No	3-band	5-band
Stereo System	Yes	Stereo tracking	W/ 2 units	W/ 2 units	Yes
Sidechain Ports	No	No	.....	Yes	No
Digital Processing	No	No	.....	No	Digital control only
Meter Types	LED	LED	Meter & LEDs	LEDs	LEDs
Meter Functions	Peak	Peak	.....	Peak/gain reduction	Peak/gain red/AGC
Time Constants	Pgm dependent	Pgm dependent	Adj	Adj & pgm dependent	Pgm dependent
Compression Ratio	>100:1	.....	0-10:1	6:1-20:1 pgm dep	Pgm dependent
Expansion Ratio	.....	.....	0-10:1	.....	.....
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	– 1/15-20k	0.25/20-20k	0.5/10-15k
Distortion	0.2%/22dBm/0dB	0.25%/24dBm/0dB	.....	0.1%/20dBm/15dB	<0.5%/10dBm/20dB
	C/L	C/L	.....	C/L	C/L
S/N Ratio	85dB	72dB	– 90dBm EIN	80dB	70dB
Reader Service Number	**763**	**764**	**765**	**766**	**767**

AUDIO PROCESSORS, Level Control

Manufacturer	Inovonics			LPB	Marti Electronics
Model/Series Number	**Model 260**	**#231 – MAP-II**	**Model 215**	**Model S-2**	**CLA-40A**
Function(s)	.....	.....	.....	.....	.....
Compression	Yes	Yes	Yes	Yes	Yes
Peak Limiting	Yes	Yes	Yes	Yes	Yes
Wideband Limiting	Yes	Yes	Yes	Yes	No
Asymmetric Limit	No	Yes	Yes	Yes	Yes
AGC Action	Yes	Yes	Yes	No	Yes
Gain Makeup	Yes	Yes	Yes	No	.....
Expansion	No	No	No	No	No
Multiband Control	No	8-band	No	No	No
Stereo System	Yes	W/ 2 units	W/ 2 units	W/ 2 units	W/ 2 units
Sidechain Ports	No	No	No	No	No
Digital Processing	Digital control only	No	No	No	No
Meter Types	LEDs	Meter	Meter	Meter	Meter
Meter Functions	Peak/gain red/AGC	Peak/gain red/AGC	Peak/gain red/AGC	Output VU	.....
Time Constants	Fixed	Fixed	Fixed	Fixed	Adj
Compression Ratio	Pgm dependent	Pgm dependent	Pgm dependent	2:1 adj threshold	12:1
Expansion Ratio	.....	.....	.....	.....	.....
AF Response (±dB/Hz)	0.5/10-15k	1/50-15k	1/50-15k	0.7/20-20k	0.5/50-15k
Distortion	<0.5%/10dBm/15dB	<1%/10dBm/20dB	<1%/10dBm/15dB	<0.25%	1%/20dBm/10dB
	C/L	C/L	C/L	.....	C/L
S/N Ratio	>75dB	65dB	60dB	– 84dB at 19dBm out	68dB
Reader Service Number	**768**	**769**	**770**	**771**	**772**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Audio Monitors/Speakers

AUDIO PROCESSORS, Level Control

Manufacturer	McMartin Industries	Modular Devices	Moseley Associates	NTP Elektronik A/S	Orban Associates
Model/Series Number	BFM1514R	MAP Model 3320	TGR-340	Type 179-170	412A (414A dual)
Function(s)	.....	.....	.....	.....	.....
Compression	No	Yes	Yes	Yes	Yes
Peak Limiting	Yes	Yes	No	Yes	Yes
Wideband Limiting	No	.....	No	.....	No
Asymmetric Limit	No	No	Yes	.....	No
AGC Action	Yes	No	Yes	Yes	Yes
Gain Makeup	No	No	.....	Yes	Yes
Expansion	No	No	Yes	Yes	No
Multiband Control	2-band	No	Yes	No	No
Stereo System	Yes	W/ multiple units	Stereo tracking	Dual mono	Stereo tracking 414A
Sidechain Ports	No	No	.....	No	Yes
Digital Processing	No	No	No	No	No
Meter Types	Meter	LEDs	Meter	LEDs	Meter
Meter Functions	Gain reduction	Gain reduction/level	.....	Gain & reduction	Gain reduction
Time Constants	Fixed	Fixed/pgm dependent	Adj & fixed	Adj	Pgm dependent
Compression Ratio	.....	Pgm dependent	60dB range	1.3:1-30:1	2:1-infinity
Expansion Ratio	.....	.....	.....	1:2	.....
AF Response (±dB/Hz)	Pre-emphasized	0.5/20-20k	1/30-15k	−0.3/40-15k	0.25/20-20k
Distortion	0.5%/10dBm/20dB C/L	<1%/30dB/GR 0dBm in	<0.7% w/ compression	<0.1%	0.5%/10dBm/15dB C/L
S/N Ratio	70dB	>91dB	>70dB	−89dBu rms/0dB gain	85dB
Reader Service Number	**773**	**774**	**775**	**776**	**777**

AUDIO PROCESSORS, Level Control

Manufacturer	Orban Associates			Protech Audio	Quad-Eight/Westrex
Model/Series Number	8100A/2 Optimod-FM	8182A Optimod-TV	9100A Optimod-AM	663CL	CL-22
Function(s)	.....	.....	.....	.....	.....
Compression	Yes	Yes	Yes	Yes	Yes
Peak Limiting	Yes	Yes	Yes	Yes	Yes
Wideband Limiting	Yes	Yes	Yes	No	.....
Asymmetric Limit	No	No	No	No	No
AGC Action	Yes	Yes	Yes	No	Yes
Gain Makeup	Yes	.....	Yes	No	Yes
Expansion	No	No	No	No	Yes
Multiband Control	3- or 6-band	3-band	6-band	No	No
Stereo System	Stereo tracking	.....	Stereo tracking	W/ 2 units	Yes
Sidechain Ports	.....	.....	.....	Yes	.....
Digital Processing	.....	No	No	No	No
Meter Types	Meters	Meters	Meters	Meter	Meter
Meter Functions	.....	.....	.....	VU	VU
Time Constants	Fixed/adj/pgm dependent	Fixed/adj/pgm dependent	Pgm dependent	Fixed	Adj .....
Compression Ratio	10:1	10:1	>10:1	2:1	2:1-20:1
Expansion Ratio	.....	.....	.....	.....	−60dB, +20dB range
AF Response (±dB/Hz)	0.75/50-15k	0.75/50-15k	1/50-7.5k	0.25/30-20k	0.25/20-20k
Distortion	0.1%/20dBm/15dB C/L	0.1%/20dBm/15dB C/L	0.1%/20dBm/15dB C/L	0.15%/24dBm/5dB C/L	0.35%/20dB C/L .....
S/N Ratio	85dB	85dB typical	85dB	85dB	91dBv
Reader Service Number	**778**	**779**	**780**	**781**	**782**

Spec Note:
Performance specs are not directly comparable because of variations in references used by manufacturers in determining those specifications' values. Equipment performance should be discussed with the manufacturers' representatives before making final decisions.

AUDIO PROCESSORS, Level Control

Manufacturer	Rebis Audio	Richmond Sound	Spectra Sonics	Thomson-CSF Broadcast	
Model/Series Number	RA-203	VCA-4	610 Complimiter	Audimax 4440A/4450A	Volumax 4300/4101
Function(s)					
Compression	Yes	Yes	Yes	No	Yes
Peak Limiting	Yes	Yes	Yes	No	Yes
Wideband Limiting	Yes	No	No	No	Yes
Asymmetric Limit	No	No	No	No	Yes
AGC Action	No	Yes	Yes	Yes	Yes
Gain Makeup	No	Yes	Yes	Yes	Yes
Expansion	No	No	No	Yes	Yes
Multiband Control	No	No	No	Yes	Yes
Stereo System	W/ 2 modules	Stereo tracking	Tracking w/ 2 units	Yes	Yes
Sidechain Ports		Yes	No	No	Yes
Digital Processing	No	No	No	No	Yes
Meter Types	LEDs	External metering	Meter	Meter	Meter
Meter Functions		Gain reduction	VU & gain reduction	Gain reduction	Gain reduction
Time Constants	Adj	Adj	Adj	Pgm dependent	Adj & pgm dependent
Compression Ratio	1:1-40:1	Variable	1.1:1-100:1	Pgm dependent	Pgm dependent
Expansion Ratio				Pgm dependent	Pgm dependent
AF Response (± dB/Hz)	1/20-20k	1/20-20k	0.1/20-40k	0.5/50-15k	0.5/50-15k
Distortion	<0.3%/15dB C/L	1%/4dBm/2dB C/L	<0.1%/16dBm/30dB C/L	<0.5%/16dBm/10dB C/L	<1%
S/N Ratio	75dB	80dB	80dB	>70dB	70dB
Reader Service Number	783	784	785	786	787

AUDIO PROCESSORS, Level Control

Manufacturer	UREI	Valley People		
Model/Series Number	Model 1178 Dual	810 Kepex II	#430 Dyna-Mite	Model 610 Dual
Function(s)				
Compression	Yes	No	No	Yes
Peak Limiting	Yes	No	Yes	Yes
Wideband Limiting		No	Yes	Yes
Asymmetric Limit		No	No	No
AGC Action	No	No	Yes	Yes
Gain Makeup	No	No	Yes	Yes
Expansion	No	Yes	Yes	Yes
Multiband Control	No	No	No	No
Stereo System	Stereo tracking	W/ 2 units	Stereo tracking	Stereo tracking
Sidechain Ports	No	Yes	Yes	Yes
Digital Processing	No	No	No	No
Meter Types	Meters	LEDs	LEDs	LEDs
Meter Functions	VU & peak	Gain reduction	Gain reduction	Gain reduction
Time Constants	Adj	Adj	Fixed & pgm dependent	Fixed & pgm dependent
Compression Ratio	4:1-20:1		60:1	1:1-60:1
Expansion Ratio		1:1-1:100	1:2-1:20	1:2-1:20
AF Response (± dB/Hz)	1/20-20k	0.25/20-20k	0.25/20-20k	0.25/20-19k
Distortion	<0.5% any level	<0.015%/20dBv	<0.1%/20dBm/20dB C/L	<0.05%/20dBm/20dB C
S/N Ratio	>81dB at threshold	>90dB	>85dB	>90dB
Reader Service Number	788	789	790	791

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Audio Processing Equipment

AUDIO DELAY SYSTEMS

Delay products for audio signal control and various delay-based audio effects.

Manufacturer	AKG Acoustics	Asaca/ShibaSoku	Audio + Design/ Calrec	Eventide	
Model Number	TDU7000 Delay	AAS-100	S24 Time Shape	BD-955 Delay	SP2016 Processor
Functions:					
Talkshow Delay	Yes	No	No	Yes	No
Plate Room Simulate	Limited	No	No	No	Yes
Reverberation	Limited	No	Multiple	No	Multiple
Audio/Video Sync	No	Yes	No	No	No
Time Compression	No	No	No	No	No
Pitch Change	No	No	No	No	No
Phasing Design	Yes	No	Yes	No	No
Time Reversal	No	No	No	No	No
Digital Design	14-bit overall	48kHz/16-bit sample	No	Yes	Yes
Delay Range	1199ms with option	To 680ms	1.2ms-45ms	To 6.4s adjustable	To 3.2s adjustable
Stereo System	Possible	Yes	Yes	Yes	Yes
Audio Bandwidth	± 1dB/30Hz-15kHz	To 18kHz	To 17kHz monaural	7.5kHz or 15kHz	To 16kHz
Delay Catchup	No	No	No	Patented system	.....
Programmed Functions	No	No	No	No	Yes
User Programmable	Manual setting only	No	No	No	Yes
Time Compression %-s	Not applicable	No	Not applicable	Not applicable	Not applicable
Time Expansion %-s	Not applicable	No	Not applicable	Not applicable	Not applicable
Multiband Control	No	No	No	No	Single-band
Reader Service Number	**301**	**302**	**303**	**304**	**305**

Manufacturer	Eventide	Fostex	Granite Telcom	Klark-Teknik	
Model Number	H949 Harmonizer	#3180	675(675II) Bleepmate	DN700	DN772
Functions:					
Talkshow Delay	No	No	Yes	No	Yes
Plate Room Simulate	No	No	No	No	No
Reverberation	No	Multiple	No	No	No
Audio/Video Sync	No	No	No	Yes	No
Time Compression	Yes	No	No	No	No
Pitch Change	Yes	No	No	No	No
Phasing Design	Yes	No	No	No	No
Time Reversal	Yes	No	No	No	No
Digital Design	Yes	3-spring delay	Yes	Yes	Yes
Delay Range	To 400ms adjustable	24s pre-delay	3s or 6s (6s)	434ms adjustable	7.15s adjustable
Stereo System	No	Yes w/ synthesis	.....	No	Yes
Audio Bandwidth	To 15kHz	To 7kHz w/ reverb	To 7.5kHz monaural	To 15kHz monaural	To 15kHz stereo
Delay Catchup	.....	No	No	No	Yes
Programmed Functions	Yes	Pre-delay only	No	No	No
User Programmable	No	For reverb mix	No	Yes	Yes
Time Compression %-s	33% (40s)	Not applicable	Not applicable	Not applicable	Not applicable
Time Expansion %-s	50% (90s)	Not applicable	Not applicable	Not applicable	Not applicable
Multiband Control	No	No	No	No	No
Reader Service Number	**306**	**307**	**308**	**309**	**310**

Manufacturer	Klark-Teknik	Lexicon			
Model Number	DN700 Reverb	95 Prime Time II	97 Super Prime Time	200 Digital Reverb	224XL Reverb/Effects
Functions:					
Talkshow Delay	No	Simple delay	Yes	No	No
Plate Room Simulate	Yes	No	No	Yes	Yes
Reverberation	Multiple	No	No	No	Multiple to 70s
Audio/Video Sync	No	No	No	No	No
Time Compression	No	No	No	No	No
Pitch Change	No	No	No	No	No
Phasing Design	No	Yes	Yes	No	Yes
Time Reversal	No	No	No	No	No
Digital Design	Yes	Yes	Yes	Yes	Yes
Delay Range	Adjustable	To 7.6s adjustable	1.9s adjustable	Decay to 70s adjustable	1.86s adjustable
Stereo System	Yes	No	No	Yes	Yes
Audio Bandwidth	To 12kHz	To 15kHz monaural	20kHz monaural	To 10kHz	To 15kHz stereo
Delay Catchup	No	No	No	Not applicable	Not applicable
Programmed Functions	Yes	No	Yes	Yes	Yes
User Programmable	Yes	No	Yes	Yes	Yes
Time Compression %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Time Expansion %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Multiband Control	No	No	No	Yes	Yes
Reader Service Number	**311**	**312**	**313**	**314**	**315**

AUDIO DELAY SYSTEMS

Manufacturer	Lexicon		MXR Innovations	Marshall Electronic	
Model Number	**1300M/1300S Delay**	**Model 1200C**	**1500 Digital Delay**	**5402 Time Modulator**	**AR-300 Delay**
Functions:					
Talkshow Delay	Yes	No	Yes	No	Yes
Plate Room Simulate	No	No	Possible	No	No
Reverberation	No	No	Yes	Multiple	No
Audio/Video Sync	Yes	No	No	No	No
Time Compression	No	Yes	No	Yes	No
Pitch Change	No	Yes	No	Yes	No
Phasing Design	No	No	Flange	Yes	No
Time Reversal	No	No	No	No	No
Digital Design	Yes	Yes	Yes	Yes	No
Delay Range	4s mono/2s stereo	Not applicable	0.1-1500ms	400ms adjustable	To 300ms adjustable
Stereo System	Yes	Monaural only	.....	No	No
Audio Bandwidth	To 20kHz	To 15kHz mono	To 20kHz	To 15kHz monaural	15kHz monaural
Delay Catchup	Yes	Not applicable	.....	No	No
Programmed Functions	Not applicable	Yes	Limited	Yes	No
User Programmable	Not applicable	Yes	.....	Yes	Yes
Time Compression %-s	Not applicable	75% (45s)	Not applicable	Not applicable	Not applicable
Time Expansion %-s	Not applicable	133% (80s)	Not applicable	Not applicable	Not applicable
Multiband Control	Not applicable	No	.....	.....	No
Reader Service Number	**316**	**317**	**318**	**319**	**320**

Manufacturer	MICMIX Audio	Orban Associates	Quantec QmbH	Tascam	Tektronix
Model Number	**XL-515 (404)**	**111B Reverb**	**QRS Room Simulator**	**RS-20**	**118-AS**
Functions:					
Talkshow Delay	No	No	No	No	No
Plate Room Simulate	Yes	No	Yes	No	No
Reverberation	Multifunction	Spring/multireverb	Multiple	Dual-channel	No
Audio/Video Sync	No	No	No	No	Yes
Time Compression	No	No	No	No	No
Pitch Change	No	No	No	No	No
Phasing Design	No	No	No	No	No
Time Reversal	No	No	No	No	No
Digital Design	No	No	Yes	3-spring/channel	Yes
Delay Range	1-6s (1-4s) decay	30ms fixed	400s adjustable	.....	160ms expandable
Stereo System	Yes	Yes	Yes	Yes or dual mono	No
Audio Bandwidth	To 12kHz stereo	To 5kHz stereo	To 8kHz stereo	To 8kHz	15kHz
Delay Catchup	No	No	Not applicable	No	Not applicable
Programmed Functions	Yes	No	Yes	No	Auto & manual
User Programmable	Yes	No	Yes	No	.....
Time Compression %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Time Expansion %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Multiband Control	No	No	.....	No	No
Reader Service Number	**321**	**322**	**323**	**324**	**325**

Manufacturer	Ursa Major		Yamaha Int'l./Combo		
Model Number	**SST-282 Processor**	**8x32 Reverb**	**YDD-2600**	**R-1000**	**REV-1**
Functions:					
Talkshow Delay	No	No	Yes	No	No
Plate Room Simulate	Yes	Yes	No	Yes	Yes
Reverberation	Multiple	Multiple	No	No	Multiple
Audio/Video Sync	No	No	Yes	No	No
Time Compression	No	No	No	No	No
Pitch Change	No	No	No	No	No
Phasing Design	No	No	No	No	Yes
Time Reversal	No	No	No	No	No
Digital Design	Yes	Yes	Yes	Yes	Yes
Delay Range	To 3.5s adjustable	To 20s adjustable	To 2.66s adjustable	1.5-2.4s fixed	To 99.9s adjustable
Stereo System	Yes	Yes	Yes	No	Yes
Audio Bandwidth	To 7kHz	To 8kHz	20Hz-20kHz stereo	20Hz-20kHz mono	30Hz-18kHz stereo
Delay Catchup	No	No	No	No	No
Programmed Functions	No	Yes	Yes	Yes	Yes
User Programmable	Yes	Yes	Yes	No	Yes
Time Compression %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Time Expansion %-s	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Multiband Control	Yes	Yes	Yes	Individual band	Yes
Reader Service Number	**326**	**327**	**328**	**329**	**330**

AUDIO RECORDERS, Cartridge

Audiotape recording products, suited to radio and TV production and on-air applications, using cartridge tape.

Manufacturer	AMPRO	Scully/TTC	Audi-Cord	Broadcast Electronics	
Model/Series Number	8300/8305	CT-3500	A/S/TDS Series	2100RPS	3200RPS
Cart Size besides AA	BB	BB	BB	BB/CC	BB
Control System	TTL	TTL	CMOS logic	TTL	TTL
Replay Inhibit	Yes	Yes	Yes	Yes	Yes
Recording Timer	No	Option	Yes	No	No
2nd/3rd Tones	Yes	Yes	Yes	Yes	Option
Phase Correction	Option	Option	No	No	No
Capstan Motor Type	dc servo	ac hysteresis	ac synchronous	ac hysteresis	ac hysteresis
Capstan Drive Type	Direct	Direct	Direct	Direct	Direct
Play Speeds (ips)	3.75/7.5	3.75/7.5	7.5	3.75/7.5	3.75/7.5
Cue Output Signal	Solid-state	Relay-closure	Solid-state	Relay-closure	Relay-closure
Meter Types	VU	VU	VU	VU	VU
Related Mono Model	8300	CT-3500	S21/A21	2100RP	3200RP
Play-Only Model	8300	CT-2500	S11/S16/A11/A16	2100P/2100PS	3200P/3200PS
Multideck Model		Scully 8300	TDS-1/TDS-6 twin	5300B/5400/5500B	5300/5400/5500
Input Connection	Xfmr-active bal	Xfmr bal	Xfmr bal	Bal	Bal
Output Connection	Xfmr-active bal	Xfmr bal	Xfmr bal	Bal	Bal
AF Response (R to P)	± 2dB/50Hz-15kHz	± 2dB/5Hz-15kHz	± 2dB/50Hz-15kHz	± 2dB/50Hz-5kHz	± 2dB/50Hz-15kHz
S/N Ratio (R to P)	18dB ref 160nWb/m	58dB ref 160nWb/m	Per NAB 1976	– 54dB	52dB 160nWb/m 1kHz
Crosstalk (Pgm-Pgm)	– 50dB ref lvl 1kHz	– 50dB ref lvl 1kHz	– 50dB	– 50dB 0dBm 1kHz	– 50dB, 8dBm 1kHz
Crosstalk (Cue-Pgm)	– 55dB ref lvl 1kHz	– 50dB ref lvl 1kHz	– 50dB	– 55dB 0dBm 1kHz	– 55dB 8dBm 1kHz
Distortion	0.5%	0.5%	1%	<2%	<8% ref lvl 1kHz
Flutter (ANSI S4.3)	0.15%	0.15%	0.15% per NAB 1976	0.15%	0.15%
Reader Service No.	**457**	**458**	**459**	**460**	**461**

AUDIO RECORDERS, Cartridge

Manufacturer	Consolidated Electronic Industries	Fidelipac	International Tapetronics Corporation/3M		
Model/Series Number	993A/R	CTR-100 Dynamax	Series 99B RPSE	DI/DIV Delta Series	Omega
Cart Size besides AA	B/C optional	B	None	With DII only	None
Control System	24V ground logic	Microprocessor	Microprocessor	Microprocessor	Microprocessor
Replay Inhibit		Yes	Yes	Yes	Customer option
Recording Timer	No	Yes	External required	External required	No
2nd/3rd Tones	Yes	Yes	Yes	Yes	Yes
Phase Correction	Manual	.....	Yes	No	No
Capstan Motor Type	dc servo	dc servo	dc servo	dc servo	dc servo
Capstan Drive Type	Direct	3.75/7.5/15/1.875-30	Direct	Direct	Direct
Play Speeds (ips)	7.5	7.5/variable	3.75/7.5/15	3.75/7.5/15	3.75/7.5
Cue Output Signal	Relay-closure	Solid-state & relay	Solid-state std	Relay-closure std	Solid-state
Meter Types	Meters	LED bargraph	Taut-band A scale	Taut-band A scale	Taut-band A scale
Related Mono Model	#913A/R	123	99B ROM/RPME	DI/DIV & DII/DIV	Omega mono
Play-Only Model	#996	111/112	99B PM/PS	DI/DII	Omega mono
Multideck Model	None	No	None	DIII mono/stereo	None
Input Connection	Xfmr bal	Differential bal	Xfmr bal	Xfmr or active bal	Xfmr bal bridging
Output Connection	Xfmr bal	Differential bal	Xfmr bal	Xfmr or active bal	Xfmr bal bridging
AF Response (R to P)	1.5, – 2dB/40Hz-15kHz	± 2dB/50Hz-16kHz	± 1dB/31.5Hz-16kHz	< ± 2dB/50Hz-16kHz	< ± 2dB/50Hz-16kHz
S/N Ratio (R to P)	46dB	– 53dB	>54dB 160nWb/m 1kHz	>52dB 160nWb/m 1kHz	>50dB 160nWb/m 1kHz
Crosstalk (Pgm-Pgm)	– 55dB 1kHz – 50dB	< – 48dB ref lvl 1kHz	< – 50dB ref lvl 1kHz	< – 50dB ref lvl 1kHz	
Crosstalk (Cue-Pgm)	– 55dB 1kHz	– 50dB	< – 50dB ref lvl 1kHz	< – 50dB ref lvl 1kHz	< – 50dB ref lvl 1kHz
Distortion	<1.5% 160nWb/m 1kHz	0.5% 250nWb/m 1kHz	>0.8%	<1.5% ref lvl 1kHz	<1.5% ref lvl 1kHz
Flutter (ANSI S4.3)	0.12%	0.12% DIN wtd 7.5ips	>0.15% DIN wtd R-P	<0.15% DIN wtd R-P	<0.15% DIN wtd R-P
Reader Service No.	**476**	**462**	**463**	**464**	**465**

AUDIO RECORDERS, Cartridge

Manufacturer	**International Tapetronics Corporation/3M**	**Pacific Recorders & Engineering**		**Ramko Research**	
Model/Series Number	**PDII Series (Mono)**	**Tomcat**	**Micromax**	**Primus RP-18**	**PhaseMaster RPS-1**
Cart Size besides AA	None	None	None	Yes	Yes
Control System	Discrete transistors	Microprocessor	CMOS	Microprocessor	Microprocessor
Replay Inhibit	No	Yes	Yes	No	No
Recording Timer	No	No	Yes	Option	Yes
2nd/3rd Tones	No	Yes	Yes	Yes	Yes
Phase Correction	No	Maxtrax format	Maxtrax	No	Yes
Capstan Motor Type	ac hysteresis	dc servo	dc servo	dc servo	dc servo
Capstan Drive Type	Direct	Direct	Belt	Direct	Direct
Play Speeds (ips)	7.5	7.5/15	7.5	7.5/15	7.5/15
Cue Output Signal	Solid-state	Solid-state	Solid-state	Relay-closure	Relay & solid-state
Meter Types	Taut-band A scale	C16.5-1954ANS-VU	VU	Bargraph	Bargraph
Related Mono Model	.....	.....	.....	RP-1m	None
Play-Only Model	PDII player	Tomcat reproducer	Micromax reproducer	P-1m	PS-1
Multideck Model	.....	No	No	None	None
Input Connection	Xfmr bal	Active bal	Active bal	Active bal	Active bal
Output Connection	Xfmr bal	Xfmr bal	Xfmr bal	Active bal	Active bal
AF Response (R to P)	< ± 2dB/50Hz-12kHz	0.5, – 1/40Hz-15kHz	0.5, – 1dB/40Hz-16k	± 1.5dB/50Hz-16kHz	± 1.5dB/50Hz-16kHz
S/N Ratio (R to P)	>50dB 160nWb/m 1kHz	64dB ref 250nWb/m	60dB A wtd	>60dB	68dB .....
Crosstalk (Pgm-Pgm)	< – 50dB ref lvl 1kHz	< – 50dB 0VU 1kHz	< – 50dB 1kHz	< – 50dB	< – 50dB
Crosstalk (Cue-Pgm)	< – 50dB ref lvl 1kHz	< – 60dB 0VU 1kHz	< – 60dB 1kHz	< – 50dB	< – 50dB
Distortion	< – 2% ref lvl 1kHz	<0.7% 250nWb/m 1kHz	<0.1%	<0.9%	0.3% amplifier .....
Flutter (ANSI S4.3)	< – 0.2% NAB wtd	<0.1%	<0.08% rms unwtd	<0.095%	
Reader Service No.	**466**	**467**	**468**	**469**	**470**

AUDIO RECORDERS, Cartridge

Manufacturer	**Sonifex**		**Telex Communications**	**UMC Electronics**	
Model/Series Number	**Micro HS 200R Series**	**CQ-20 (CQ Series)**	**MC-II Series**	**Type 100**	**Type 200**
Cart Size besides AA	None	None	BB	None	BB/CC
Control System	CMOS logic	CMOS logic	TTL logic	TTL logic	TTL logic
Replay Inhibit	Yes	No	Yes	Yes	Yes
Recording Timer	Option	No	No	No	No
2nd/3rd Tones	Yes	No	Yes	Option	Option
Phase Correction	No	No	No	Option	Option
Capstan Motor Type	dc servo	dc servo	dc servo	ac synchronous	ac synchronous
Capstan Drive Type	Belt	Belt	Belt	Direct	Direct
Play Speeds (ips)	7.5	7.5	3.75/7.5	7.5	7.5
Cue Output Signal	Solid-state	Solid-state	Relay-closure	Relay or solid-state	Relay or solid-state
Meter Types	VU	None	VU	VU	VU
Related Mono Model	HS100R	CQ-10	MC-P3/MC-PR3	#102-113-034	#202-113-034
Play-Only Model	HS200	.....	MC-PS3/MC-PRS3	#101-123-034	#201-123-034
Multideck Model	HS200-T	CQ-20-T	.....	#301-123-039	.....
Input Connection	Active bal	.....	Xfmr bal	Xfmr bal	Xfmr bal
Output Connection	Active bal	Bal	Xfmr bal	Xfmr bal	Xfmr bal
AF Response (R to P)	± 1dB/30Hz-16kHz	± 1.5dB/40Hz-15kHz	± 1dB/50Hz-15kHz	0.5, – 1.5dB/40Hz-20kHz	0.5, – 1.5dB/40Hz-20kHz
S/N Ratio (R to P)	52dB 160nWb/m 1kHz	48dB	50dB	50dB	50dB
Crosstalk (Pgm-Pgm)	< – 50dB ref lvl 1kHz	– 50dB 160nWb/m 1kHz	– 50dB	– 50dB	.....
Crosstalk (Cue-Pgm)	< – 50dB ref lvl 1kHz	– 50dB 160nWb/m 1kHz	– 50dB	– 50dB	.....
Distortion	<0.6%	1%	0.5%	0.06%	0.06%
Flutter (ANSI S4.3)	0.05%	0.08%	0.05%	0.1%	0.1%
Reader Service No.	**472**	**473**	**474**	**475**	**471**

AUDIO RECORDERS, CASSETTE

Audiotape recording products, suited to radio or TV production and on-air applications, using cassette tape.

Manufacturer	Studer/Revox		TASCAM/Teac		
Model/Series Number	**A710**	**B710**	**122/122B**	**Model 225**	**Model 234**
Tape Speed (ips)	1⅞ips	1⅞ips	1⅞ & 3¾ips	1⅞ips,3¾ips	3.75ips
Fast Wind Time/C-60	45s for C-60	45s for C-60	90s for C-60	100s for C-60	85s for C-60
Capstan Motor Type	dc servo	dc servo	dc servo	dc servo	dc servo
Reel Motor Type	dc servo	dc servo	dc servo	dc servo	dc servo
Number of Heads	3	3	3	3	3
Line Input Level	4dBu/5kΩ bal	70mV 10kΩ unbal	4dBm 600Ω bal	– 10dBv/unbal	– 10dBv 100kΩ unbal
Line Output Level	4dBu/600Ω bal	0.775V 20kΩ unbal	4dBm 600Ω bal	– 10dBv/unbal	– 10dBv 10kΩ unbal
Equalization	3180 + 120μs or 70μs	3180 + 120μs or 70μs	3180 + 35μs at 3¾ips	3180 + 70μs or 120μs	3180 + 70μs 3.75ips
Wow/Flutter	0.06% DIN	0.06% DIN	0.04% per NAB	0.7% wtd per NAB	0.04% wtd per NAB
Harmonic Distortion	1.5% at 1⅞ips	1.5% at 1⅞ips	1% 3.75ips CrO_2 tape	1.5% 1⅞ips	0.05% 3.75ips CrO_2
S/N Ratio	72dB/1⅞ips/3%THD	72dB at 1⅞ips	60dB CrO_2	61dB 1⅞ips	54dB 3.75ips
AF Response (± dB/Hz)	2, – 3/30-20k	2, – 3/22-22k	2/35-14k 0VU	3/40-14k	3/40-16k
Adjacent Channel Separation	40dB	70dB	35dB	45dB	50dB
Noise Reduction	Dolby B & C	Dolby B & C	Dolby	Dolby	dbx
Cueing Facility	No	No	Yes	Yes	Yes
Time Code Track	No	No	No	No	No
Reader Service Number	**452**	**453**	**454**	**455**	**456**

AUDIO RECORDERS, Reel-to-Reel

Audiotape recording products, suited to radio or TV production and on-air applications, using reel tape and analog recording techniques.

Manufacturer	AEG-Telefunken	Ampro Scully/TTC		Elektroimpex	Enertec/Schlumberger
Model/Series Number	**M-21**	**Model 250**	**Model 280B**	**STM-631 editor**	**F462**
Number of Tracks	2	1/2/4	1/2/4	.....	1/2/4
Tape Width (Inches)	¼"	¼"	¼" or ½"	¼"	¼ ⅝ ⅜ & ½"
Tape Speeds	A/B/C/D	A/B or B/C	A/B or B/C	B/C	A/B, B/C, C/D
Variable Speed Range	± 10%	No	± 25%	.....	– 50%, + 100% option
Reel Size/Hub Type	12.25" any hub	10.5" for NAB/EIA	10.5" for NAB/EIA	10.5" IEC I/II/III	11.4"/CCIR DIN NAB
Number of Heads	3	3	3	.....	2
Capstan Motor Type	dc servo	ac hysteresis	dc servo	PPL controlled	dc servo
Reel Motor Type	dc servo	ac hysteresis	ac hysteresis	2/.....	dc servo
Metering Types	.....	.....	.....	No	VU
Equalization	NAB/IEC/DIN/CCIR/EIA	NAB/IEC	NAB/IEC	DIN	NAB/CCIR
Tape Timer	Electronic	None	None	.....	Electronic
Cueing Feature	Search cue/zero	No	No	Manual	Search zero
Editing Function	Yes	.....	.....	Tape cutting only	No
SMPTE Interface	Yes	.....	.....	No	Yes
Input Connection	Active bal	Xfmr bal	Xfmr bal	.....	Xfmr bal
Output Connection	Active bal	Xfmr bal	Xfmr bal	.....	Xfmr bal
Audio Response R/P	± 1.5dB/30Hz-20kHz	± 2dB/50Hz-15kHz	± 2dB/50Hz-20kHz	0, – 3dB/31.5Hz-16kHz	± 1dB/50Hz-12kHz
S/N Ratio R/P	74dB 2-track	66dB 2-track/4-track	63dB 2-track/4-track	>65dB	70dB NAB unwtd
Crosstalk (Adj. Tracks)	60dB 510nWb/m	60dB 250nWb/n	60dB 250nWb/m 1kHz	.....	< – 40dB 2-track 10kHz
Distortion R/P	0.6% 510nWb/m	3%	3%	.....	<1% 185nWb/m
Related Models	M-21-4	.....	.....	STM-600 recorder	.....
Reader Service Number	**522**	**523**	**524**	**525**	**526**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Audio Recorders

HOW TO RELIEVE TENSION IN THE CONTROL ROOM.

In the world of audio production, tension is a killer. Draining creative energy and making tight deadlines impossible. If you're still trying to do today's job with yesterday's technology we've just solved one of your headaches. Our prescription is a dose of our deuce, the TASCAM 42.

Everything you've considered to be a must is there, and a whole lot more. Balanced and unbalanced, with individual connector to interface with broadcast automation equipment and SMPTE control, the 42 fits in anywhere.

To more precisely control tape tension, and yours, our rugged transport is built with a full computer control on all three motors. Our autolocator function with Return-to-zero and Search-to-cue doesn't just start putting on the brakes when it hits the mark, it stops on the dime.

You also get a positive/negative real time counter and a precision splicing block mounted just below the plug-in fixed mount head assembly, where it belongs. That translates to faster, more accurate editing, and the peace of mind that comes with it.

To learn more about the hottest half-track in the under $2,500 class see your TASCAM dealer or write TASCAM Production Products, 7733 Telegraph Road, Montebello, CA 90640, (213) 726-0303.

TASCAM
TEAC Production Products

Circle (19) on Reply Card

AUDIO RECORDERS, Reel-to-Reel

Manufacturer	Entertec/Schlumberger	ITC/3M	Leevers-Rich	Lyrec Mfg. A/S	
Model/Series Number	F500	770 Series	Proline 1000SC	TR-55	TR-432
Number of Tracks	1/2	2	1/2	2	24
Tape Width (Inches)	¼"	¼"	¼"	¼" & ½"	2"
Tape Speeds	A/B/C	A/B/C	A/B/C	B, C, or D	C/D
Variable Speed Range	±7 half-ton	No	Yes	−50%, +100%	7.5-60ips
Reel Size/Hub Type	11.5"	10.5" for NAB/EIA	11"/various hubs	14" for NAB/DIN/CINE	10.5"/NAB
Number of Heads	2	3	.....	.....	3
Capstan Motor Type	dc servo	dc servo	dc servo	dc servo	dc servo
Reel Motor Type	dc servo	ac induction	dc servo	dc servo	dc servo
Metering Types	VU	Tautband A-scale	VU	.....	VU
Equalization	NAB/CCIR	NAB	NAB/DIN	NAB/CCIR	NAB/CCIR
Tape Timer	Electronic	No	Mechanical	Electronic	Electronic
Cueing Feature	No	No	.....	Search zero/cue, auto locate	Search cue/zero, auto locate
Editing Function	No	No	No	Yes	Yes
SMPTE Interface	No	No	No	Yes	Yes
Input Connection	Bal	Xfmr/active bal	.....	.....	Floating bal
Output Connection	Bal	Xfmr/active bal	.....	.....	Floating bal
Audio Response R/P	±1.5dB/60Hz-16kHz 15ips	+2, −3dB/15Hz-35kHz	±1dB/100Hz-10kHz	±1dB/60Hz-18kHz 15ips	±1dB/60Hz-16kHz 15ips
S/N Ratio R/P	60dB 1040nWb/m	>52dB	58dB 2-track 15ips	68dB 15ips	53dB rms A wtd
Crosstalk (Adj. Tracks)	−40dB 2-track 10kHz	<−55dB	<−56dB 1kHz	−40dB 510nWb/m	−46dB 1kHz
Distortion R/P	<1% 185nWb/m	0.5%	<1% 15ips	.....	.....
Related Models	.....	.....	Proline 1000/2000	.....	.....
Reader Service Number	527	528	529	530	531

AUDIO RECORDERS, Reel-to-Reel

Manufacturer	Nagra Kudelski		Otari Corporation	
Model/Series Number	T-audio	IV-STC	MTR-10	MTR-20	MTR-90 II
Number of Tracks	2 or 3 (w/ SMPTE TC)	3	2 or 4	1/2-4 center TC	8/16/24
Tape Width (Inches)	¼"	¼"	¼" or ½"	¼" & ½"	1" or 2"
Tape Speeds	A/B/C/D	A/B/C	A/B/C/D	A/B/C/D	C/D
Variable Speed Range	±6%	Yes	±20%	±45%	±20%
Reel Size/Hub Type	12.5" NAB/CINE/AEG	10.5" NAB adapter	10.5"/NAB	14" NAB	14"/NAB
Number of Heads	.....	4	.....	3 or 4	.....
Capstan Motor Type	2 dc servo	dc servo	dc servo	dc servo	dc servo
Reel Motor Type	2 dc servo	.....	dc servo	dc servo	dc servo
Metering Types	.....	Peak	VU	VU w/ peak LEDs	VU
Equalization	NAB/EIA/DIN/IEC/CCIR	NAB	NAB/IEC	NAB/IEC/AES	NAB/DIN/IEC/CCIR
Tape Timer	Electronic	Mechanical	Electronic	Electronic	Electronic
Cueing Feature	Search zero	No	Search zero auto locate	Search cue/zero, auto locate	Search zero, auto locate
Editing Function	Servo edit	No	.....	Yes	.....
SMPTE Interface	Yes	Integral generator	Various controllers	W/ RS-233C or RS-422	Various controllers
Input Connection	Xfmr bal	Current input	Active bal	Xfmr/active bal	Active bal
Output Connection	Xfmr bal	Resistive bal	Active bal	Xfmr/active bal	Active bal
Audio Response R/P	±1.5dB/30Hz-20kHz	±2dB/30Hz-20kHz	0.5, −2dB/55Hz-26kHz	±2dB/35Hz-28kHz	1.5, −3dB/42Hz-29kHz
S/N Ratio R/P	74dB 2-track 1020nWb/m	72dB 810nWb/m 400Hz	72dB 2-track 3%THD	75dB 2-/4-track	75dB 3%THD .....
Crosstalk (Adj. Tracks)	−50dB 510nWb/m 1kHz	−50dB 510nWb/m 1kHz	−45dB 250nWb/m 12kHz	−55dB 250nWb/m 1kHz	55dB 250nWb/m 1kHz
Distortion R/P	<1% 510nWb/m + 6dB	1% 810nWb/m 400Hz	0.2% 160nWb/m 400Hz	0.2% 250nWb/m 1kHz	<0.1% 160nWb/m 400Hz .....
Related Models	.....	.....	.....	.....	.....
Reader Service Number	532	533	534	535	536

AUDIO RECORDERS, Reel-to-Reel

Manufacturer	Otari Corporation		L.J. Scully	Sony/Pro Audio Div.	
Model/Series Number	**5050 Mark III/***	**MX5050 BQ-II**	**LJ-7**	**JH-24**	**JH-110C-3LB LayBack**
Number of Tracks	*4/*8	4	2	8/16/24	1/2/4/8
Tape Width (Inches)	½"	¼"	¼"	1" or 2"	¼",½",1"
Tape Speeds	B/C	B/C	A/B/C/D	C/D	A/B/C/D
Variable Speed Range	±0.2%	0.2%	3-36ips	±20%	±20%
Reel Size/Hub Type	10.5"/NAB	10.5"	11.5"/NAB/IEC	14"/NAB/DIN	14"/All hub types
Number of Heads	3	4	5 positions	3	3
Capstan Motor Type	dc servo	dc servo	dc servo	dc servo	dc servo
Reel Motor Type	ac hysteresis	ac hysteresis	dc servo	dc servo	dc servo
Metering Types	VU	VU	VU w/ peak LEDs	VU	VU
Equalization	NAB(*4)/IEC(*8)	NAB	NAB/IEC	NAB/IEC/CCIR	NAB/IEC/CCIR
Tape Timer	Electronic	Electronic	Electronic	Available	Electronic
Cueing Feature	Auto locate	.....	Search zero	Available	Search zero, auto locate
Editing Function	.....	.....	No	.....	.....
SMPTE Interface	Various controllers	.....	Accessory connector	.....	Yes
Input Connection	Active unbal	Active unbal	Active bal	Active bal	Xfmr active bal
Output Connection	Active unbal	Active unbal	Active bal	Active bal	Xfmr active bal
Audio Response R/P	±2dB/30Hz-20kHz	±2dB/30Hz-20kHz	1, –2dB/30Hz-24kHz	1.5, –3dB/36Hz-26kHz	0.75, –2dB/40Hz-28kHz
S/N Ratio R/P	70dB(*4)68dB(*8)	66dB 4-track 3%THD	65dB 510nWb/m	67dB 16-track	76dB 4-track
Crosstalk (Adj. Tracks)	55dB 250nWb/m 1kHz	55dB 250nWb/m 1kHz	–60dB	–65dB 250nWb/m 1kHz	–70dB 4dBm 400Hz
Distortion R/P	0.3%(*4)0.7%(*8)	0.7%	0.75%	0.35%	0.1%
Related Models	.....	.....	.....	.....	–3TC Center Time Code
Reader Service Number	**537**	**538**	**539**	**540**	**541**

AUDIO RECORDERS, Reel-to-Reel

Manufacturer	Sony/Pro Audio Div.	Stellavox	Studer Revox America		TASCAM/Teac
Model/Series Number	**JH-110C**	**TD88**	**A800**	**A810**	**30 Series Model 32**
Number of Tracks	1/2/4/8	To 8	8/16/24	1/2	2
Tape Width (Inches)	¼",=",1"	¼",½" or 16mm	1" or 2"	¼"	×"
Tape Speeds	A/B/C/D	A/B/C/D 24/25ips	C/D	A/B/C/D	B/C
Variable Speed Range	±20%	Yes	Yes	±45%	±12%
Reel Size/Hub Type	14"/all hub types	14"/NAB/DIN/CINE	14"	11.1"/all hub types	10.5"/NAB
Number of Heads	3	.....	3	3	3
Capstan Motor Type	dc servo	dc servo	ac servo	ac servo	dc servo
Reel Motor Type	dc servo	Patented	ac servo	ac servo	dc
Metering Types	VU	.....	VU	VU/PPM switchable	VU w/ peak LEDs
Equalization	NAB/IEC/CCIR	NAB option	NAB/CCIR	NAB/CCIR	NAB/IEC/CCIR
Tape Timer	Electronic	Electronic	Electronic	Electronic	Electronic
Cueing Feature	Search zero, auto locate	No	Search cue/zero, auto locate	Search cue/zero, auto locate	Search zero .....
Editing Function	No	No	Yes	Yes	Dump edit
SMPTE Interface	Yes	Yes	Yes	Yes	No
Input Connection	Xfmr active bal	Floating bal	Xfmr active bal	Xfmr active bal	Active unbal
Output Connection	Xfmr active bal	Floating bal	Xfmr active bal	Xfmr active bal	Active unbal
Audio Response R/P	0.75, –2dB/40Hz 28kHz	±2dB/30Hz-20kHz	±1dB/60Hz-18kHz	±1dB/20Hz-18kHz	±3dB/40Hz-22kHz .....
S/N Ratio R/P	76dB 4-track	65dB 15ips	70dB 8-track 1020nWb/m	72dB 2-track 6dBm 400Hz	68dB 1120nWb/m .....
Crosstalk (Adj. Tracks)	–70dB 4dBm 400Hz	....	–40dB 510nWb/m	–65dB 510nWb/m 1kHz	–50dB 0VU 1kHz .....
Distortion R/P	0.1%	1% 15ips	0.06%	0.6% 160nWb/m 400Hz	0.8% 250nWb/m + 0VU .....
Related Models	.....	.....	.....	.....	.....
Reader Service Number	**542**	**543**	**544**	**545**	**546**

AUDIO RECORDERS, Reel-to-Reel

Manufacturer	TASCAM/Teac		Technics/Panasonic		Telex Communications
Model/Series Number	**40 Series Model 42**	**50 Series Model 52**	**RS-1700**	**RS-1520**	**Model 3000**
Number of Tracks	2	2	4	2 rec or 2/4 play	1/2/4
Tape Width (Inches)	¼"	×"	¼"	¼"	×"
Tape Speeds	B/C	B/C	A/B/C	A/B/C	A, B or C
Variable Speed Range	±12½	±15%	±6%	±6%	No
Reel Size/Hub Type	10.5"/NAB	10.5"/NAB	10.5"/NAB	10.5"/NAB	10"/NAB
Number of Heads	3	3	6	6	.....
Capstan Motor Type	dc servo	dc servo	dc servo/quartz ctl	dc servo	ac synchronous
Reel Motor Type	dc servo	dc servo	dc servo	dc servo	ac synchronous
Metering Types	VU w/ peak LEDs	VU w/ peak LEDs	Peak analog	Peak analog	.....
Equalization	NAB/IEC/CCIR	NAB/IEC/CCIR	NAB	NAB/IEC	NAB/IEC/DINCCIR/EIA
Tape Timer	Electronic	Electronic	Electronic	Electronic	Mechanical
Cueing Feature	Search zero/cue	Search zero/cue	.....	Search cue	Search cue
Editing Function	Dump edit	Dump edit	.....	.....	Dump edit
SMPTE interface	Yes	Yes	.....	.....	No
Input Connection	Active bal	Active bal	Unbal	Bal	Xfmr bal
Output Connection	Active bal	Active bal	Unbal	Bal	Xfmr bal
Audio Response R/P	±3dB/30Hz-22kHz	±2dB/30Hz-24kHz	±3dB/30Hz-30kHz	±2dB/30Hz-22kHz	±3dB/30Hz-18kHz
S/N Ratio R/P	70dB 0VU + 13dB 1kHz	69dB 0VU + 13dB 1kHz	66dB	63dB 2-track	55dB 160nWb/m
Crosstalk (Adj. Tracks)	−55dB 0VU 1kHz	−64dB 0VU 1kHz	.....	.....	−50dB 250nWb/m
Distortion R/P	0.8% 250nWb/m + 0VU	0.8% 250nWb/m + 0VU	<1%	<0.8%	0.2% 160nWb/m
Related Models	.....	.....	.....	.....	.....
Reader Service Number	**547**	**548**	**549**	**550**	**551**

PHONO TURNTABLES

Phono systems using dc-servo drive motors with manual tonearm operation, suitable for broadcast and production applications.

Manufacturer	Broadcast Electronics	EMT-Franz/Gotham		Ramko Research	Russco Electronics
Model/Series Number	**Galaxy II**	**EMT-938**	**EMT-948**	**SL-1200MK2/Technics**	**RT-700/RT-710**
Drive System	Rim idler	Direct	Direct	Direct	.....
Speeds (rpm)	15-85	78/45/33/variable	78/45/33/variable	45/33⅓	.....
Speed Indicator	LEDs	Strobe	Strobe	LEDs	LEDs or RT-710
Controls	Base-mounted	On-base or remote	On-base or remote	Base-mounted	Base-mounted
Crystal Controlled	No	Yes	Yes	Yes	Yes
Pitch Control Range	±10%	±10%	±10%	±8%	±9%
Start Time	0.1s	0.5s	0.5s	0.7s or ¼-turn	¼-turn
Rumble Rating	−38dB per NAB	70dB wtd	70dB DIN 45539	−70dB IEC 98A wtd	−52dB DIN A
Wow Rating	0.14%	0.075%	0.075%	>0.01% Wrms	0.025%
Flutter Rating	0.14%	0.075%	0.075%	>0.01% Wrms	0.025%
S/N Ratio	.....	>70dB	70dB	.....	.....
Platter Size/Weight	12"/5 lb	12"	12"	13"/4.4 lb	13"/3.75 lb
Base Dimensions (inches)	16.63x17.38	19.5x17	18.5x18	17.85x14.2	17x16
Multideck Model	Integral	Integral	Integral	Integral	Remotely located
Tonearm Included	S-320 suggested	Yes	Yes	Yes	RTA-12 recommended
Cartridge Mount Type	Plug-in	Plug-in	Yes	Universal 4-pin	Adjustable separate plate
Reader Service No.	**337**	**338**	**339**	**340**	**341**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Audio Accessories

PHONO TURNTABLES

Manufacturer	Sonetec	Technics			Thorens/Gertatewerk
Model/Series Number	**DR-1000S**	**SP-10MK2**	**SP-25**	**SP-15**	**TD126 Mk III**
Drive System	Direct	Direct	Direct	Direct	Belt
Speeds (rpm)	78/45/33⅓	Variable & 3-speed	45/33⅓/variable	Variable & 3-speed	3 fixed
Speed Indicator	LEDs	LED	Strobe	LED	.....
Controls	Base-mounted	Base-mount & remote	Base-mounted	Base-mounted	Base-mounted
Crystal Controlled	Yes	Yes	Yes	Yes	Yes
Pitch Control Range	No	±9.9%	±6%	±9.9%	.....
Start Time	0.25s	0.25s	0.7s	0.4s	0.25s
Rumble Rating	−65dB DIN 45544 wtd	−92dB IEC 98A wtd	−78dB IEC 98A wtd	−78dB IEC 98A wtd	−72dB DIN wtd
Wow Rating	0.1% DIN 45545	>0.015% Wrms	0.01%	0.008%	0.04%
Flutter Rating	0.1% DIN 45545	>0.015% Wrms	0.01%	0.008%	0.04%
S/N Ratio	.....	.....	.....	.....	.....
Platter Size/Weight	12.6"	.....	13.4"/4.4 lb	13.3"/5.9 lb	13"/4.73 lb
Base Dimensions (inches)	.....	20.8x15.6 optional	13.75x14.6 optional	13.75x14.6 optional	.....
Multideck Model	Remotely located	Remotely located	Integral	Integral	Integral
Tonearm Included	Carbon fiber	No	No	No	TP-16 MK III
Cartridge Mount Type	(Includes pre-amps)	Universal 4-pin	Universal 4-pin	Universal 4-pin	Universal mount
Reader Service No.	**342**	**343**	**344**	**345**	**346**

WIRELESS MICROPHONES

FM radio systems for in-studio or on-set use, as a replacement for wired microphone equipment.

Manufacturer	Eugen Beyer	Cetec Vega			Coherent Communications
Model/System Number	**System 185**	**66A/77DII**	**R-42/77DII**	**67A/T-82**	**Model A/J**
RF Frequency Band	150-225MHz in U.S.	150-216MHz	150-216MHz	150-216MHz	150-240MHz
Diversity Receiver	NE-185.11 option	.....	Yes	Yes	No
Multiple Channels	1 (3 Optional)	1 in receiver	2 in receiver	2 in receiver	1 per system
Typical Range	.....	1000ft	1500ft	1200ft	¼-mile
AF Response T-R	−2dB/40Hz-20kHz	±1.5dB/40Hz-15kHz	±1.5dB/40Hz-15kHz	±1.5dB/40Hz-15kHz	2dB/80Hz-20kHz
S/N Ratio T-R	.....	103dB A-wtd	108dB A wtd	103dB A-wtd	.....
Distortion	0.5%	0.3%	0.15%	0.3%	2%
Modulation Control	Limiting compandor	Soft compression	Soft compression	Soft compression	.....
Transmitter Model Number	**S185 U.S. hand-held**	**77/DII**	**77/DII**	**T-82**	**Model A**
RF Output Power	35mW	50mW	50mW	50mW	50mW
Carrier Deviation	±13kHz	±15kHz	±15kHz	±15kHz	±12kHz
Microphone	Adapts to various	....	External	Internal	Dynamic or electret
Line Input	No	No	No	No	No
Level Control	.....	Manual	Manual	Manual	Manual
Power Required	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc
Operating Weight	12.7oz	5oz	5oz	9.5oz	10.5ox
Receiver Model Number	**NE-185**	**66A**	**R-42**	**67A**	**Model J**
Sensitivity	1μV	0.8μV 20dB quieting	0.6μV 20dB quieting	0.8μV 20dB quieting	0.8μV 12dB SINAD
Spurious Rejection	−75dB	85dB	90dB	85dB	−85dB
Audio Output Level	+6dBm	+16dBm	+20dBm	+16dBm	+10dBm & mic level
Power Required	117Vac/15-27Vdc	−18 to 10.5Vdc	+15Vdc/115-220Vac	10.5-18Vdc	9Vdc
Carrier Indicator	Yes	Meter	Meter & LED	Meter	Yes
Metering	.....	Battery RF VU	Audio/RF/VU LEDs	Audio/Battery/RF/VU	.....
Antenna Included	.....	Whip	Dipoles or whip	Whips	.....
Reader Service No.	**347**	**348**	**349**	**350**	**351**

WIRELESS MICROPHONES

Manufacturer	Edcor		HM Electronics		Micron Audio
Model/System Number	**E COM Highband**	**E COM Highband**	**System 82**	**System 58 (85)**	**MDR-540**
RF Frequency Band	150-216MHz	150-216MHz	150-240MHz	150-240MHz	150-216MHz
Diversity Receiver	No	Yes	.....	.....	Yes
Multiple Channels	1 per system	1 per system	1 per channel	1 per receiver	To 8 per receiver
Typical Range	¼-mile	¼-mile	1000ft line-of-sight	1000ft	1200ft
AF Response T-R	2dB/200Hz-16kHz	2dB/200Hz-16kHz	2dB/50Hz-15kHz	3dB/50Hz-15kHz	± 1dB/50Hz-15kHz
S/N Ratio T-R	.....	.....	115dB	115dB	115dB
Distortion	1%	1%	<0.3%	<1%	<0.3%
Modulation Control	Soft compression	Soft compression	Dynamic expansion II	Dynamic expansion	.....
Transmitter Model Number	**E COM 1 lavalier**	**E COM 1 hand-held**	**TX822 body-pac**	**TX582 (852) hand-held**	**TX-501/TX-503**
RF Output Power	100mW	100mW	50mW	50mW	50mW
Carrier Deviation	± 7.5kHz	± 7.5kHz	± 15kHz	± 15kHz	± 15kHz
Microphone	Various types	EV-671 element	Low Z external	Shure 58 (85)	Various
Line Input	No	No	No	No	Model dependent
Level Control	Manual	.....	.....	.....	Manual
Power Required	9Vdc	12Vdc	9Vdc	9Vdc	9Vdc
Operating Weight	10.7oz w/o battery	8.7oz w/o battery	4.5oz	15oz (12oz)	8.5-10.5oz
Receiver Model Number	**E COM 2 or 3**	**E COM 5**	**RX722**	**RX722**	**MDR-540**
Sensitivity	1μV, 12dB SINAD	1μV 20dB quieting	1μV 30dB quieting	1μV 30dB quieting	1μV 80dB SINAD
Spurious Rejection	– 70dB	– 70dB	.....	.....	>80dB
Audio Output Level	100mV & line	3Vp-p	+ 18dBm line	+ 18dBm line	0dBm line/ – 51dB mic
Power Required	12Vdc or 115Vac	12Vdc or 115Vac	12-30Vdc external	12-30Vdc external	12-15Vdc/110-240Vac
Carrier Indicator	Yes	Yes	LED	LED	LED
Metering	.....	.....	AF/RF	RF/AF	Battery/RF LEDs
Antenna Included	Telescoping whip	Yes	Telescoping whip	Telescoping whip	Option
Reader Service No.	**352**	**353**	**354**	**355**	**356**

WIRELESS MICROPHONES

Manufacturer	Micron Audio		Nady Systems		RF Technology
Model/System Number	**CTR-501**	**MDR3-SHC**	**701 VHF Diversity**	**601 VHF**	**RM-102 (RM-100)**
RF Frequency Band	150-216MHz	150-216MHz	151-215MHz	151-215MHz	947-952MHz
Diversity Receiver	Optional	Yes	True diversity	No	Yes
Multiple Channels	1 per receiver	1 per receiver	1 per receiver	1 per receiver	1 (5 with RM-100)
Typical Range	1000ft	1200ft	300ft	300ft	500ft
AF Response T-R	± 1dB/50Hz-15kHz	± 1dB/50Hz-15kHz	± 3dB/20Hz-20kHz	± 3dB/20Hz-20kHz	± 1dB/50Hz-10kHz
S/N Ratio T-R	115dB	115dB	120dB	120dB	.....
Distortion	<0.3%	<0.3%	<0.3%	<0.3%	1% w/ AGC in use
Modulation Control	.....	.....	.....	.....	Soft limiting
Transmitter Model Number	**TX-501**	**TX-503**	**701LT**	.....	**Standard unit**
RF Output Power	50mW	50mW	50mW	50mW	50mW
Carrier Deviation	± 15kHz	± 15kHz	± 15kHz	± 15kHz	± 50kHz
Microphone	External	Internal	Various	Various	External
Line Input	220kΩ	No	.....	.....	No
Level Control	Manual & auto	Manual	Manual	Manual	Manual
Power Required	9Vdc	9Vdc	9Vdc	9Vdc	9Vdc
Operating Weight	8.5oz	10.5oz	.....	.....	12.5ox w/ battery
Receiver Model Number	**MR-510**	**MDR-530**	**701VHF**	**601VHF**	**RM-102 (RM-100)**
Sensitivity	1μV, 60dB SINAD	1μV 60dB SINAD	.....	.....	.....
Spurious Rejection	>80dB	>80dB	80dB	80dB	– 70dB
Audio Output Level	– 51dB mic	0dBm line/ – 51dB mic	0dBm line/ – 40dB mic	0dBm line/ – 40dB mic	+ 8dBm for RM-100
Power Required	12-30Vdc	12-15Vdc/100-240Vac	24Vdc/120Vac	24Vdc/120Vac	12Vdc/115Vac
Carrier Indicator	LED	LED	Meter & LED	Meter & LED	.....
Metering	Battery/RF LEDs	Battery/RF LEDs	Audio/RF LEDs	Audio/RF LEDs	.....
Antenna Included	Helical whip	Helical dipole	Yes	Yes	2 for diversity
Reader Service No.	**357**	**358**	**359**	**360**	**362**

MAYBE YOU'D USE WIRELESS WITH GREATER FREQUENCY IF IT WAS EASIER TO CHOOSE FREQUENCIES.

INTRODUCING THE WIRELESS MICS YOU CAN USE ANYWHERE WITHOUT HAVING THEM RECRYSTALED.

Wireless mics were invented for people who are constantly on the go. Unfortunately, the only place wireless mics seem to be constantly going is back to the lab for a different frequency.

Which is why Sony developed this new VHF wireless system. It has a circuit that can synthesize frequencies built right into it. So all you do is turn the units on, select a frequency, and you're ready to go. Anywhere. One mic. Two. Up to 24. In simultaneous operation.

And since the entire system is based on frequency synthesis, chances are your Sony wireless mic dealer will always have the frequencies you want.

On hand, not in a catalog.

EXTRAORDINARY PERFORMANCE AT A SURPRISINGLY ORDINARY PRICE.

Still, the best part of the story is how this system sounds. After all, Sony designed it to the same standards as its UHF system, the wireless system ABC chose to take to the 1984 Games. So its specs are duly impressive—dynamic range: greater than 90 dB; frequency response: 100-15,000 Hz; S/N ratio: greater than 60 dB.

You can also eliminate drop-out by using the system's true space diversity receiver. And the entire system is AC/DC operable.

Yet the Sony VHF wireless mic system is priced right in line with all the wireless mics you're used to seeing (or not seeing because they're out getting their crystals changed again).

So, whether you've been dragging your feet about going wireless, or have already gone and are going crazy with frequency problems, one thing is clear. There's never been a better way to cut the cable.

Just visit the Sony wireless mic dealer in your area, or contact your nearest Sony Professional Audio regional office. In the North, (201) 368-5000; in the South, (615) 883-8140; in the Midwest, (312) 773-6000; in the West, (213) 537-4300. And see the reception you'll get.

SONY
Professional Audio

WIRELESS MICROPHONES

	Sennheiser	Sony/Pro Audio Div.		Swintek Enterprises	Telex Communications
Manufacturer					
Model/System Number	**SK1010-9/EM1010-4**	**UHF Systems**	**VHF Systems**	**dB·S 5000 Series**	**WHM-300/FMR-1**
RF Frequency Band	181-205MHz	470MHZ & 900MHz	174.6-215.4MHz	174-216MHz	150-215MHz
Diversity Receiver	w/ 2 EM1010 units	Yes	W/ WRR-220 tuner	Option Mark 9-2	Yes
Multiple Channels	5	1 per receiver	48, PLL synthesis	1 per receiver	1 per receiver
Typical Range		.....	.....	2000ft	1000ft
AF Response T-R	3dB/40Hz-20kHz	± 2dB/75Hz-13kHz	± 2.5dB/100Hz-15kHz	2dB/30Hz-12kHz	± 2dB/50Hz-15kHz
S/N Ratio T-R		60dB	>60dB, ± 1.9kHz dev	.....	.....
Distortion	3%	2%	<0.7% at 15kHz dev	0.7%	1%
Modulation Control	Compression	.....	Companding	Compression	Compression/limiting
Transmitter Model Number	**SK1010-9**	**WRT-27/27A**	**WRT-210/WRT-220**	**Mark 50A/dBs**	**WHM-300 hand-held**
RF Output Power	50mW	6mW	50mW, 50Ω load	50mW	15mW
Carrier Deviation	± 16kHz	± 150kHz	± 1.9kHz at – 64dB	± 10kHz	± 12kHz
Microphone	MKE-2010/MKE-4010	External	Various for WRT-220	Various	Electret contained
Line Input	No	Yes	No	Yes	No
Level Control	Manual	Automatic	24dB range WRT-220	Manual	Manual
Power Required	9Vdc	9Vdc/120Vac	2 AA cells	9Vdc	9Vdc
Operating Weight	8oz w/ battery	1 lb	14oz WRT-210	5oz	.....
	.....	.....	hand-held	.....	.....
Receiver Model Number	**EM1010-4**	**WRR-27/37/57**	**WRR-210/WRR-220**	**Mark 1 dBs**	**FMR-1**
Sensitivity	2.5μV	.....	>65dB at ± 200kHz	0.25μV 12dB SINAD	<1μV 12dB SINAD
Spurious Rejection		>80dB	> – 70dB	70dB	>70dB
Audio Output Level	1.55V	– 20dBm	– 58dBs into 600Ω	10dBV line/ – 36dB mic	+ 10dBm line/ – 50dB
Power Required	110Vac & battery	9Vdc/120Vac	6 AA or ext 9Vdc	115Vac or ext battery	12Vdc/10Vac
Carrier Indicator	Yes	LED	LEDs	Yes	Yes
Metering		Audio/RF	LEDs AF/RF	.....	.....
Antenna Included	TA203	Yes	Whips supplied	Various	⅝-wave
Reader Service No.	**363**	**364**	**167**	**365**	**366**

Cable shielding

By Robert E. Sharp

When installing a sound or video system, the goal is to deliver a faithful reproduction of the source signal at the output terminals. In addition to using proper techniques to avoid distortion, the contractor must be concerned with keeping extraneous noise out of the system.

Electromagnetic interference (EMI) has become the catchall term for all sorts of interference or noise, whether coupled capacitively, inductively or through ground loops and other common impedance paths. EMI can be of any frequency and can have any waveshape. It can be continuous or transient.

Proper shielding

A powerful tool for controlling EMI in sound and video systems is proper shielding of cables. Selection of the proper shield should be based on several factors, including the range of frequencies to which the system is susceptible, the nature of potential EMI sources in the area where the system is to be used, and mechanical factors such as continuous flexing vs. fixed installation.

The best cable shield is a seamless sheath of metal that has good conductivity, such as the shield used in CATV and MATV trunk cables. However, these cables, which the military categorizes as semi-rigid, are not practical for most broadcast applications because of the difficulty in handling and pulling. The traditional *flexible* shield consists of braids of copper wire. Because the strands are braided in an over-and-under pattern, it is impossible to obtain complete coverage of a cable core by using only a single braid.

Coverage

Percent shield coverage, or optical coverage, as provided in cable specifications refers to the percent of the cable core surface that is actually covered by shielding material. This is strictly a mechanical concept—it does not mean that a shield having 90 percent coverage will have 90 percent of the shield effectiveness of a shield having 100 percent coverage. Although it holds true that a shield having a higher percentage of coverage will usually be a more effective shield, other factors, such as the angle that the braids make with the axis of the cable, also enter into the effectiveness.

The optical coverage of a shield consisting of two braids cannot be calculated directly because it depends on the statistical probability of strands in the outer braid that happen to be over the holes in the inner braid. However, a double braid is measurably more effective than a single braid.

Precision video coax, for example, uses a high-coverage double braid for excellent shielding and reasonably good flexibility. At video frequencies, low dc resistance is also an important shield characteristic.

Mic cable, on the other hand, requires extreme limpness. A single braid having lower optical coverage (in the 80 to 85 percent range) is usually adequate for the short runs used in a typical mic application, particularly when a balanced-output, low-impedance system is used.

Some newer techniques in miniature cable design use a conductive textile wrap having 100 percent optical coverage and a more open (60 percent) copper wire braid or a spiral wrap of copper wire. Conductive textiles are only effective in the audio range, and the coil effect of a spiral wire shield also limits its effectiveness to audio frequencies.

Mic cables should never be used for permanent installations as audio cable because their shielding capability is marginal. The features that give them

Figure 1

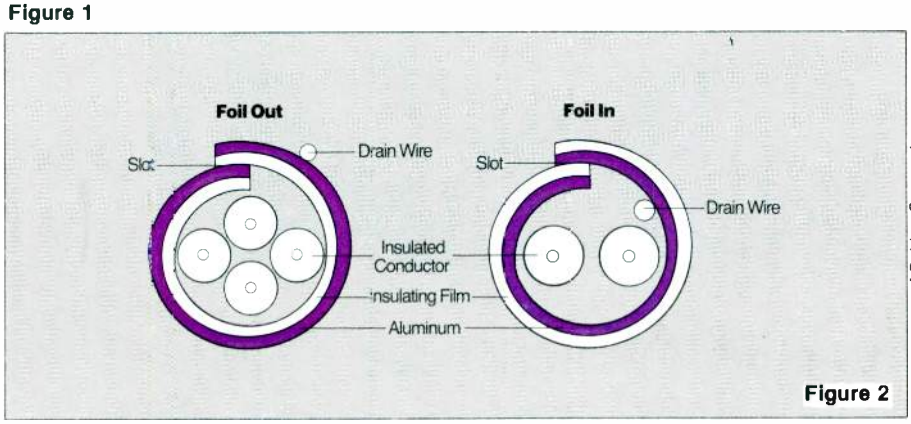


Figure 2

Photo courtesy of Belden Corporation

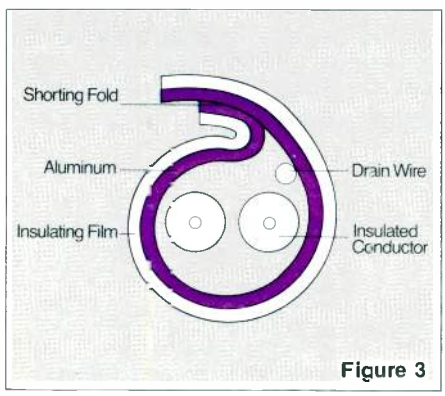


Figure 3

Photo courtesy of Belden Corporation

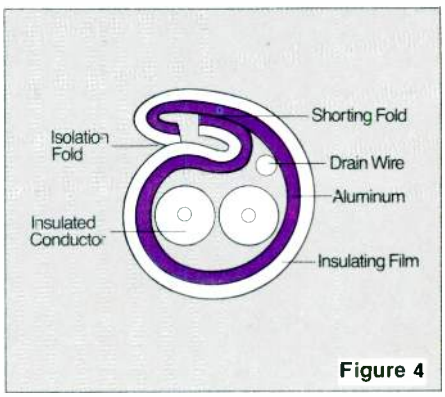


Figure 4

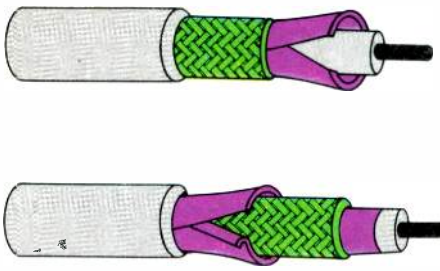
Photo courtesy of Belden Corporation

Figure 1. The two basic types of copper (sometimes tinned or aluminum) shield found on cable. Braided shields are usually interwoven strands—one set clockwise and the other counterclockwise. Spiral (or serve) shields are usually copper wire wound in a spiral around the inner cable core.

Figure 2. The basic foil configuration without shorting folds (foil out and foil inside the insulating film).

Figure 3. The basic shorting fold configuration used in foil-shielded type cables.

Figure 4. A method of improving high-frequency shield performance using two folds in the foils in a z configuration with a separate insulating film.



Foil/Braid Foil

Figure 5. Two types of combination shielding—foil and braid and the foil-braid-foil system.

limpness also make them cost about three times as much as the better shielded cables designed for fixed audio installations.

Miniature audio cables using aluminum-polyester laminated shields (Beldfoil) with a drain wire and z-fold provide an ideal answer for fixed installations. The shield is highly effective and is easy to terminate by use of the drain wire, which is in intimate contact with the aluminum foil shield throughout its length. The outer fold of the z provides metal-to-metal contact, giving the effect of a solid tube, while the inner fold provides extra protection of the conductor insulation. For multiple audio runs, several series of multipair cables are available in which the individual shields are applied with foil inward so that the layer of polyester with the outer folded edge provides complete isolation of each shield from the others while the inner foil-to-foil provides complete shield coverage. Each pair in this type of cable has its own drain wire.

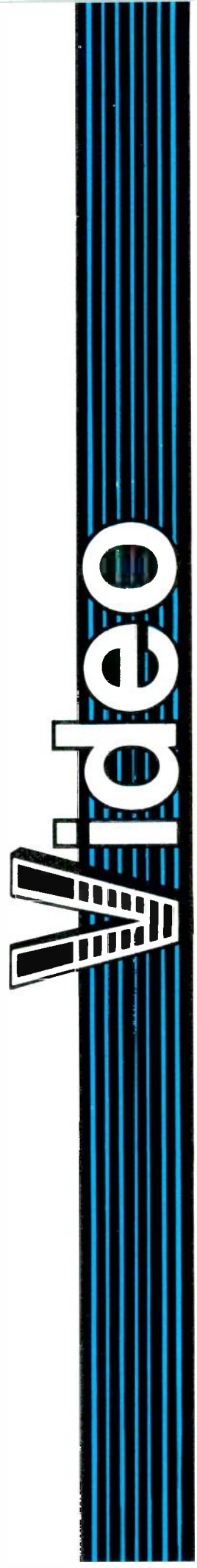
At VHF and UHF frequencies, shield combinations consisting of foil and braid make the most effective flexible shields. Particularly effective is a type consisting of an aluminum/poly/aluminum laminate bonded to the core so it will push back when an F-connector is inserted under the aluminum braid immediately above it (Duobond Plus). Above the braid is an aluminum/poly laminate with the edge folded to provide the equivalent of a closed tube.

Measurement

There are several methods for measuring shield effectiveness. Be aware that decibels represent a ratio (in logarithm form) of two readings—the reading on the shielded cable and some reference reading. The numbers obtained by two methods may not be the same because the reference is not the same. Some methods use the voltage applied to a test fixture as the reference. The numbers obtained by a given method on two cables that are the same except for the shield can be useful in comparing two shields, however. For example, if the reading on Cable A is 85dB and the reading on Cable B is 95dB, you can say that Cable B has 10dB better shielding than Cable A.

There is one source of EMI against which conventional cable shields are not effective, and that is near-field magnetic coupling. This occurs near transformers, fluorescent lamp ballasts, relays, arc welders and the like. This is a major source of hum at 60Hz and its harmonics. The only ways to combat this form of EMI are to route the cable away from it or enclose the cable in an iron shield that will divert the magnetic lines of force. Use of well-balanced twisted pairs and carefully balanced circuits having good common mode rejection will reduce susceptibility to this form to interference by exposing the two conductors equally to the same interference, resulting in cancellation of the induced voltages at the load.

Sharp is product development engineer for Belden Wire and Cable, Geneva, IL.



COLOR TV CAMERAS

Color camera systems for all broadcast applications, including hand-held ENG/EFP and camera/recorder units, studio/EFP pedestal-mounted types and HDTV systems.

Manufacturer	Ampex		Robert Bosch		
Model Number	**FPC-10P**	**FPC-10S**	**KCF-1**	**KCI-100**	**KCA-110**
Typical Application	ENG	ENG/EFP	ENG	Studio/ENG	ENG/EFP
Number & Type Pickup	3 LOC DG PbO	3 S-M SAT	3 PbO	3 LOC DG PbO	3 LOC DG PbO
Optical Format	⅔"	⅔"	½"	1"	⅔"
Sensitivity	200fc, f/4, 60%R	200fc	900 lux, f/2, 70%R	140fc, f/4	30fc, f/1.4
Maximum Video Gain	+18dB	+18dB	+12dB	.....	+18dB
Resolution	600 TVL	550 TVL	>40% green 4MHz	50% mod green 5MHz	750 TVL
Registration (1/2/3)	0.1, 0.2, 0.5%	0.1, 0.2, 0.5%	<40ns, <80ns	20ns, 20ns, 50ns	40ns, 80ns, 160 ns
S/N Ratio (NTSC)	59dB NTSC/56dB PAL	58dB NTSC/55dB PAL	54dB NTSC/52dB PAL	55dB NTSC/53dB PAL	57dB NTSC/55dB PAL
Contours From	Green	Green	Green/red	Green	Green
Internal ND Filters	Yes	Yes	Yes	Yes	Electronic
Color Correction By	Filters	Filter	Electronic	Electronic	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	With adapter	With adapter	Video or sync	Video or sync	Video
Computer Setup	Microprocessor	Microprocessor	No	Yes	No
Digital Operation	.....	.....	No	.....	No
Multicore Cable	Yes	Yes	150ft	1960ft	1640ft
Other Cable Types	.....	.....	.....	4920ft triax	4920ft traix
	.....	.....	.....	7380ft fiber-optic	13,000 fiber-optic
Automatic Functions	B/W balance, iris	B/W balance, iris	B/W balance, iris	All functions	B/W balance, iris
	Lens close	Lens close	.....	.....	Centering option
CCU Required	Optional RCU	Optional RCU	No	Yes	Option
Camera Head Weight	8.66 lb	8.25 lb	8 lb	77 lb	13.2 lb
VF Diagnostics	Yes	Yes	Yes	.....	Yes
Color Standards	NTSC/PAL	NTSC/PAL	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Component Outputs	Y/I/Q or Y/U/V	Y/I/Q or Y/U/V	RGB	RGB	RGB
Detachable VCR	M-format	M-format	Lineplex format	No	No
VCR Model Number	FPR-10	FPR-10	BCFYK9A	.....	.....
Reader Service Number	**600**	**601**	**602**	**603**	**604**

Pickup types: LOC = low output capacitance; DG = diode gun; PbO = lead oxide targets, i.e., Leddicon (EEV) or Plumbicon (Amperex); M-F = mixed field (electrostatic focus); M-S = mixed field (electrostatic deflection); SAT = Saticon (NHK/Hitachi).

COLOR TV CAMERAS

Manufacturer	Harris/Studio Division		Hitachi/Denshi		
Model Number	**TC-90**	**TC-85C**	**FP-15**	**SK-97**	**SK-970**
Typical Application	ENG	Studio/EFP	ENG/EFP	EFP	Studio
Number & Type Pickup	3 LOC DG PbO	3 DG PbO	3 M-F SAT	3 SAT or PbO	3 SAT or PbO
Optical Format	½"	1"	⅔"	⅔"	⅔"
Sensitivity	56fc, f/1.4, 60%R	80fc, f/2.8, 60%R	200fc, f/4, 89.9%R	200fc, f/4	200fc, f/4, 89.9%R
Maximum Video Gain	+18dB	+18dB	+12dB	+18dB	.....
Resolution	400 TVL	600 TVL	500 TVL	700 TVL (Saticon)	700 TVL (Saticon)
Registration (1/2/3)	0.1, 0.2, 0.3%	0.05, 0.1, 0.2%	0.1, 0.3, 0.7%	0.05, 0.1, 0.2%	0.05, 0.1, 0.2%
S/N Ratio (NTSC)	60dB NTSC/57dB PAL	56dB NTSC/53dB PAL	54dB NTSC/51dB PAL	59dB NTSC/56dB PAL	59dB NTSC/56dB PAL
Contours From	Green & red	Red & green	Green	Green	Green
Internal ND Filters	Yes	Yes	No	Yes	Yes
Color Correction By	Filters	Filter & electronic	Filters	Filters	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video	Video	Video	Video	Video
Computer Setup	"Smart option"	Yes	No	Yes	Yes
Digital Operation	No	No	No	Option	Option
Multicore Cable	.....	2000ft, 0.65"	300ft	1000ft F-TVC-26C	11,000ft F-TVC-26C
Other Cable Types	5000ft coax	5000ft triax	.....	3650ft RG-11/AU	6000ft triax
	.....	.....	.....	7650ft triax	.....
Automatic Functions	B/W balance, iris	B/W balance, center	B/W balance, iris	B/W balance, iris	B/W balance, iris
	Centering	Register, black level	.....	Registration	Registration
CCU Required	Option	Yes	Optional RCU	Option	Option
Camera Head Weight	8.2 lb	85 lb	11 lb	15 lb	55 lb
VF Diagnostics	Option	No	No	Yes	Yes
Color Standards	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC/PAL
Component Outputs	No	RGB	.....	Y/I/Q or RGB	RGB
Detachable VCR	No	No	No	M-format compatible	No
VCR Model Number	.....	.....	.....	.....	.....
Reader Service Number	**605**	**606**	**607**	**608**	**609**

COLOR TV CAMERAS

Manufacturer	Hitachi/Denshi	Ikegami			
Model Number	**SK-110**	**HL-95 Unicam**	**ICT-730A (AP)**	**HK-302**	**HK-322**
Typical Application	Studio/EFP	ENG/EFP	ENG/EFP	Studio/EFP	Studio
Number & Type Pickup	3PbO	3 S-M DG PbO	3 H8399B SAT (PbO)	3 LOC DG PbO	3 PbO
Optical Format	1¼"	⅔"	⅔"	⅔"	1 or 1¼"
Sensitivity	200fc, f/5.6, 90%R	2000 lux, f/4.5, 89.9%R	2000 lux, f/4, 89.9%R	2000 lux, f/4.5	1500 lux, f/4, 89.9%R
Maximum Video Gain		+24dB	+18dB	.....	+12dB
Resolution	600 TVL	650 TVL	650 TVL	400 TVL, 50% mod	700 TVL
Registration (1/2/3)	0.05% overall	0.05, 0.1, 0.2%	0.1, 0.2, 0.4%	0.1, 0.3, 0.4%	<0.05% overall
S/N Ratio (NTSC)	54dB NTSC	60dB NTSC	57dB NTSC	57dB NTSC	56dB NTSC
Contours From	Green	Green	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes	No	Yes
Color Correction By	Filters	Filters	Filters	Filters	Filter & electronic
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video or sync	Video	Video	Video	Video
Computer Setup	Yes	No	No	No	Option
Digital Operation	No	Yes	No	No	Yes
Multicore Cable	2000ft TV24	984ft TV39	.....	984ft TV28	1968ft TV24 or TV81
Other Cable Types	Triax	6560ft triax	984ft coax	. ...	4920ft triax
Automatic Functions	B/W balance	B/W balance, iris	B/W balance, iris	B/W balance, iris	B/W balance, center
	Registration	Black level	Black level	Black level, detail	Register, black level
CCU Required	Yes	Option	Option	Yes	Yes
Camera Head Weight	90.3 lb	6.6 lb	11.4 lb	57 lb	94.6 lb
VF Diagnostics	No	Yes	Option	No	.....
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
Component Outputs	RGB	RGB Y/I/Q	RGB Y/R-Y/B-Y	RGB	RGB
	.....	Y/R-Y/B-Y	.....	.....	Y/R-Y/B-Y
Detachable VCR	No	Compatible to all	No	No	No
VCR Model Number	.....	.....	.....	.....	.....
Reader Service Number	**610**	**611**	**612**	**613**	**614**

COLOR TV CAMERAS

Manufacturer	Ikegami		JVC	
Model Number	**HK-357R**	**EC-35HD**	**HDK-1125**	**KY-110U**	**KY-310U**
Typical Application	Studio/EFP	Electronic cinema	High definition	ENG/EFP	ENG/EFP
Number & Type Pickup	3 DG PbO	3 LOC DG type	3 M-S type	3 SAT	3 M-F SAT
Optical Format	1"	⅔"	5:3 ratio/1"	½"	⅔"
Sensitivity	1000 lux, f/2.8	2500 lux T/4	150fc, f/2.8, 89.9%	186fc, f/2.8	186fc, f/4
Maximum Video Gain		.....	.....	+12dB	+18dB
Resolution	400 TVL, 50% mod	900 TVL	800 TVL, G>35%	600 TVL	600 TVL
Registration (1/2/3)	0.05, 0.3, 0.4%	0.05, 0.1%	0.05, 0.1%	0.1, 0.4, 0.8%	0.1, 0.2, 0.4%
S/N Ratio (NTSC)	>53dB	40dB rms	.....	54dB	57dB
Contours From	Green	.....	Green	Green	Green
Internal ND Filters	Yes	.....	Yes	Yes	Yes
Color Correction By	Filter	.....	Filter & matrix	Filters	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video	Video	Black	Video or black	Video or black
Computer Setup	Yes	Microprocessor	Yes	Microprocessor	Microprocessor
Digital Operation	.....	.....	.....	No	No
Multicore Cable	1968ft TV81	16.4ft setup cable	656ft F-7 28-core	Available	32ft to VCR
Other Cable Types	4920ft triax	Coax	3000ft fiber-optic	Coax for video	Coax for video
Automatic Functions	B/W balance, iris	B/W balance, gamma	B/W balance, iris	B/W balance, iris	B/W balance, iris
	.....	.....	Centering	Register, black level	Register, black level
CCU Required	Option	Setup only	Yes	RCU option	No
Camera Head Weight	88 lb	22 lb	86 lb	8.2 lb	9.1 lb
VF Diagnostics	No	No	.....	.....	.....
Color Standards	NTSC	HDTV 1125-line	HDTV 1125-line	NTSC	NTSC
Component Outputs	RGB	.....	RGB Y/Cw/Cn	.....	No
Detachable VCR	No	No	No	No	No
VCR Model Number	.....	.....	.....	.....	.....
Reader Service Number	**615**	**616**	**617**	**618**	**619**

COLOR TV CAMERAS

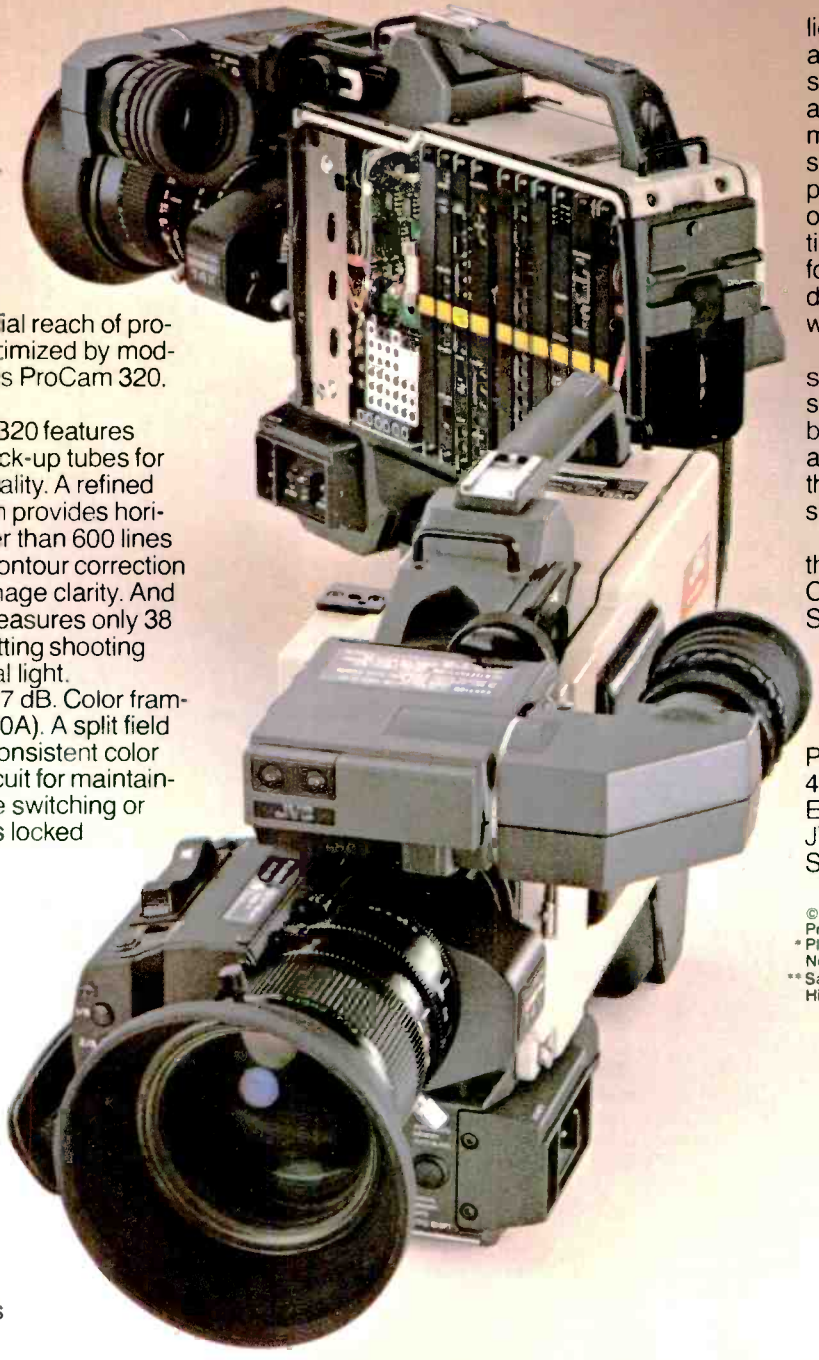
Manufacturer	JVC		Link Electronics		Marconi
Model Number	**KY-900U (950)**	**KY-210U**	**#130**	**NEC-100**	**Mark IX**
Typical Application	ENG/EFP	ENG/EFP	Studio/EFP	ENG/EFP	Studio/EFP
Number & Type Pickup	3 LOC DG SAT (PbO)	3 M-F SAT	3 PbO	3 LOC DG PbO or SAT	3 PbO
Optical Format	⅔"	⅔"	⅔"	⅔"	1¼"
Sensitivity	186fc, f/4	186fc, f/4	80fc, f/2, 60%R	200fc	800 lux, f/4, 60%R
Maximum Video Gain	+ 18dB	+ 18dB	.....	+ 18dB	.....
Resolution	600 TVL	650 TVL	>600 TVL	650 TVL	100% mod at 5MHz
Registration (1/2/3)	0.1, 0.2, 0.4%	0.1, 0.2, 0.4%	0.05% overall	>0.1, >0.2, >0.4%	40ns, 80ns, 120ns
S/N Ratio (NTSC)	58dB	57dB	54dB PAL/SECAM	56dB PAL	51dB
Contours From	Green	Green	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes	Yes	Yes
Color Correction By	Detachable filters	Filters	Electronic	Filters	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video or black	Video or black	Video	Video	Sync
Computer Setup	Microprocessor	Microprocessor	Yes	ASU option	Yes
Digital Operation	No	No	Yes	No	.....
Multicore Cable	32ft to VCR	.....	.....	1000ft 36-conductor	3000ft
Other Cable Types	Coax for video	Coax for video	4920ft triax	3000ft coax	4500ft triax
	.....	.....	.....	10,000 fiber-optic	.....
Automatic Functions	B/W balance, iris	B/W balance, iris	B/W balance, center	B/W balance, iris	All functions
	Register, black level	Register, black level	Iris, registration	Flare, centering	.....
CCU Required	No	No	Yes	RCU option	Yes
Camera Head Weight	10 lb	7.8 lb	44 lb	10 lb	75 lb
VF Diagnostics	Yes	.....	Yes	.....	.....
Color Standards	NTSC	NTSC	NTSC/PAL	PAL (NTSC available)	NTSC/PAL/SECAM
Component Outputs	No	No	.....	No	RGB
Detachable VCR	No	No	No	No	No
VCR Model Number	.....	.....	.....	.....	.....
Reader Service Number	**620**	**621**	**622**	**623**	**624**

COLOR TV CAMERAS

Manufacturer	Marconi	NEC	Panasonic		
Model Number	**Mark IX Portable**	**SP-3**	**B-100S**	**B-100PL**	**AK-30**
Typical Application	ENG/EFP	ENG	ENG/EFP	ENG/EFP	ENG/EFP
Number & Type Pickup	3 PbO	3 CCD devices	3 SAT	3 LOC DG PbO	3 PbO
Optical Format	1"	⅔"	⅔"	⅔"	⅔"
Sensitivity	1100 lux, f/2.8, 60%R	200fc, f/4, 60%R	200fc, f/3.5, 60%R	200fc, f/4, 60%R	200fc, f/4.5, 89.9%R
Maximum Video Gain	.....	+ 12dB	+ 18dB	+ 18dB	+ 18dB
Resolution	100% mod at 5MHz	>450 TVL	550 TVL	600 TVL	650 TVL
Registration (1/2/3)	40ns, 80ns, 120ns	No error	0.1, 0.2, 0.5%	0.1, 0.2, 0.5%	<0.05, 0.1, 0.25%
S/N Ratio (NTSC)	49dB	55dB	58dB	59dB	62dB
Contours From	Green	Green	Green	Green	Red/green/blue
Internal ND Filters	.....	Yes	Yes	Yes	Yes
Color Correction By	Filters	Filter & electronic	Filters	Filters	Filters
Beam Optimization	Yes	Not applicable	Yes	Yes	Yes
Gen-lock Signal	Video or sync	Video	Video with adapter	Video with adapter	Video or sync
Computer Setup	.....	No	No	No	No
Digital Operation	.....	No	No	No	No
Multicore Cable	2400ft	160ft	1000ft 32R type	1000ft 32R type	1000ft 32R type
Other Cable Types	4500ft triax	.....	.....	.....	3000ft triax
Automatic Functions	B/W balance, iris	B/W balance, iris	B/W balance, iris	B/W balance, iris	B/W balance, center
	Centering	Black level	.....	.....	Iris, black level
CCU Required	Yes	Option	No	No	No
Camera Head Weight	26 lb	5.9 lb	8.25 lb	8.66 lb	10.8 lb
VF Diagnostics	.....	No	Yes	Yes	Yes
Color Standards	NTSC/PAL	NTSC	NTSC	NTSC	NTSC
Component Outputs	RGB	RGB Y/R-Y/B-Y	Y/I/Q RGB	Y/I/Q RGB	Y/I/Q RGB
Detachable VCR	No	Adaptable to Beta	M-format	M-format	No
	.....	or ¼" systems	.....	.....	.....
VCR Model Number	.....	.....	AU-100B	AU-100B	.....
Reader Service Number	**625**	**626**	**627**	**628**	**629**

320.

The ProCam™ Video Camera with Plumbicon* tubes at Saticon** price.



JVC's experience—and success—in designing the highest quality and reliability into compact video production cameras is unmatched. Now, continuing this tradition of high performance at an affordable price, JVC has brought a "high-end" teleproduction camera within the financial reach of production people often victimized by modest budgets. This time, it's ProCam 320.

What a package!

SENSITIVITY. ProCam 320 features three, 2/3" Plumbicon pick-up tubes for incomparable picture quality. A refined f/1.4 prism optics system provides horizontal resolution of better than 600 lines at center. A 2H vertical contour correction circuit further assures image clarity. And minimum illumination measures only 38 lux (3.6 fc) at f/1.7, permitting shooting even in limited or artificial light.

A video S/N ratio of 57 dB. Color framing output signal (RS-170A). A split field color bar generator for consistent color reference. A genlock circuit for maintaining a stable picture while switching or mixing with other signals locked on the same source.

EASY OPERATION. Several 8-bit data memory chips offer operator conveniences for quick set-up and consistent performance. These include: Auto centering, auto-black balance and auto-white balance, auto black level stabilization and auto beam control circuits. Matrix masking for true color reproduction and automatic protection for the pick-up tubes are a few of the many features standard on this new camera.

VERSATILITY. Easy portability. Outstanding performance in low-level lighting. High degree of automation. An extensive selection of options and accessories combine to make the ProCam 320 suitable for both studio production, EFP, or ENG; or, indeed, to any application, anywhere, that calls for top quality video production while staying within a tight budget.

PROCAM TECHNICAL SUPPORT. Your ProCam sales representative will be happy to explain the availability and calibre of the ProCam technical support program

For a demonstration of the ProCam 320 Video Camera, a 320 Spec Sheet, or JVC's complete catalog, call, toll-free:

1-800-JVC-5825

JVC Company of America
Professional Video Division
41 Slater Drive,
Elmwood Park, N.J. 07407
JVC CANADA,
Scarborough, Ont.

PROCAM

JVC®

JVC COMPANY OF AMERICA
Professional Video Division

Circle (12) on Reply Card

COLOR TV CAMERAS

Manufacturer	Philips				
Model Number	**LDK-6**	**LDK-26**	**LDK-614**	**LDK-14SL**	**LDK-54**
Typical Application	Studio/EFP	Studio/EFP	Studio/EFP	Studio/EFP	ENG/EFP
Number & Type Pickup	3 PbO	3 PbO	3 PbO	3 PbO	3 PbO
Optical Format	1 or 1¼"	⅔"	⅔"	⅔"	⅔"
Sensitivity	53fc, f/2.8, 90%R	87fc, f/2.8, 90%R	81fc, f/2.8, 90%R	93fc, f/3, 90%R	85fc, f/3, 90%R
Maximum Video Gain	+12dB	+12dB	+12dB	+18dB	+18dB
Resolution	700 TVL	700 TVL	700 TVL	700 TVL	700 TVL
Registration (1/2/3)	0.06, 0.1, 0.1%	0.06, 0.1, 0.1%	0.1, 0.2, 0.3%	0.1, 0.2, 0.4%	0.075, 0.15, 0.25%
S/N Ratio (NTSC)	58dB NTSC/56dB PAL	58dB NTSC/56dB PAL	57dB NTSC/55dB PAL	57dB NTSC/55dB PAL	57dB NTSC/55dB PAL
Contours From	Green (red option)	Green	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes	Yes	Yes
Color Correction By	Filter & electronic	Filter & electronic	Filters	Filters	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video	Video	Video	Video	Video
Computer Setup	Yes	Yes	No	No	No
Digital Operation	Yes	Yes	Yes	Option	No
Multicore Cable	.....	.....	.....	1000ft TV15P	.....
Other Cable Types	6500ft triax	6500ft triax	5000ft triax	4800ft triax	.....
Automatic Functions	B/W balance, center Register, black level	Black level, register B/W balance, center	B/W balance, iris Centering	B/W balance, iris Centering	B/W balance, iris Centering
CCU Required	Yes	Yes	Yes	Option	No
Camera Head Weight	90 lb	75 lb	16 lb	13 lb	20.5 lb
VF Diagnostics	Yes	Yes	No	No	No
Color Standards	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Component Outputs	RGB	RGB	No	RGB	Y/U/V
Detachable VCR	No	No	No	No	¼" format
VCR Model Number	.....	.....	.....	.....	LDL-2000
Reader Service Number	**630**	**631**	**632**	**633**	**634**

COLOR TV CAMERAS

Manufacturer	Philips	RCA			Sharp
Model Number	**LDK-44**	**CCD-1**	**TK-48**	**TK-47B**	**XC-800II**
Typical Application	Studio/ENG/EFP	ENG	Studio	Studio	Studio/ENG/EFP
Number & Type Pickup	3 PbO	3 CCD devices	3 PbO	3 PbO	3 SAT-II
Optical Format	⅔"	½"	1¼"	1¼"	⅔"
Sensitivity	12fc, f/2.8, 60%R	178fc, f/4, 89.9%R	125fc, f/4, 60%R	125fc, f/4, 60%R	186fc, f/4, 89.9%R
Maximum Video Gain	+12dB	+18dB	+12dB	+12dB	+18dB
Resolution	>600 TVL	300 TVL, G>60%	>750 TVL	>750 TVL	650 TVL
Registration (1/2/3)	60ns, 80ns, 150ns	0.05% overall	0.05, 0.05, 0.1%	0.05, 0.05, 0.1%	0.1, 0.2, 0.4%
S/N Ratio (NTSC)	52dB NTSC	62dB NTSC	55dB NTSC/52dB PAL	55dB NTSC/52dB PAL	57dB NTSC
Contours From	Green	Green	Green & red	Green & red	Green
Internal ND Filters	No	Yes	Yes	Yes	No
Color Correction By	Electronic	Filters	Filter & electronic	Filter & electronic	Filters
Beam Optimization	Yes	Not applicable	Yes	Yes	Yes
Gen-lock Signal	Video	Video	Video	Video	Video
Computer Setup	No	No	Yes	Yes	No
Digital Operation	No	No	Yes	Yes	Yes
Multicore Cable	500ft LDH-8110	200ft TV-39	2000ft TV-24	2000ft TV-24	1000ft 26-core
Other Cable Types	1000ft coax	5000ft triax	11,000ft triax	11,000ft triax	6000ft triax
Automatic Functions	Register, black level B/W balance, center	B/W balance, iris	B/W balance, center Register, black level	B/W balance, center Register, black level	B/W balance, iris Black level
CCU Required	Option	No	Yes	Yes	Option
Camera Head Weight	19 lb	13.5 lb	88 lb	88 lb	12.6 lb
VF Diagnostics	Yes	No	Yes	Option	Yes
Color Standards	NTSC	NTSC	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC
Component Outputs	No	U/I/Q Y/R-Y/B-Y	RGB	RGB	No .....
Detachable VCR	No	M-format	No	No	No
VCR Model Number	.....	HR-1	.....	.....	.....
Reader Service Number	**635**	**636**	**637**	**638**	**639**

Camera Mart Video Systems:

We don't love you and leave you.

At Camera Mart, we believe our responsibility for your video system doesn't end with its installation.

Not only do we design, engineer, build and install the video system you need, we also *service* what we sell.

And, at Camera Mart, size doesn't matter. Whether your video system is a simple off-line unit or a complex broadcast studio, you get Camera Mart's *total* support. We give you a complete "turn-key" system. Delivered on time, and on budget.

This policy—where old-fashioned service is a thing of the *present*—sets us apart from other designers of production, post-production and mobile video systems.

Whatever you spend, we have so many sources to choose from, we can customize a system to any specs. And then keep it working.

And that's kind of unusual these days.

Typical Systems From Camera Mart:

1. Longwood Video Post-Production Facility.
2. Sheridan-Elson Production House Editing System.
3. CMTV Transportable "Super System."
4. Camera Mart Broadcast Multi Source Editing Suite.

Video Systems designed, engineered, serviced by CMV SYSTEMS

1 2 3 4

The Camera Mart, inc.
456 West 55th Street, New York 10019 • (212) 757-6977 Telex: 1-2078
304 First St., Liverpool, NY 13088 • (315) 457-3703

Circle (13) on Reply Card

COLOR TV CAMERAS

Manufacturer	Sharp	Sony Broadcast			
Model Number	**XC-900D**	**BVP-3 (30)**	**BVP-150**	**BVP-360**	**BVW-2 Newsmaker**
Typical Application	Studio/ENG/EFP	ENG/EFP	ENG/EFP	Studio/EFP	ENG
Number & Type Pickup	3 DG PbO	3 M-F SAT (PbO)	3 M-F SAT	3 M-F LOC SAT	1 SAT (Trinicon)
Optical Format	⅔"	⅔"	⅔"	⅔"	½"
Sensitivity	186fc, f/4, 89.9%R	200fc, f/4, 90%R	200fc, f/4	200fc, f/4, 90%R	200fc, f/4, 89.9%R
Maximum Video Gain	+18dB	+18dB	+18dB	+18dB	+12dB
Resolution	650 TVL	650 TVL	650 TVL	700 TVL	280 TVL
Registration (1/2/3)	0.1, 0.2, 0.4%	0.1, 0.15, 0.3%	0.1, 0.2, 0.4%	0.05, 0.1, 0.15%	Not applicable
S/N Ratio (NTSC)	57dB NTSC	58dB NTSC/56dB PAL	57dB NTSC/55dB PAL	60dB NTSC	47dB (NTSC system)
Contours From	Green	Green	Green	Green	Green
Internal ND Filters	No	Yes	Yes	Yes	Yes
Color Correction By	Filters	Filters	Filters	Filters	Filters
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video	Video with adapter	Video	Sync or video	No gen-lock feature
Computer Setup	No	Microprocessor	Microprocessor	Microprocessor	Microprocessor
Digital Operation	Yes	.....	.....	.....	No
Multicore Cable	1000ft 26-core	984ft CCW-41C	330ft 26/14-cond	984ft	No cables used
Other Cable Types	6000ft triax	.....	.....	7872ft triax	.....
Automatic Functions	B/W balance, iris Black level	B/W balance, iris Centering	B/W balance, iris Center, black level	B/W balance, iris Registration	B/W balance .....
CCU Required	Option	Option with adapter	No	Yes	No
Camera Head Weight	13.4 lb	9.5 lb	9.25 lb	50 lb	9 lb
VF Diagnostics	Yes	Yes	Yes	.....	Limited
Color Standards	NTSC	NTSC/PAL/SECAM	NTSC/PAL	NTSC	NTSC/PAL
Component Outputs	No	Y/R-Y/B-Y	Y/R-Y/B-Y	Y/R-Y/B-Y	Y/R-Y/B-Y to VCR
Detachable VCR	No	Adapts to Beta	No	No	Non-detaching
VCR Model Number	.....	BVV-1	.....	.....	Betacam compatible
Reader Service Number	**640**	**641**	**642**	**643**	**644**

COLOR TV CAMERAS

Manufacturer	Sony Broadcast	Thomson-CSF			
Model Number	**HDC-100**	**TTV-1623 (1624)**	**BC-613 Betacam**	**TTV-1525C**	**MC-701F**
Typical Application	High definition	ENG/EFP	ENG/EFP	Studio/EFP	ENG/EFP
Number & Type Pickup	3 M-F SAT	3 LOC SAT (PbO)	3 M-F SAT	3 DG LOC PbO	3 DG PbO
Optical Format	5:3 ratio/1"	⅔"	⅔"	1"	⅔"
Sensitivity	200fc, f/3, 90%R	200fc, f/4, 89.9%	200fc, f/4, 89.9%	140fc, f/4, 60%R	200fc, f/4.5, 60%R
Maximum Video Gain	+6dB	+18dB	+18dB	+12dB	+18dB
Resolution	1200 TVL	650 TVL	650 TVL	400 TVL, G>50%	>600TVL
Registration (1/2/3)	0.025, 0.05, 0.1%	0.1, 0.2, 0.4%	0.1, 0.15, 0.3%	20ns, 20ns, 40ns	0.1, 0.2, 0.4%
S/N Ratio (NTSC)	.....	56dB NTSC/54dB PAL	58dB NTSC	53.5dB NTSC	57dB NTSC
Contours From	Green	Green	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes	Including effects	Yes
Color Correction By	Filters	Filter & electronic	Filter & electronic	Electronic	Filter & electronic
Beam Optimization	Yes	Yes	Yes	Yes	Yes
Gen-lock Signal	Video or sync	Video	Video	Video	Video
Computer Setup	Yes	Option	No	Yes	No
Digital Operation	.....	Option	Option	Yes	Yes
Multicore Cable	656ft	1920ft TV-39	1920ft TV-39	190ft	1920ft TV-39
Other Cable Types	3280ft fiber-optic	Coax & triax	Coax & triax	4800ft triax 7570ft fiber-optic	Coax & triax .....
Automatic Functions	All functions	B/W balance, center Register, black level	B/W balance, iris Centering, black level	B/W balance, center Register, black level	B/W balance, iris Center, black level
CCU Required	Yes	Option	Option	Yes	Option
Camera Head Weight	22 lb	9 lb	9.5 lb	88 lb	12.7 lb
VF Diagnostics	.....	Yes	Yes	Yes	Yes
Color Standards	HDTV 1125-line	NTSC/PAL	NTSC/PAL/SECAM	No	NTSC/PAL/SECAM
Component Outputs	Y/I/Q Y/R-Y/B-Y	Y/R-Y/B-Y	Y/R-Y/B-Y	NTSC/PAL/SECAM RGB	RGB .....
Detachable VCR	No	Betacam	Betacam	No	No
VCR Model Number	.....	VR-611	VR-611	.....	.....
Reader Service No.	**645**	**646**	**647**	**648**	**649**

CAMERA LENSES, ½-inch Format

Manufacturer	Angenieux	Canon	Fujinon		Schneider	Tamron
Model Number	15x7	PH13x6.6IE	S12x6.6RM	S14x6.6ERM	TV54	70H
Typical Application	ENG	ENG	ENG	ENG	ENG/OB/EFP	ENG
Zoom Range	7-105mm	6.6-86mm	6.6-80mm	6.6-92mm	6.5-91mm	10-60mm
Widest Aperture	f/1.4	f/1.4	f/1.4	f/1.4	f/1.4	f/1.2
Widest Aperture After Knee	f/1.8	.....	f/1.5	f/1.5	Constant	f/1.4
MOD (inches or feet)	31"	31"	37.4"	31.5"	2.5'	39.4"
MOD Area (mm)	44x34	56x42	72x54	52.4x39.3	53x40	.....
Horizontal Angles	48°/3.5°	51.7°/4.3°	51.75°/4.6°	51.75°/4°	70°/2°	35.5°/6.2°
Back Focus Distance	Adjustable	33mm	35.02mm	35.03mm	35.7mm	15.607mm
Clear Aperture Front	.....	.....	68mm	72.7mm	72mm	41mm
Clear Aperture Rear	.....	.....	27mm	27.2mm	30mm	13.6mm
Range Extenders	2x	2x	No	2x	2x	No
Iris Servo	Yes	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes	No
Integral Diascope	No	No	No	No	Option	No
Lens Assembly Weight	3.7 lb	3.75 lb	3.5 lb	3.25 lb	3.3 lb	12.5 lb
Reader Service Number	650	651	652	653	654	655

FYI

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

TV Cameras

WHILE EVERYONE ELSE HAS BEEN PROMOTING A FORMAT, SONY HAS BEEN PERFECTING A SYSTEM.

Over the last three years, Sony's rivals in the combination camera/recorder arena have spent considerable time inventing wonderful things to say about their new formats. But apparently, they've overlooked inventing many wonderful new products to go along with these formats.

Sony has taken a different course.

In 1982, Sony introduced Betacam™ and the BVW-10 playback unit. An evolutionary system that didn't force stations to abandon their existing ¾″ and 1″ equipment.

Then, in 1983, Sony expanded the system with the three-tube Betacam, the BVW-40 edit/recorder, and the world's first battery-operated ½″ field playback unit.

And this year at NAB, Sony announced a major breakthrough in cart machine technology with Betacart.™ A system

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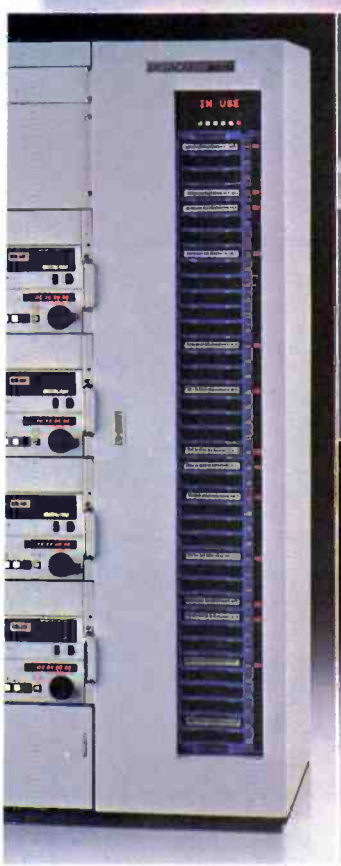
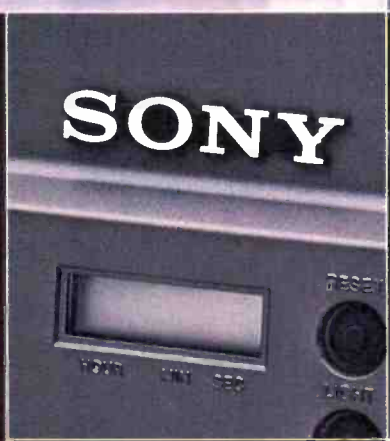




that demonstrated the Betacam format's strength beyond the newsroom, beyond the studio, and beyond field production.

At the same time, Sony also unveiled the world's lightest camera/recorder, the BVW-2 Newsmaker.™ And a prototype coder/decoder system that will make it possible for Betacam to be transmitted by microwave.

Each of these products is the result of Sony's dedication to the needs of the ENG and EFP industry. Work which has earned the Betacam format widespread acceptance by television stations and production companies around the world.

Which only makes sense. After all, in this business you don't win sales on the merits of your arguments. You win them on the merits of your products.

SONY
Broadcast

CAMERA LENSES, ⅔-inch Format

Manufacturer	Angenieux		Canon	
Model Number	**15x9**	**25x10**	**J13x9BIE-II**	**J18x9BIE**	**J20x8.5BIE**
Typical Application	EFP/ENG	OB/EFP	ENG	ENG	ENG/EFP
Zoom Range	9-135mm	10-250mm	9-117mm	9-162mm	8.5-170mm
Widest Aperture	f/1.5	f/1.4	f/1.6	f/1.7	f/1.6
Widest Aperture After Knee	f/1.9	f/2.8	.....	.....	f/2.1
MOD (inches or feet)	31"	3'	31"	2.95"	24"
MOD Area (mm)	48x36	27x20	56x42	80.2x60	82x60
Horizontal Angles	51°/3.75°	46°/2°	52.1°/4.3°	52.1°/3.1°	54.7°/1.8°
Back Focus Distance	Adjustable	Adjustable	Specify camera	48.6mm	Specify camera
Clear Aperture Front	.....	.....	72.6mm	82.8mm	132.9mm
Clear Aperture Rear	.....	.....	Specify camera	31.2mm	Specify camera
Range Extenders	2x	1.7x	2x	2x	2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes
Integral Diascope	Option	Option	.....	No	No
Lens Assembly Weight	4.7 lb	13.7 lb	3.5 lb	3.7 lb	17.6 lb
Reader Service Number	**656**	**657**	**658**	**659**	**660**

FYI

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Camera Lenses

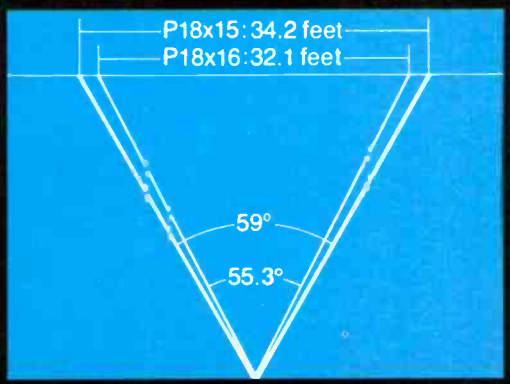
New Standards

The Widest Angle, The Highest Performance

Canon engineers have done it again, advancing the optical state-of-the-art so far forward that new standards must be considered.

The Canon P18 x 15 BIE offers the widest angle of any broadcast television zoom lens: 59°, plus incredible edge-to-edge sharpness, fidelity and sensitivity throughout its 18X range.

Every one of these superb lenses will be supplied with both 1.5X and 2X built-in extenders and a pattern projector. Options include manual, semi-servo or full servo operation.



The Canon P18 x 15 is the most versatile studio lens ever made, setting new standards for years to come.

P18 x 15 BIE F2.1 for 30mm Cameras*
KEY SPECIFICATIONS

■ Focal Length:	15-270mm
■ Max. Relative Aperture:	1:2.1 (15-218mm) 1:2.7 at 270mm
■ Angular Field of View:	59° x 45.6° at 15mm 3.6° x 2.7° at 270mm
■ Minimum Object Distance:	0.6 meter (2 feet)

*Also available: PV18 x 11 BIE F1.6 for 25mm Cameras

Canon®

Optics Division
Canon USA, Inc., Head Office: One Canon Plaza, Lake Success, N.Y. 11042 (516) 488-6700
Dallas Office: 2035 Royal Lane, Suite 290, Dallas, Texas 75229 (214) 620-2641 Chicago Office: 140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070
West Coast Office: 123 Paularino Avenue East, Costa Mesa, Ca. 92626 (714) 979-6000
Canon Canada, Inc., 3245 American Drive, Mississauga, Ontario L4V1B8, Canada (416) 678-2730

Circle (17) on Reply Card

CAMERA LENSES, ⅔-inch Format

Manufacturer	Canon		Fujinon		
Model Number	**J25x11.5BIE**	**J40x9BIE**	**A7x7RM**	**A14x8ESM**	**A14x9ERM**
Typical Application	ENG/EFP	Sports	Special purpose	Studio	ENG
Zoom Range	11.5-288mm	9-360mm	7-50mm	8-112mm	9-126mm
Widest Aperture	f/1.6	f/1.4	f/1.7	f/1.5	f/1.7
Widest Aperture After Knee	f/2.1	f/1.9	f/2.3	f/1.6	f/2
MOD (inches or feet)	59"	8.2'	13"	27.5"	31.5"
MOD Area (mm)	101.9x76.5	.....	.....	.....	.....
Horizontal Angles	41.9°/1.8°	.....	64.3°/10.05°	57.6°/4.5°	52°/4°
Back Focus Distance	Specify camera	Specify camera	Specify camera	.....	.....
Clear Aperture Front	137mm	.....	.....	.....	.....
Clear Aperture Rear	Specify camera	Specify camera	.....	.....	.....
Range Extenders	2x	2x	.....	2x	2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes
Integral Diascope	No	No	No	Option	Option
Lens Assembly Weight	22 lb	50 lb	3.5 lb	23.3 lb	3.25 lb
Reader Service Number	**661**	**662**	**663**	**664**	**665**

CAMERA LENSES, ⅔-inch Format

Manufacturer	Fujinon	Schneider			
Model Number	**A17x9ERM**	**TV44**	**TV27b**	**TV45**	**TV80**
Typical Application	EFP/OB	ENG/EFP	EFP	EFP	Studio/EFP
Zoom Range	9-153mm	9-126mm	12-240mm	11-330mm	8.5mm to 150mm
Widest Aperture	f/1.7	f/1.7	f/1.4	f/1.4	f/1.4
Widest Aperture After Knee	f/2.3	f/2.1	f/1.4-2.8	f/1.4-3.5	f/2
MOD (inches or feet)	35.4"	2.5'	59"	33.5"	27.5"
MOD Area (mm)	.....	54x41	52x39	30x22	53x40
Horizontal Angles	52.1°/3.3°	70°/2.2°	39.5°/2.1°	42.5°/1.6°	55.5°/3.4°
Back Focus Distance	.....	42.5-47.6mm	40.9mm	41.1mm	42.4mm
Clear Aperture Front	81mm	72mm	98mm	132mm	133mm
Clear Aperture Rear	27.4mm	29.5mm	34mm	38.4mm	33mm
Range Extenders	2x	2x	No	1.17x diopter	2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	.....
Integral Diascope	Option	Option	No	.....	Yes
Lens Assembly Weight	4 lb	3.3 lb	17.2 lb	35.2 lb	33 lb
Reader Service Number	**666**	**667**	**668**	**669**	**670**

CAMERA LENSES, ⅔-inch Format

Manufacturer	Tamron			
Model Number	**265H**	**181H**	**976H**	**466HB**
Typical Application	ENG	ENG	ENG	ENG
Zoom Range	10-100mm	10.5-105mm	9.5-114mm	9-126mm
Widest Aperture	f/1.6	f/1.5	f/1.6	f/1.6
Widest Aperture After Knee	.....	f/1.8	f/2	f/1.9
MOD (inches or feet)	39.36"	43.3"	39.36"	39.36"
MOD Area (mm)	.....	89.2x66.9	72.6x54.5	66.9x50.2
Horizontal Angles	50°/5°	45.5°/4.8°	49.7°/4.4°	52.6°/4°
Back Focus Distance	Adjustable	39.34mm	46.65mm	38.98mm
Clear Aperture Front	63mm	60mm	65.5mm	76.5mm
Clear Aperture Rear	14mm	24.7mm	29mm	24.8mm
Range Extenders	No	No	2x	No
Iris Servo	Yes	Yes	Yes	Yes
Zoom Servo	Available	Option	Available	Yes
Integral Diascope	No	No	No	No
Lens Assembly Weight	1.5 lb	2.5 lb	3.3 lb	3.3 lb
Reader Service Number	**671**	**672**	**673**	**674**

CAMERA LENSES, 1-inch Format

Manufacturer	Angenieux		Canon		
Model Number	**15x13**	**42x12.5**	**PV12x14BIE**	**PV18x11BIE**	**PV40x13.5BIE**
Typical Application	Studio	Studio/OB	Studio	Field/studio	EFP
Zoom Range	13-195mm	12.5-525mm	13.5-162mm	11-200mm	13.5-540mm
Widest Aperture	f/1.5	f/1.5	f/1.6	f/1.6	f/1.7
Widest Aperture After Knee	f/2.1	f/5.3	.....	f/2	.....
MOD (inches or feet)	31"	25"	3'	23.6"	8.2'
MOD Area (mm)	69x52	22x17	65x57	49x37	53x40
Horizontal Angles	52.5°/3.75°	56°/1.5°	50.8°/39.1°	60.4°/3.7°	50.7°/1.4°
Back Focus Distance	Adjustable	Adjustable	Specify camera	62.79mm	62.8mm
Clear Aperture Front	.....	.....	.....	185.2mm	.....
Clear Aperture Rear	.....	.....	Specify camera	42.4mm	.....
Range Extenders	2x	No	1.5x/2x	1.5x/2x	2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes
Integral Diascope	Option	Option	.....	Yes	.....
Lens Assembly Weight	44 lb	58 lb	44 lb	59 lb	66 lb
Reader Service Number	**676**	**677**	**678**	**679**	**680**

CAMERA LENS, 1-inch Format

Manufacturer	Fujinon				Schneider	
Model Number	**R14x12.5ESM**	**R17x12.5ESM**	**R20x11ESM**	**R44x13.5ESM**	**TV63**	**TV64**
Typical Application	High resolution	Studio	Studio	Sports	Studio	Studio
Zoom Range	12.5-175mm	12.5-212mm	11-220mm	13.5-600mm	12.5-190mm	13-190mm
Widest Aperture	f/1.6	f/1.6	f/2.1	f/1.8	f/1.7	f/1.7
Widest Aperture After Knee	f/1.7	f/2	f/3	f/3.1	f/1.7-2.5	f/1.7-2.5
MOD (inches or feet)	29.5"	29.5"	29.5"	8.2'	15.7"	15.7"
MOD Area (mm)	69x52	.....	.....	.....	43.3x32.5	43.3x32.5
Horizontal Angles	54.2°/3.5°	54.2°/3.5°	59.25°	50.75°/1.1°	53°/3.9°	54°/4°
Back Focus Distance	60.61mm	Specify camera	Specify camera	.....	71.6mm	71.6mm
Clear Aperture Front	173mm	.....	.....	.....	134mm	134mm
Clear Aperture Rear	.....	Specify camera	Specify camera	.....	40mm	43mm
Range Extenders	2x	1.5x/2x	2x	2x	2x	2x
Iris Servo	Yes	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes	Yes
Integral Diascope	.....	Option	Yes	Option	. ...	Option
Lens Assembly Weight	55.1 lb	52.8 lb	41.8 lb	55 lb	41.8 lb	41 lb
Reader Service Number	**681**	**682**	**683**	**684**	**685**	**686**

CAMERA LENSES, 1¼-inch Format

Manufacturer	Angenieux				Canon
Model Number	**12x16**	**15x17**	**42x16**	**42x32**	**P12x18BIE**
Typical Application	Studio	Studio	Studio/OB	Sports	Studio
Zoom Range	16-192mm	17-262mm	16-675mm	32-1350mm	18-216mm
Widest Aperture	f/2	f/2	f/2	f/2.3	f/2.1
Widest Aperture After Knee	Constant	f/2.8	f/6.8	f/7.6	.....
MOD (inches or feet)	3'	31"	25"	13'	3'
MOD. Area (mm)	109x82	69x52	22x17	50x37	65x49
Horizontal Angles	56°/5°	52.5°/3.75°	56°/1.5°	38°/0.7°	50.8°/4.5°
Back Focus Distance	Adjustable	Adjustable	Adjustable	Adjustable	78.27mm
Clear Aperture Front	.....	.....	.....	.....	.....
Clear Aperture Rear	.....	.....	.....	.....	.....
Range Extenders	2x	2x	No	.....	1.5x/2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes
Integral Diascope	Option	Option	Option	Option	.....
Lens Assembly Weight	59 lb	44 lb	49 lb	75 lb	44 lb
Reader Service Number	**687**	**688**	**689**	**690**	**691**

CAMERA LENSES, 1¼-inch Format

Manufacturer	Canon		Fujinon	
Model Number	**P18x15BIE**	**P40x18BIE**	**P15x16.5ESM**	**P17x16.5ESM**	**P20x14ESM**
Typical Application	Field/studio	Sports	Studio	Studio	Studio
Zoom Range	15-270mm	18-720mm	16.5-250mm	16.5-280mm	14-280mm
Widest Aperture	f/2.1	f/2.3	f/2.1	f/2.1	f/2.1
Widest Aperture After Knee	f/2.7	.....	f/2.3	f/2.7	f/2.7
MOD (inches or feet)	23.6"	8.2'	29.5"	29.5"	29.5"
MOD Area (mm)	49x37	53x40	66.7x50	.....	.....
Horizontal Angles	60.4°/3.7°	50.7°/1.8°	54.8°/3.9°	54.8°/3.5°	.....
Back Focus Distance	75.3mm	75mm	Specify camera	Specify camera	.....
Clear Aperture Front	185.2mm	200mm	.....	.....	.....
Clear Aperture Rear	39.1mm	36mm	Specify camera	Specify camera	.....
Range Extenders	1.5x/2x	2x	1.5x/2x	1.5x/2x	1.5x/2x
Iris Servo	Yes	Yes	Yes	Yes	Yes
Zoom Servo	Yes	Yes	Yes	Yes	Yes
Integral Diascope	Yes	.....	Option	Option	Option
Lens Assembly Weight	59 lb	66 lb	40 lb	46.2 lb	39.6 lb
Reader Service Number	**692**	**693**	**694**	**695**	**696**

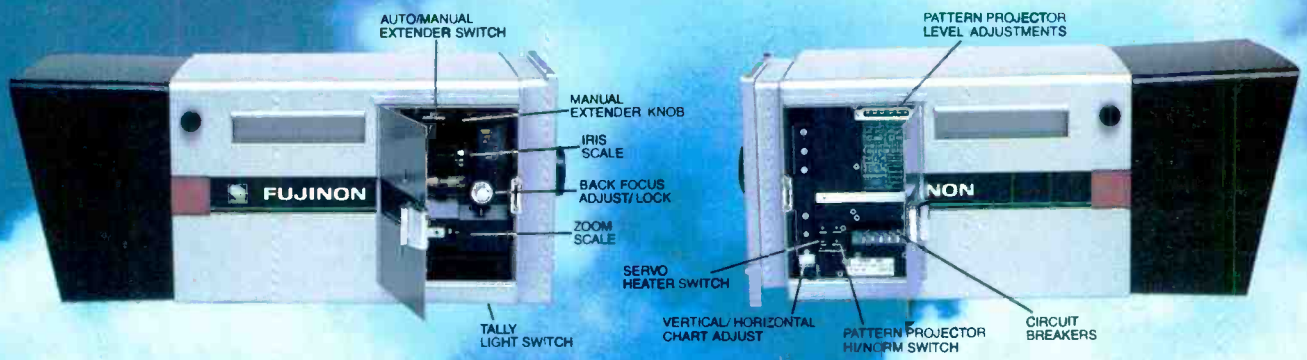
Manufacturer	Fujinon	Schneider
Model Number	**P30x20ESM**	**TV80**
Typical Application	OB/Sports	Studio/EFP
Zoom Range	20-620mm	8.5mm to 150mm
Widest Aperture	f/2.2	f/1.4
Widest Aperture After Knee	f/3.3	f/2
MOD (inches or feet)	8.2'	27.5"
MOD Area (mm)	65x49	53x40
Horizontal Angles	46.4°/1.5°	55.5°/3.4°
Back Focus Distance	91.39mm	42.4mm
Clear Aperture Front	190mm	133mm
Clear Aperture Rear	.....	33mm
Range Extenders	2x	2x
Iris Servo	Yes	Yes
Zoom Servo	Yes	.....
Integral Diascope	Option	Yes
Lens Assembly Weight	61.6 lb	33 lb
Reader Service Number	**697**	**698**

CHARACTER GENERATOR

Digital-based equipment for formation and placement of alphanumeric data on a raster with internally or externally supplied background material. For program use, not data terminals, the systems may be gen-locked to external video. Does not include time code character generators.

Manufacturer	Aston Electronics	Beston Electronics	Robert Bosch	Chyron Telesystems	Chyron Video/Cable
Model Number	**Aston 3**	**Marquee 3000**	**Compositor I**	**Chyron IV**	**VP-2**
Page Format (C/L)	40C/21L at 24 TVL	40C/21L at 18 TVL	32C/12L	Font dependent	Font dependent
Character Resolution	31.25nsec	31.25nsec	30nsec	27nsec	35nsec (1510-Pixel)
Italic Characters	Yes	Yes	Yes	By letter	Yes
Surround Edging	Yes	Yes	Yes	Yes	Yes
Drop Shadowing	Yes	Yes	Yes	Yes	Yes
Edge Luma/Color	Variable	Variable	Variable	Variable	Variable
Number of Colors	4096	4096	32	512/7 per screen	512
Display Flashing	By character	By words	By character	To a character	Yes
Auto Centering	Horizontal	Horizontal	H and V	H and V	H and V
Roll & Crawl Speeds	8 each	8 each	5 each	5 each	4 roll
Subtitling Feature	Lower 3rds	Yes	Lower 3rds	Yes	Yes
On-line Fonts	4 loaded from disc	4 loaded from disc	200 from disc	6 on line from disc	6 on line from disc
Internal Page Memory	1	150	999	1	.....
Mass Storage Type	150 page 8" floppy	Floppy disc	Disc	Floppy disc	Micro floppy disc
Access Time (Worst)	1sec	165msec	0.5sec	1.5s	.....
Prvw/Pgm Outputs	1 preview/1 pgm	1 preview/1 pgm	2 preview/2 pgm	2 preview/2 pgm	1 preview/2 pgm
Colorizer/Keyer	Yes	Yes	Yes	Yes	Yes
RS-232 Interfacing	Yes	Yes	Yes	Yes	Yes
Number of Keyboards	1 standard	Infinite	7 possible	Multiple	1
Font Compose Feature	Option	Option	Yes	Yes	.....
Graphics Feature	No	No	Yes	MGM option	Yes
Related Models	Aston 2	Marquee 2000/1000	.....	RGU-2	.....
Reader Service Number	**949**	**950**	**951**	**952**	**953**

FUJINON'S revolutionary 2-door zoom lens.



It works the way you do.

FUJINON's new 17X studio zoom will permanently change the way you use and feel about a lens. More than refining the studio zoom, FUJINON has revolutionized it to give you greater control, flexibility and efficiency than ever before.

Downtime for adjustments and repair is drastically reduced. And the need to remove a shroud is virtually eliminated. For instant access to all important adjustments, just open one of the two doors.

The new 17X zoom incorporates more "FUJINON firsts" than any lens in our history. For example, you can pre-set limits on the zoom range to match the lens' outstanding ramping characteristics to the lighting levels of every production. (If necessary, you can still override the limit from the pan bar.) To change the slow/fast zoom speed, you do it on the new pan bar zoom control instead of somewhere inside the lens. You also have the option of adjusting servo focus and zoom control tension—to get the exact "feel" you want.

With the new 17X studio zoom, every major component is modular to make user servicing a practical reality.

FUJINON's new 17X zoom is the first generation studio lens of the future. And it's here, now.

For more information on the P17X16.5ESM studio zoom lens and other fine FUJINON products, contact the FUJINON office nearest you.

FUJINON INC.
672 White Plains Road
Scarsdale, NY 10583
(914) 472-9800
Telex 6818115

FUJINON INC.
2101 Midway
Suite 350
Carrollton, TX 75006
(214) 385-8902

FUJI OPTICAL SYSTEMS, INC.
118 Savarona Way
Carson, CA 90746
(213) 532-2661

4855 Atherton Avenue
San Jose, CA 95130
(408) 866-5468

Circle (18) on Reply Card

FUJINON

CHARACTER GENERATOR

Manufacturer	Dubner Computer	For-A Corporation	Knox Video Products	Laird Telemedia	MPB Technologies
Model Number	**CBG-1/CBG-2**	**VTW-400**	**K100 Opt B**	**7200 Communicator**	**Vista 90 Broadcast**
Page Format (C/L)	To 100C/30L	26C/8L	10-66C/1-16L	60C/24L at 12 TVL	1-140C/1-64L
Character Resolution	50nsec	50nsec	57nsec	35nsec	35nsec
Italic Characters	By character	No	Yes	Yes	Yes
Surround Edging	Yes	Yes	Yes	Yes	Yes
Drop Shadowing	Yes	Yes	Yes	Yes	Yes
Edge Luma/Color	Variable	No	Variable	Variable	Variable
Number of Colors	4096/64 per screen	64	512	32768/32 on screen	63 normal (to 255)
Display Flashing	To character	By character	To character	By character	To character
Auto Centering	H and V	Horizontal	Horizontal	Horizontal	Horizontal
Roll & Crawl Speeds	9 each	4 each	10 each	10 each	20 roll/5 crawl
Subtitling Feature	Yes	.....	Any location	Lower 3rds	Lower 3rds
On-line Fonts	250 from disc	2 in memory	4 in memory	4 on line from disc	To 72 from disc
Internal Page Memory	1000	8	64	100 lines	1
Mass Storage Type	10MByte rigid disc	Floppy disc	None	8" disc	Dual floppy disc
Access Time (Worst)	0.5sec	.....	.....	0.5sec	>1sec
Prvw/Pgm Outputs	2 preview/2 pgm	.....	1 preview/1 pgm	1 preview/2 pgm	1 preview/1 pgm
Colorizer/Keyer	Yes	Yes	Yes	Option	Yes
RS-232 Interfacing	Yes	Yes	Yes	Option	Yes
Number of Keyboards	1 only	1 only	2 possible	4 possible	3 possible
Font Compose Feature	Yes	No	Option	Yes	Yes
Graphics Feature	Yes	No	No	No	Yes
Related Models	.....	VTW-210	K50	Model 1500	.....
Reader Service Number	**954**	**955**	**956**	**957**	**958**

CHARACTER GENERATOR

Manufacturer	Mycro-Tek	Piher Electronics	Quanta Corporation		
Model Number	**Mycro-Vision Supra 2**	**TP-4696B**	**Microgen MG-100B**	**QUANTAFONT Q8**	**Select 7 (S7-7)**
Page Format (C/L)	32C/16L at 24 TVL	32C/16L	32C/12L at 24 TVL	64C/24L each maximum	32C/16L maximum
Character Resolution	40nsec	80nsec	100nsec	26nsec	20nsec (Nanolog)
Italic Characters	Yes	No	No	Yes	Yes
Surround Edging	Yes	No	Yes	Yes	Yes
Drop Shadowing	Yes	No	No	Yes	Yes
Edge Luma/Color	No	Fixed	No	Variable	Variable
Number of Colors	12	8	256	16 million	8
Display Flashing	To character	Yes	By character	By character	By words
Auto Centering	Horizontal	H & V	H & V	H & V	H & V
Roll & Crawl Speeds	3 each	5 each	9 each	9 each and stop	9 each
Subtitling Feature	No	No	No	No	No
On-line Fonts	To 6 in memory	2 in memory	2 in memory	Font-Flex from disc	7 faces (56 fonts)
Internal Page Memory	2000	256 line	50	1	224
Mass Storage Type	Internal RAM	Microcassette	Internal RAM	8" floppy/5M rigid	Dual 5.25" floppy
Access Time (Worst)	Instantaneous	.....	0.2sec	.....	4sec
Prvw/Pgm Outputs	0-1 preview/1-2 pgm	1 preview/2 pgm	1 preview/2 pgm	2 preview/4 pgm	2 preview/2 pgm
Colorizer/Keyer	No	Yes	Yes	Yes	Yes
RS-232 Interfacing	Yes	.....	Option	Yes	Yes
Number of Keyboards	1	1	1 only	5 possible	Unlimited
Font Compose Feature	No	No	No	Option	No
Graphics Feature	Yes	No	No	No	No
Related Models	Mycro-Vision Supra Mycro-Vision Max	....	....	....	QUANTAFONT S7-3 .....
Reader Service Number	**959**	**960**	**961**	**962**	**963**

Spec Note:
Performance specs are not directly comparable because of variations in references used by manufacturers in determining those specifications' values. Equipment performance should be discussed with the manufacturers' representatives before making final decisions.

CHARACTER GENERATOR

Manufacturer	Ryley Communications	Shintron	SYMTEC	3M Company	Thomson-CSF Broadcast
Model Number	CapGen Series 2	Model 505	PGS III	D-5000	Vidifont V
Page Format (C/L)	Font dependent	16C/8L	35C/25L at 20 TVL	Font dependent	Font dependent
Character Resolution	.....	.....	90nsec	35nsec	48nsec
Italic Characters	Yes	.....	Yes	Yes	Yes
Surround Edging	.....	Black or white	Yes	Yes	Yes
Drop Shadowing	.....	No	Yes	Yes	Yes
Edge Luma/Color	.....	No	Variable	Variable	Variable
Number of Colors	65	Black or white	4096	512	4096
Display Flashing	By word	By characters	To character	By words	To character
Auto Centering	H & V	.....	H & V	H & V	H & V
Roll & Crawl Speeds	Various	Various	1 each	9 each	7 each/2 directions
Subtitling Feature	Yes	Yes	Any location	Any location	Any location
On-line Fonts	8 faces/2 per page	2 18 TVL & 36 TVL	22 from disc	8 on line from disc	99 loaded from disc
Internal Page Memory	1	16	2	100	440
Mass Storage Type	Mini floppy disc	Internal RAM	Hard disc	3.5" floppy option	Floppy disc
Access Time (Worst)	.....	.....	3sec	1.5sec	0.9sec
Prvw/Pgm Outputs	1 preview/1 pgm	1 preview/2 pgm	1 preview/1 pgm	Multiples	1 preview/3 pgm
Colorizer/Keyer	External keyer	Keyer	Yes	Yes	Yes
RS-232 Interfacing	.....	No	Option	Yes	Option
Number of Keyboards	1	1	1 only	To 99	To 99
Font Compose Feature	No	Yes	Yes	Option	Yes
Graphics Feature	No	No	Yes	No	Yes
Related Models	.....	.....	.....	.....	.....
Reader Service Number	**964**	**965**	**966**	**967**	**968**

CHARACTER GENERATOR

Manufacturer	Unitel		Video Data Systems
Model Number	Scriptel 300	Scriptel V	CG-1000
Page Format (C/L)	Font dependent	32C/12L	22C/10L
Character Resolution	33nsec	43nsec	70nsec
Italic Characters	By row	Yes	No
Surround Edging	Yes	Yes	Yes
Drop Shadowing	Yes	Variable	Yes
Edge Luma/Color	Variable	Fixed	Variable
Number of Colors	4096/16 per screen	4096/12 per screen	512
Display Flashing	To character	To characters	By words
Auto Centering	H & V	Horizontal	H & V
Roll & Crawl Speeds	4 each	2 each	9 each
Subtitling Feature	Time code controlled	For captions	Optional
On-line Fonts	4	2 in memory	2 in memory
Internal Page Memory	16	16	360 lines
Mass Storage Type	Floppy or hard disc	Floppy disc	Floppy disc
Access Time (Worst)	0.6sec	.....	100msec
Prvw/Pgm Outputs	1 preview/1 pgm	1 preview/1 pgm	1 preview/2 pgm
Colorizer/Keyer	Yes	Option	Yes
RS-232 Interfacing	Option	Yes	Option
Number of Keyboards	2 possible	1 only	1
Font Compose Feature	Yes	No	No
Graphics Feature	Yes	No	Yes
Related Models	Scriptel PWWP	.....	.....
Reader Service Number	**969**	**970**	**971**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Processing/Keying

DIGITAL EFFECTS UNIT

Equipment for visual image manipulation, aspect alteration, and/or dimensional distortions. Digital techniques are used in the operation. Simpler key, border, wipe, etc., effects may be within the repetoire, but are not listed here.

Manufacturer	**Abekas Video Systems**	**Ampex Corporation**	**CEL Electronics**	**Chroma Digital**	**Digital Services DSC**
Model Number	**A52**	**ADO**	**P151 Controller**	**Chromafex 766**	**FLX2010 Flexikey**
Output Channels	2	4	1	1	1 to 4
Image Size Changes	Continuous	Continuous	1/4x	Along H and V axes	Continuous
Compression Ratio	Variable axis	H and V	1/4x H and V	To 1/2x or 1/4x	H and V/infinite
Expansion Ratio	Infinite	H and V	No	.....	H and V/infinite
Rotation (X/Y/Z)	X, Y	X, Y, Z	.....	No	X, Y, Z
Axes Offsets	.....	Yes	No	No	Yes
Perspective Change	.....	H/V page turns	Geometric distortion	No	Y and V
Image Freeze	Single & multi	Multi, trail, update	Single fields	Single field/frame	No
Picture Splits	Various	Yes	H and V	Yes	Halves
Key Tracking	.....	No	.....	.....	.....
Mirror Image Effect	Yes	H/V	Inversions	Inversion	H and V
Push-On/Push-Off	Yes	Yes	Yes	Yes	Yes
Posterization	Yes	16 levels	15 levels	W/ false coloring	No
Mosaics	Yes	Yes	No	No	No
Sequence Programming	Yes	Yes	No	No	Yes
Instruction Memory	Fixed, EEPROM	ROM, floppy disc	None	None	PROM, hard disc
Reader Service Number	**792**	**793**	**794**	**795**	**796**

DIGITAL EFFECTS UNIT

Manufacturer	**Digital Services SCA**	**Grass Valley Group**	**Harris Video**	**IVCC-Carlton Ltd.**	**MCI/Quantel**
Model Number	**ILN4000 'Illusion'**	**DVE-2**	**HDE 200 (HDE series)**	**ZENO**	**DPE 5000/Plus**
Output Channels	1 to 4	1	1 or 2	1	5
Image Size Changes	Continuous	Continuous	Continuous	Continuous	Continuous
Compression Ratio	H and V/infinite	Infinite	Infinite H and V	H and V/infinite	Infinite
Expansion Ratio	H and V/infinite	Infinite	Infinite H and V	H and V to 2x	4x H and V
Rotation (X/Y/Z)	X, Y, Z	X, Y	X, Y	X, Y	X, Y, Z
Axes Offsets	Yes	.....	No	.....	.....
Perspective Change	Along H & V axis	No	No	.....	Along H and V axes
Image Freeze	Field or frame only	Yes	Multi & trailing	Yes	Multi & trailing
Picture Splits	Halves	Yes	Halves, quarters	Yes	Yes
Key Tracking	.....	Yes	Yes	.....	Yes
Mirror Image Effect	H and V	Yes	H and V	Includes inversions	H and V
Push-On/Push-Off	Yes	Yes	Yes	Yes	Yes
Posterization	Yes	Yes	Yes	Yes	No
Mosaics	.....	Yes	6 tiles to infinity	Yes	.....
Sequence Programming	Yes	Yes	Yes	Yes	Yes
Instruction Memory	PROM, bubble	Disc	PROM, bubble	.....	PROM, disc
Reader Service Number	**797**	**798**	**799**	**800**	**801**

DIGITAL EFFECTS UNIT

Manufacturer	**MCI/Quantel**	**Microtime**	**NEC America**	**Pye TVT/Philips**	**Precision Echo**
Model Number	**Mirage**	**T²E-120**	**E-Flex**	**CVE**	**Squeezer**
Output Channels	Multiple	1	1 or 2	2 std, expand to 8	1
Image Size Changes	Continuous	.....	Continuous	Continuous	Stepped
Compression Ratio	Infinite	No	H and V/infinite	To 32x	4x, 9x, 16x, 25x
Expansion Ratio	Infinite	No	H and V/infinite	To 32x	Variable crop only
Rotation (X/Y/Z)	X, Y, Z	No	X, Y, Z	X, Y, Z	None
Axes Offsets	Yes	No	Optiflex option	Z-offset	No
Perspective Change	Along X & Y axes	No	H & V (Optiflex)	H, V & 3D	No
Image Freeze	Multi & trailing	No	Multi & trailing	Yes	No
Picture Splits	Yes	No	Halves, quarters	Yes	No
Key Tracking	Yes	No	Yes	Yes	No
Mirror Image Effect	H and V	No	No	H and V	Yes
Push-On/Push-Off	Yes	Yes	Yes	Yes	No
Posterization	Yes	No	Yes	Yes	No
Mosaics	.....	Yes	16 to infinite	With Montage to 25x	No
Sequence Programming	Yes	Yes	Yes	Yes	No
Instruction Memory	Disc	.....	Internal, bubble	Internal	None
Reader Service Number	**802**	**803**	**804**	**805**	**806**

DIGITAL EFFECTS UNIT

Manufacturer	**QuesTech**	**Regis-BLT**	**Thomson-CSF**	**Vital Industries**
Model Number	**6101P**	**Modulo Uno**	**TTV 5305**	**SqueeZoom**
Output Channels	1 or 2	1	2 (Comp & Y/Cr/Cb)	4
Image Size Changes	Continuous	Stepped	Continuous	Continuous
Compression Ratio	H and V/infinite	H & V to 1/64	H & V to 33%	H & V to 100%
Expansion Ratio	H and V/Infinite	H & V to 16x	H & V to 33%	H & V to 256x
Rotation (X/Y/Z)	X, Y	No	X, Y, Z	X, Y
Axes Offsets	No	No	Yes	No
Perspective Change	Vertical only	No	No	Y and V
Image Freeze	Multi-image	Multi & trailing	Image trailing	Multi & trailing
Picture Splits	1/2, 1/4 variable	To 64 pictures	Quarters	1/2, 1/4, varying crop
Key Tracking	No	Yes	Yes	Yes
Mirror Image Effect	H and V	H and V	H and V	H and V
Push-On/Push-Off	Yes	Yes	Yes	Yes
Posterization	Yes	Yes	Yes	Yes
Mosaics	20% pix ht to 0%	4- or 16-pixel tile	.....	0 to 256 tile
Sequence Programming	Yes	.. ..	Yes	Yes
Instruction Memory	CMOS RAM, floppy disc	RAM	Micro-floppy disc	Floppy disc
Reader Service Number	**807**	**808**	**809**	**810**

STILL-STORE SYSTEMS

Magnetic disc material based equipment for use in slow motion, image library, animation and graphics systems as a mass storage/retrieval unit. Video and drive inputs are typically 1Vp-p, 75Ω.

Manufacturer	Abekas Video Systems	ADDA	Ampex	ASACA/ShibaSoku	Eigen Video
Model/Series Number	**VSP-42**	**ESP Series**	**ESS-3**	**680/1 Video Memory**	**FP/FP-1**
Reference Input	Composite video	Composite video	Composite video	Composite video	External sync
Output Channels	Pgm A/B & preview	Pgm A/B & preview	5 standard	1	2 optional
Video Response	±0.25dB to 4.2MHz	±0.5dB to 5MHz	±0.5dB to 5MHz	±0.5 to 4.5MHz	To 4MHz
S/N Ratio	52dB	56dB	>50dB	>52dB-P/rms	54dB
Phase/Gain Rating	2°/2%	<2°/<2%	1°/1.5%	.....	.....
K Factor (2T)	1%	1%	1%	2%	1%
Chroma/Luma Delay	.....	.....	Adjustable to 0	.....	.....
Moire Rating	Not applicable	Not applicable	Not applicable	Not applicable	.....
Time Base Stability	.....	±1ns	.....	.....	.....
Integral TBC	Yes	Yes	Yes	Yes	.....
Direct Color	No	No	No	No	No
Heterodyne Color	No	No	No	No	No
Digital Recording	Yes	Yes	Yes	Yes	Yes
Component Recording	No	No	Y/R-Y/B-Y (4-2-2)	No	No
Disc Drives/Size	5.25" Winchester	Winchester	14" Winchester	DSDD floppy	1 floppy and
Number of Drives Max.	3	4	16 standard	1	1 Winchester
Frames Per Disc	100 (200 fields)	150	400	4 (8 fields)	9/floppy disc or
Frames System (Max.)	300 (600 fields)	600	6400	4 (8 fields)	120/Winchester
Sequenced Programs	Yes	Yes	Yes	No	.....
Random Access	Yes	Yes	Yes	Yes	Yes
Worst Access Time	.....	<450ms	0.8s	15s field read time	0.5s Winchester
Color Standards	NTSC	NTSC	NTSC/PAL	NTSC	RS-170/CCIR
Image Directory	No	No	Yes, 16x16	No	No
Portable Packaging	Possible	Possible	No	No	.....
Integral Effects	With companion A52	Yes	Yes	No	Window/masking
Reader Service Number	**572**	**573**	**574**	**575**	**576**

STILL-STORE SYSTEMS

Manufacturer	Gunnerfield Marketing	Harris Video Systems	IVC-Carlton Ltd.	MCI/Quantel	NTI America
Model/Series Number	**GML 8500**	**IRIS II**	**DM-3000**	**DLS 6000 Series**	**DSS-11**
Reference Input	Composite video	Video or sync	Composite video	Composite video	Black or comp sync
Output Channels	4	6 pairs for 6 users	1 with options	Pgm A/B & preview	Pgm, preview, data
Video Response	−3dB to 5MHz	±0.2dB to 4.2MHz	−3dB to 6MHz	±0.3dB to 4.2MHz	±0.3dB to 5MHz
S/N Ratio	56dB	57dB average	53dB 3600rpm NTSC	58dB	56dB
Phase/Gain Rating	4°/4%	1°/1%	3°/3%	1°/1%	>2°/>2%
K Factor (2T)	2%	1%	2%	.....	1%
Chroma/Luma Delay	Adjustable to 0	17ns	.....	.....	.....
Moire Rating	Not applicable	Not applicable	−40dB 75% color bars	Not applicable	Not applicable
	.....	.....		.....	.....
Time Base Stability	Not applicable	±10ns	±50ns	.....	.....
Integral TBC	Frame store	Yes	No	Yes	Yes
Direct Color	No	Yes	Yes	No	No
Heterodyne Color	No	Yes	No	No	No
Digital Recording	Yes	Yes	No	Yes	Yes
Component Recording	Y/U/V	RGB	No	Y/R-Y/B-Y	.....
Disc Drives/Size	8"/14" Winchester	8"/14" Winchester	16" rigid	Winchester	Winchester
Number of Drives Max.	4	8	1	8	8
Frames Per Disc	1200	1064 (2128 fields)	1800 (360C fields)	1000	1000
Frames System (Max.)	4500	8512 (17024 fields)	1800	8000	8000
Sequenced Programs	Yes	Yes	Yes	Yes	Yes
Random Access	Yes	Yes	Yes	Yes	Yes
Worst Access Time	0.7s	750ms	0.2s	1.5s	0.35s
Color Standards	PAL/SECAM	NTSC/PAL	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL
Image Directory	.....	Catalog	Search mode	.....	.....
Portable Packaging	No	No	.....	No	Possible
Integral Effects	No	System dependent	No	.....	No
Reader Service Number	**577**	**578**	**579**	**580**	**581**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Accessories

STILL-STORE SYSTEMS

Manufacturer	Oktel Corporation	Picture Element Ltd.	Precision Echo	Rank Cintel Ltd.
Model/Series Number	DM-3000	VSP	Image Maker	Slide File
Reference Input	Composite video	Video or sync	Composite video	Sync
Output Channels	1 with options	4	Pgm & preview	2 RGB (pgm & preview)
Video Response	– 3dB to 6MHz	±0.2dB to 4.2MHz	– 3dB to 4.2MHz	±0.1dB to 5.5MHz
S/N Ratio	44dB 1800rpm NTSC	60dB	>42dB	>50dB
Phase/Gain Rating	3°/3%	<1°/<1.5%	.....	.....
K Factor (2T)	2%	<1%	4%	.....
Chroma/Luma Delay	.....	Not applicable	.....	.....
Moire Rating	– 40dB 75% bars	Not applicable	– 40dB	Not applicable
Time Base Stability	±50ns	Not applicable	.....	.....
Integral TBC	External required	Not required	External required	Yes
Direct Color	Yes	Yes	Yes	No
Heterodyne Color	No	No	No	No
Digital Recording	No	Yes	No	Yes
Component Recording	No	All types available	No	Y/U/V (4-2-2)
Disc Drives/Size	16" Oktel disc	8"/10" Winchester	12" floppy	8" Winchester
Number of Drives Max.	1	100	1	1 w/ streaming tape
Frames Per Disc	900 (1800 fields)	. . . .	256/side	80
Frames System (Max.)	1800	15000 RGB	512/discassette	.....
Sequenced Programs	Yes	Yes	Stepped	Yes
Random Access	Yes	Yes	Yes	Yes
Worst Access Time	200ms	<0.1s	4.3s	1s
Color Standards	NTSC/PAL/SECAM	NTSC/PAL/SECAM/RGB	NTSC	NTSC/PAL
Image Directory	Search mode	. . . .	No	30-image matrix
Portable Packaging	.....	No	Yes	No
Integral Effects	No	. . . .	No	No
Reader Service Number	582	583	584	585

EDITING CONTROLLERS

Equipment interconnecting recording and playback/source units to control machine synchronization and switching function requirements in post-production editing.

Manufacturer	Adams-Smith	Albrecht Elektronik	Ampex Corporation	Robert Bosch	CMX Systems
Model Number	2600 Audio-for-Video	ESP-M Systems	ACE	Mach One Series II	340XL/3400/3400+
Specific Machines	Most VTRs & ATRs	VPR, BCN, BVU, BVH, A80	AVR, VPR, ARC, BVU, BVH	BCN, VPR, AVR, BVH, BVU	Any machines
Record/Play Machines	1 record/8 play	32 machines total	16 any combination	1 record/5 play	7 record/6 play
Microprocessor	Centralized	Distributed	Distributed	Yes	Distributed
Number Stored Event	60	Multiple	2000	500 to 700	9999 for 3400+
External Storage	Per user's computer	.....	Disc & paper tape	Disc & paper tape	Disc & paper tape
Edit Decision List	No	Yes	Yes	Yes	Yes
Edit Data Display	LEDs	LED displays	CRT	CRT	CRT
Print Output Format	Per user's computer	Yes	ACE (industry std)	Centronics 703	Yes
Assembly/Insert	Both	Both	Both	Both	Both
Animation Mode	No	Yes	Yes	Yes	Yes
Split A/V Modes	6 audio channels	Yes	3 audio channels	2 audio channels	Yes
A/B Roll System	Yes	Yes	Yes	Yes	Yes
TC Reader/Generator	Integral	EBU	External required	Reader in interface	Yes
Time Code Types	LTC/VITC/Ctl track	LTC	LTC/VITC/Ctl track	SMPTE/EBU LTC	LTC
Color Framing	Not applicable	For PAL	NTSC/PAL	Yes	Yes
Edit Accuracy	±1 frame	±0 frames	±0 frames	±0 frames	±0 frames
VTR Speed Control	Not applicable	Yes	Joystick	Shuttle/jog knob	Gismo knob
Direction Control	Not applicable	Yes	Joystick	Knob	Gismo knob
Switcher Interface	No	Yes	AVC/4100/GVG series	Yes	Yes
Mixer Interface	No	Yes	Harrison/ADM	Yes	No
Reader Service Number	918	919	920	921	922

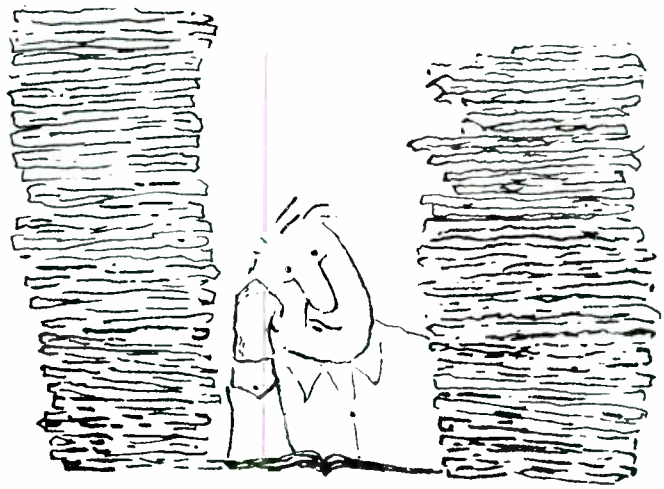
Manufacturer	Control Video Corporation		Convergence Corporation		EECO
Model Number	Sword	Lightfinger Series	ECS-200 Series	Editdroid	IVES
Specific Machines	Most VTRs	Most VTRs	All VTRs	Laser disc & VTR	VO, CR, BVU, AU VCRs
Record/Play Machines	1 record/1 play	1 record/31 play	1 record/2 play	Per configuration	1 record/2 play
Microprocessor	Yes	Distributed	Yes	Multi 16-bit/32-bit	Centralized
Number Stored Event	20	500 events	250	>80,000	2
External Storage	No	Disc & tape option	Dual disc	Yes	No
Edit Decision List	Yes	Yes	With joyscroll	CMX/Convergence type	No
Edit Data Display	No	Touch active CRT	CRT	CRT	CRT
Print Output Format	No	Yes	.....	.....	Parallel data
Assembly/Insert	Both	Both	Both	Both	Insert only
Animation Mode	No	Yes	Yes	Yes	Yes
Split A/V Modes	No	Yes	3 audio channels	Yes	No
A/B Roll System	No	Yes	Yes	Yes	Yes
TC Reader/Generator	Option	Yes	Reader included	.....	Integral
Time Code Types	LTC/Ctl track/VITC	LTC/VITC/Ctl track	LTC/Ctl track	.....	LTC/Ctl track
Color Framing	Yes	Yes	Yes	.....	No
Edit Accuracy	±0 frames	±0 frames	±0 frames	±0 frames	±0 frames
VTR Speed Control	Stroker	CRT or keyboard	Joystick	Knob	Rotary knob
Direction Control	Stroker	CRT or keyboard	Joystick	Knob	Rotary knob
Switcher Interface	No	Yes	Yes	.....	Integral switcher
Mixer Interface	No	No	Yes	.....	Integral mixer
Reader Service Number	923	924	925	926	927

EDITING CONTROLLERS

Manufacturer	ECCO	Giese Electronic	Interactive Systems		JVC Company
Model Number	EMME	Taker A/B	System 51	System 31/System 41	RM-86U
Specific Machines	VPR, BVU, BVH, HR, VO	All popular VTRs	VPR, BVH, BVU, BVW, AU	VPR, BVU, BVH, BVW, AU	Any VHS or U-matic
Record/Play Machines	To 9 total	1 record/2 play	6 record/7 play	6 record/7 play	1 record/1 play
Microprocessor	Distributed	Centralized	Central/distributed	Central/distributed	Yes
Number Stored Event	800	4	.....	1000	Single event
External Storage	Disc & paper tape	Disc	Disc & paper tape	Disc & paper tape	No
Edit Decision List	Yes	Yes	Optional	Optional	No
Edit Data Display	CRT	CRT	CRT	CRT	LEDs
Print Output Format	.....	Standard listings	132-column	80-column	No
Assembly/Insert	Both	Both	Both	Both	Both
Animation Mode	Yes	No	Yes	Yes	No
Split A/V Modes	Yes	2 audio channels	3 audio channels	Yes	2 audio channels
A/B Roll System	Yes	Yes	Yes	Yes	No
TC Reader/Generator	Integral	Integral	Per configuration	Per configuration	No
Time Code Types	LTC/VITC/Ctl track	LTC/VITC SMPTE/EBU	All types	All types	Control track
Color Framing	NTSC/PAL	No	NTSC/PAL	For NTSC/PAL	No
Edit Accuracy	±0 frames	±1 frame	±0 frames	±0 frames	.....
VTR Speed Control	Rotary knob	Keyboard control	Knob & keypad	Keypad & knob	Knob
Direction Control	Rotary knob	Keyboard control	Knob & keypad	Keypad & knob	Knob
Switcher Interface	GVG/CDL/Ross/Vital	Integral	For most switchers	Most manufacturers	No
Mixer Interface	Many popular systems	Integral	For many mixers	Many popular mixers	No
Reader Service Number	928	929	930	931	932

Manufacturer	JVC Company		Montage Computer	Omicron/Elecon	Paltex
Model Number	VE-90 (-90A)	VE-92/-93	Picture Processor	EM-7100 Series	ABR-1A
Specific Machines	U-matic & VHS	Any U-matic or VHS	7 Beta format	Many VTRs & VCRs	Various ½", ¾", 1" C
Record/Play Machines	1 record/1 play	1 record/1 play	Per configuration	1 record/3 play	1 record/2 play
Microprocessor	Yes	Yes	MC68000 processor	Z-80 distributed	Centralized
Number Stored Event	Multiple	Single event	Unlimited	To 192	20
External Storage	Option	Option	Disc	Disc/paper tape opt	Disc or paper tape
Edit Decision List	Option	Option	.....	New or old CMX type	Yes
Edit Data Display	CRT	Yes	CRT	CRT	CRT
Print Output Format	RS-232C	No	.....	Serial data	RS-232C
Assembly/Insert	Both	Both	Assemble	Both	Both
Animation Mode	Yes	Yes	Yes	Yes	Yes
Split A/V Modes	Yes	Yes	Yes	2 audio channels	2 audio channels
A/B Roll System	No	No	Yes	Yes	Yes
TC Reader/Generator	TCR-90 reader option	Both integral	Integral	Integral	Reader option
Time Code Types	LTC/Ctl track	LTC/Ctl track	Various	SMPTE/EBU VITC opt	LTC/Microloc/Ctl trk
Color Framing	No	No	Yes	Yes	No
Edit Accuracy	±0 frames	±0 frames	±0 frames	±0 frames	±1 frame
VTR Speed Control	Joystick	Joystick	Knobs	Knob & keyboard	Knob
Direction Control	Joystick	Joystick	Knobs	Knob & keyboard	Knob
Switcher Interface	Internal fader	No	Integral system	Various switchers	Contact closure
Mixer Interface	.....	No	Integral system	.....	No
Reader Service Number	933	934	935	936	937

Manufacturer	Paltex		Panasonic Broadcast	RCA Broadcast	
Model Number	Edit-Star (ST-3)	Vanguard	AU-A30	HE-1 Hawkeye	AE-800
Specific Machines	All ½", ¾", 1" C	All machines	AU and NV VCRs	HR-2	Various
Record/Play Machines	1 record/3(5) play	1 record/4 play	1 record/1 play	1 record/1 play	1 record/8 play
Microprocessor	16-bit centralized	Centralized	Centralized	Yes	Yes
Number Stored Event	318	500	Single event	Single event	Multiple
External Storage	Disc or paper tape	Disc or paper tape	No	No	No
Edit Decision List	Yes	Yes	No	No	.....
Edit Data Display	CRT	CRT	LEDs	LEDs	CRT
Print Output Format	RS-232C	RS-232C	No	No	Available
Assembly/Insert	Both	Both	Both	Both	Both
Animation Mode	No	Yes	No	No	Yes
Split A/V Modes	2 audio channels	2 audio channels	2 audio channels	Yes	3 audio channels
A/B Roll System	Yes	Yes	No	No	Yes
TC Reader/Generator	Integral reader	Integral reader	None	.....	Various options
Time Code Types	LTC/VITC/Ctl track	LTC/VITC/Ctl track	Control track only	Control track	LTC/VITC
Color Framing	NTSC/PAL	NTSC/PAL	No	No	NTSC/PAL
Edit Accuracy	±0 frames	±1 frame	±2 frames	.....	±0 frames
VTR Speed Control	Rotary knob	Knob	Knob	Knob	Knob & keyboard
Direction Control	Rotary knob	Knob	Knob	Knob	Knob & keyboard
Switcher Interface	Parallel or serial	Parallel or serial	None	No	.....
Mixer Interface	None (for ADM)	For ADM	None	No	.....
Reader Service Number	938	939	940	941	942



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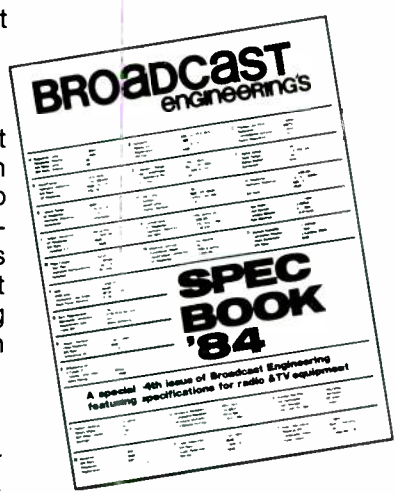

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EDITING CONTROLLERS

Manufacturer	Sony Broadcast		United Media		Videomedia	
Model Number	**BVE-800**	**BVE-3000 (-5000)**	**Mini-Com**	**Commander II**	**Eagle I/II/III**	**Z6000-E (A/B/C/D)**
Specific Machines	BVH, BVU, BVW	BVH, BVU, BVW	Most VTRs & VCRs	Most VTRs & VCRs	All ½" & ¾"	½", ¾", 1" & ATR
Record/Play Machines	1 record/2 play	1 (2) rec/2 (6) play	To 3 machines	To 8 machines	1 record/2 play	1 record/8 play
Microprocessor	Yes	Yes	Centralized	Centralized	Distributed	Distributed
Number Stored Event	128 events	200 (512)	250	500	250	250
External Storage	Paper tape option	Disc & tape options	Disc or paper tape	Disc or paper tape	Disc	Disc
Edit Decision List	No	Yes	Yes	Yes	Not on Eagle I	Not on -A or -B
Edit Data Display	LEDs	CRT	CRT	CRT	CRT	CRT
Print Output Format	Yes	Yes	Industry standard	Industry standard	RS-232C	RS-232C
Assembly/Insert	Both	Both	Both	Both	Both	Both
Animation Mode	Possible	Possible	Yes	Yes	Yes	Yes
Split A/V Modes	Yes	Yes	2 audio channels	Yes	2 audio channels	2 audio channels
A/B Roll System	Yes	Yes	Yes	Yes	Option Eagle I & II	-D & -E only
TC Reader/Generator		Both	Integral	Integral	Integral	External required
Time Code Types	LTC/VITC/Ctl track	LTC/VITC/Ctl track	LTC/Ctl track	LTC/Ctl track	All types	All types
Color Framing	Yes	Yes	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Edit Accuracy	±0 frames	±0 frames	±0 frames	±0 frames	±0 frames	±0 frames
VTR Speed Control	Knob	Knob & keyboard	Knob	Knob	Joystick	Joystick
Direction Control	Knob	Knob & keyboard	Knob	Knob	Joystick	Joystick
Switcher Interface	BVS-500 option	Yes	Various switchers	Most switchers	Echo SE-3 Eagle III	Serial/parallel D/E
Mixer Interface	BVS-500 option	Yes	United Media 500	United Media 500	Closures Eagle I/II	Serial/parallel D/E
Reader Service Number	**943**	**944**	**945**	**946**	**947**	**948**

VIDEO PROCESSORS

Equipment providing signal improvement through image enhancement, noise reduction, color correction or signal/sync regeneration.

Manufacturer	Applied Video System	Michael Cox Electronics	Electrocraft Consultants	Faroudja Labs	For-A Corporation
Model Number	**AVS 6500**	**600J Color Corrector**	**CPS-84**	**Image System**	**CCS-4300**
Primary Function:					
Image Enhancement	H aperture corrector	No	Horizontal coring	Yes	No
Noise Reduction	Yes	No	>6dB noise reduction	6dB luma & chroma	No
Color Correction	H & V	Time code controlled	Coring & crispening	Yes	Yes
Signal Regeneration	TBC/freeze modes	No	Integral SPG	Yes	No
Standards Conversion	NTSC/PAL/SECAM/RGB	No	PAL system only	NTSC system only	No
Recommended Use	Any	Dubs, production	Any	Tape playback	Any
Video Response	–3dB/to 3.5MHz/NTSC	To 8MHz luminance	3.5MHz L/800kHz C	±1dB to 5MHz	Flat to 4.2MHz luma
S/N Ratio	.....	65dB	.....	65dB	>60dB
C/L Delay	Adjustable	±10ns	480ns adj range	±300ns	<40ns
Video Level Control	w/ fade-to-black	±30 IRE	±6dB	Automatic	±40 IRE
Chroma Level Control	±6dB	+30 IRE –90 IRE	±6dB	Control	±40 IRE
Setup Level Control	±60mV range	±30 IRE	150mV nominal	of all	±20 IRE
Hue Phase Control	±500ns range	±45°	200mV RGB gamma adj	parameters	±15°
Subcarrier Phase	Yes	Variable/brightness	180° switch/vernier	.....	±180°
Subcarrier Level	Yes	+30 IRE-90 IRE	.....	.....	Not applicable
Sync Level Control	Yes	0 IRE	±2μs phase only	.....	±10 IRE
Reader Service Number	**552**	**553**	**554**	**555**	**556**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Editing Equipment

VIDEO PROCESSORS

	GEC-McMichael/				
Manufacturer	**Marconi**	**G.F. Video Technik**	**Grass Valley Group**	**ICM Video**	**Knox Video**
Model Number	**ACE**	**STC-2003**	**3240 Processor**	**VC-2000P Corrector**	**K700 (K701)**
Primary Function:					
Image Enhancement	No	.....	.....	Secondary function	K700
Noise Reduction	4dB luma/9dB chroma	Yes	.....	No	K700
Color Correction	Of color noise	R-Y/B-Y sampling	.....	No	K701
Signal Regeneration	Yes	TBC mode	For NTSC or PAL	From VCR player	Both
Standards Conversion	NTSC/PAL/SECAM/ RGB	NTSC/PAL/SECAM	No	No	No .....
Recommended Use	Any conversion	Any	Any	Any	Dubs, production
Video Response	Standard limited	Standard dependent	±0.2dB to 6MHz	To 5MHz luma	To 8MHz luma
S/N Ratio	>50dB luma or chroma	48dB	70dB	60dB	.....
C/L Delay	±50ns	.....	±10ns to 5MHz	.....	.....
Video Level Control	±2dB	Yes	±6dB	0-300% of input	***±50 IRE*** **(±10IRE)**
Chroma Level Control	±2dB	Yes	±6dB	50-100% of input	±50 IRE (each RGB)
Setup Level Control	±70mV	Yes	±15 IRE	±20 IRE	±20 IRE
Hue Phase Control	±15 for NTSC only	Yes	±13°	±6.5°	±180°
Subcarrier Phase	15°	±180°	±13°	No	±180°
Subcarrier Level	Yes	Yes	−6, +3dB	No	±30 IRE (±20 IRE)
Sync Level Control	Yes	Yes	−6, +3dB	±20 IRE	±30 IRE (±20 IRE)
Reader Service Number	557	**558**	**559**	**560**	**561**

VIDEO PROCESSORS

Manufacturer	**Leitch Video**	**Lenco**	**Marconi**	**MCI/Quantel**	**OKI Electric**
Model Number	**VPA-330N**	**PRC-365**	**DICE B3564**	**DSC4005**	**LT1210**
Primary Function:					
Image Enhancement	No	No	Yes	Yes	Yes
Noise Reduction	No	Comb filtering	No	Yes	No
Color Correction	With auto AGC	Yes	No	.....	Yes
Signal Regeneration	Per RS-170A	Per RS-170A	TBC functions	TBC functions	Yes
Standards Conversion	No	No	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Recommended Use	Any	Any	Any	Any	Any
Video Response	±0.1dB to 5MHz luma	±0.5dB to 10MHz	−3dB to 4.2MHz NTSC	Standard dependent	Standard dependent
S/N Ratio	>60dB	.....	.....	.....	>50dB
C/L Delay	.....	.....	.....	.....	±20ns
Video Level Control	11, −2 IRE	0.5-2Vp-p	Yes	Yes	±42 IRE
Chroma Level Control	±2 IRE	6, −30dB	Yes	Yes	±28 IRE
Setup Level Control	±10 IRE	±40 IRE	Yes	Yes	±14 IRE
Hue Phase Control	No	.....	Yes	Yes	±180°
Subcarrier Phase	±20°	45°	Yes	Yes	±180°
Subcarrier Level	±10 IRE	40 IRE	Yes	Yes	±12 IRE
Sync Level Control	±10 IRE	20-80 IRE	Yes	Yes	±12 IRE
Reader Service Number	562	**563**	**564**	**565**	**566**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Production Vehicles
Midwest Corporation ..... IFC

VIDEO PROCESSORS

Manufacturer	Siegel Electronics	Snell & Wilcox	Tektronix	Thomson-CSF	
Model Number	**1100 Image Corrector**	**DIP9700**	**1440**	**8010 Enhancer**	**5700 Color Corrector**
Primary Function:					
Image Enhancement	Yes	H & V detail	No	Yes	No
Noise Reduction	No	9dB luma/12dB chroma	No	No	No
Color Correction	Yes	Per RB white levels	No	No	Yes
Signal Regeneration	No	TBC functions	Yes	No	No
Standards Conversion	No	NTSC/PAL/SECAM/ YUV	No	No	No
Recommended Use	Production	Any	On-air	Any	Any
Video Response	To 5MHz	± 1dB to 3.3MHz NTSC	To 5MHz luma	– 1dB to 5MHz luma	± 0.3dB to 6MHz
S/N Ratio	58dB	52dB CCIR wtd	>60dB	55dB	65dB
C/L Delay	± 200ns	Adjustable	10ns	.....	840ns
Video Level Control	± 100 IRE	± 6dB	± 50 IRE	± 1dB	± 3dB
Chroma Level Control	± 200 IRE	± 6dB	± 40 IRE	.....	± 3dB ± 40 IRE
Setup Level Control	± 20 IRE	± 150mV	± 10 IRE	.....	± 15 IRE
Hue Phase Control	± 250°	NTSC only	± 25°	.....	± 15°
Subcarrier Phase	± 0°	.....	.....	.....	.....
Subcarrier Level	Internal adjustment	.....	± 20 IRE	.....	.....
Sync Level Control	Internal adjustment	.....	± 16 IRE	.....	.....
Reader Service Number	**567**	**568**	**569**	**570**	**571**

VIDEO SWITCHERS

Video production switching systems based on vertical interval switched signals. Inputs shall be 1V P-P or 0.714V non-composite; pulse drives shall be 4V P-P; reference subcarrier signals shall be 2V P-P. All impedances are 75Ω.

Manufacturer	Ampex Corporation		ASACA/ShibaSoku	Beaveronics	Robert Bosch
Model/Series Number	**4100H**	**AVC-33**	**ASW-100**	**BI-156**	**R 102 ME**
Number of Inputs	18 to 26	16 to 32	6 (3 w/ CCUs)	15	24
Video Black	Yes	Yes	Yes	Yes	Yes
Color Background	Yes	Yes	No	Yes	Yes
Non-Sync Detector	Yes	Yes	No	Yes	.....
Titling Input	Yes	Yes	Yes	Yes	4 possible
Key Source Int/Ext	Int/Ext	Int/Ext	Yes	Int/Ext	11 possible
Encoded Chroma-Key	Option	Option	No	Option	Option
RGB Chroma-Key	Option	Option	No	Option	Yes
Downstream Key	Option	Yes	Yes	Option	Yes
Switching Buses	8 prime/8 key	8 prime/10 key	2	6	10
Auxiliary Buses	To 8	To 16	.....	2 optional	Yes
Mix/Effects Amps	3	3	Yes	2	2
Auto Transitions	Yes	Yes	No	No	Possible
Pattern Generator	100 patterns	125	Yes	Yes	Yes
Rotary Wipes	35	All patterns	No	No	Yes
Soft Wipe	Yes	Yes	Yes	Yes	Yes
Spotlight Effect	No	Yes	No	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	Yes	No	Yes	Yes
Quad Split Unit	Option	Option	No	Option	.....
Border Effects	Option	Option	No	Yes	Yes
Shadow Effects	Option	Option	No	.....	.....
Re-Entries	Triple	Triple	No	Yes	Yes
Automation Port	Option	X-Star w/ 3.5" disc	No	No	Option
Programmable	No	Yes	No	No	Option
Digital Effects Port	Yes	For Ampex ADO	No	No	Option
Related Models	4100A/-L/-E	AVC-31/-23/-21	ASW-200/-50	BI-154	M 51 ME
Reader Service Number	**972**	**973**	**974**	**975**	**976**

VIDEO SWITCHERS

Manufacturer	Central Dynamics		Cox Electronics	Crosspoint Latch	
Model/Series Number	**CD-480**	**CD-1080**	**T-Series (T24/2)**	**6139 Series**	**6112 Series**
Number of Inputs	16 or 24	16, 24, 32	23 prime	8, 16, 24	9
Video Black	Yes	Yes	Yes	Yes	Yes
Color Background	Yes	Yes	Yes	Yes	Yes
Non-Sync Detector	Yes	Yes	Yes	No	No
Titling Input	Yes	Yes	Yes	Yes	Yes
Key Source Int/Ext	Int/Ext	Int/Ext	Int/Ext	Int/Ext	Int/Ext
Encoded Chroma-Key	Option	Option	Yes	Option	Option
RGB Chroma-Key	Option	Option	Yes	Option	Option
Downstream Key	Option	Yes	Yes	Yes	Yes
Switching Buses	6	10 prime	10 prime	6 prime	4
Auxiliary Buses	Option	Option	4	0	0
Mix/Effects Amps	1 SFX 4-channel	2 SFX	2	3	2
Auto Transitions	Option	Option	.....	Yes	Yes
Pattern Generator	38 w/ 32 optional	38 w/ 52 optional	57 patterns	12 (32 on -H- models)	12
Rotary Wipes	Option	Option	Yes	Option	No
Soft Wipe	Yes	Yes	Adjustable	Yes	Yes
Spotlight Effect	Yes	Yes	.....	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	Yes	.....	Yes	Yes
Quad Split Unit	Option	Option	.....	Yes	No
Border Effects	Option	Option	Yes	Yes	Yes
Shadow Effects	.....	.....	Yes	No	No
Re-Entries	No	Double	Double	Double	Double
Automation Port	No	.....	Option	Option	Option
Programmable	Option	Option	Yes	Yes	Yes
Digital Effects Port	Yes	Yes	Yes	Option	Option
Related Models	Series 80 CD-680	.....	T16	A/AH/AHK/AK/	6112AK/BH 6124
	.....	.....	.....	B/BHK/BK/C/CH/CK/	.....
	.....	.....	.....	CHK	.....
Reader Service Number	**977**	**978**	**979**	**980**	**981**

VIDEO SWITCHERS

Manufacturer	Crosspoint Latch	ECHOlab	Electrocraft	Grass Valley Group	
Model/Series Number	**6116 Component**	**SE/3**	**VM-8548 Component**	**Series 300-2A (-3A)**	**Series 1680-24K (16K)**
Number of Inputs	8	10	8 prime	24	24 (16)
Video Black	Yes	Yes	Yes	Yes	Yes
Color Background	Yes	Yes	Yes	Yes	Yes
Non-Sync Detector	No	Yes	.....	Yes	Yes
Titling Input	Yes	Yes	Yes	5 possible	4
Key Source Int/Ext	Int/Ext	Int/Ext	Int/Ext	All primaries/6 ext	2 int/2 ext
Encoded Chroma-Key	Option	Option	.....	Yes	Available
RGB Chroma-Key	Yes	Option	Yes	Yes	Yes
Downstream Key	Yes	Yes	Yes	Yes	Yes
Switching Buses	3	3 or 4	4	12 (16)	8 primary
Auxiliary Buses	0	No	.....	7 (2) and options	.....
Mix/Effects Amps	1	2	1	2 (3)	3
Auto Transitions	Yes	Yes	Yes	Yes	With E-MEM option
Pattern Generator	32	40	23 standard/options	40 std geometric	32 patterns
Rotary Wipes	0	None	No	Yes	8
Soft Wipe	Yes	Yes	Yes	Yes	Yes
Spotlight Effect	No	Yes	No	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	With audio input	Yes	Yes	Yes
Quad Split Unit	No	Yes	No	Yes	Yes
Border Effects	Yes	Yes	Yes	Yes	Yes
Shadow Effects	No	Option	.....	Yes	Yes
Re-Entries	Double	Double	.....	Yes	Triple
Automation Port	Option	Yes	Yes	E-MEM	For E-MEM option
Programmable	Yes	Yes	Option	Via serial link	Serial data
Digital Effects Port	No	Option	.....	Yes	Yes
Related Models	6109/6107	.....	.....	300-2B/300-3B	1680-24F/16F/10V
	.....	.....	.....	.....	1680-10X/1A/1L/1X
Reader Service Number	**982**	**983**	**984**	**985**	**986**

VIDEO SWITCHERS

Manufacturer	Grass Valley Group	Industrial Sciences		JVC Company	Marconi
Model/Series Number	**Model 100**	**Model 904**	**200 Series (200-3)**	**KM-2000**	**B3730**
Number of Inputs	8	10	29 primary	8	22
Video Black	Yes	Yes	Yes	Yes	Yes
Color Background	Yes	Yes	Yes	Yes	Yes
Non-Sync Detector		No	Yes	No	Yes
Titling Input	Yes	Yes	To 10	Yes	Yes
Key Source Int/Ext	Ext/Int	Int/Ext	Int/Ext	External	Int/Ext
Encoded Chroma-Key		Option	.....	No	.....
RGB Chroma-Key	Option	Option	Yes	Yes	.....
Downstream Key	Yes	Yes	Yes	Yes	Yes
Switching Buses	3	6 primary	8 primary	3	5
Auxiliary Buses		Option	Option	1	.....
Mix/Effects Amps	Multilevel	2 M/E	3 5-level M/E	2 M/E	Yes
Auto Transitions	0 to 999 frames	Option	Yes	No	No
Pattern Generator	10	16 patterns	32 patterns	13 patterns	Yes
Rotary Wipes	No	Yes	Yes	No	No
Soft Wipe	Yes	.....	Yes	Yes	Yes
Spotlight Effect		.....	Yes	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	Yes	Yes	Yes	Yes
Quad Split Unit	No	No	Yes	No	.....
Border Effects	Yes	Yes	Yes	No	.....
Shadow Effects	Yes	Yes	.....	No	.....
Re-Entries	Via M/E amp	Double	Triple	Single	Yes
Automation Port	RS-232C/RS-422	Option	Option	No	.....
Programmable		Yes	Yes	No	.....
Digital Effects Port	No	No	Option	No	.....
Related Models		901/902/903	210	.....	.....
Reader Service Number	**987**	**988**	**989**	**990**	**991**

VIDEO SWITCHERS

Manufacturer	Panasonic Company		Ross Video		Shintron
Model/Series Number	**AS-6100**	**WJ-5500A**	**RVS 508**	**RVS 10-4R**	**#375 SuperSwitcher**
Number of Inputs	10	8 primary	20, 24	10	10
Video Black	Yes	Yes	Yes	Yes	Yes
Color Background	Yes	No	Yes	Yes	Yes
Non-Sync Detector	No	No	Yes	Yes	Yes
Titling Input	Yes	Yes	Yes	Yes	Yes
Key Source Int/Ext	Int/Ext	Int/Ext	Int/Ext	Int/Ext	Int/Ext
Encoded Chroma-Key	No	No	Option	No	Yes
RGB Chroma-Key	W/ AS-2000	No	Option	Option	No
Downstream Key	No	Possible	Option	Option	Yes
Switching Buses	5	4	8	4	4
Auxiliary Buses		No	4	2	.....
Mix/Effects Amps	1 M/E	1 M/E	2 multilevel	1 M/E	1 M/E
Auto Transitions	No	No	Yes	No	No
Pattern Generator	16 patterns	9 patterns	62 patterns	24 patterns	10 patterns
Rotary Wipes	No	No	15	No	No
Soft Wipe	Yes	Yes	Yes	Yes	Yes
Spotlight Effect	Yes	No	Yes	No	No
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	No	No	Yes	No	Yes
Quad Split Unit	No	No	Option	No	No
Border Effects	No	No	Yes	Yes	Limited
Shadow Effects	No	No	.....	.....	No
Re-Entries	Single	Yes	Single	Single	Single
Automation Port	No	No	Scene-Store/Encore	No	No
Programmable	No	No	Yes	No	No
Digital Effects Port	No	No	Yes	No	No
Related Models		.....	517/524/514	.....	Empress 2000
Reader Service Number	**992**	**993**	**994**	**995**	**996**

VIDEO SWITCHER

Manufacturer	Sony Broadcast	Vital Industries
Model/Series Number	SEG-2000	3000 Series
Number of Inputs	6	24
Video Black	Yes	Yes
Color Background	Yes	Yes
Non-Sync Detector	Possible	Yes
Titling Input	Possible	Yes
Key Source Int/Ext	Int/Ext	Int/Ext
Encoded Chroma-Key	No	Yes
RGB Chroma-Key	W/ CRK-2000	Yes
Downstream Key	Yes	Yes
Switching Buses	3	6 to 12
Auxiliary Buses	No	4
Mix/Effects Amps	Yes	1 to 3
Auto Transitions	No	Yes
Pattern Generator	84 w/ WEX-2000	62 patterns
Rotary Wipes	No	10
Soft Wipe	W/ CRK-2000	Yes
Spotlight Effect	No	No
Effects Positioning	Yes	Yes
Effects Modulation		Yes
Quad Split Unit	No	Option
Border Effects		Yes
Shadow Effects	No	Yes
Re-Entries	Yes	Double
Automation Port	No	For PSAS
Programmable	No	No
Digital Effects Port	No	For SqueeZoom
Related Models	SEG-1210	3000-1/3000-2
Reader Service Number	**997**	**998**

TBC/SYNCHRONIZERS

Equipment for stabilizing video signals through the use of a reference input from the station (or system) sync generator. The corrected signal may be used for mixing or effects applications with other station video sources.

		ADDA		Ampex	
Manufacturer					
Model/Series Number	**VW2**	**AC20A**	**AC20A/TB2**	**TBC-80**	**TBC-3**
Function	TBC/synchronizer	Field/frame sync	TBC	TBC	TBC
Sampling Freq/Bits	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit NTSC	10.7MHz/8-bit
Correction Window	2 fields	1-field/2-field	16 TVL	14 TVL	>10 TVL
Video Bandwidth	To 5MHz	To 4.2MHz	To 4.2MHz	To 4.2MHz NTSC	To 4.2MHz
S/N Ratio	56dB	56dB	55dB	56dB	56dB NTSC/56dB PAL
Phase/Gain Rating	2°/2%	2°/2%	2°/2%	2°/2%	2°/2%
Residual Error		± 10nsec	± 10nsec	± 10nsec	± 10nsec NTSC
Coherent 3.58MHz	Yes	Yes	Yes	Yes	Yes
Advanced Sync Output	Yes	Yes	Yes	Yes	Yes
Component Inputs	No	No	No	No	No
Component Outputs	No	No	No	No	No
Velocity Compensator	Line-by-line	No	No	Look-ahead/line-line	Yes
Heterodyne Processor	Yes	No	Yes	Yes	Yes
Non-Servo Capstan		No	.....	No	No
Dropout Compensation	Yes	No	Yes	Yes	Yes
Dynamic Tracking	No	No	Yes	Yes	Yes
Noise Reduction	No	No	No	No	No
Color Correction	No	No	No	No	No
Image Enhancement	No	No	No	No	No
Hot Switching	Yes	No	No	No	No
Video Gain Adjust	±3dB	±3dB	±3dB	Yes	Yes
Chroma Gain Adjust	±3dB	±3dB	±3dB	Yes	Yes
Setup Gain Adjust	±10 IRE	±10 IRE	±10 IRE	Yes	Yes
Hue Phase Adjust	±45°/180° switch	±360°	±360°	Yes	Yes
Subcarrier Adjust	±370°	±360°	±360°	Yes	Yes
Sync Phase Adjust	+4, −2μsec	+4, −2μsec	+4, −2μsec	Yes	Yes
Color Standards	NTSC	NTSC (PAL available)	NTSC (AC20A/TB1 similar)	NTSC/PAL	NTSC/PAL/SECAM
	.....	.....		.....	.....
Reader Service Number	**701**	**702**	**703**	**704**	**705**

TBC/SYNCHRONIZERS

Manufacturer	Apert-Herzog		ASACA/ShibaSoku	CEL Electronics	Digital Video System
Model/Series Number	Model A2	Model H2 (H)	AVS-100	P147	Phaser VI
Function	Frame synchronizer	TBC/synchronizer	Synchronizer	TBC/synchronizer	Synchronizer
Sampling Freq/Bits	14.3MHz/8-bit	14.3MHz/8-bit	14.318MHz/8-bit	12.9MHz	14.3MHz/8-bit
Correction Window	2-field	2-field	1 frame	2-field	512 TVL
Video Bandwidth	To 4.2MHz	To 4.2MHz	±0.3dB/to 6MHz	3.5MHz PAL	To 4.2MHz
S/N Ratio	54dB	54dB	<50dB	48dB	56dB
Phase/Gain Rating	2°/2%	3°/3%	<1.5°/<2%	.....	1°/1%
Residual Error	±3nsec	±25nsec	.....	±15nsec	±2nsec
Coherent 3.58MHz	No	Yes	No	No	No
Advanced Sync Output	No	Option	No	No	No
Component Inputs	No	No	No	No	.....
Component Outputs	No	No	No	No	.....
Velocity Compensator	No	No	No	.....	No
Heterodyne Processor	No	No (switchable)	No	Component video	No
Non-Servo Capstan	No	Yes	.....	Yes	No
Dropout Compensation	No	Option	No	Last full field	Last full field
Dynamic Tracking	No	Option	No	.....	No
Noise Reduction	No	No	No	No	Adaptive 3-line
Color Correction	No	No	No	No	Comb filter
Image Enhancement	No	No	No	No	No
Hot Switching	Yes	Yes	Yes	Yes	Yes
Video Gain Adjust	±3dB	±3dB	Yes	Yes	±3dB
Chroma Gain Adjust	±2dB	±2dB	Yes	Yes	±3dB
Setup Gain Adjust	±30 IRE	±30 IRE	Yes	Yes	±20 IRE
Hue Phase Adjust	±360°	±360°	Yes	Yes	±25°
Subcarrier Adjust	±360°	±360°	Yes	Yes	±180°
Sync Phase Adjust	±120μsec	±120μsec	Yes	Yes	±9μsec
Color Standards	NTSC	NTSC	NTSC	NTSC/PAL	NTSC
Reader Service Number	**706**	**707**	**708**	**709**	**710**

TBC/SYNCHRONIZERS

Manufacturer	Digital Video System	Electrocraft Consult		FOR-A Corporation	
Model/Series Number	DPS-103	TBC-84	FA-400N	FA-410	FA-430
Function	TBC	TBC	TBC	TBC	TBC
Sampling Freq/Bits	14.3MHz/8-bit	.....	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction Window	16 TVL	2-line	2-field	16 TVL	16 TVL
Video Bandwidth	To 4.2MHz	3.5MHz luma	To 4.2MHz	To 4.2MHz	−3dB at 3.2MHz
S/N Ratio	56dB	>50dB	58dB	58dB	58dB
Phase/Gain Rating	3°/3%	.....	2°/2%	2°/2%	2°/2%
Residual Error	±5nsec	±25nsec	±15nsec	±15nsec	±15nsec
Coherent 3.58MHz	Yes	Yes	No	Yes	No
Advanced Sync Output	Yes	3-line	Yes	Yes	Yes
Component Inputs	Yes	Y/U/V dub	No	No	Y/R-Y/B-Y (dub)
Component Outputs	Yes	Y/U/V dub	No	No	Y/R-Y/B-Y (dub)
Velocity Compensator	No	.....	No	No	No
Heterodyne Processor	No	Yes	Yes	Yes	Yes
Non-Servo Capstan	No	No	Yes	Yes	Yes
Dropout Compensation	No	Yes	No	Yes	Yes
Dynamic Tracking	No	.....	No	Option	Option
Noise Reduction	No	No	No	No	4dB luma/6dB chroma
Color Correction	No	No	No	No	Yes
Image Enhancement	No	No	No	No	H & V detail
Hot Switching	No	No	Yes	No	No
Video Gain Adjust	±3dB	Yes	±3dB	±3dB	±3dB
Chroma Gain Adjust	±3dB	Yes	±3dB	±3dB	±3dB
Setup Gain Adjust	±20 IRE	Yes	±200mV	±200mV	±200mV
Hue Phase Adjust	±180°	No	±180°	.....	±180°
Subcarrier Adjust	±180°	±0-180° switch/vernier	±180°	±180°	±180°
Sync Phase Adjust	±9μsec	±1μs H/±5 line V	±2μsec	±2μsec	±2μsec
Color Standards	NTSC	PAL	NTSC/PAL	NTSC/PAL	NTSC/PAL
	.....	.....	FA-420N NTSC only	.....	.....
Reader Service Number	**711**	**712**	**713**	**714**	**715**

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[1]Dynamic Tracking and U-Matic are trade names of Sony Corporation.
[2]The Panasonic VHS NV-8950 is V-locked with modification by FOR-A Corporation. Contact FOR-A Sales Department for complete information.

Circle (21) on Reply Card

TBC/SYNCHRONIZERS

Manufacturer		Fortel			Gunnerfield Marketing
Model/Series Number	**Y-688132 Corrector**	**C-YIQ132**	**The Dubber**	**CCDHP**	**2002S**
Function	TBC	TBC	TBC	TBC	TBC
Sampling Freq/Bits	14.3MHz/8-bit	14.3MHz luminance	.....	.....	.../8-bit
Correction Window	32 TVL	32 TVL	2 TVL	2 TVL	16 TVL
Video Bandwidth	– 3dB at 5MHz	4.5MHz/1.5MHz	4.2MHz Y-688 mode	2.8MHz/3.2MHz PAL	To 5.5MHz
	.....	chroma	.....	.....	.....
S/N Ratio	57dB encoded	>57dB	60dB	60dB/58dB PAL	55dB
Phase/Gain Rating	1.5°/1.5% encoded	0.5°/0.5% YIQ	0.5°/1.5%	0.5°/1.5%	4°/4%
Residual Error	±20nsec	±7.5nsec	±25nsec	±25nsec	25nsec
Coherent 3.58MHz	Yes	Yes	.....	.....	Yes
Advanced Sync Output	Yes	Yes	Yes	Yes	Yes
Component Inputs	Y/688kHz-C	YIQ	Y/C	Y/R-Y/B-Y processor	.....
Component Outputs	Y/688kHz-C	YIQ	Y/R-Y/B-Y processor	.....	R/G/B
Velocity Compensator	Look-ahead	.....	.....	.....	Floating window
Heterodyne Processor	Yes	Yes	No	Yes	Yes
Non-Servo Capstan	Yes	.....	.....	Yes	Yes
Dropout Compensation	Yes	Yes	Yes	Yes	Yes
Dynamic Tracking	Yes	Yes	.....	No	Yes
Noise Reduction	To 20dB (Faroudja)	.....	To 4dB color	Yes	Yes
Color Correction	Yes	.....	.....	Yes	Yes
Image Enhancement	Yes	.....	Yes	Yes	Yes
Hot Switching	No	No	No	No	No
Video Gain Adjust	±3dB	Yes	Yes	Yes	Yes
Chroma Gain Adjust	±3dB	Yes	Yes	Yes	±6dB
Setup Gain Adjust	±20 IRE	Yes	Yes	Yes	Yes
Hue Phase Adjust	±30°	Yes	Yes	Yes	Yes
Subcarrier Adjust	>360°	.....	Yes	Yes	Yes
Sync Phase Adjust	±4μsec	.....	Yes	Yes	Yes
Color Standards	NTSC	NTSC/YIQ	NTSC	NTSC/PAL	PAL/SECAM
Reader Service Number	**716**	**717**	**718**	**719**	**720**

TBC/SYNCHRONIZERS

Manufacturer	Gunnerfield Marketing	Harris Video Systems			
Model/Series Number	**8000**	**HVS 690**	**HVS 632 (631)**	**HVS 516WB (517)**	**HVS 540 (540VT)**
Function	TBC/synchronizer	Frame synchronizer	Frame synchronizer	TBC	TBC
Sampling Freq/Bits	.../8-bit	14.3MHz/9-bit	14.3MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction Window	1-field	Uses hysteresis	Uses hysteresis	16 TVL	16 TVL
Video Bandwidth	To 5.5MHz	To 4.2MHz	4.2MHz (5.5MHz)	To 4.2MHz	To 4.2MHz
S/N Ratio	55dB	59dB	57dB (58dB)	55dB	59dB
Phase/Gain Rating	4°/4%	2°/2%	1°/1% (2°/2%)	1.5°/1.5%	2°/2%
Residual Error	±25nsec	±20nsec	±10nsec	±20nsec	±20nsec
Coherent 3.58MHz	No	Yes	.....	..... (No)	Yes
Advanced Sync Output	No	No	Yes	Yes	Yes
Component Inputs	Y/C	No	RGB	No	No
Component Outputs	RGB option	No	RGB	No (RGB)	No
Velocity Compensator	Yes	Line-by-line	.....	Digital averaging	.....
Heterodyne Processor	Yes	Yes	Yes	Yes	No
Non-Servo Capstan	Yes	Yes	Yes	Yes	No
Dropout Compensation	Yes	Yes	Yes	..... (Yes)	Yes
Dynamic Tracking	Yes	No	No	.....	Option
Noise Reduction	Yes	±3dB	±12dB	±3dB (±5dB option)	±3dB
Color Correction	Yes	No	.....	Yes	No
Image Enhancement	Yes	No	.....	..... (Option)	No
Hot Switching	Yes	Yes	Yes	No	No
Video Gain Adjust	Yes	±6dB	±6dB	±6dB	±6dB
Chroma Gain Adjust	±6dB	±6dB	±6dB	±6dB	±6dB
Setup Gain Adjust	Yes	±10 IRE	±10 IRE	±10 IRE	±10 IRE
Hue Phase Adjust	Yes	±360°	±360°	±360°	±40° automatic
Subcarrier Adjust	Yes	±360°	±360°	±360°	±360°
Sync Phase Adjust	Yes	±6μsec	±6μsec	±6μsec	±6μsec
Color Standards	PAL/SECAM	NTSC	NTSC (PAL)	NTSC (PAL/SECAM)	NTSC
Reader Service Number	**721**	**722**	**723**	**724**	**725**

TBC/SYNCHRONIZERS

Manufacturer	Harris Video Systems	IVC-Carlton	MCI/Quantel	Microtime	
Model/Series Number	**HVS 550VT (550)**	**Gemini 1**	**DSF1750**	**T-120D**	**S-230D**
Function	TBC	TBC/synchronizer	TBC/synchronizer	TBC	TBC/synchronizer
Sampling Freq/Bits	14.3MHz/8-bit	13.5MHz/8-bit	14.318MHz/8-bit	14.3MHz/8-bit	14.3MHz/8-bit
Correction Window	16 TVL	1-field	1 frame	16 TVL	1 frame
Video Bandwidth	To 4.2MHz	5MHz HB U-matic	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 5MHz
S/N Ratio	59dB	>50dB	58dB	58dB	58dB
Phase/Gain Rating	2°/2%	.....	1°/1%	2°/2%	2°/2%
Residual Error	±20nsec	±4nsec	<2nsec	±10nsec	±10nsec
Coherent 3.58MHz	Yes	.....	Yes	Yes	Yes
Advanced Sync Output	Yes	.....	Yes	Yes	Yes
Component Inputs	No	Yes	No	No	No
Component Outputs	No	Yes	No	No	No
Velocity Compensator	.....	Yes	Yes	Averaging	.....
Heterodyne Processor	Yes	.....	Yes	Yes	Yes
Non-Servo Capstan	No	.....	.....	Yes	Yes
Dropout Compensation	Yes	.....	.....	No	Auto-freeze
Dynamic Tracking	Yes (option 550)	.....	.....	Yes	W/ BVU-820
Noise Reduction	±3dB	No	.....	No	No
Color Correction	No	No	.....	No	Yes
Image Enhancement	No	No	.....	No	No
Hot Switching	No	Yes	Yes	No	Yes
Video Gain Adjust	±6dB	Yes	Yes	±3dB	±3dB
Chroma Gain Adjust	±6dB	Yes	Yes	±3dB	±3dB
Setup Gain Adjust	±10 IRE	Yes	Yes	±10 IRE	±10 IRE
Hue Phase Adjust	±40° automatic	.....	Yes	360° in 90° steps	±50°
Subcarrier Adjust	±360°	Yes	Yes	360° in 90° steps	360°
Sync Phase Adjust	±6μsec	Yes	Yes	−5μs, +2μs	−9μs, +2μs
Color Standards	NTSC	PAL/SECAM	NTSC (DSF1751 PAL)	NTSC	NTSC
Reader Service Number	**726**	**727**	**728**	**729**	**730**

TBC/SYNCHRONIZERS

Manufacturer	NEC America		Nova Systems		QuesTech	
Model/Series Number	**FS-18**	**FS-19**	**Nova 500**	**Nova 510**	**2101P**	**6001P**
Function	TBC/synchronizer	TBC/synchronizer	TBC	TBC	TBC/synchronizer	TBC/synchronizer
Sampling Freq/Bits	14.3MHz/8-bit	14.3MHz/10-bit	14.3MHz/8-bit	14.3MHz/8-bit	8-bit component	12.5MHz/8-bit
Correction Window	1 frame	.....	32 TVL	32 TVL	2 fields	2 fields
Video Bandwidth	To 5MHz	To 5MHz	To 4.2MHz	To 4.2MHz	±0.5dB/to 5.5MHz	±0.5dB/to 5.5MHz
S/N Ratio	>53dB	60dB	56dB	56dB	54dB luma	54dB luma
Phase/Gain Rating	2°/2%	1°/1%	<2°/<2%	<2°/<2%	1.5°/2.5%	1.5°/2.5%
Residual Error	.....	.....	±10nsec	±10nsec	±10nsec	±10nsec
Coherent 3.58MHz	Yes	Yes	Yes	Yes	.....	No
Advanced Sync Output	No	No	Yes	Yes	No	No
Component Inputs	No	No	No	No	RGB Y/U/V	RGB
Component Outputs	No	No	No	No	RGB Y/U/V	RGB
Velocity Compensator	Line-by-line	Line-by-line	No	No	No	Intrinsic
Heterodyne Processor	Yes	Yes	No	Yes	Yes	Yes
Non-Servo Capstan	Yes	Yes	No	No	. ...	Yes
Dropout Compensation	Yes	Yes	No	No	Last field or black	No
Dynamic Tracking	No	No	No	Yes	No	No
Noise Reduction	No	No	No	No	No	No
Color Correction	No	No	No	No	No	No
Image Enhancement	No	No	No	No	No	No
Hot Switching	Yes	Yes	No	No	Yes	Yes
Video Gain Adjust	±3dB	±3dB	±3dB	±3dB	+6, −3dB	±6dB
Chroma Gain Adjust	±3dB	±3dB	±3dB	±3dB	±2dB	±3dB
Setup Gain Adjust	±10 IRE	±10 IRE	±8 IRE	±8 IRE	10%	±1dB
Hue Phase Adjust	±15°	±15°	±360°	±360°	.....	No
Subcarrier Adjust	360°	360°	.....	.....	180° switch/vernier	360°
Sync Phase Adjust	−3μs, 1μs	±2μs	±6μs	±6μs	−5μs, +20μs	±5μs
Color Standards	NTSC	NTSC	NTSC	NTSC	PAL	PAL
Reader Service Number	**731**	**732**	**733**	**734**	**735**	**736**

TBC/SYNCHRONIZERS

Manufacturer	Regis/BLT	Sony Broadcast		Tektronix		Thomson-CSF
Model/Series Number	**FSC 770**	**BVT-800**	**BVT-2000**	**BVX-30**	**110-S**	**9100 Processor**
Function	TBC/synchronizer	TBC	TBC	TBC/synchronizer	TBC/synchronizer	TBC/synchronizer
Sampling Freq/Bits	12.5MHz/8-bit	10.7MHz/8-bit	14.3MHz/9-bit	14.3MHz/8-bit	14.3MHz/10-bit	14.3MHz/8-bit
Correction Window	1 field	15 TVL floating	4 TVL	1 frame	2 or 4 fields	Infinite
Video Bandwidth	To 3.5MHz luma	±0.4dB/to 4.2MHz	±0.3dB/to 4.2MHz	0.5dB/to 5MHz	To 4.2MHz	−3dB at 5.5MHz
S/N Ratio	56dB	55dB	58dB	51dB	60dB unwtd (52dB TBC)	>56dB
Phase/Gain Rating	<3°/<3%	2°/2%	2°/2%	2°/3%	1°/1%	2°/2%
Residual Error	Not applicable	±15ns	±15ns	.....	±20ns	.....
Coherent 3.58MHz	No	Yes	Option	Yes	No	Yes
Advanced Sync Output	Yes	Yes	Yes	Yes	No	Yes
Component Inputs	No	.....	.....	.....	No	.....
Component Outputs	No	.....	.....	.....	No	.....
Velocity Compensator	Yes	No	Line-by-line	Yes	No	.....
Heterodyne Processor	Yes	Yes	Option	Yes	Yes	Yes
Non-Servo Capstan	Yes	No	No	Yes	Yes	.....
Dropout Compensation	Yes	Yes	Yes	Yes	No	.....
Dynamic Tracking	Yes	Yes	Yes	No	No	.....
Noise Reduction	No	No	Color noise	3 ranges	No	15dB improvement
Color Correction	Yes	No	No	With option BK-31	No	Comb filtering
Image Enhancement	No	No	No	H & V	No	.....
Hot Switching	Yes	No	No	No	Yes	Yes
Video Gain Adjust	±6dB	±3dB	±3dB	Yes	±3dB	Yes
Chroma Gain Adjust	+6dB, −30dB	±3dB	±3dB	Yes	±3dB	Yes
Setup Gain Adjust	±1dB	±15 IRE	0, −15 IRE	Yes	±10 IRE	Yes
Hue Phase Adjust	.....	±25°	±15°	Yes	±20°	Yes
Subcarrier Adjust	360°	>360°	>360°	>360°	.....	.....
Sync Phase Adjust	.....	−1μs, +3μs	±3μs	Yes	.....	.....
Color Standards	PAL, NTSC	NTSC	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**737**	**738**	**739**	**740**	**741**	**742**

TIME CODE GENERATORS

Generator units for 80-bit serial or 90-bit vertical interval time code. If no reader capability is included within the package, a matching reader model number is given, if available.

Manufacturer	Adams-Smith	Amtel Systems			Audio + Design
Model/Series Number	**2600LR/VR Generator**	**Evertz 3600D**	**Evertz ECM4000**	**6000 Series**	**TCR-1 Regenerator**
Portable Unit	No	#3500	No	Module	Yes
Operation Mode(s)—					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
Color Frame	Yes	Yes	Yes	Yes	Yes
Jam Sync	Yes	Yes	Yes	Yes	No
Timing Reference—					
Video Input/60Hz	Either	Video	Video	Video	Video
Internal Crystal	No	Yes	Yes	Yes	No
Data Entry—					
Time Set/Reset	Yes	Yes	Yes	Yes	No
User Bits	Yes	Yes	Yes	Yes	No
Data Display(s)					
Time Code/User Bits	Yes	Yes	Yes	Yes	Yes
Character Generator	W/ #2600CI	Yes	Yes	Yes	No
Reader Function	No	Integral	Integral	Integral	Integral
Computer Interface	W/ #2600SI	No	Yes	Yes	No
VITC Format Output	SMPTE & EBU	No	SMPTE format	SMPTE format	No
Output Signal Level	10dBm	12dBm	−6, 12dBm	.....	0dBm
Powering From	115/230Vac 60Hz	110/230Vac 50/60Hz	110Vac	60Hz Vac	115Vac & battery
Color Standards	NTSC/PAL/SECAM	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC
Reader Service Number	**888**	**889**	**890**	**891**	**892**

Manufacturer	Audio Kinetics	Avitel Electronics	BTX Corporation	Cipher Digital	
Model/Series Number	**Q-Lock 210**	**TGE 2040**	**Cypher Generator**	**#716A Generator**	**Model 766 Generator**
Portable Unit	.....	No	No	No	No
Operation Mode(s)—					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
Color Frame	Yes	Yes	Yes	Yes	Yes
Jam Sync	No	Yes	Yes	Yes	Yes
Timing Reference—					
Video Input/60Hz	Video	Video, square wave	Video	Either	Either
Internal Crystal	Yes	.....	Yes	Yes	Yes
Data Entry—					
Time Set/Reset	Yes	Yes	Yes	Yes	Yes
User Bits	No	Yes	Yes	Static & ASCII	Yes
Data Display(s)					
Time Code/User Bits	LEDs	Yes	LEDs	Yes	Yes
Character Generator	No	.....	Yes	No	W/ #735 reader
Reader Function	Yes	Yes	Yes	Use #710A reader	W/ #735 series
Computer Interface	Yes	Parallel interface	RS-232C/RS-422	Yes	Yes
VITC Format Output	No	SMPTE & EBU	Yes	No	SMPTE & EBU formats
Output Signal Level	20dBm	4Vp-p into 10kΩ	8dBm	4dBm	5Vp-p
Powering From	115/240Vac	120/240Vac 50/60Hz	110Vac	110Vac 60Hz	110Vac
Color Standards	NTSC/PAL	PAL/SECAM/NTSC	NTSC/PAL	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Reader Service Number	**894**	**893**	**895**	**896**	**897**

TIME CODE GENERATORS

Manufacturer	Datum	EECO			Elector
Model/Series Number	**#5350 (5300 Series)**	**TCP-250**	**VIG-850**	**MTG-550**	**TCG/D-2**
Portable Unit	No	No	No	No	No
Operation Mode(s)—					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
Color Frame	Yes	Yes	Yes	Yes	Yes
Jam Sync	Yes	Yes	Yes	Yes	Yes
Timing Reference—					
Video Input/60Hz	Video only	Video only	Video only	Either	Either
Internal Crystal	No	No	No	No	Yes
Data Entry—					
Time Set/Reset	Yes	.....	Yes	Yes	Yes
User Bits	Yes	.....	Yes	Yes	.....
Data Display(s)					
Time Code/User Bits	Yes	Yes	Yes	Yes	LEDs
Character Generator	Yes	Yes	W/ VCG-750	W/ VCG-75	.....
Reader Function	Integral or #5360	Integral	Integral	Integral or TCR-650	TCR/VCG/D-2
Computer Interface	No	Yes	Yes	Yes	No
VITC Format Output	SMPTE & EBU	SMPTE format	SMPTE & EBU	No	No
Output Signal Level	0-6Vp-p into 600Ω	5Vp-p	1Vp-p	10Vp-p	10dBm
Powering From	115/220Vac 50/60Hz	110Vac 60Hz	110Vac	110Vac 60Hz	110Vac
Color Standards	NTSC/PAL	NTSC	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL
Reader Service Number	**898**	**899**	**900**	**901**	**902**

TIME CODE GENERATORS

Manufacturer	ESE	For-A Corporation	Giese Electronic	Gray Engineering	JVC Company
Model/Series Number	**ES261**	**TCG-3200**	**TCG-111**	**DT-104F Generator**	**TG-P47U**
Portable Unit	No	Yes	No	No	Yes
Operation Mode(s)—					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	No	Yes	Yes	Yes
Color Frame	Yes	No	No	Yes	No
Jam Sync	Yes	No	No	Yes	No
Timing Reference—					
Video Input/60Hz	Either	Either	No	Either	No
Internal Crystal	Yes	No	Or biphase, 50Hz	No	Yes
Data Entry—					
Time Set/Reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	No	No	Yes	Yes
Data Display(s)					
Time Code/User Bits	Yes	Time code only	Time code only	Yes	LEDs
Character Generator	Yes	No	No	Use DR-107B	No
Reader Function	#ES253/254/255/256	Use TCR-3500 reader	Use TCR-110/910/120	Integral	No
Computer Interface	No	No	No	Yes	No
VITC Format Output	No	No	No	VIE-224, VID-225	No
Output Signal Level	0dBm	0dBm	0dBm	8dBm	0dBm
Powering From	115Vac	8-20Vdc	110/220Vac 50/60Hz	110/230Vac 60Hz	CR4700U VCR
Color Standards	NTSC	PAL/NTSC	NTSC/PAL/SECAM	NTSC/PAL	NTSC
Reader Service Number	**903**	**904**	**905**	**906**	**907**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Test Products

TIME CODE GENERATORS

Manufacturer	Multidyne	Panasonic	Skotel		Sony Broadcast
Model/Series Number	**TCC-1**	**NV-F450**	**PTC-100**	**TCG-80N (-80P)**	**BVG-1600**
Portable Unit	No	Yes	Yes	No	No
Operation Mode(s) –					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	No	Yes	.....	Yes
Color Frame	Yes	No	Yes	Yes	Yes
Jam Sync	Yes	No	Yes	Option	Yes
Timing Reference –					
Video Input/60Hz	Video only	.....	Video only	Either	Video
Internal Crystal	Yes	Yes	Yes	No	No
Data Entry –					
Time Set/Reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	Yes	Yes	Yes	Yes
Data Display(s)					
Time Code/User Bits	Yes	Yes	LEDs	LEDs	LEDs
Character Generator	Yes	No	No	Option	Yes
Reader Function	Yes	In AU-A70 editor	Integral	W/ TCR-80 unit	W/ BVG-1500
Computer Interface	Yes	No	No	No	Yes
VITC Format Output	Yes	No	No	With VITC unit	Yes
Output Signal Level	8dBm	– 20dBm	10dBm	8dBm	8dBm
Powering From	110Vac	Battery	4 AA cells	115/230Vac	110Vac
Color Standards	NTSC/PAL/SECAM	NTSC	NTSC/PAL	NTSC (PAL)	NTSC/PAL
Reader Service Number	**908**	**909**	**910**	**911**	**912**

TIME CODE GENERATORS

Manufacturer	Sony/Pro Audio Div.	Telcom Research		United Media	
Model/Series Number	**JH-45**	**T-7000**	**Time Code Centre**	**Model 210**	**Model 205**
Portable Unit	No	Yes	No	No	No
Operation Mode(s) –					
Drop Frame	Yes	Yes	Yes	Yes	Yes
Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
Color Frame	W/ JH-48	Yes	Yes	Yes	Yes
Jam Sync		Option	Yes	.....	.....
Timing Reference –					
Video Input/60Hz	Either	.....	Either	Either	Either
Internal Crystal	Yes	.....	No	.....	.....
Data Entry –					
Time Set/Reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	Yes	Yes	Yes	Yes
Data Display(s)					
Time Code/User Bits	LEDs	LEDs	LEDs	LEDs	LEDs
Character Generator		.....	Option	Use Model 215	Yes
Reader Function	W/ synchronizer	Integral	Integral	Use Model 310	Use Model 305
Computer Interface	Possible	No	Yes	Possible	Possible
VITC Format Output	No	No	No	No	No
Output Signal Level	– 3dBv	11dBm	11dBm	8dBm	8dBm
Powering From	115Vac	Battery	120/220Vac 60Hz	110Vac	110Vac
Color Standards	SMPTE/EBU	NTSC/PAL	SMPTE/EBU/EIA	NTSC/PAL/SECAM	NTSC/PAL/SECAM
Reader Service Number	**913**	**914**	**915**	**916**	**917**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Recorders

AUTOMATED VCR SYSTEMS

Multideck videocassette player units, operating under programmed computer control for sequenced, automated playback. Units may include a randomly accessible cassette storage magazine and recording/editing facilities.

Manufacturer	**ASACA/ShibaSoku**	**Panasonic Broadcast**	**RCA Broadcast**	**Sony Broadcast**
Model Number	**ACL-3000**	**MVP-100**	**TCR-10B**	**BVC-10/11 Betacart**
VCR Format	Any one ½" format	M-format	M-format	Betacam
Number of Play Decks	8 maximum	4 to 24	To 8 HR-2A decks	To 4 BVW-11 players
Number Record Decks	None	2 to 8	As required to 8	1 BVW-41/3 BVW-11
Editing Functions	External required	Yes	Yes	Yes
Control System	Various computers	Integral computer	Motorola MC6802	BVR-11 & floppy disc
Control Interface	RS-232C standard	RS-422	RS-422 to IBM PC	RS-422
Play Logging	By control system	Yes	Yes	Yes RS-232C
Program ID Type	Bar code	Time code	Time code	Bar codes
Auto Cueing	Yes	Yes	Yes	Yes
Removable Decks		Yes	Yes	Yes
Storage Magazine	To 300 cassettes	No	None	For 40 cassettes
Worst Access Time	20s	1 frame	.....	.....
Manual Control	Yes	Yes	Yes	Yes
Integral TBC		2 TBC units	HT-32	1 per player
Reader Service Number	**845**	**846**	**847**	**848**

VIDEO RECORDERS Small Format

Video recorder-studio systems, for use with material from camera/recorder ENG units.

Manufacturer	**Ampex**	**Robert Bosch**	**Hitachi Denshi**	**Panasonic**
Model/Series Number	**ARC-40**	**BCF10/20/9**	**ECR-50**	**AU-300B**
Recording Format	M-format Y/I/Q	Lineplex	M-format Y/I/Q	M-format Y/I/Q
Tape Cassette Type	½" VHS T-120	¼" CVC	½" VHS T-120	½" VHS T-120
Output Standard	NTSC/PAL	NTSC/PAL	NTSC	NTSC
Video Response	–3dB/to 3.6MHz luma	–3dB/to 3.6MHz	–3dB/to 3.6MHz	–3dB/to 3.6MHz
S/N Ratio (Video)	47dB luma/48dB color	46dB luma/46dB color	47dB luma/48dB color	50dB luma/52dB color
Resolution TVL		.....	.....	.....
Video Metering		.....	.....	.....
Audio Response	±3dB/50Hz-15kHz	±2dB/50Hz-15kHz	±3dB/50Hz-15kHz	±2dB/50Hz-15kHz
S/N Ratio (Audio)	52dB	60dB rms unwtd	50dB	50dB
Wow/Flutter Rating	0.2%	<0.2% peak unwtd	0.2% rms	0.15%
Time Code Track	Yes	Yes	Yes	Yes
Integral Editor	Full feature	Full feature	Yes	10
System TBC	Integral	Integral	External TC-15 TBC	External required
Dubbing Connections	Yes	.....	Yes	Yes
Reader Service Number	**838**	**839**	**840**	**841**

Manufacturer	**RCA Broadcast**	**Sony Broadcast**	**Thomson-CSF**
Model/Series Number	**HR-2A Hawkeye**	**BVW-10/20/40**	**VT-615 Player**
Recording Format	M-format Y/I/Q	Betacam Y/R-Y/B-Y	Betacam Y/R-Y/B-Y
Tape Cassette Type	½" VHS T-120	½" Beta	½" Beta
Output Standard	NTSC/PAL	NTSC/PAL/SECAM/ DUB	NTSC
Video Response	To 4.1MHz NTSC	+0.5 –6dB/to 4.1MHz	To 4MHz
S/N Ratio (Video)	50dB luma/52dB color	48dB luma/50dB color	48dB luma/50dB color
Resolution TVL		.....	.....
Video Metering		Yes	.....
Audio Response	±2dB/50Hz-15kHz	±3dB/50Hz-15kHz	±2dB/50Hz-15kHz
S/N Ratio (Audio)	53dB	60dB Dolby C used	50dB Dolby C used
Wow/Flutter Rating	<0.15%	<0.15%	<0.15%
Time Code Track	Yes	With TC gen/read	Yes
Integral Editor	Full feature	BVW-40 only	No
System TBC	Integral	BVW-10 & BVW-40	Integral
Dubbing Connections	Yes	Yes	Output only
Reader Service Number	**842**	**843**	**844**

VIDEOTAPE RECORDERS B/C

Portable and studio models, typically with audio channels. A third channel, not specified, may be available. Audio inputs for line are +8dBm, 600Ω balanced. Video input and output are 1Vp-p, 75Ω.

Manufacturer	Ampex Corporation				Robert Bosch
Model/Series Number	**VPR-3**	**VPR-5 Portable**	**VPR-6**	**VPR-80**	**BCN-41/51A (B)**
Video Response	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.5MHz
S/N Ratio (Video)	46dB	46dB	46dB	46dB NTSC/43dB PAL	>47dB unwtd
Phase/Gain Rating	4°/4%	4°/4%	4°/4%	4°/4%	<4°/<4%
Chroma/Luma Delay	<20ns	20ns	20ns	20ns NTSC	.....
K-Factor 2T	1%	1%	1%	1%	<1.5%
Moire Rating	–40dB, 70% bars	–40dB, 75% bars	–40dB, 75% bars	–40dB, 75% bars	<–37dB, 75% bars
Input Reference	Video or sync	Video	Video or sync	Video	Video or sync
Advanced Sync Input	Not required	Yes	.....	Not required	Not required
DOC Signal Type	Internal DOC	No	Integral DOC	TTL	No
System TBC	Integral unit	Not applicable	TBC-6	External required	Integral
Audio Response	±1dB/20-12kHz	±2dB/50Hz-15kHz	±2dB/50Hz-18kHz	±2dB/50-15k	+2, –3dB/40Hz-14kHz
S/N Ratio (Audio)	56dB tracks 1 & 2	56dB	56dB tracks 1 & 2	56dB	>57dB unwtd
Audio Distortion	<1%, 100nWb/m, 1kHz	1%, 8dBm, 1kHz	1%, 100nWb/m, 1kHz	1%, 8dBm, 1kHz	.....
Integral Editor	Full feature	.....	.....	.....	.....
Assembly/Insert	Both	Full feature	Yes	Full feature	Yes
Edit Controllers	ACE/CMX/ISC & others	Both	Both	Both	Both
SMPTE LTC Generator	Yes	Not applicable	Various via RS-422 serial & parallel	Various via RS-422 serial & parallel	Bosch/CMX and others .....
SMPTE VITC Generator	Yes	Yes	Yes	Yes	Yes
Still & Slow Motion	Yes	No	Yes	No	.....
Dynamic Tracking	Yes	No	Yes	Yes	Yes
Maximum Reel Size	14"	9"	11.75"	Auto scan tracking	No
Maximum Record Time	190 min	60 min.	124 min	11.75"	10.5"
Weight (Portable)	.....	15 lb	.....	124 min	98 min
Color Standards	NTSC/PAL-M/PAL/SECAM	NTSC/PAL	NTSC/PAL/PAL-M/SECAM	..... NTSC/PAL/PAL-M/SECAM	..... NTSC/PAL/SECAM
Reader Service Number	**811**	**812**	**813**	**814**	**815**

VIDEOTAPE RECORDERS B/C

Manufacturer	**Robert Bosch**	Hitachi Denshi			**Marconi Broadcast**
Model/Series Number	**BCN21 (B)**	**HR-100 Portable**	**HR-200E**	**HR-230**	**B4600-MR2 (MR20)**
Video Response	±0.5dB/to 4.5MHz	±0.5dB/to 4.2MHz	±0.5dB/30Hz-4.2MHz	±0.2dB/30Hz-4.2MHz	Flat to 4.2MHz
S/N Ratio (Video)	>47dB NTSC/43dB PAL	>46dB	>48dB	>48dB	>46dB NTSC .....
Phase/Gain Rating	<4°/<4%	<4°/<4%	<3°/<3%	<3°/<3%	4°/4%
Chroma/Luma Delay	.....	.....	<20ns	<20ns	<20ns
K-Factor 2T	<1.5%	<1%	<1%	<1%	<1%
Moire Rating	<–37dB, 75% bars	<–38dB, 75% bars	<–40dB, 75% bars	<–40dB, 75% bars	–40dB
Input Reference	.....	.....	Sync & subcarrier	Video	Video
Advanced Sync Input	.....	Yes	Yes	Not required	.....
DOC Signal Type	.....	TTL	.....	TTL level	TTL
System TBC	BCQW9B TBC ext	Ext TC-200TBC	TC-200B	TC-230 4H ext	MTBC2
Audio Response	+2, –3dB/40-14kHz	1.5, –3dB/50Hz-15kHz	1.5, –3dB/50Hz-15kHz	1.5, –3dB/40Hz-15kHz	±2dB/50Hz-15kHz
S/N Ratio (Audio)	>57dB 254nWb/m	>56dB tracks 1 & 2	>56dB tracks 1 & 2	>56dB tracks 1 & 2	>56dB
Audio Distortion	<1%, 100nWb/m, 1kHz	<1%, 1kHz	<1%, 1kHz	<1%, 1kHz	>1%, 8dBm .....
Integral Editor	Full feature	Auto-backspace	Yes	Full feature	Yes
Assembly/Insert	Both	No	Both	Both with split	Assembly
Edit Controllers	Various	No	Various possible	ECS-240 and others	Various
SMPTE LTC Generator	With user bits	Or EBU w/ user bits	TG-20 option	Yes	.....
SMPTE VITC Generator	.....	No	.....	.....	No
Still & Slow Motion	No	No	–0.25 to +1.5	SB-30 accessory	Yes
Dynamic Tracking	No	No	Option	Yes	Yes
Maximum Reel Size	9"	9"	10.5"	14"	10.5"
Maximum Record Time	60 min	64 min	96 min	180 min	92 min
Weight (Portable)	20.1 lb operational	48.5 lb operational	.....	.....	.....
Color Standards	NTSC/PAL-M/PAL/SECAM	NTSC/PAL	NTSC	NTSC	NTSC/PAL/SECAM .....
Reader Service Number	**816**	**817**	**818**	**819**	**820**

VIDEOTAPE RECORDERS B/C

Manufacturer	Philips TV Systems	RCA Broadcast		Sony Broadcast	
Model/Series Number	**PVR2 (PVR20)**	**TH-400 Transportable**	**TH-900**	**BVH500A Portable**	**BVH-2000 (-2000PS)**
Video Response	Flat to 4.2MHz	0.5, – 3dB/to 5MHz	0.5dB, – 3dB/to 5MHz	± 0.5dB/to 4.2MHz	± 0.5dB/to 4.2MHz
S/N Ratio (Video)	46dB	>46dB	46dB	47dB	48dB (44dB)
Phase/Gain Rating	4°/4%	<4°/<4%	<4°/<4%	<4°/<4%	4°/4%
Chroma/Luma Delay	20ns	<20ns	<20ns	<25ns	25ns
K-Factor 2T	<1%	<1%	<1%	<1%	<1%
Moire Rating	< – 40dB, 75% bars	< – 40dB, 75% bars	< – 40dB, 75% bars	– 40dB	– 40dB (– 35dB)
Input Reference	Video or sync	Video	Video	Video	Video or sync
Advanced Sync Input	.....	Not required	Not required	Not required	Not required
DOC Signal Type	TTL	Yes	Yes	.....	TTL or RF
System TBC	External PVC2	External	External	External required	Integral unit
Audio Response	± 2dB/50Hz-15kHz	1, – 2dB/500Hz-15kHz	1, – 2dB/200Hz-18kHz	1.5, – 3dB/50Hz-15kHz	1.5, – 3dB/50Hz-15kHz
S/N Ratio (Audio)	>56dB	56dB	56dB	56dB	56dB tracks 1 & 2
Audio Distortion	<3%, 16dBm	<1%, 8dBm, 1kHz	1%, 8dBm, 1kHz	1.2%, 0dBm, 1kHz	1%, 0dBm, 1kHz
Integral Editor	Yes	Full feature	Full feature	Backspace	Full feature
Assembly/Insert	Both	Both	Both	Assembly	Both
Edit Controllers	Various	ACE/CMX/Paltex	ACE/CMX/Paltex	Yes	Various
SMPTE LTC Generator	Yes	Yes	Yes	No	Optional
SMPTE VITC Generator	.....	Yes	Yes	No	Optional
Still & Slow Motion	.....	Yes	Yes	No	Yes
Dynamic Tracking	.....	Yes	Yes	No	Yes
Maximum Reel Size	10.5"	11.75"	14"	9"	11.75 "
Maximum Record Time	90 min	124 min	188 min	62 min	126 min
Weight (Portable)	.....	.....	.....	.....	.....
Color Standards	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC	NTSC (PAL/SECAM)
Reader Service Number	**821**	**822**	**823**	**824**	**825**

VIDEOTAPE RECORDERS B/C

Manufacturer	Sony Broadcast	
Model/Series Number	**BVH-2500 Delta-T**	**BVH-2180**
Video Response	± 0.5dB/to 4.2MHz	± 0.5dB/to 4.2MHz
S/N Ratio (Video)	48dB (44dB)	> 48dB
Phase/Gain Rating	4°/4%	4°/4%
Chroma/Luma Delay	25ns	25ns
K-Factor 2T	<1%	<1%
Moire Rating	– 40dB, (– 35dB)	– 40dB
Input Reference	Video or sync	Video or sync
Advanced Sync Input	Not required	Not recuired
DOC Signal Type	TTL or RF	TTL or RF
System TBC	Integral unit	Integral unit
Audio Response	1.5, – 3dB/50Hz-15kHz	1.5, – 3dB/50Hz-15kHz
S/N Ratio (Audio)	56dB tracks 1 & 2	56dB tracks 1 & 2
Audio Distortion	1%, 0dBm, 1kHz	1%, 0dBm, 1kHz
Integral Editor	Full feature	Full feature
Assembly/Insert	W/ single frame edit	Both
Edit Controllers	Various	Various
SMPTE LTC Generator	Optional	Optional
SMPTE VITC Generator	Optional	Optional
Still & Slow Motion	Yes	Yes
Dynamic Tracking	Yes	Yes
Maximum Reel Size	11.75"	14"
Maximum Record Time	126 min	3-hour
Weight (Portable)	.....	.....
Color Standards	NTSC (PAL/SECAM)	NTSC (PAL/SECAM)
Reader Service Number	**826**	**827**

VIDEOTAPE RECORDERS U

Studio and portable equipment. Luminance recorded as FM with chroma downconverted typically. Dual audio channels. Video inputs and outputs are 1V P-P, 75Ω. NTSC Color Standards.

Manufacturer	JVC Company		Panasonic Company	
Model/Series Number	**CR-4700U Portable**	**CR-8250U Editing**	**AU-700 Editing**	**NV-9450 Portable**
S/N Ratio (Video)	>46dB	49dB luma/46dB color	50dB luma/46dB color	46dB color
Resolution in TVL	340 luma/260 color	340 luma/260 color	330 luma/260 color	330 luma/260 color
Video AGC System	Yes	Yes	Yes	Yes
Video Metering	No	Yes	Yes	No
Advanced Sync Input	No	Yes	Yes	Yes
Composite Sync Input	Yes	Yes	Yes	Yes
Subcarrier Input	Yes	Yes	Yes	No
RF Dubbing In/Out	No	Input & output	Input & output	No
Tracking Meter	Audio 1 meter	Yes	Yes	Yes
AF Response	50Hz-15kHz	50Hz-15kHz	50Hz-15kHz	50Hz-15kHz
S/N Ratio (Audio)	>48dB	>48dB at 3% THD	>48dB	>48dB
Audio Metering	1 each track	For tracks 1 & 2	For tracks 1 & 2	Yes
Time Code Track	With TG-P47U option	Yes	Yes	Yes
Variable Play Speed	3.75ips only	No	3.75ips	3.75ips only
Search Speeds	x10 fwd or rev only	x15 fwd & rev	x6 fwd & rev	x10 fwd & rev
Integral Editor	Backspace	Full feature	Yes	Backspace
Assembly or Insert	Assembly	Both	Both	Assembly
Edit Controller	.....	Various	Various	No
Vac Powering	AA-P47U adapter	110Vac	110Vac	With adapter
External Vdc Power	12Vdc	No	No	12Vdc
Internal Battery	NB-P2U 12Vdc	No	No	12Vdc
Weight (Portable)	19.6 lb	.....	.....	19.6 lb
Related Models	.....	CR-6650U rec/play	NV-9600 editing	.....
	.....	CR-6060U rec/play	NV-9240 rec/play	.....
	.....	CR-5550U play only	.....	.....
Reader Service Number	**828**	**829**	**830**	**831**

VIDEOTAPE RECORDERS U

Manufacturer	Sony Broadcast			TEAC Company
Model/Series Number	**BVU-110 Portable**	**BVU-800 series**	**BVU-820**	**V-1000AB-F Airborne**
S/N Ratio (Video)	50dB luma/45dB color	50dB luma/46dB color	50dB luma/46dB color	40dB
Resolution in TVL	330 luma/260 color	330 luma/260 color	330 luma/260 color	420
Video AGC System	Yes	Switchable	Yes	Yes
Video Metering	Yes	Yes	Yes	No
Advanced Sync Input	Composite video	Yes	Yes	.....
Composite Sync Input	No	Composite video	Composite video	.....
Subcarrier Input	Yes	Yes	Yes	.....
RF Dubbing In/Out	Output	Input & output	Input & output RF	.....
Tracking Meter	No	Yes	Yes	.....
AF Response	50Hz-15kHz	50Hz-15kHz	50Hz-15kHz	3dB/80Hz-10kHz
S/N Ratio (Audio)	>48dB	48dB at 3% THD	48dB at 3% THD	40dB
Audio Metering	For 2 tracks	For tracks 1 & 2	For tracks 1 & 2	No
Time Code Track	Yes	Yes	Yes	On audio 1 track
Variable Play Speed	3.75ips only	3.75ips only	−1x to +3x play	3.75ips/1.5ips
Search Speeds	.....	1/30 to 10x fwd/rev	1/30-10x fwd/rev	To 7x fwd & rev
Integral Editor	Backspace only	Full feature	Full feature	.....
Assembly or Insert	Assembly	Both	Both w/ split edits	No
Edit Controller	.....	Various	Various	No
Vac Powering	With adapter option	110Vac	110/240Vac	115Vac 400Hz
External Vdc Power	12Vdc	No	No	27Vdc unregulated
Internal Battery	BP-90 Nicad	No	No	.....
Weight (Portable)	24.5 lb operational	No	No	28.6 lb
Related Models	.....	.....	.....	V-1000AB-R record
Reader Service Number	**832**	**833**	**834**	**835**

Telephone technology: Planning for the future

By Eric Platt and Rick Bourbina

Every company communicates with the rest of the world in three ways: by reception desk, by mail and by telephone. For their telephone needs, most small- to medium-sized companies still rely on POTS (plain old telephone service), using equipment leased or purchased through the Bell operating companies or AT&T.

One good example of POTS is the electromechanical 1A2 key telephone system. After 50 years of use, this system is a fairly sophisticated product. It can be economical in many different configurations and rarely breaks down.

Until a few years ago, electromechanical devices were the only choice. But since the introduction of microprocessor-based electronic key systems, users are being urged to switch away from *Old Reliable*. The dynamic growth of the telecommunications industry, coupled with the deregulation and demise of the old Bell System, has created a new world of feature-rich electronic key systems. Moreover, the electronic world divides further, into *analog* and *digital*. Some systems combine PABX (private automated branch exchange) features with key telephone features, commonly known as *hybrids*.

Freedom of choice

Owing to a series of landmark court decisions, every telephone user now has the right to:

- use telephone terminal equipment in ways that are privately beneficial without being publicly detrimental *(1968)*,
- connect privately owned and manufactured terminal equipment to the public telephone network *(1977)*, and
- dial up alternate long-distance services from any telephone in the network *(1974)*.

These deregulatory decisions and the resulting competition that developed over the past 15 years have created a fragmented, diverse telecommunications industry. New submarkets have emerged, and new suppliers are gearing up to serve them. The market for key telephone systems alone, for example, is estimated to be $3 billion annually.

Today, the telecommunications market falls into two broad categories: public network and subscriber equipment. The public network includes basic local voice transmission and is dominated by the Bell operating companies. The equipment side, however, is wide open and offers interconnect companies an unparalled opportunity.

The breakup of the Bell network (1984) has also caused telephone users to assume a larger role in selecting equipment and managing telephone systems. Before deregulation, a company would simply order whatever the local telephone company salespeople recommended. But those days are gone, and even small users are forced to cope with the consequences of deregulation and divertiture.

In an effort to keep communications costs low and efficiency high, the telephone users must judge the merits of new technology, consider the cost of an array of equipment and services and choose from among hundreds of telephone equipment companies. They must also worry about keeping their telephone systems working after installation, so warranty and service have become as important as operating features and price.

The basic telephone

Clearly, the small telephone user needs help. He is looking for someone who understands voice communications systems and can analyze his needs. He needs help in selecting a system to fit those needs, and he needs advice on installation and service, financing the purchase, and *planning* for the future.

All voice communications systems, from the single-line designer telephone to the half telephone/half computer unit, incorporate certain basic elements.

Radio and TV stations commonly use the *key telephone system*, which is easily recognized by a row of keys, or buttons, that are used to select and to access outside lines. Key systems theoretically can be unlimited in size, but in practice they are seldom used to accommodate more than 50 stations.

The main feature of the key telephone system is its ability to provide direct selection of any central office lines from each telephone set connected to the system.

Key system configuration

A cabinet called a key service unit (KSU) houses printed circuit boards that provide central office interface, intercom, flashing lights, ringing and other system features. It also contains the power supply that provides proper voltages to various components.

Lines coming into a key system from the local central office are numbered and arranged in a *hunt* group. With this arrangement, only the first line needs to be dialed or listed in the telephone directory. Should an incoming call receive a busy signal on one of the hunt lines, the central office equipment will automatically go to the next number in the sequence until it finds an idle line. Hunt groups can be configured in a variety of sequences.

Another configuration option reserves certain central office lines for private lines to one or several telephones, or provide WATS lines (wide area telephone service) to several telephones. This allows some incoming lines to be shared by all stations in the system, while allotting each station or group of stations access to separate private outgoing lines.

Because the private lines are not included in the hunt group, they are never blocked or tied up by incoming calls. In this way, the flexibility and capacity of the system is increased without requiring a drastic increase in the number of central office lines.

Types of key systems

Key systems fall into two broad categories: electromechanical and electronic. The electromechanical systems, often referred to as 1A2, rely on a number of mechanical switches and electric relays. Electronic key systems rely on solid-state microprocessors for their operation and

may be either analog or digital. They are usually easier to install and offer a great number of special features.

Expanding an electromechanical key system beyond a certain size becomes awkward, inefficient and costly. Systems requiring more than 50 outside lines and extensions usually call for installing a private branch exchange (PBX) system. A PBX actually duplicates the functions of a telephone company central office on a small scale, but is located on the customer's premises.

PBXs can range from one to hundreds of outside lines, or trunks. The recent introduction of hybrid key systems and very small PBXs (down to 2-trunk capacity) has blurred the distinction between an electronic key system and PBX.

The ratio of central office lines to stations varies with each application and is determined by the volume of user telephone traffic. However, experience shows that in an installation of 50 stations or less, the average ratio of lines to stations is 50 percent. With hybrid key systems, the ratio drops to 15 to 20 percent. Generally, if a customer requires a great many central lines (about 25), he needs a hybrid system or small PABX.

The advent of microprocessors and integrated circuits has revolutionized key telephone systems. Now the control and memory functions of electronic systems are microprocessor-driven, known as stored program systems. For example, many key telephone systems contain software based on a programmable read-only memory (PROM), which is preconfigured for easy installation at time of manufacturing.

Electromechanical key systems

This system is relatively low in cost and high in durability and functionality. In small installations, electromechanical systems can be easily reconfigured to accommodate changes. Necessary add-ons, such as dialers, telephones and speaker-phones, can come from several different manufacturers.

Other advantages of the electromechanical system for small radio or TV stations are that installation requires no special training, and the system's average life expectancy is about 17 years. Because the circuits are simple, problems can quickly be traced to a specific fault, and only a small stock of back-up parts is needed.

From an installer's viewpoint, the 1A2's flexibility is an important plus. An installation can be configured to meet the customer's needs with special features such as extra-loud ringing bells, off-premises or speakerphone stations.

The disadvantages of the 1A2 come into play in the larger systems. Every connection must be hard-wired, using five to six wires for each line. Two stations, therefore, require at least 10 to 12 wires. Virtually every option—ring-down circuits, music-on-hold, paging—requires separate additional hardware.

The multiconductor cables that 1A2 systems require mean that installation will take longer and the initial labor cost will be high. It is a good practice to *home-run* the cable from each station back to the central control panel to facilitate future options, and to terminate each conductor at the central panel.

Electronic key systems

Although electronic key system equipment is more expensive than the old 1A2, it is quicker and easier to install. Only 2- or 3-pair *skinny wire* cable is needed, so the cost of both cable and labor to install it is low. Electronic systems are highly suitable for installations of more than 12 lines.

Unlike the 1A2, electronic units are pre-programmed. The features of the entire system are incorporated at the time of manufacturing. Stored programs, mounted on printed circuit boards, are housed in the KSU. At installation, each station is configured to the user's specifications by punching in a special numerical code.

Because the programs are stored within the KSU, it is easy to move stations and change features. The system is easily expandable by adding modular, plug-in circuit boards to increase the number of stations.

Analog vs. digital

Both analog and digital electronic key systems use solid-state electronics and microprocessor logic, but they differ significantly in the way they transmit information.

The public telephone network, voice-oriented since its inception, employs primarily analog technology in its transmission and switching systems. Central offices are slowly being converted to digital, but the technology is still in its infancy. When the majority have converted, probably in the next 10 to 15 years, digital key systems will have much more value than they do today.

For the time being, the output of a digital system must still be converted to an analog signal before it can enter the public telephone network. Thus, the main benefit of digital is its capability of transmitting data internally, or via a common carrier, and to prepare for the future when computers will be linked through digital central office switches.

Hybrid systems

Many digital electronic key systems resemble computerized PABX systems in their application. For this reason, the term *hybrid* is often used to describe them.

Because a digital hybrid is a cross between a PBX and a key telephone system, it offers much more flexibility and many more user features than an analog key system alone.

Evaluating a vendor

If you are planning to move into telecommunications systems, look into each potential vendor's support services as well as the equipment. Among the factors to be considered are:

- *Vendor qualifications:* The manufacturer's history, financial stability, commitment to research and development, and dedication to future growth as the industry expands.
- *Product quality:* The incorporation of features demanded by customers, advanced state-of-the-art technology, potential for product-line expansion to include data handling.
- *Service:* Local parts inventory, service personnel, repair response time, service training program, reputation for standing behind products.
- *Price:* Favorable price/value relationship.

Maintaining a backup stock of spare parts and systems is important in the telecommunications business, as is being familiar with the procedure for ordering, checking and verifying central office lines. This information is available from the Centralized Operating Group (COG) of the local telephone company in your area.

It seems clear that electromechanical systems will be with us for some time. For the customer who needs POTS, the combination of cost, durability and flexibility is hard to beat.

However, there is no doubt that telecommunications will continue to evolve in order to satisfy the need for digital, computer-enhanced applications. As the industry develops, customers will choose from an array of sophisticated equipment, offered by a variety of vendors.

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ENG MICROWAVE SYSTEMS

Transmitter/receiver equipment operating in (2, 7, 13)GHz spectrum. Transmitters are typically portable and/or mobile. Receivers are typically rack-mounted. Video into transmitters and out of receivers is 1V P-P, 75Ω; audio from receivers is approximately +8dBm, 600Ω, balanced. FM modulation is used.

Manufacturer	Broadcast Microwave Services				Harris Broadcast Microwave
Transmitter Model	**TBT-50A**	**TBT-202**	**BMT-2GP**	**TBT-50**	**FV2/2.5G Global IX**
Frequency Band	2/2.5/7/13GHz	2/2.5/7/13GHz	2/2.5/7/13GHz	2/2.5GHz	2/2.5GHz
Frequency Agile	Yes	Crystal control	Yes	Crystal control	55 channels
Aural Subcarriers	2 standard	3 standard	2 standard	2 standard	2
IF Input Connection	. . . . .	No	Yes	No	Yes
Audio Input	Mic or line	Line	Mic or line	Line only	Each mic or line
RF Output Power	12W-2/5W-7/1W-13	12W at 2GHz	12W maximum	12W maximum	3W
Power Required	115Vac or 12-28Vdc	115Vac	115Vac, 12-24Vdc	12-24Vdc	115/220Vac
Operating Weight	2 lb	31 lb	15 lb	<1 lb	15 lb
Receiver Model	**TBR-50A**	**TBR-202**	**TBR-1K**	**TBR-2K**	**VF2CR/2.5CR**
Frequency Band	2/2.5/7/13GHz	2/2.5/7/13GHz	2/2.5/7/13GHz	2/2.5/7/13GHz	2/2.5GHz
Frequency Agile	Yes	Crystal control	Yes	Yes	21 (60) channels
IF Output Connection	No	No	Yes	Yes	Yes
System Noise Figure	5dB	8dB	3dB	4dB	3dB
Video Response	0.5dB to 5MHz	0.5dB to 4.5MHz	0.5dB to 4 5MHz	0.4dB to 4.5MHz	0.6dB to 4.2MHz
S/N Ratio (Video)	70dB	65dB	65dB	68dB	70dB
Audio Response	0.5dB/40Hz-15kHz	1dB/40Hz-15kHz	1.5dB/40Hz-15kHz	1dB/40Hz-15kHz	1dB/40Hz-15kHz
S/N Ratio (Audio)	60dB	58dB	60dB	65dB	66dB
Audio Distortion	<1%/9dBm/4kHz	<1%/9dBm/4kHz	<1%/9dBm/4kHz	<1%/9dBm/4kHz	1%
Power Required	115Vac or 12-32Vdc	115Vac	115Vac	115Vac or 12-32Vdc	115/220Vac
	. . . . .	. . . . .	. . . . .	. . . . .	−24, +28Vdc
Receiver Weight	2 lb	30 lb	30 lb	8 lb	35 lb
Reader Service Number	**204**	**205**	**206**	**207**	**208**

ENG MICROWAVE SYSTEMS

Manufacturer	Harris Broadcast Microwave		Ikegami Electronics	M/A-COM	
Transmitter Model	**FV-7MP**	**FV-11/13MP**	**ML-83/79(WL201T)**	**MA Super 2 MX**	**MA13CP**
Frequency Band	7GHz	13GHz	2GHz	2GHz	13GHz
Frequency Agile	Crystal (12 channel)	12 channels	Crystal control	21 channel	Crystal control
Aural Subcarriers	2 standard	2 standard	2 standard	2 standard	1 standard
IF Input Connection	Yes	Yes	Yes	No	No
Audio Input	2 line level	2 line	Mic or line	Mic or line	Line only
RF Output Power	250mW or 1W	0.63W	0.2W	12W maximum	0.5W maximum
Power Required	115/230Vac or −24Vdc	115/230Vac or −24Vdc	12Vdc	115/230Vac, 12/32Vdc	115/230Vac, 12/32Vdc
Operating Weight	14 lb	14 lb	5 lb	13 lb	7 lb
Receiver Model	**FV7/8MP (FV7CR)**	**FV11/13MP**	**ML-83/79(WL201R)**	**MA 2MRC**	**MA13CP**
Frequency Band	7GHz	13GHz	2GHz	2/2.5GHz	13GHz
Frequency Agile	(60 channels FV7CR)	Crystal control	Crystal control	30 channel	Crystal control
IF Output Connection	Yes	Yes	Yes	Yes	Yes
System Noise Figure	6dB	. . . . .	−55dB	<2.5dB	9dB
Video Response	0.4dB (0.6dB)/4.2MHz	0.4dB to 4.2MHz	±1dB to 4.5MHz	±0.25dB to 5MHz	±0.25dB to 5MHz
S/N Ratio (Video)	70dB (68dB)	70dB	55dB	>65dB at −35dBm RCL	65dB
	. . . . .	. . . . .	. . . . .	±1.5dB/40Hz-15kHz	. . . . .
Audio Response	1dB/40Hz-15kHz	1dB/40Hz-15kHz	±1dB/50Hz-12kHz	>65dB	±1.5dB/40Hz-15kHz
S/N Ratio (Audio)	70dB (66dB)	70dB	60dB	0.5%/18dBm/1kHz	60dB
Audio Distortion	1%	1%	1%	115/230Vac, 12/32Vdc	<1%/7dBm/1kHz
Power Required	115Vac/230Vac or −24Vdc	115/230Vac or −24Vdc	115Vac	. . . . .	115/230Vac, 12/32Vdc
Receiver Weight	17 lb (35 lb)	17 lb	. . . . .	14.5 lb	12.5 lb
Reader Service Number	**209**	**210**	**211**	**212**	**213**

ENG MICROWAVE SYSTEMS

Manufacturer	M/A-COM	Nurad	RF Technology		TerraCom/Loral
Transmitter Model	**MA40GHz**	**130PT1-1**	**RF-202 (-251)**	**RF-701**	**TCM-7 Series**
Frequency Band	40GHz	13GHz	2GHz (2.5GHz)	7GHz	1.7-15.35GHz with
Frequency Agile	28 channels	Yes	Crystal control	Crystal control	crystal reference
Aural Subcarriers	2 standard	2 standard	2 standard	2 standard	1 standard
IF Input Connection	No	Yes	No	No	Line (data option)
Audio Input	Mic or line	Mic or line	2 line (& 1 mic)	2 line	Line (data option)
RF Output Power	50mW maximum	1W maximum	2W (1W)	1W	500mW at 2GHz
Power Required	115/230Vac, 12/32Vdc	115/230Vac, 10/30Vdc	120/240Vac, 11/17Vdc	120/240Vac, 12-17Vdc	110/220Vac, 12/24Vdc
Operating Weight	<2 lb	18 lb	7 lb	8 lb	10.5 lb
Receiver Model	**MA40GHz**	**45AR2**	**RF-204 (-254C)**	**RF-700 (-704C)**	**Integral to TCM-7**
Frequency Band	40GHz	2/7GHz	2GHz (2.5GHz)	7GHz	Operates per module
Frequency Agile	28 channels	Yes	Yes	Yes	for transmit section
IF Output Connection	Yes	Yes	.....	.....	No
System Noise Figure	9dB	3dB/4dB	2.5dB	3dB	7.5dB at 2GHz
Video Response	±0.25dB to 5MHz	1dB to 4.2MHz	0.5dB to 4.5MHz	0.5dB to 4.2MHz	.....
S/N Ratio (Video)	>60dB	70dB	60dB	70dB (60dB)	72dB
Audio Response	±1.5dB/40Hz-15kHz	1dB/40Hz-15kHz	1dB/50Hz-15kHz	1dB/50Hz-15kHz	1dB/20Hz-15kHz
S/N Ratio (Audio)	>55dB	>60dB	.....	65dB	>70dB
Audio Distortion	1%/0dBm/1kHz	1% at peak output	1%	1%	<1%
Power Required	115/230Vac, 12/32Vdc	115Vac/220Vdc	110/220Vac	120/240Vac, 12/17Vdc	110/220Vac, 12/24Vdc
Receiver Weight	14 lb	35 lb	23 lb	12 lb (23 lb)	Part of transmitter
Reader Service Number	**214**	**215**	**216**	**217**	**218**

REMOTE PICKUP SYSTEMS

FM radio equipment, designed for voice transmission from a remote site to the radio studios.

Manufacturer	Comrex Corporation		Marti Electronics		
Model/System Number	**450TA**	**HHT-1KA**	**RPT-15**	**RPT-2**	**RPT-40**
Frequency Band	450/1MHz 455/6MHz	450/1MHz 455/6MHz	150-170/450-470MHz	150-170/450-470MHz	152-171MHz
Diversity Receiver	No	No	No	No	No
Multichannel	No	No	.....	No	No
Typical Range	0.5 mile	2 miles	25 miles	2 miles	25 miles
Audio Response	±1dB/100Hz-6kHz	±1dB/100Hz-6kHz	1.5dB/50Hz-12.5kHz	1.5dB/50Hz-12.5kHz	1.5dB/50Hz-7.5kHz
S/N Ratio (System)	60dB	60dB	58dB	58dB	50dB
Distortion (System)	1%	1%	2%	2%	2%
Modulation Control	Automatic	Automatic	Compressor/limiter	Compressor/limiter	Compressor/limiter
Transmitter Part Number	450TA	HHT-1KA	RPT-15/450S	RPT-2/450S	RPT-40L
RF Output Power	150mW	1W	15W	2.5W	40W
Carrier Deviation	±5kHz	±5kHz	±10kHz	±10kHz	±5kHz
Microphone Type	150Ω	Integral electret	External	External	External
Audio Line Input	No	Yes	Yes	600Ω	600Ω
Level Control	.....	.....	Automatic	Auto	Automatic
Power Required	9Vdc	9Vdc	13Vdc	13Vdc/120Vac	13Vdc/120-240Vac
Operating Weight	11oz	14oz	9 lb	5 lb	20 lb
Receiver Part Number	450RA	RRB	BR-10	BR-10	BR-10
Sensitivity	1μV	1μV	0.5μV 20dB quieting	0.5μV 20dB quieting	0.5μV 20dB quieting
Spurious Rejection	80dB	80dB	90dB	90dB	90dB
Audio Line Output	.....	−0dBm	+10dBm	+10dBm	+10dBm
Audio Mic Output	−50dB/150Ω	−10dB	.....	.....	.....
Power Required	2-9Vdc alkaline	12Vdc/110Vac	13Vdc/120Vac	13Vdc/120Vac	13Vdc/120Vac
Carrier Indicator	.....	Yes	Meter & LED	Meter & LED	Meter & LEDs
Metering	.....	.....	AF/RF/dc/VU LEDs	AF/RF/dc/VU LEDs	AF/RF/dc/VU LEDs
Antenna Included	¼-wave whip	External required	Option	Option	Option
Reader Service Number	**367**	**368**	**369**	**370**	**371**

REMOTE PICKUP SYSTEMS

Manufacturer	Marti Electronics	McMartin Industries	Moseley Associates		Sennheiser
Model/System Number	**RPT-25**	**RPU-1403/1430**	**RPL-4A**	**RPL-3A**	**SER1-4/ER-3**
Frequency Band	450/470MHz	450MHz	450-470MHz	148-174MHz	25-110MHz
Diversity Receiver	No	No	Possible	Possible	No
Multichannel	No	2 in receiver	.....	.....	.....
Typical Range	25 miles	25 miles	20 miles	20 miles	.....
Audio Response	1.5dB/50Hz-12.5kHz	± 1dB/50Hz-10kHz	1.5dB/30Hz-10kHz	1.5dB/30Hz-7.5kHz	3dB/30Hz-12kHz
S/N Ratio (System)	58dB	50dB	55dB	55dB	60dB
Distortion (System)	2%	0.8%	<1.3%	<1.3% at 1kHz	3%
Modulation Control	Compressor/limiter	.....	Limiter	Limiter	Limiter
Transmitter Part Number	RPT-25S	RPU-1403	RPL-4A	RPL-3A	SER1-4
RF Output Power	25W	3W	10W nominal, 13W max	10W nominal, 13W max	10W
Carrier Deviation	± 10kHz	± 10kHz	± 5kHz	± 5kHz	± 15kHz
Microphone Type	External	External	External 150Ω	External 150Ω	Low Z
Audio Line Input	600Ω	Yes	Yes	Yes	Yes
Level Control	Automatic	Automatic	Manual	Manual	Manual
Power Required	13Vdc/120-240Vac	12Vdc	13.5Vdc/110Vac	13.5Vdc/110Vac	15Vdc
Operating Weight	20 lb	7 lb	16 lb	16 lb	9.7 lb
Receiver Part Number	BR-10	RPU-1450R	RPL-4A	RPL-3A	ER-3
Sensitivity	0.5μV 20dB quieting	0.5μV 20dB quieting	1μV 20dB quieting	1μV 20dB quieting	2.5μV 26dB quieting
Spurious Rejection	90dB	65dB	65dB below carrier	65dB below carrier	80dB
Audio Line Output	+ 10dBm	− 10dBm	+ 10dBm	+ 10dBm	1.5V 300Ω
Audio Mic Output	.....	− 60dB	.....	.....	.....
Power Required	13Vdc/120Vac	13Vdc/110Vac	110Vac	110Vac	12-16Vdc
Carrier Indicator	Meter & LEDs	LED	Yes	Yes	Yes
Metering	AF/RF/dc/VU LEDs	AF/RF	.....	.....	.....
Antenna Included	Option	No	No	No	Yes
Reader Service Number	**372**	**373**	**374**	**375**	**376**

AM RADIO TRANSMITTERS

Amplitude-modulated radio transmitting systems for broadcast band (535-1635kHz) and shortwave applications. The RF output is 50Ω. Audio signals of approximately 10dBm produce 100% modulation.

Manufacturer	CSI Electronics		Continental Electronics Mfg. Co.		
Model/Series Number	**T-1-A**	**T-50-A**	**316F**	**315R-1**	**317C-2**
Broadcast/Shortwave	Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Power Output Rating	1.1kW	55kW	10.6kW	5.5kW	60kW
Frequency Stability	± 10Hz	± 10Hz	± 5Hz	± 5Hz	± 5Hz
Carrier Shift	.....	.....	<3% at 100% mod	<2%	<2% at 100% mod
Modulation Capacity	100%	100%	125%	125% maximum	125%
AF Response	± 1.5dB/50Hz-10kHz	± 1.5dB/50Hz-10kHz	± 1.5dB/20Hz-10kHz	± 1dB/20Hz-10kHz	± 0.5dB/10Hz-7.5kHz
Distortion	2.5%	2.5%	<3%	<3%	<2.5% at 95% mod
AM Noise Figure	− 55dB	− 55dB	− 60dB	− 63dB	− 60dB
Efficiency	.....	.....	.....	>57%	60%
Final Amp Type	Two 7527A	3CX10000A3	Two 4CX15000A	3CX3000F7	Two 4CX35000C
Modulator Final Amp	Two 7527A	Two 4CX3000A	Solid-state	3CX3000F7	Two 3CX3000A1
Driver Amp Types	Tube	Tube	Solid-state	Solid-state	Tube
Stereo Capable	.....	.....	W/ any exciter	W/ any exciter	W/ any exciter
Floor Space Required	.....	.....	66"x25"	34"x35"	144"x54"
Related Models	T-3-A 3.3kW	T-25-A 30kW	315F 5.5kW	314R-1 1kW	.....
	T-5-A 6kW	T-100-A 110kW	.....	.....	.....
	T-10-A 12kW	.....	.....	.....	.....
Reader Service Number	**101**	**102**	**103**	**104**	**105**

Manufacturer	Elcom Bauer			Harris Broadcast	
Model/Series Number	**701B**	**705C**	**750**	**SX-1 (SX series)**	**MW-50C**
Broadcast/Shortwave	Both	Both	Broadcast	Broadcast	Broadcast
Power Output Rating	1kW	10kW	50kW	1kW	50kW
Frequency Stability	± 5Hz	± 5Hz	± 5Hz	± 10Hz synthesized	± 10Hz
Carrier Shift	<3% at 100% mod	<3% at 100% mod	<3% at 100% mod	2% at 100% mod	2% at 100% mod.
Modulation Capacity	125%	125%	125%	125%	125%
AF Response	± 1.5dB/50Hz-10kHz	± 1dB/50Hz-10kHz	± 1dB/50Hz-7.5kHz	0.5, − 1.5dB/20Hz-12.5	± 1dB/20Hz-12.5kHz
Distortion	<2.5% at 100% mod	<2% at 100% mod	2.5% at 100% mod	1% at 100% mod	2.5% at 100% mod
AM Noise Figure	− 55dB	− 60dB	− 60dB	− 60dB	− 60dB
Efficiency	72%	80% (final amp)	86%	70%	62.5%
Final Amp Type	Two 4-400C or 4-500	4CX5000A	Two 4CX20000B	Solid-state	4CX-35000C
Modulator Final Amp	Two 4-400C or 4-500	Two 4CX5000A	Two 4CX20000B	Solid-state	4CX-35000C
Driver Amp Types	Solid-state	Solid-state	Solid-state	Solid-state	Two 4CX-1500A
Stereo Capable	W/ any exciter	W/ any exciter	W/ any exciter	W/ STX-1A exciter	W/ STX-1A exciter
Floor Space Required	3'x2.6'	ca. 6'x2.5'	12'x3.25'	2.3'x2.5'	12'x4'
Related Models	.....	710C	725	SX-2.5 2.5kW	MW-10B
	.....	715C	.....	SX-5 5kW	.....
Reader Service Number	**106**	**107**	**108**	**109**	**110**

AM RADIO TRANSMITTERS

Manufacturer	ITAME	LPB	Marconi/Eddystone	Marconi Broadcast	McMartin Industries
Model/Series Number	EAM2.000A	AM-150	B6038E	B6034	BA50K (BA-K series)
Broadcast/Shortwave	Both	Broadcast	Broadcast	Both	Both
Power Output Rating	2kW	75kW to 165W	1kW	50kW	60kW
Frequency Stability	± 1Hz	± 10Hz	± 10Hz	± 10Hz	± 2Hz
Carrier Shift		<2% at 100% mod	<5% at 100% mod	4% at 100% mod	2% at 100% mod
Modulation Capacity	125%	100%		125%	125%
AF Response	± 1dB/30Hz-10kHz	± 1dB/20Hz-15kHz	± 1dB/40Hz-10kHz	± 1.5dB/30Hz-10kHz	± 1dB/50Hz-10kHz
Distortion	2%	<2% to 7.5kHz	<3% at 90% mod	3% at 90% mod	1.5% at 100% mod
AM Noise Figure	– 60dB	– 55dB below 100% mod	< – 60dB	– 59dB	– 55dB
Efficiency					75%
Final Amp Type	EIMAC triode	Solid-state	Solid-state	Two 4CX35000C	Two tubes
Modulator Final Amp	Solid-state	Solid-state	Solid-state	Two CX1500B	Two tubes
Driver Amp Types	Solid-state	Solid-state	Solid-state	Solid-state	
Stereo Capable					W/ Motorola unit
Floor Space Required		21"x19"	2.6'x1.75'		3'x12'
Related Models	EAM5.000 5kW	AM-5/-25/-50/-100			BA10K 10kW
					BA5K2
					BA2.5K 2.5kW
					BA1K 1kW
Reader Service Number	111	112	113	114	115

AM RADIO TRANSMITTERS

Manufacturer	Nautel Maine		Radio Systems	Tesla	
Model/Series Number	AMPFET 1	AMPFET 10	TR-20	SRV-5	SRV-21
Broadcast/Shortwave	Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Power Output Rating	1kW	10kW	0.2kW	5kW	20kW
Frequency Stability	0.0005%	0.0005%	0.002% (± 30Hz)	Synthesized	Synthesized
Carrier Shift	<3% at 100% mod	<3% at 100% mod	2% at 100% mod		0.1% at 100% mod
Modulation Capacity	125%	125%	100%	100%	100%
AF Response	± 0.5dB/50Hz-10kHz	± 0.5dB/50Hz-10kHz	± 1dB/20Hz-15kHz	± 1dB/40Hz-10kHz	1, – 2dB/40Hz-10kHz
Distortion	<2% at 100% mod	<2%	<2% at 100% mod	2.5% at 100% mod	3% at 100% mod
AM Noise Figure	< – 60dB	< – 60dB	– 60dB	– 60dB	– 60dB
Efficiency	70%	74%	25%	38%, pf = 0.93	57%
Final Amp Type	Solid-state MOSFET	Solid-state MOSFET	Solid-state	GU61B tube	Two RE15VM tetrode
Modulator Final Amp	Solid-state MOSFET	Solid-state MOSFET	Solid-state	Solid-state	Two RE15VM tetrode
Driver Amp Types	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Stereo Capable	W/ any exciter	W/ any exciter			
Floor Space Required	1.75'x2'	2.2'x2.1'	Wall-mount unit	4.9'x3'	6.2'x4.4'
Related Models	AMPFET 2.5 2.5kW	AMPFET 20 20kW			
	AMPFET 5 5kW				
Reader Service Number	116	117	118	119	120

AM RADIO TRANSMITTERS

Manufacturer	Wilkinson/TTC		
Model/Series Number	AM-1000B	AM-5000D	AM-25000C
Broadcast/Shortwave	Both	Both	Both
Power Output Rating	1kW	5kW	25kW
Frequency Stability	± 10Hz	± 10Hz	± 10Hz
Carrier Shift	3% at 100% mod	3% at 100% mod	3% at 100% mod
Modulation Capacity	140%	140%	140%
AF Response	± 1dB/50Hz-10kHz	± 1dB/50Hz-10kHz	± 1dB/50Hz-10kHz
Distortion	3% at 100% mod	3% at 100% mod	3% at 100% mod
AM Noise Figure	– 55dB	– 55dB	– 55dB
Efficiency	70%	70%	85%
Final Amp Type	4-400C	3CX2500F3	4CX20000B
Modulator Final Amp	4-400C	4CX1500	4CX10000D
Driver Amp Types	Solid-state	Tube	Tube
Stereo Capable	Motorola exciter	Motorola exciter	Motorola exciter
Floor Space Required	3'x3.5'	3.33'x3.5'	9.5'x6'
Related Models	AM-2500B 2.5kW	AM-10000D 10kW	AM-20000C 20kW
			AM-50000C 50kW
Reader Service Number	121	122	123

FM RADIO TRANSMITTERS

Frequency-modulated radio transmitters for FM broadcast band (88-108MHz) or CCIR Band II. 100% modulation results in a carrier deviation of ±75kHz, per FCC regulations. The RF output impedance is 50Ω.

Manufacturer	Bayly Engineering		Broadcast Electronics	
Model/Series Number	**S3168**	**S3152**	**FM-300A**	**FM-3.5A**	**FM-30**
Power Output Rating	3kW	10kW	300W	3.5kW	30kW
Feed Line (Inches)	.....	.....	Type N	1⅝"	3⅛"
Carrier Stability	<700Hz in 3 months	<700Hz in 3 months	±300Hz	±300Hz	±300Hz
Modulation Capacity	±100kHz	±100kHz	±200kHz	±200kHz	±200kHz
Audio Input for 100%	.....	.....	+10dBm	+10dBm	+10dBm
AF Input Impedance	>2000Ω	>2000Ω	50	600Ω	600Ω
Audio Response (±dB/Hz)	0.2/40-43k	0.2/40-43k	0.5/30-15k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	0.3% at 75kHz dev.	<0.4% 75kHz dev.	0.05%	0.08%	0.08%
Pre-Emphasis	Any value	Any value	75μsec standard	75μsec standard	75μsec standard
AM Noise Figure	>50dB unwtd	>50dB unwtd	−55dB	−55dB	−55dB
FM Noise Figure	62dB unwtd	62dB unwtd	−75dB	−75dB	−75dB
Harmonic Suppression	Per CCIR and ARD	Per ARD and CCIR	80dB	80dB	80dB
Recommended Exciter	S3150	S3150	FX-30	FX-30	FX-30
Power Consumption	5.5kVA	20kVA	550W	6.8kW	50kW
Input Power Required	110/220Vac 1ph	380Vac 3ph	194-266Vac 1ph	208/240Vac 1ph	208/240Vac 3ph
Overall Efficiency	.....	.....	55%	50%	60%
Power Factor	.....	.....	0.9	0.9	0.9
Automatic Recycling	Yes	Yes	Yes	Yes	Yes
Final PA Type	Solid-state	Tetrode	Solid-state	4CX3500A	8990/4CX20000A
Driver Amp Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	4'x2'	3.5'x2'	ca. 2'x2.5'	ca. 2.8'x3.2'	4.7'x2.6'
Related Models	S3161 0.1kW	.....	FM-100 100W	FM-1.5A 1.5kW	FM-60
	S3157 1kW	.....	FM-250 250W	FM-5A 5kW	.....
Reader Service Number	**126**	**127**	**128**	**129**	**130**

Manufacturer	CSI Electronics	Continental Electronics			
Model/Series Number	**T-25-F**	**814R-1**	**816R-1A**	**816R-3**	**817R-1**
Power Output Rating	27.5kW	2.5kW	10kW	25kW	50kW
Feed Line (Inches)	3⅛" EIA	1⅝"	3⅛"	3⅛"	6⅛"
Carrier Stability	±250Hz	±500Hz	±500Hz	±500Hz	±500Hz
Modulation Capacity	±100kHz	±100kHz	±150kHz	±150kHz	±100kHz
Audio Input for 100%	10dBm	+10dBm	10dB	10dBm	10dBm
AF Input Impedance	600Ω	600Ω	600Ω	600Ω	600Ω
Audio Response (±dB/Hz)	±0.5/30-15k	±1/FCC curve	±1/FCC curve	±1/FCC curve	±1/FCC curve
Harmonic Distortion	0.5%	0.25%	0.25%	0.25%	0.25%
Pre-Emphasis	75μs	75μs	75μs	75μs	75μs
AM Noise Figure	−55dB	−55dB	−55dB	−55dB	−55dB
FM Noise Figure	−65dB	−65dB	−65dB	−65dB	−65dB
Harmonic Suppression	.....	−77dB	−80dB	−80dB	−80dB
Recommended Exciter	EX-20-F	Continental 802A	Continental 802A	Continental 802A	Continental 802A
Power Consumption	36kW	4.9kW	17.7kW	40kW	80kW
Input Power Required	290/460Vac 3ph	20/250Vac 3ph	200/250Vac 3ph	200/250Vac 3ph	200/250Vac 3ph
Overall Efficiency	.....	50%	60%	62%	62%
Power Factor	.....	0.94	0.89	0.95	0.92
Automatic Recycling	Yes	Yes	Yes	Yes	Yes
Final PA Type	3CX15000A7	5CX1500A	4CX10000D	4CX15000A	4CX15000
Driver Amp Type	8874	Solid-state	4CX250B	4CX250B	4CX250B
IPA Type	3CX3000A7	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	.....	35"x24"	72"x28"	72"x28"	168"x28"
Related Models	T-20-F 20kW	.....	.....	816R-2A 20kW	817R-2A 40kW
	T-1-F 1.5kW	.....	.....	816R-4 27.5kW	817R-4 55kW
Reader Service Number	**131**	**132**	**133**	**134**	**135**

Manufacturer	Elcom Bauer				Harris Broadcast
Model/Series Number	**SS-100**	**601B**	**605**	**610A**	**FM-3.5K**
Power Output Rating	0.1kW	1.5kW	5kW	10kW	3.8kW
Feed Line (Inches)	Type N	⅞"	1⅝"	3⅛"	1⅝"
Carrier Stability	±300Hz	±300Hz	±300Hz	±300Hz	±300Hz
Modulation Capacity	±150kHz	±150kHz	±150kHz	±150kHz	±100kHz
Audio Input for 100%	.....	.....	.....	.....	+10dBm
AF Input Impedance	.....	.....	.....	.....	600Ω
Audio Response (±dB/Hz)	0.5/50-15k	0.5/50-15k	0.5-50-15k	0.5/50-15k	0.5/30-15k
Harmonic Distortion	<0.2%	<0.2%	<0.2%	<0.2%	0.15%
Pre-Emphasis	75μsec	75μsec	75μsec	75μsec	0
AM Noise Figure	−60dB	−55dB	−55dB	−55dB	−55dB
FM Noise Figure	−65dB	−65dB	−65dB	−65dB	−80dB
Harmonic Suppression	−70dB	−75dB	−80dB	−80dB	Exceeds FCC reg
Recommended Exciter	Model 690	Model 690	Model 690	Model 690	MX-15
Power Consumption	0.25kW	3kW	8.9kW	21kW	7kW
Input Power Required	110Vac 1ph	230Vac 1ph	230Vac 3ph	230Vac 3ph	197/250Vac 1ph
Overall Efficiency	60%	50%	50%	50%	50%
Power Factor	0.9	0.9	0.9	0.9	.....
Automatic Recycling	No	Optional	Yes	Yes	Yes
Final PA Type	Solid-state	3CX1500A7	3CX3000A7	3CX15000A7	4CX3500A
Driver Amp Type	Solid-state	Solid-state	4CX250BC	3CX1500A7	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	2'x1'	2'x2'	3'x2.6'	4'x2.6'	2.75'x2.8'
Related Models	SS-250 0.25kW	.....	603 3.5kW	625A 25kW	FM-K series
	SS-500 0.5kW	.....	.....	.....	.....
Reader Service Number	**136**	**137**	**138**	**139**	**140**

FM RADIO TRANSMITTERS

Manufacturer	Harris Broadcast		ITAME	Larcan	
Model/Series Number	FM-20K	FM-25K	EFM-10000DA	FMT 10F	FMT-25F
Power Output Rating	20kW	25kW	10kW	10kW	25kW
Feed Line (Inches)	3⅛"	3⅛"	1⅝"	3⅛"	3⅛"
Carrier Stability	±300Hz	±300Hz	±500Hz	±1kHz	±1kHz
Modulation Capacity	±100kHz	±100kHz	.....	±100kHz	±100kHz
Audio Input for 100%	+10dBm	+10dBm	.....	.....	.....
AF Input Impedance	600Ω	600Ω	.....	.....	.....
Audio Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/30-1k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	0.2%	0.15%	0.5%	1.5%	1.5%
Pre-Emphasis	Selectable	Selectable	50μsec	75μsec	75μsec
AM Noise Figure	−52dB	−55dB	−70dB	−50dB	−50dB
FM Noise Figure	−80dB	−80dB	−60dB	−60dB	−60dB
Harmonic Suppression	Exceeds FCC reg	Exceeds FCC reg	1mW per FCC/CCIR	−80dB	−80dB
Recommended Exciter	MX-15	MX-15	FM-80A	Bayly S3150	Bayly S3150
Power Consumption	30.15kW	40kW	19kW	.....	35.2kW
Input Power Required	208/240Vac 3ph	208/240Vac 3ph	220/308Vac 3ph	208Vac 3ph	108Vac 3ph
Overall Efficiency	66%	62.5%	.....	80%	.....
Power Factor	0.9	0.9	.....	0.95	0.95
Automatic Recycling	Yes	Yes	.....	Yes	Yes
Final PA Type	4CX15000	8990 EIMAC	EIMAC triode	.....	9011
Driver Amp Type	Two 4CX250B	Solid-state	Solid-state	Solid-state	Solid-state
IPA Type	.....	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	6'x3'	2.9'x2.6'	.....	4'x2.6'	4'x2.6'
Related Models	FM-K series	FM-K series	EFM-5000DA 5kW	.....	.....
	.....	.....	EFM-100TDA 125W	.....	.....
Reader Service Number	**141**	**142**	**143**	**144**	**145**

Manufacturer	Marconi Broadcast	McMartin Industries	NEC America	Philips (Pye TVT)	
Model/Series Number	B6523	BF30M	FBN-9200E	LDM 1239	LDM 1233
Power Output Rating	1kW	30kW	20kW	1kW	10kW
Feed Line (Inches)	1⅝"	3⅛"	3⅛"	Type N	1⅝"
Carrier Stability	±1kHz per year	±200Hz	±500Hz	±150Hz	±150Hz
Modulation Capacity	±200kHz	±150kHz	±100kHz	±150kHz	±150kHz
Audio Input for 100%	To 12dBm	−10dBm	.....	+10dBm	+10dBm
AF Input Impedance	600Ω/2kΩ	500Ω	>2kΩ bal/unbal	600Ω	600Ω
Audio Response (±dB/Hz)	0.2/40-43k	0.2/50-15k	0.5/50-15k	<0.1/30-15k	1/30-15k
Harmonic Distortion	0.4% at 75kHz dev	<0.5%	1%	<0.5%	<0.5%
Pre-Emphasis	50/75μsec	50μs	0	0/25/50/75μsec	0/25/50/75μsec
AM Noise Figure	<−50dB	−55dB	−50dB	−65dB	<−55dB
FM Noise Figure	<−60dB	−65dB	−68dB	<−75dB	<−68dB
Harmonic Suppression	.....	Meets FCC reg	−80dB	<−75dB	<−80dB
Recommended Exciter	.....	BFM 8000	NEC HPA-4536B	LDM 1248	LDM 1248
Power Consumption	2.8kW	45kW	35kW	2.1kW	18.5kVA for 10kW
Input Power Required	200/240Vac 1ph	208/240Vac 3ph	200/240Vac 3ph	110/240Vac 1ph	220/415Vac 3ph
Overall Efficiency	.....	60%	57%	.....	.....
Power Factor	0.8	0.9	>0.9	.....	>0.9
Automatic Recycling	Yes	Yes	Yes	Yes	Yes
Final PA Type	4CX1000A	One tube	4CX15000A	Solid-state	TH399 tetrode
Driver Amp Type	Solid-state	Two tubes	Solid-State	Solid-state	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	2'x2.2'	5'x3'	4.5'x2.4'	1.75'x2.6'	2'x3.75'
Related Models	.....	BFM series from	FBN series	LDM 1238 0.5kW	.....
	.....	50W to 60kW	.....	LDM 1237 0.3kW	.....
	.....	.....	.....	LDM 1248 0.1kW	.....
Reader Service Number	**146**	**147**	**148**	**149**	**150**

Manufacturer	Philips (Pye TVT)	QEI Corporation	Rohde & Schwarz		C.N. Rood/Marcom
Model/Series Number	LDM 1236	695T30kW	NU411	NU311	SC204 SFMT
Power Output Rating	20kW	30kW	10kW	1kW	50W
Feed Line (Inches)	3⅛"	3⅛"	Dezifix D	7/16"	.....
Carrier Stability	±150Hz	±200Hz	Crystal stabilized	Crystal stabilized	TCXO stabilized
Modulation Capacity	±150kHz	±75kHz	.....	±150kHz	±200kHz
Audio Input for 100%	+10dBm	+10dBm	+9dBm for 40kHz dev	9dBm for 40kHz	.....
AF Input Impedance	600Ω	600Ω	600Ω	600Ω/2kΩ bal/unbal	.....
Audio Response (±dB/Hz)	<1/30-15k	0.5/30-15k	<0.1/40-43k	<0.1/40-43k	0.15/20-15k
Harmonic Distortion	<0.5%	0.025% 10dBm/400Hz	<0.4% 75kHz dev	<0.4% at 75kHz dev	0.03%
Pre-Emphasis	25μsec	75μs	50/75μsec	50/75μsec	0/25/50/75μsec
AM Noise Figure	<−55dB	−55dB	−68dB	−68dB	−70dB
FM Noise Figure	<−68dB	−75dB	−40dB	−40dB	−70dB
Harmonic Suppression	−80dB	−80dB	<1mW	<1mW	−60dB
Recommended Exciter	LDM 1248	Model 695	SU155	SU155	.....
Power Consumption	34kVA	50kW	20kVA	2.8kVA	110W
Input Power Required	220/415Vac 3ph	208/240Vac 3ph	220/380Vac 3ph	110/240Vac 1ph	110/220Vac 1ph
Overall Efficiency	.....	62%	.....	.....	.....
Power Factor	>0.9	>0.95	.....	.....	.....
Automatic Recycling	Yes	Yes	Yes	Yes	Yes
Final PA Type	TH374F tetrode	3CX15000	RS2024CL	Solid-state	Solid-state
Driver Amp Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	3.6'x3'	.....	1.9'x2.4'	1.8'x2.4'	Rack-mount
Related Models	.....	695T1kW	NU351 5kW	NU331 3kW	.....
	.....	695T3.5kW	.....	NU321 2kW	.....
	.....	695T10kW	.....	NU251 0.5kW	.....
	.....	695T20kW	.....	.....	.....
Reader Service Number	**151**	**152**	**153**	**154**	**155**

FM RADIO TRANSMITTERS

Manufacturer	Thomson-LGT		Wilkinson/TTC	
Model/Series Number	**EFM-10**	**EFM-2500**	**FME-15**	**FM-3500J**	**FM-30000J**
Power Output Rating	10W	2.5kW	30W	3.8kW	30kW
Feed Line (Inches)	Type N	1⅝"	Type N	1⅝"	3⅛"
Carrier Stability	<1x10^{-6}/year	<1x10^{-6}/year	± 100Hz	± 100Hz	± 100Hz
Modulation Capacity	± 150kHz	± 150kHz	± 200kHz	± 200kHz	± 200kHz
Audio Input for 100%	+ 10dBm	+ 10dBm	.....	+ 10dBm	10dBm
AF Input Impedance	600Ω/20kΩ bal/unbal	600Ω/20kΩ bal/unbal	.....	600Ω	600Ω
Audio Response (± dB/Hz)	0.2/30-75k	0.2/30-75k	0.1/20-15k	0.1/20-15k	0.1/20-15k
Harmonic Distortion	<0.2%	<0.2%	0.05%	0.05% 10dBm/400Hz	0.05%
Pre-Emphasis	Selectable	Selectable	75μsec	Selectable	Selectable
AM Noise Figure	< – 52dB	< – 52dB	– 80dB	– 80dB	– 80dB
FM Noise Figure	< – 82dB	< – 82dB	– 100dB	– 100dB	– 100dB
Harmonic Suppression	– 80dB	– 80dB	– 80dB	– 80dB	– 80dB
Recommended Exciter	This unit	Thomson EFM-10	This unit	Wilkinson FME-15	Wilkinson FME-15
Power Consumption	90VA	7.2kVA	0.135kW	5.4kW	45kW
Input Power Required	120/240Vac 1ph	208/240Vac 1 or 3 ph	110/220Vac 1ph	208/240Vac 1ph	208/240Vac 3ph
Overall Efficiency	30%	30%	25%	61%	66%
Power Factor	0.9	0.9	0.9	0.9	0.9
Automatic Recycling	Yes	Yes	No	Yes	Yes
Final PA Type	Solid-state	Solid-state	Solid-state	3CX3000A7	4CX20000B
Driver Amp Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Floor Space Required	1'x1.5 portable	2'x2.6'	Rack-mount	2.2'x2.8'	3'x3.5'
Related Models	EFM-50 EFM-100	....	....	FM-5500J FM-1000J	FM-10000J .....
Reader Service Number	**156**	**157**	**158**	**159**	**160**

UHF TV TRANSMITTERS

Manufacturer	Acrodyne	Comark Corporation	EMCEE	Harris Corporation	Information Transmission Systems
Model/Series Number	**TRU-10KV**	**CCT-U-60SE**	**TTU5000DP**	**TVE-60S**	**ITS-240**
Frequency/Channels	470-810MHz	470-810MHz	470-860MHz	Channels 14-69	470-860MHz
Visual Power Peak	10kW	60kW	5kW	60kW	10kW
Carrier Regulation	3%	3%	3%	± 500Hz	2%
Response/Brightness	0.75dB	± 0.75dB	± 0.75dB	± 0.75dB	± 0.5dB
Modulation Capacity	3%	97%	3%	0%	1%
ICPM Rating	± 2°	CCP-145 corrector	± 3°	3°	± 2°
Phase/Gain Rating	3°/5%	± 3°/0.5dB	± 3°/0.5dB	± 3°/0.5dB	± 1°/0.5dB
Linearity (Low Frequency)	5%	1dB	0.5dB	1dB	0.5dB
S/N Ratio	62dB	55dB	55dB	55dB	55dB
K-Factor 2T/12.5T	2%/5%	2%/5%	2%/5%	2%/5%	2%/4%
Harmonic Radiation	< – 60dB	< – 60dB	< – 60dB	– 70dB	– 60dB
Visual PA Type	TH-582 tetrode	Ext cavity klystron	TH-382	VKP-7550S klystron	TH-382
IPA Type	TH-347 tetrode	Solid-state	TH-327	Solid-state	RCA 9017
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filter Design	Yes	Yes	Yes	Yes	Yes
Aural Power Output	1kW	6kW	0.5kW	6kW	1kW
Modulation Capacity	± 50kHz	± 25kHz	± 25kHz standard	± 120kHz	± 75kHz
Audio Response (± dB/Hz)	1/30-15k	0.5/30-15k	1/50-15k	0.5/30-15k	0.3/30-15k
Harmonic Distortion	1%	0.5%	1%/0dBm/1kHz	0.5%	0.2%/10dBm/400Hz
AM & FM Noise	– 50dB/ – 60dB	– 50dB/ – 60dB	– 50dB/ – 60dB	– 55dB/ – 59dB	– 55dB/ – 60dB
Aural PA Type	Internally diplexed	Ext cavity klystron	Internally diplexed	VKP-7550S klystron	Low level diplexed
IPA Type	.....	Solid-state	.....	Solid-state	.....
Cooling System Type	Vapor-phase	Vapor-phase/water	Air	Vapor-phase	Air
Input Power Required	.....	480Vac 3ph	208Vac 3ph	480Vac 3ph	208/240Vac 1ph
Power Consumption	28kVa	190kW	20kW	135kW	36kW
Power Factor	0.9	.....	0.9	>0.95	0.95
Related Models	TRU-5KA, TRU/5KA, 5kW	....	TTU5000DR, TUA5000	TVE-120S	ITS-230 1kW, ITS-235 5kW
Reader Service Number	**189**	**190**	**191**	**192**	**193**

UHF TV TRANSMITTERS

Manufacturer	Marconi Broadcast	NEC America	Pye TVT/Philips	RCA Broadcast	
Model/Series Number	B7321	PCU-790K5	LDM 1208/8	TTU-55C (CS)	TTG-100U
Frequency/Channels	470-860MHz	470-860MHz	470-860MHz	470-860MHz (14-69)	470-860MHz
Visual Power Peak	55kW	80kW	55kW	55kW	100kW
Carrier Regulation		2%	2%	3%	<3%
Response/Brightness		2dB	0.75dB	1.5, – 1dB	±0.75dB
Modulation Capacity	5%	100%	0.5%	3%	3%
ICPM Rating		3°	< – 40dB	....	Pre-corrector
Phase/Gain Rating	3°/0.95dB	3°/3%	1.5°/0.5dB	±3°/0.5dB	±3°/0.5dB
Linearity (Low Frequency)	0.9dB	2%	2%	1dB/pulser 1.5dB	<1.5dB
S/N Ratio	49dB	52dB	55dB	55dB	>55dB
K-Factor 2T/12.5T	2%/1%	1.5%/5%	2%/5%	1.5%/<8%	1.5%/<5%
Harmonic Radiation	– 60dB	– 80dB	– 60dB	– 60dB	– 60dB
Visual PA Type	VA-935A klystron	1AV97 klystron	Ext or int klystron	Int cavity (S series)	VKP-7853 klystron
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filter Design		Yes	Yes	Yes	Yes
Aural Power Output	5.5kW or 11kW	8kW or 16kW	5.5kW	6kW or 12kW	10kW or 20kW
Modulation Capacity	±50kHz	±50kHz	100kHz	±50kHz	Stereo capable
Audio Response (±dB/Hz)	1/30-15k	1/30-15k	0.5/30-15k	1/30-15k	1/30-15k
Harmonic Distortion	1%	1%	0.5%	1%/30Hz-15kHz	1%/30Hz-15kHz
AM & FM Noise	– 50dB/ – 60dB	– 50dB/ – 60dB	– 55dB/ – 60dB	– 50dB/ – 60dB	– 50dB/ – 60dB
Aural PA Type	VA-935A klystron	1AV97 klystron	Ext or int klystron	Int cavity (S series)	VKP-7853 or VA-890H
IPA Type		Solid-state	Solid-state	Solid-state	Solid-state
Cooling System Type	Vapor-phase	Vapor phase	Vapor phase	Vapor/phase	Water/steam
Input Power Required		480Vac 3ph	.....	440/480Vac 3ph	.....
Power Consumption	264kW	264kW	130kW (ABC klystron)	215kW standard	.....
Power Factor	0.9	>0.9	0.9	0.9	0.9
Related Models		.....	LDM 1208/1219 110kW, LDM 1742 25kW	From 30kW to 220kW	.....
	.....	.....	.....	.....	.....
Reader Service Number	194	195	196	197	198

UHF TV TRANSMITTERS

Manufacturer	Rohde & Schwarz	TV Technology	Thomson-LGT	Townsend Associates	
Model/Series Number	**NT Series**	**XL1000TU**	**EUHF-1000S**	**TA-1000 ATU**	**TA-55NV**
Frequency/Channels	470-860MHz	470-890MHz	Channels 14-69	Channels 14-69	470-860MHz
Visual Power Peak	10W to 10kW	1kW	1kW	1kW	55kW
Carrier Regulation		0.00000032%	0.0003%	.....	3%
Response/Brightness		0.5dB	0.5dB	.....	−1.5dB
Modulation Capacity		1%	100%	5%	5%
ICPM Rating		2°	1°	.....	.....
Phase/Gain Rating	<±3°	2°/.....	3°/<0.3dB	3°/1dB	3°/1dB
Linearity (Low Frequency)	>5%	1dB	0.5dB	1dB	1dB
S/N Ratio	>63dB	55dB	60dB	60dB	60dB
K-Factor 2T/12.5T		2%/.....	2%/2%	.....	.....
Harmonic Radiation	<−60dB	−80dB	−60dB	−60dB	−60dB
Visual PA Type	Tetrode	TH-347 tetrode	TH-347	TCA 4628	VA-953H klystron
IPA Type	Tetrode/solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filter Design		Yes	Yes	Yes	Yes
Aural Power Output	10% or 20% of visual	100W	0.1kW	0.1kW	11kW
Modulation Capacity		±50kHz	±100kHz	±25kHz	±50kHz
Audio Response (±dB/Hz)	−1/30-15k	0.5/30-15k	0.5/30-15k	1dB/75μs curve	1dB/75μs curve
Harmonic Distortion	0.4%	0.5%/10dBm/1kHz	0.5dB/10dBm	1%	1.5%
AM & FM Noise	−40dB/−60dB	−60dB/−60dB	−50dB/−60dB	−50dB/−58dB	−50dB/−58dB
Aural PA Type	Tetrode	TH-347	Internally diplexed	Solid-state	VA-953H klystron
IPA Type	Solid-state	Solid-state	Internally diplexed	Solid-state	Solid-state
Cooling System Type	Air or water	Air	Air	Air	Vapor phase
Input Power Required	220Vac 3ph	208/240Vac 1ph	208Vac 3ph	.....	.....
Power Consumption	220kVA for 10kW	4.8kW	4kW	8.15kW	146.7kW w/ phasor
Power Factor	>0.9	0.9	0.9	.....	.....
Related Models		.....	EUHF-100S 0.1kW	.....	.....
Reader Service Number	**199**	**200**	**201**	**202**	**203**

VHF TV TRANSMITTERS

Manufacturer	Acrodyne	EMCEE	Harris Broadcast	Larcan	
Model/Series Number	**TT-3500VH**	**TTV-5000B**	**TV-30H**	**TTC-16LL**	**TTC-16LH**
Frequency/Channel	7-13	7-13	7-13	2-6	7-13
Visual Power Peak	12.5kW	5kW	30kW	16kW	16kW
Carrier Regulation	±250Hz	3%	±250Hz	±200Hz	±200Hz
Modulation Capacity	3%	.....	0%	1%	1%
ICPM Rating		3°	1.5°	1.5°	1.5°
Phase/Gain Rating	1°/0.5dB	3°/5%	1°/3%	2°/0.5dB	2°/0.5dB
Linearity (Low Frequency)	5%	.....	10%	7.5%	7.5%
S/N Ratio	54dB	55dB	−55dB	−55dB	−55dB
K-Factor 2T/12.5T	<3%	2%	2%/5%	2%/5%	2%/5%
Harmonic Radiation	−80dB	−60dB	−80dB	−80dB	−80dB
Visual PA Type	TH561 tetrode	TH361	9007	8807	8807
IPA Type	RCA 8791	TH338	8988	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filter Design	No	Yes	Yes	Yes	Yes
Aural Power Output	1.25kW	0.5kW	6kW	1.6kW	1.6kW
Modulation Capacity	±50kHz	±40kHz	±120kHz	±100kHz	±100kHz
Audio Response (±dB/Hz)	0.5/300-15k	1/50-15k	0.5/30-15k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	<0.5% at 25kHz	0.5%	0.5%	0.5%/10dBm/1kHz	0.5%/10dBm/1kHz
AM & FM Noise Rating	−50dB/−60dB	−60dB	−55dB/−60dB	−55dB/−60dB	−55dB/−60dB
Aural PA Type	Combined to visual	Combined to visual	8807	8792	8792
IPA Type		Solid-state	Solid-state	Solid-state	Solid-state
Cooling System Type	Water	Air	Air	Air	Air
Input Power Required	208Vac/3ph	208-230Vac/3ph	208-240Vac/3ph	208Vac/3ph	208Vac/3ph
Power Consumption	37kVA	20kVA	50kW	37kW	37kW black picture
Power Factor		.....	>0.95	0.95	0.95
Floor Space Required		ca. 7'x2.5'	8.8'x2.7'	5'x3'	7.7'x3'
Related Models		TV1000D/V TV100D/V	TV-35H/-50H TVD-60H/-70H/-100H	TTC-3LL/-6LL/-30LL/ TTC-60LL	TTC-3LH/-5LH/-10LH TTC-30LH/-60LH
Reader Service Number	**175**	**176**	**177**	**178**	**179**

VHF TV TRANSMITTERS

Manufacturer	NEC America	Pye TVT/Philips	Marconi Broadcast	RCA Broadcast	
Model/Series Number	PCN-1225BH	LDM-1211/06	B7433	TTG-16L	TTG-50H
Frequency/Channel	7-13	Channels 7-13	174-230MHz/7-13	Channels 2-6	Channels 7-13
Visual Power Peak	25kW	17.5kW	10kW	16kW	50kW
Carrier Regulation	± 2%	2%	2%	± 250Hz	.....
Modulation Capacity	100%	.....	.....	1%	1%
ICPM Rating	2°	.....	– 46dB	3°	3°
Phase/Gain Rating	1°/3%	3°/0.5dB	20ns/5%	2°/0.5dB	2°/0.5dB
Linearity (Low Frequency)	1%	1dB	2%	0.15dB	0.5dB
S/N Ratio	52dB	55dB	54dB	55dB	55dB
K-Factor 2T/12.5T	1%/5%	2%/2T	2%/1%	2%/5%	2%/5%
Harmonic Radiation	– 80dB	– 40dB	< – 70dB	– 80dB	– 80dB
Visual PA Type	8F68R	YL1430	TH361	8976 tetrode	8984 tetrode
IPA Type	Solid-state	YL1450	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filter Design	Yes	.....	Yes	Yes	Yes
Aural Power Output	2.5kW or 5kW	2kW	1kW	3.6kW	6.6kW
Modulation Capacity	± 100kHz	To 100kHz	To 50kHz	± 50kHz	± 50kHz
Audio Response (± dB/Hz)	0.5/30-15k	1/30-15k	1/30-15k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	0.5%	1%	1%	0.5%	0.5%
AM & FM Noise Rating	– 50dB/ – 60dB	– 50dB/ – 60dB	– 50dB/ – 50dB	– 53dB/ – 60dB	– 53dB/ – 60dB
Aural PA Type	7F71R	YL1450	Solid-state	8977 tetrode	8977 tetrode
IPA Type	Solid-state	Solid-state	.....	Solid-state	Solid-state
Cooling System Type	Air	Air	Air	Air	Air
Input Power Required	200-240Vac/3ph	.....	.....	208/480Vac/3ph	440/480Vac/3ph
Power Consumption	56kW	40kW	25kW	50kW black picture	106kW black picture
Power Factor	>0.92	0.9	0.9	0.94	0.94
Floor Space Required	.....	.....	.....	9.2'x3.3'	9.2'x3.3'
Related Models	.....	.....	.....	TTG-30L, TTG16-16L	TTG-17HH/-30H/-35H
	.....	.....	.....	.....	TTG-3030/3535/5050
Reader Service Number	180	181	182	183	184

Transmitters

VHF TV TRANSMITTERS

Manufacturer	RCA Broadcast	Thomson-LGT	Rohde & Schwarz	Townsend Associates
Model/Series Number	**TTG-10(III)**	**EVHF-1000S**	**NT Series**	**TA-1000ATL(H)**
Frequency/Channel	CCIR Band III	Channels 2-13	174-230MHz	Channels 2-6 (7-13)
Visual Power Peak	10kW	1kW	100W to 2kW	1kW
Carrier Regulation		0.00003%	.....	.....
Modulation Capacity		100%	.....	5%
ICPM Rating	<3°	1°	.....	.....
Phase/Gain Rating	<2°/6%	3°/0.3dB	<±3°/.....	3°/1dB
Linearity (Low Frequency)	< 2.5%	0.5%	<5%	1dB
S/N Ratio	42dB hum & noise	60dB	>63dB	.....
K-Factor 2T/12.5T	<2%	2%/2%	.....	.....
Harmonic Radiation	–70dB	–60dB	–60dB	–60dB
Visual PA Type	8976 tetrode	Solid-state	Tetrode	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes
SAW Filter Design	Yes	Yes	.....	Yes
Aural Power Output	1kW	0.1kW	10% or 20% of visual	100W
Modulation Capacity	±75kHz	±100kHz	±50kHz	±25kHz
Audio Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	–1/30-25k	1dB/per FCC curve
Harmonic Distortion	<0.75%	0.5% at 10dBm	0.4%	1%
AM & FM Noise Rating	–52dB/–60dB	–50dB/–60dB	–46dB/–60dB	–50dB/–58dB
Aural PA Type	Combined to visual	Internally diplexed	Solid-state	Solid-state
IPA Type	Solid-state	Solid-state	Solid-state	Solid-state
Cooling System Type	Air	Air	Air	Air
Input Power Required	220/415Vac/3ph/50Hz	208Vac/3ph	220Vac	.....
Power Consumption	32kW black picture	5.6kW	0.9kVa for 100W	6.1kW
Power Factor	0.9	0.9	>0.9	.....
Floor Space Required	6.2'x3.3'	26.2"x35.8"	.....	.....
Related Models		EVHF-100S 0.1kW	.....	.....
Reader Service Number	**185**	**186**	**187**	**188**

AURAL STL SYSTEM

Aural STL receiver/transmitter, typically operating in 940 to 960MHz spectrum with 50Ω RF impedances. Overall intent of system is for stereo operation.

Manufacturer	Marti Electronics	Moseley Associates			TFT
Model/System Number	**STL-10**	**PCL-505/C (PCL-505)**	**PCL-606/C**	**8300**	**7700B**
System Type	Dual	Composite or dual	Composite & dual	Composite	Composite or dual
AF Response (Comp)	.....	±0.3dB/30Hz-60kHz	±0.1dB/30Hz-53kHz	±0.1dB/30Hz-53kHz	±0.2dB/50Hz-75kHz
AF Response (Dual)	±0.25dB/20Hz-15kHz	±0.4dB/30Hz-15kHz	±0.25dB/30Hz-15kHz	.....	±0.2dB/50Hz-30kHz
Distortion (Comp)	.....	0.4% 30Hz-60kHz	0.3% 30Hz-53kHz	0.2% 30Hz-53kHz	0.75% 30Hz-75kHz
Distortion (Dual)	0.25% 20Hz-15kHz	0.4% 30Hz-15kHz	0.2% 30Hz-15kHz	.....	0.75dB 30Hz-30kHz
S/N Ratio (Comp/Dual)	75dB dual	68dB/68dB	72dB/72dB	75dB	75dB/73dB
Crosstalk (Sub-Main)	–72dB	43dB	50dB	50dB	46dB
Stereo Separation	72dB	38dB	48dB	50dB	45dB
Transmitter Part Number	**STL-10**	**PCL-505/C (PCL-505)**	**PCL-606/C transmitter**	**8300**	**7700**
RF Power Output	10W	7W	10W	14W	12W
Frequency Stability	±0.00025%	0.0005%	0.00025%	0.0001%	0.0001%
AM Noise Rating	–72dB	.....	.....	–60dB	–65dB
Input (Level/Imped)	.....	.....	.....	.....	.....
Composite System	.....	3.5Vp-p/12kΩ	3.5Vp-p/6kΩ	3.5Vp-p/10kΩ	1.24dB/10kΩ
Dual System	8dBm/600Ω	10dBm/600Ω bal	10dBm/600Ω	3.5Vp-p/10kΩ	10dBm/10kΩ
Multiplexed System	0dB/600Ω	1.5Vp-p/2kΩ	1.5Vp-p/4kΩ	1.5Vp-p/10kΩ	0.53dB/10kΩ
Receiver Part Number	**R-10**	**PCL-505/C (PCL-505)**	**PCL-606/C receiver**	**8301**	**7707**
Conversion Design	Double	Double	Triple	Double	Triple
Sensitivity (Comp)	14μV 60dB S/N	125μV 60dB S/N	150μV 60dB S/N	30μV 60dB S/N	40μV 60dB S/N
Sensitivity (Dual)	.....	20μV 60dB S/N	20μV 60dB S/N	. . .	.....
Sensitivity (Mux)	.....	.....	.....	. . .	.....
Bandwidth Dual Base	10Hz-16kHz	30Hz-15kHz	30Hz-15kHz	30Hz-200kHz	50Hz-15kHz
Bandwidth Dual Mux	25kHz-76kHz	22kHz-85kHz	22Hz-85kHz	.....	39Hz-67kHz
Bandwidth Comp Mux	.....	100kHz-200kHz	110kHz-185kHz	.....	152kHz-185kHz
Reader Service Number	**170**	**171**	**172**	**173**	**174**

Measuring transmitter operating power

The views expressed are those of the author and do not necessarily reflect the views of the commission.

A wide variety of methods are currently available to measure the RF power output of radio and TV transmitting equipment. The FCC— in response to recent advances in transmission and instrumentation technology—has issued a Notice of Proposed Rulemaking on the question of how RF power output should be measured by broadcasters.

By John Reiser, FCC, Washington, DC

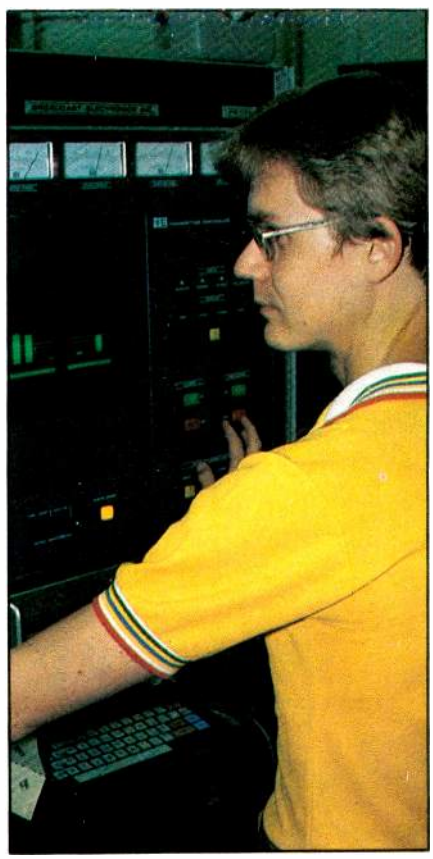
Broadcast stations are authorized in the United States to provide service to a specified area through maintenance of a pre-determined signal strength contour. Broadcasters are expected to provide full signal coverage to that area during the broadcast day, but not to operate at excessive power—which could intrude into the service area of another licensee.

The FCC has established two procedures for determining the RF transmitter output power—traditionally called the *direct* and *indirect* methods. Unfortunately, these terms are neither precise nor actually correct. The so-called direct method must be used to determine the power of all AM and TV visual transmitters. The indirect method may be used only on a temporary basis during specified conditions, such as during periods when equipment is out of service for repairs. The indirect method may be used at any time for FM and TV aural transmitters.

Direct method for AM

At AM stations, the *direct method* of determining power output consists of measuring the radio frequency (RF) current at a specified point in the antenna system. The rules require that the RF current be measured with an ammeter inserted into the circuit at a point where the resistance component of the circuit impedance has been determined. The procedures for making this determination are specified in the rules.

The power is determined by squaring the value of the current in amperes and then multiplying the quantity by the previously established resistance value. The current must be determined without the effects of modulation. This is required because the most commonly used RF ammeter—the thermocouple-type meter—will indicate an increase in current when the carrier wave is modulated. Operators frequently have difficulty in finding pauses sufficiently long in station programming to take readings without the effects of modulation.



An example of new instrumentation systems for power output measurement. Shown is an engineer at Broadcast Electronics performing tests on a CRT bargraph display which gives operators a visual representation of the performance of the transmission system.

A few years ago, the commission's rules were amended to permit the use of other types of RF current metering devices that are somewhat less sensitive to the effects of modulation and temperature variations.

Thermocouple-type ammeters have other problems, as well, particularly accuracy variations with temperature. Some licensees have installed thermostat-controlled heaters near their antenna ammeters to stabilize readings. However, the major problem is often that the value of the antenna resistance (or impedance) may change with weather conditions, although a properly installed and maintained antenna system should not be so effected.

Base current meters for non-directional antennas must be installed at the tower base, which may be some distance from the operator. Some means must be used, therefore, to allow the antenna ammeter value to be observed by the operator. This remote indicating ammeter must be kept periodically calibrated to agree with the main base current meter. TV cameras located at the base of the tower have sometimes been used for reading antenna base currents in lieu of remote ammeters.

Indirect power method

The so-called *indirect method* of power determination consists of measuring the voltage (E_p) and current (I_p) supplied to the final RF power amplifier of the transmitter and applying a previously determined efficiency factor to the product of E_pI_p. The efficiency factor is determined by the transmitter manufacturer, or by the licensee if the necessary measuring equipment is available.

In practice, this factor can depend

on the operating condition of the amplifier devices, deterioration of components, frequency and power level at which the measurement was made, tuning of the transmitter and transmission line losses. The efficiency of a transmitter may be entirely different when operating at 500W or 5kW. Frequently, manufacturers provide the efficiency factor for only one frequency, usually the middle of the band or at one output power (usually the transmitter rated power) and this may not be appropriate for the station's particular mode of operation.

In older AM transmitters having plate modulated Class C final RF amplifiers, the applied plate voltage and current values do not change with modulation. The FCC rules for using the indirect method are based on the Class C amplifier. However, many different transmitter designs have been developed recently for improved audio quality and operating efficiency. In some of these systems, the measurable power input to the amplifier stage(s) is (are) not necessarily proportional to the RF output power. Some of the new low power transmitters marketed for pre-sunrise and post-sunset operation use a Class A power amplifier for the final stage, and output power, therefore, is not a direct function of the applied dc input power.

The use of the indirect method of power determination for FM and TV transmitters presents other difficulties as well. With some of the grounded-grid-type FM transmitters, part of the grid drive power passes to the antenna circuit, bringing up another source of possible error in the indirect method.

Many of the power amplifier devices used for UHF television cannot be metered for the indirect method of power measurement. With klystrons, for example, there is no direct relationship between beam current and target voltage and the output power. There are, instead, many other operating parameters of the klystron amplifier that affect output power.

Another problem with indirect power measurement occurs when the final RF amplifiers are operated in parallel, and in some cases with separate power supplies. Each device or amplifier must be separately metered, the indirect power value for each determined and the two values added. This certainly complicates the use of automatic power control devices for such transmitters. Likewise, when a common power amplifier is used for both the aural and visual TV signals, it is impossible to determine the individual aural and visual power outputs using the indirect method.

One problem frequently encountered with FM transmitters is that the manufacturer may use a cathode current meter, rather than a plate current meter, for circuit design convenience. The cathode current is the sum of the plate, control grid and screen grid currents. The control grid current is usually small and can be disregarded in most cases. The screen current, however, must be measured and subtracted from the cathode current to give an accurate reading of plate current. Provisions for accurately reading or providing remote control indications of the screen current value are not always present.

A possible error could result if the transmitter manufacturer's stated efficiency is based on the product of the plate voltage and *cathode* current,

rather than the true plate current. Be alert to this possible problem. Rules permit the manufacturer to specify alternative methods for calculating power by the indirect method.

Meter accuracy

The commission requires that all meters used for determining operating power must have an accuracy of 2% of the full-scale value. The normal operating value must also indicate above 1/5 full-scale on linear or log scaled meters, and above 1/3 full-scale on square-law scaled meters.

Even with these requirements, however, the possibility exists for significant error in determining RF power output by the indirect method. For example, a normal operating value of 2kV on a 10kV full-scale meter *could* have an error of as much as 10%. The plate current value *could* have a similar metering error, and when these values are multiplied, an error far exceeding the absolute operating power tolerance would result.

Direct method for FM and TV

The direct method of power determination for FM and TV transmitters consists of reading a metering device located directly in the output transmission line of the transmitter. This device may be sensitive to either voltage or current in the line, and usually has a sensitivity adjustment for calibration. The meter must be calibrated at intervals using a power absorbing wattmeter of known accuracy. Two types of calibrating wattmeters are used. The calimetric meter measures power by determining the temperature difference in a known quantity of mass, usually water. The electronic wattmeter is similar to the transmitter's power meter, but is calibrated to a known accuracy and sealed by the manufacturer.

Similar to the situation with AM station power measurements, the direct method for FM and TV aural transmitters is only accurate if the transmission line impedance remains unchanged, which under normal operating conditions is the case. In areas where freezing rain or sleet is a problem, however, indications of the transmission line meter may vary if the antenna characteristics change due to ice build-up on the antenna. For FM transmission systems, the output power of the transmitter does not—or at least should not—change with the level or composition of the program material.

Many transmission line meters incorporate a directional coupler that permits the operator to see if a change in the impedance of the transmission line has occurred. Normally, this meter is calibrated at the intended operating power of the station. The meter scale may be highly inaccurate in indicating other power levels, unless calibration measurements have been made over the entire operating range. Changing any components in the metering system can change the scale calibration.

Similar to FM and TV aural transmitters, the TV signal visual transmitter must have an adjustable meter in the output circuit that is sensitive to the amplitude of the power in the output transmission line. Amplitude modulation is used for the transmission of TV pictures, and therefore, the actual RF power transmitted varies with the luminance intensity and composition of the scene being broadcast. Synchronization pulses continously modulate the carrier, regardless of the picture being transmitted. In the NTSC system, an all-black screen results in the maximum power being

Continued on page 113

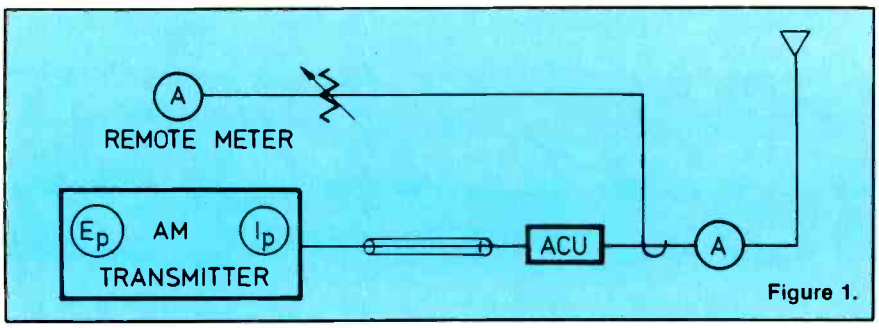


Figure 1.

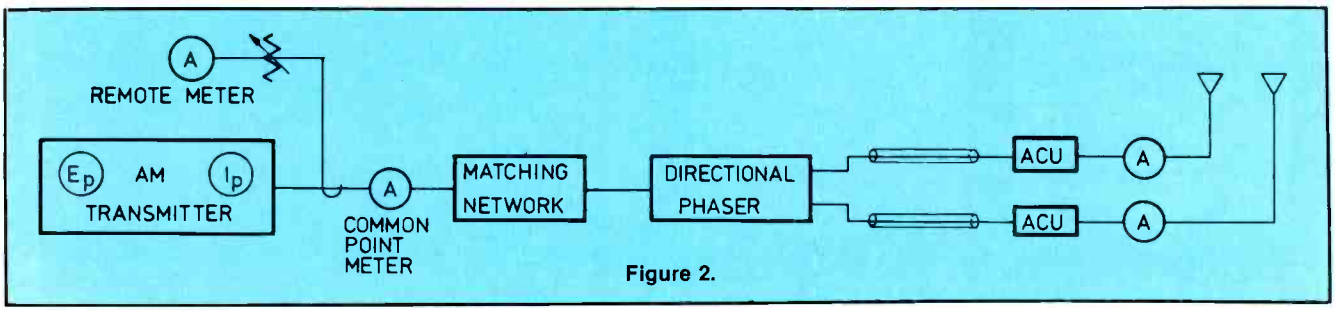


Figure 2.

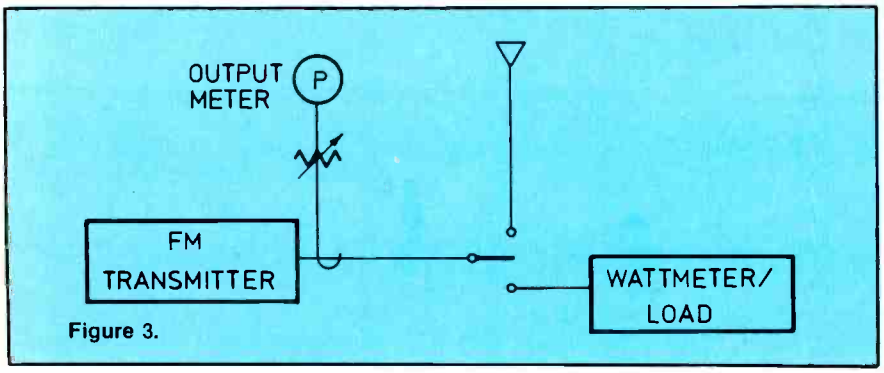
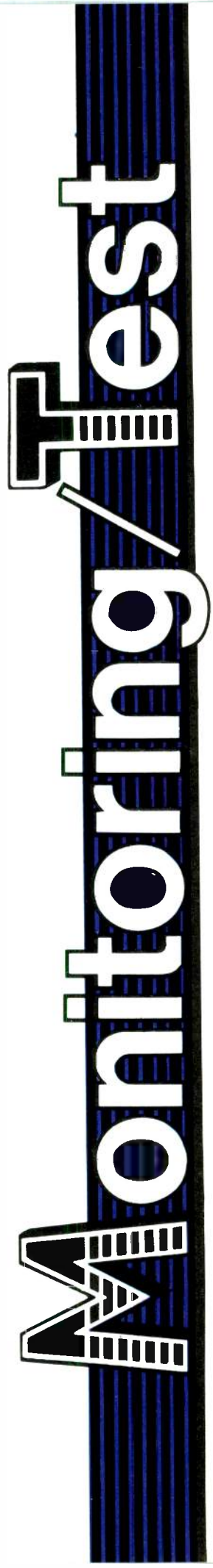


Figure 3.

Figure 1. The basic metering requirements for a nondirectional AM station. Note the use of a remote base current meter to provide antenna current readings at the transmitter control point.

Figure 2. Power output metering for a directional AM station. RF ammeters are placed at the base of each antenna and at the common point.

Figure 3. Power output metering for an FM transmitter. Power output calibrations should be made with the transmitter patched into the wattmeter/load.



DISTORTION ANALYZERS

Manufacturer	Amber Electro Design			ASACA/ShibaSoku	
Model Number	**3501**	**5500**	**796F**	**856A**	**725B**
Frequency Range	10Hz-100kHz	10Hz-100kHz	20Hz-200kHz (5-range)	20Hz-60kHz	5Hz-500kHz 4-range
Input Level	100V to 30mV	100V to 30mV	−15dBm to +42dBm	−25dBm to +20dBm	0.1V-100V auto-range
Input Impedance	100kΩ or 600Ω	100kΩ/600Ω/150Ω	100kΩ10kΩ/600Ω	600Ω/10kΩ bal	.....
Fundamental Reject	>100dB at 1kHz	>100dB at 1kHz	.....	Automatic	>90dB to 110kHz
Auto Set Level	Yes	Yes	.....	Yes	Yes
Auto Null	Yes	Yes	Yes	Yes	Yes
Minimum THD Reading	0.0008%	0.003%	<0.1% to 100kHz	<0.05%	0.0001% (−120dB)
THD Accuracy	±1dB	±1dB	±5% of full scale	±5% of full scale	.....
IMD Measurements	Optional	Optional	No	No	No
IMD Procedures	SMPTE/DIN/CCIR	SMPTE/DIN/CCIR	.....	.....	.....
Other Functions	.....	.....	.....	.....	.....
ac Volts	Yes	Yes	−70dBm to +40dBm	−80dBm to +20dBm	−90dBs to +40dBs
Audio Noise	Yes	Yes	0dB to −70dB	W/ weighting network	>100dB range
Signal Generator	Yes	Yes	Yes	Yes	No
AM Detector	Optional	Optional	No	Level/phase diff	Frequency counter
Recorder Test Unit	No	Optional	Possible	Includes wow/flutter	.....
Meter Types	Meter movement	7-segment LED	Meter & 7-segment	Meter & 7-segment	Meter & 7-segment
Digital Design	No	Yes	No	No	No
Automated Testing	No	Yes	No	No	GPIB adapter
Outputs	.....	.....	.....	.....	.....
Oscilloscope	Yes	Yes	Yes	Yes	Yes
X-Y Plotter	.....	Yes	.....	.....	.....
Other	.....	IEEE-488/RS-232	.....	.....	.....
Reader Service Number	**219**	**220**	**221**	**222**	**223**

DISTORTION ANALYZERS

Manufacturer	**Bruel & Kjaer**	**Hewlett-Packard**	**Leader Instruments**	**Potomac Instruments**	**RE Instruments**
Model Number	**2010/1902**	**Model 339A**	**LDM-170**	**AT-51 System**	**RE-201 (RE-256)**
Frequency Range	2Hz-200kHz	10Hz-110kHz	20Hz-20kHz	20Hz-20kHz	20Hz-75kHz (25-25k)
Input Level	10μV to 300V	30mV to 300V rms	0.35V to 30V rms	0.1V to 80V	5mV to 15V rms
Input Impedance	1MΩ	100kΩ	600Ω	.....	600Ω
Fundamental Reject	.....	>86dB overall	70dB overall	>80dB, 20Hz-20kHz	80dB at 1kHz
Auto Set Level	No	Yes	No	Yes	Yes
Auto Null	No	Yes	No	Yes	Yes
Minimum THD Reading	0.01%	0.0018%	0.03%	0.02%	0.003% (0.01%)
THD Accuracy	.....	+1.5, −4dB overall	0.05% of full scale	±5%	±1dB
IMD Measurements	Yes	No	No	Yes	Also TIM
IMD Procedures	SMPTE/DIN/CCIR	.....	.....	SMPTE	SMPTE CCIR
Other Functions	.....	.....	.....	.....	.....
ac Volts	Yes	Yes	Yes	Yes	Yes
Audio Noise	No	No	Yes	Yes	Yes
Signal Generator	Yes	Yes	No	Yes	RE-201
AM Detector	No	Yes	No	Yes	No
Recorder Test Unit	.....	No	.....	No	Yes
Meter Types	dBV & true rms meter	Meter (VU/dBm/%THD)	Meter (dBV/%THD/ave)	Meter	..... CRT-simulated meter
Digital Design	No	No	No	No	Yes
Automated Testing	No	No	No	Yes	IEEE-488 system
Outputs	.....	.....	.....	.....	.....
Oscilloscope	No	No	Yes	Yes	RE-256
X-Y Plotter	Yes	No	Yes	.....	RE-256 option
Other	.....	.....	.....	.....	CRT RS-232C printer
Reader Service Number	**224**	**225**	**226**	**227**	**228**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Video Monitoring Equipment

DISTORTION ANALYZERS

Manufacturer	Rohde & Schwarz	Sound Technology	Tektronix	
Model Number	**SUN 2/U**	**1710A**	**AA-501**	**AA-5001**
Frequency Range	40Hz/1kHz/4.7kHz	10Hz-110kHz	10Hz-100kHz	10Hz-100kHz
Input Level	– 20dBm to 32dBm	30μV to 100V	60mV to 200V	60mV to 200V
Input Impedance	20kΩ	200kΩ	100kΩ	100kΩ
Fundamental Reject	>65dB	>110dB at 1kHz	Residual THD + N-10dB	Residual THD + N-10dB
Auto Set Level	Yes	Yes	Yes	Yes
Auto Null	No	Yes	Yes	Yes
Minimum THD Reading	0.06%	0.002%	<0.0032% rms	<0.0025% average
THD Accuracy	± 1dB	2%	± 1dB	± 1dB
IMD Measurements	Yes	Option	Optional	Yes
IMD Procedures	DIN	SMPTE/DIN	SMPTE/DIN/CCIR	SMPTE/DIN/CCIR
Other Functions		.....	.....	.....
ac Volts	Yes	Yes	Yes	Yes
Audio Noise	Yes	Yes	.....	.....
Signal Generator	No	Yes	External unit	SG-5010 package
AM Detector	No	No	No	No
Recorder Test Unit		Yes	No	No
Meter Types	Meter (dBm/peak/rms)	Meter (dBm/dBV/%THD)	7-segment LED	7-segment LED
Digital Design		Yes	No	No
Automated Testing		Yes	Possible	GPIB control
Outputs		.....	.....	.....
Oscilloscope		Yes	Yes	Yes
X-Y Plotter		No	Yes	Yes
Other		.....	.....	.....
Reader Service Number	**229**	**230**	**231**	**232**

COLOR VIDEO MONITORS

Color TV monitors for viewing of composite and/or RGB signals in master control, the production studio or viewing rooms.

Manufacturer	Amtron	ASACA/ShibaSoku			Barco
Model/Series Number	**7819**	**CM99A**	**CMM20-11 Series**	**CMM20-7 Series**	**DCD2740F Series**
CRT Diagonal (Inches)	19"	9"	20"/14"/26"	20"/14"	27"/16"/22"
Preferred CRT Type		In-line gun	Delta gun, dot matrix	In-line gun	In-line gun
		Dot matrix	Shadow mask	Dot matrix	Black matrix
Beam Feedback Design	No	No	No	No	No
Aspect Ratio	4H-3V	4H-3V	4H-3V	4H-3V	4H-3V
HDTV Product	No	No	No	No	No
Resolution in TVL	500 TVL	500 TVL	600 TVL	600 TVL	575x500 pixel
Chroma Bandwidth		.....	.....	.....	.....
Luma Bandwidth	To 10MHz	To 7MHz	To 7MHz	To 7MHz	To 6MHz
Comb Filter Design		Yes	Yes	Yes	No
Blue Gun Test	Yes	No	No	No	No
NTSC Test Matrix	No	No	Yes	No	No
Aperture Correction	Yes	Yes	Yes	Yes	No
X-Y Vector Outputs	Yes	No	Option	Option	No
Demodulation Axes		R-Y/B-Y	I/Q	R-Y/B-Y	R-Y/B-Y
Underscan	Yes	Yes	Yes	Yes	No
H-V Delay/Pulsecross	Yes	Yes	Yes	Yes	No
Color Standards	NTSC	NTSC	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
		.....	RGB	RGB	RGB
Multistandard Unit	No	No	Yes	No	Yes
Composite Inputs	2	2	3	2	1
Multipin VCR Input	No	No	No	No	Yes
RGB Inputs	No	1 set	1 set	1 set	2 sets
Rack-Mountable	Yes	Dual & single	Yes	Yes	Cabinet (27")
Reader Service Number	**1000**	**1001**	**1002**	**1003**	**1004**

More information on the manufacturers who advertised in this issue can be obtained by referring to their advertisements on the pages given.

Acoustic Materials
Alpha Audio 3

COLOR VIDEO MONITORS

Manufacturer	Barco		Bosch	Conrac Division	
Model/Series Number	**CTVM4 Series**	**CM22**	**MC51BAB2 Series**	**6200 Series**	**6100 Series**
CRT Diagonal (Inches)	14"/20"	9"	20"/15"/9"	19"/13"	19"
Preferred CRT Type	Black matrix	Black matrix	Delta gun	PIL/slot mask (19")	Delta gun
	.....	.....	HiRes shadow mask	PIL/dot mask (13")	.....
Beam Feedback Design	Yes	Yes	Option	No	Yes
Aspect Ratio	4H-3V	4H-3V	4H-3V	4H-3V	4H-3V
HDTV Product	Option	No	No	No	.....
Resolution in TVL	770 TVL	320 TVL	To 8MHz	600 TVL	600 TVL
Chroma Bandwidth	To 1.5MHz	.....	To 1MHz	To 8MHz	To 7MHz
Luma Bandwidth	±0.5dB to 7MHz	.....	To 7MHz	To 12MHz	To 6.5MHz
Comb Filter Design	Yes	Yes	Yes	Yes	Option
Blue Gun Test	Yes	Yes	As B/W picture	.....	No
NTSC Test Matrix	Yes	No	No	Yes	Yes
Aperture Correction	Yes	No	Yes	±6.5dB	±1dB
X-Y Vector Outputs	Yes	No	Yes	Yes	.....
Demodulation Axes	I/Q & R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y
Underscan	Yes	Yes	Yes	Yes	Yes
H-V Delay/Pulsecross	Yes	Yes	Yes	Yes	Yes
Color Standards	NTSC, PAL, SECAM, RGB	NTSC, PAL	NTSC, PAL, SECAM RGB	NTSC, RGB	NTSC, RGB .....
Multistandard Unit	Yes	No	Yes	No	No
Composite Inputs	2	2	3	3	3
Multipin VCR Input	No	Yes	No	No	No
RGB Inputs	1 set	1 set	1 set	.....	1 set
Rack-Mountable	Yes	Cabinet only	Yes	Yes	Yes
Reader Service Number	**1005**	**1006**	**1007**	**1008**	**1009**

COLOR VIDEO MONITORS

Manufacturer	Conrac Division		Croma Research	Electrohome	GEC McMichael
Model/Series Number	**5700 Series**	**5222 Series**	**CM1 Series**	**ECM 1301**	**GM7100 Series**
CRT Diagonal (Inches)	13"	25"	14"/16"/20"	13"/19"	14"/20"
Preferred CRT Type	Delta gun	Delta gun	In-line gun	In-line gun	In-line gun
	.....	Black matrix mask	Dot shadow mask	Shadow mask	Dot mask
Beam Feedback Design	No	No	.....	Yes	.....
Aspect Ratio	4H-3V	4H-3V	4H-3V	5H-4V	4H-3V
HDTV Product	No	No	No	Yes	No
Resolution in TVL	500 TVL	450 TVL	.....	720x512 pixel	600 TVL (20")
Chroma Bandwidth	To 5.5MHz	To 5.5MHz	To 5.5MHz	To 25MHz	To 6MHz
Luma Bandwidth	To 5.5MHz	To 5.5MHz	To 5.5MHz	To 25MHz	To 6MHz
Comb Filter Design	Option	No	.....	No	.....
Blue Gun Test	No	.....	.....	No	.....
NTSC Test Matrix	Yes	Yes	.....	No	.....
Aperture Correction	Yes	±6dB	Yes	No	Yes
X-Y Vector Outputs	.....	No	Option	No	.....
Demodulation Axes	R-Y/B-Y	R-Y/B-Y	.....	.....	.....
Underscan	Yes	Yes	Yes	Yes	Yes
H-V Delay/Pulsecross	Yes	Yes	Yes	.....	For PAL
Color Standards	NTSC, PAL, SECAM, RGB	NTSC	NTSC, PAL, SECAM RGB	RGB	NTSC, PAL, SECAM, RGB
Multistandard Unit	.....	No	No	No	No
Composite Inputs	3	3	3	No	2
Multipin VCR Input	No	No	No	No	No
RGB Inputs	1 set	1 set	1 set	1 set	1 set
Rack-Mountable	Yes	Yes	Yes	No	Yes
Reader Service Number	**1010**	**1011**	**1012**	**1013**	**1014**

COLOR VIDEO MONITORS

Manufacturer	Hitachi Denshi	Ikegami			Isie Communications
Model/Series Number	**CM1481**	**TM20-9RH Series**	**TM20-10RH Series**	**TM-751H**	**MCM37P Series**
CRT Diagonal (Inches)	13"	20"/14"/10"	20"/14"	30"	14"/20"
Preferred CRT Type	In-line gun	PIL gun, shadow mask	Yes	Delta gun	In-line gun
	.....	.....	Shadow mask	Shadow mask	Stripe or dot
	.....	0.43mm dot triad	.....	0.34mm	.....
Beam Feedback Design	No	No	Yes	Yes	.....
Aspect Ratio	4H/3V	4H-3V	4H-3V	5H-3V	4H-3V
HDTV Product	No	No	No	Yes	No
Resolution in TVL	260 TVL	600 TVL	525 TVL	1000 TVL	385 TVL (480 TVL dot)
Chroma Bandwidth	.....	To 3.58MHz	To 3.58MHz	To 25MHz	To 5MHz
Luma Bandwidth	.....	To 8MHz	To 10MHz	To 25MHz	To 5MHz
Comb Filter Design	.....	Yes	Yes	. ...	.....
Blue Gun Test	No	Yes	Yes	.....	.....
NTSC Test Matrix	No	Yes	Yes	No	No
Aperture Correction	No	Yes	Yes	.....	No
X-Y Vector Outputs	No	Yes	Yes	.....	No
Demodulation Axes	R-Y/B-Y	I/Q	I/Q	.....	.....
Underscan	No	Yes	Yes	Yes	Yes
H-V Delay/Pulsecross	No	Yes	Yes	Yes	.....
Color Standards	NTSC	NTSC, RGB	NTSC, RGB	HDTV	PAL, RGB
Multistandard Unit	No	No	No	No	Option
Composite Inputs	1	3	3	1 with decoder	2
Multipin VCR Input	No	Yes	Yes	No	Yes
RGB Inputs	No	1 set	1 set	2 sets	1 set
Rack-Mountable	No	Yes	Yes	Yes	Yes
Reader Service Number	**1015**	**1016**	**1017**	**1018**	**1019**

COLOR VIDEO MONITORS

Manufacturer	JVC				Lenco
Model/Series Number	**TM-R9U**	**TM-22U**	**TM-90U**	**TM-14PSN**	**ICM-214 Series**
CRT Diagonal (Inches)	9"	5"	9"	13"	14"/19"
Preferred CRT Type	In-line stripe	In-line gun	In-line gun	In-line gun	PIL gun, shadow mask
	0.47mm dot triad	Stripe mask	.....	Black matrix	0.61mm slot mask
Beam Feedback Design	.....	No	No	No	No
Aspect Ratio	4H-3V	4H-3V	4H-3V	4H-3V	4H-3V
HDTV Product	No	No	No	No	No
Resolution in TVL	310 TVL	.....	.....	270 TVL NTSC	350 TVL
Chroma Bandwidth	To 4MHz	To 4MHz	To 3.58MHz	.....	To 5MHz
Luma Bandwidth	To 5MHz	To 4MHz	To 4MHz	.....	To 6MHz
Comb Filter Design	Yes	.....	.....	.....	No
Blue Gun Test	Yes	No	No	No	No
NTSC Test Matrix	No	No	No	No	No
Aperture Correction	No	No	No	No	Yes
X-Y Vector Outputs	No	No	No	No	No
Demodulation Axes	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	I/Q
Underscan	Yes	No	No	No	Yes
H-V Delay/Pulsecross	Yes	No	No	No	No
Color Standards	NTSC	NTSC	NTSC, RGB	NTSC, PAL, SECAM	NTSC
Multistandard Unit	No	No	No	Yes	No
Composite Inputs	2	2	2	3	2
Multipin VCR Input	No	Yes	Yes	Yes	No
RGB Inputs	No	No	Yes	No	No
Rack-Mountable	Yes	Portable	Yes	No	Cabinet only
Reader Service Number	**1020**	**1021**	**1022**	**1023**	**1024**

COLOR VIDEO MONITORS

Manufacturer	Lenco	Panasonic	Philips	Sharp Broadcast	Sony Broadcast
Model/Series Number	**PCM-519 Series**	**AT-H190G Series**	**LDH-6200 Series**	**XM-1300**	**BVM 1900**
CRT Diagonal (Inches)	19″/14″	19″/13″	14″/20″	13″	19″/12″/4″
Preferred CRT Type	PIL gun, shadow mask 0.47mm dot pattern	Delta gun, shadow mask 0.43mm pattern	PIL gun	In-line gun Black mask 0.31mm	Trinitron 0.3mm dot pitch
Beam Feedback Design	No	Yes	Yes	No	.....
Aspect Ratio	4H-3V	4H-3V	4H-3V	4H-3V	4H
HDTV Product	No	No	No	No	No
Resolution in TVL	625 TVL	600 TVL	>310 TVL	600 TVL	900 TVL
Chroma Bandwidth	To 5MHz	To 1.3MHz	To 0.9MHz	.....	To 10MHz
Luma Bandwidth	To 6MHz	To 8MHz	To 5MHz	To 7MHz	To 10MHz
Comb Filter Design	Yes	Yes	Yes	Yes	Yes
Blue Gun Test	Yes	Yes	No	Yes	Yes
NTSC Test Matrix	No	No	No	No	Yes
Aperture Correction	±5dB	±6dB	±4dB	Yes	To ±8dB
X-Y Vector Outputs	No	No	No	No	Yes
Demodulation Axes	I/Q	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y
Underscan	Yes	Yes	Yes	Yes	Yes
H-V Delay/Pulsecross	Yes	Yes	Yes	Yes	Yes
Color Standards	NTSC, RGB	NTSC, RGB	NTSC, PAL, RGB	NTSC	NTSC
Multistandard Unit	No	No	No	No	No
Composite Inputs	2	2	2	2	2
Multipin VCR Input	No	No	No	No	.....
RGB Inputs	2 sets	1 set	1 set	1 set	Yes
Rack-Mountable	Yes	Yes	Yes	Yes	Yes
Reader Service Number	**1025**	**1026**	**1027**	**1028**	**1029**

COLOR VIDEO MONITORS

Manufacturer	Sony	Tektronix		Videotek		
Model/Series Number	**HDM-1800**	**650HR Series**	**6908R**	**HR-130**	**Studio-13**	**VM-13PRO Series**
CRT Diagonal (Inches)	18″	12″	19″	13″	13″/8″/15″/17″/26″	13″/8″/15″/17″/26″
Preferred CRT Type	Trinitron	Single gun Stripe mask	Delta gun, dot mask 0.43mm pattern	PIL gun, delta dot	In-line gun Stripe mask	In-line gun Stripe mask .....
Beam Feedback Design	Yes	No	Yes	Yes	Yes	Yes
Aspect Ratio	5H-3V	4H-3V	4H-3V	4H-3V	4H-3V	4H-3V
HDTV Product	Yes	No	Yes	No	No	No
Resolution in TVL	625 TVL horizontal	480 TVL	600 TVL	600 TVL	380 TVL	340 TVL .....
Chroma Bandwidth	To 30MHz	To 1.2MHz	To 1.2MHz	To 4.58MHz	3.58MHz ±975kHz	3.58MHz ±975kHz
Luma Bandwidth	To 30MHz	To 6MHz	To 10MHz	To 10MHz	To 3.2MHz	To 3.2MHz
Comb Filter Design	.....	No	Yes	Yes	Yes	No
Blue Gun Test	.....	Yes	Yes	Yes	Yes	Yes
NTSC Test Matrix	Not applicable	Yes	Yes	No	No	No
Aperture Correction	.....	±10dB	±10dB	+6dB	±3dB	±3dB
X-Y Vector Outputs	.....	Yes	No	No	No	No
Demodulation Axes	.....	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y	R-Y/B-Y
Underscan	Yes	Yes	Yes	Yes	Yes	Yes
H-V Delay/Pulsecross	Yes	Yes	Yes	Yes	Yes	Yes
Color Standards	HDTV	NTSC, PAL, SECAM, RGB	NTSC, RGB	NTSC	NTSC	NTSC .....
Multistandard Unit	No	Yes	No	No	No	No
Composite Inputs	.....	2	2	3	3	3
Multipin VCR Input	No	Yes	No	No	No	No
RGB Inputs	2 sets	1 set	1 set	Yes	No	No
Rack-Mountable	HDM-1100 11″ diagonal	Yes	Yes	Yes	Yes	Yes .....
Reader Service Number	**1030**	**1031**	**1032**	**1033**	**1034**	**1035**

AM MODULATION MONITORS

Equipment to monitor amplitude modulation parameters.

Manufacturer	Belar Electronics		Harris Broadcast	QEI Corporation	TFT
Model Number	**AMM-2A**	**AMM-3**	**AM-90**	**#571**	**#753**
Frequency Range	200kHz-160MHz	200kHz-160MHz	450kHz-30MHz	540-1600kHz	500kHz-4MHz
Frequency Selector	Broadband	Broadband	Broadband	Broadband	Pre-selectors
Input Level Off-Air	100μV w/ opt RF amp	100μV w/ opt RF amp	1-10Vrms (direct)	2-10Vrms (direct)	100μV
Modulation Range	±133%	+100%, +133%	−100%, +140%	0-133%	−100%, +125%
Input Attenuator	No	No	Internal control	.....	Yes
AF Meter Response	0.5dB/20Hz-25kHz	0.5dB/20Hz-25kHz	Not applicable	−0.2dB/30Hz-10kHz	2%/50Hz-10kHz
Peak Mod Indicators	±130% flashers	Flashers & LEDs	−100/125% pgmable	Flasher	Flashers
AF Signal Output	10dBm	10dBm	10dBm	2.5Vrms in 600	0dBm
Distortion Rating	0.25%	0.25%	0.15%	0.25%	0.25% at 400Hz
S/N Ratio	75dB below 100% mod	75dB below 100% mod	75dB below 100% mod	>75dB below 100% mod	>75dB
Alarm/Indicator For—	.....	.....	.....	.....	.....
Carrier Failure	Lamp/relay closure	Lamp/relay closure	Lamp/relay closure	Yes	Relay closure
Modulation Failure	Relay closure option	Relay closure option	Lamp/relay closure	.....	Relay closure
ATS Compatible	Yes	Yes	Yes	.....	Yes
Frequency Counter	No	No	No	No	Yes
AM Stereo Use	Yes	Yes	Not applicable	.....	Yes
Reader Service Number	**858**	**859**	**861**	**862**	**863**

FM MODULATION MONITORS

Modulation monitoring system for FM broadcast spectrum, 88-108MHz. RF input impedance typically 50Ω. Deviation at 100% is ±75kHz. Standard 75μs de-emphasis.

Manufacturer	Belar Electronics	McMartin Industries	QEI Corporation	Rohde & Schwarz
Model Number	**FMM-2**	**TBM 3500B**	**#691**	**FKD/FKDL**
Frequency Selector	Crystal	Crystal	Tuned PLL	Tuned PLL
Input Level Off-Air	100μV w/ opt RF amp	0.35Vrms	3.16mVrms	7.5V (direct)
Modulation Range	To 133%	±133%	0% to 133%	0 to 77.5kHz
Input Attenuator	No	Yes	Yes	No
AF Meter Response	±0.25dB/50Hz-100kHz	0.25dB/20Hz-15kHz	0.2dB/30Hz-75kHz	0.5dB/40Hz-65kHz
Meter Accuracy	2%	1% at 5kHz	±2% at 5kHz	5%
Peak Modulation Adj	Yes	To 133%	To 199%	No
Residual AM Monitor	Internal	Internal	Internal	No
Composite Output	Yes	Yes	Yes	Yes
AF Output Level	10dBm	0dBm	10dBm	6dBm
Distortion Rating	0.01% 50Hz-75kHz	0.15% 20Hz-15kHz	0.05% 30Hz-15kHz	0.3% 30Hz-15kHz
S/N Ratio	90dB below 100% mod	80dB below 100% mod	>75dB below 100% mod	66dB
Alarm/Indicator for—				
Carrier Failure	Lamp/relay closure	Lamp	Lamp	Lamp/relay closure
Modulation Failure	Relay closure option	None	Lamp	.....
Stereo Monitor	Output for FMS-2	Output available	Integral	Integral
SCA Monitor	Output available	Output available	Integral	Integral
ATS Compatible	Yes	Yes	Yes	Yes
Reader Service Number	**874**	**875**	**876**	**877**

Manufacturer	TFT		
Model Number	**#724A**	**#763**	**#844**
Frequency Selector	Tuned PLL	Tuned PLL	50kHz/step PLL
Input Level Off-Air	0.5V/600 (direct)	1-7V (direct)	1mV
Modulation Range	To 133%	To 133%	±133%
Input Attenuator	Yes	Yes	.....
AF Meter Response	±4dB	0.1dB/100Hz-75kHz	0.35dB/50Hz-15kHz
Meter Accuracy	.....	.....	±2% at 5kHz
Peak Modulation Adj	Yes	Yes	To ±199%
Residual AM Monitor	Internal	Internal	Internal
Composite Output	Yes	Yes	Yes
AF Output Level	1Vrms	0dBm	0dBm
Distortion Rating	0.25% 50Hz-15kHz	0.1% SMPTE standard	0.1% 50Hz-120kHz
S/N Ratio	60dB below 100% mod	75dB below 100% mod	80dB below 100% mod
Alarm/Indicator for—			
Carrier Failure	.....	Relay closure	Relay closure
Modulation Failure	.....	Relay closure	Relay closure
Stereo Monitor	Integral	Integral	Integral
SCA Monitor	Integral	Integral	Output available
ATS Compatible	.....	Yes	Yes
Reader Service Number	**878**	**879**	**880**

VECTORSCOPES

Video signal monitoring equipment providing a CRT display of phase and amplitude characteristics of the TV video system. Other functions may be included.

Manufacturer	Electronic Visuals		Hitachi Denshi	Leader Instruments	Philips T&M
Model Number	**4021 Vector Monitor**	**4061 Signal Monitor**	**V-089**	**5850B (5850A)**	**PM 5567**
Display Size	10x8cm	10x8cm	3.5"	10x8cm	10x8cm
Graticule Type	Internal	External	External	Generated	Internal
Color Standards	NTSC/PAL	NTSC/PAL	NTSC	NTSC (PAL)	NTSC/PAL
Other Functions—					
Waveform Monitor	No	Yes	No	No	No
Oscilloscope	No	No	No	No	No
Video Inputs	A & B	A & B	A & B	A & B	A & B
Subcarrier Input	Yes	Color black	Yes	Yes	Or color black
Sync Input	No	Color black	.....	No	No
Display Reference	A, B or ext	A, B or ext	A or B	A, B or ext	A, B or ext
Calibrator	No	Yes	Test circle	Test circle	Test circle
Measurement Range—					
Differential Phase	20°	20°	.....	Within 1°	20°
Differential Gain	10%	10%	.....	1%	20%
VITS Line Selector	No	No	No	.....	No
Bench Case	Yes	Yes	Yes	Yes	Yes
Rack Mount	2-wide	2-wide	3-wide	2-wide	2-wide
Reader Service Number	**864**	**865**	**866**	**867**	**868**

Manufacturer	System Video Ltd.	Tektronix			Videotek
Model Number	**1255 Vector Monitor**	**520A Series**	**1420 Series**	**1750 (1740)**	**VSM-5A (VSM-5A/P)**
Display Size	10x10cm	5"	10x8cm	10x8cm	10.9x8.9cm
Graticule Type	Internal	Internal	Internal	Internal (int/ext)	Internal
Color Standards	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC/PAL	NTSC (PAL)
Other Functions—					
Waveform Monitor	No	No	No	Yes	No
Oscilloscope	X-Y display	No	No	SCH phase 1750 only	No
Video Inputs	A, B and alternate	A & B	A & B	A & B	A & B
Subcarrier Input	Yes	Yes	Yes	Color black	Yes
Sync Input	Yes	Yes	No	No	No
Display Reference	A, B or ext	A, B or ext	A, B or ext	A, B or ext	A, B or ext
Calibrator	Yes	Circle & vertical	No	Both H and V	No
Measurement Range—					
Differential Phase	2°	±10°	±10°	.....	<1°
Differential Gain	2%	±10%	±10%	.....	<1%
VITS Line Selector	No	Yes	No	9-24 by field 1750	No
Bench Case	Yes	Yes	Yes	Yes	Yes
Rack Mount	2-wide	Full width	2-wide	2-wide	2-wide
Reader Service Number	**869**	**870**	**871**	**872**	**873**

WAVEFORM MONITORS

Manufacturer	Electronic Visuals	Elektroimpex	Leader Instruments	Philips T&MI	System Video Ltd.
Model Number	**4041 Waveform Monitor**	**TR-1854/H113**	**LBO-5860L (5861)**	**PM 5565**	**#1254**
Display Size	10x8cm	10x8cm	9.5x7.6cm	10x8cm	10x10cm
Graticule Type	External	External	Internal	Internal	Internal
Color Standards	NTSC/PAL	PAL/SECAM/NTSC	NTSC (PAL/SECAM)	CCIR G/M/N	NTSC/PAL/SECAM
Other Functions	None	No	No	No	No
Calibrator	Vertical	Yes, also ext	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma, diff gain	Flat, band-pass, low-pass	Flat, IRE, chroma, diff, gain	Flat, luma, chroma	Flat, IRE, chroma, diff gain, linearity
Horizontal Time Base	1-/2-line, 1-/2-field, 2-line/field expand	5μs/cm, 10μs/cm, 1-line, 2-field	1μs/cm 2-V mag, 2-line, 2-field	1-H/V, 2-H/V, 2H-/2V-magnified	1-/2-line, 1-/2-field, 1H/2H/2V, expanded
Expansion Factor	10x	5x, 20x, 25x	10x, 20x	2Hx10, 2Vx20	12.8x
RGB/YRGB Capable	Yes	Yes	Yes	Yes	Yes
dc Restore/Clamp	Back porch	Back porch	Back porch	Back porch, sync tip	Black level
VITS Line Selector	Option	Yes	Yes	No	Digitally any line
Line Strobe Output	Yes	.....	Blanking out	No	Yes
Test Probe Input	Yes	No	No	Yes	No
Waveform Comparison	No	No	No	No	Yes
Bench Case	Yes	Yes	Yes	Yes	Yes
Rack Mount	2-wide	Full-width	2-wide	2-wide	2-wide
Reader Service Number	**849**	**850**	**851**	**852**	**853**

Manufacturer		Tektronix		Videotek
Model Number	**#528A**	**1480 Series**	**1740 (1750)**	**TSM-5A (TSM-5A/P)**
Display Size	10x8cm	10x8cm	10x8cm	10.3x8.3cm
Graticule Type	Internal	Internal/External	Int/Ext (Int 1750)	Internal
Color Standards	NTSC/PAL/SECAM	NTSC/PAL/SECAM	NTSC/PAL	NTSC (PAL)
Other Functions	No	No	Vectorscope	No
Calibrator	Yes	Yes	Yes	Yes
Vertical Response	Flat, IRE, chroma, diff gain	Flat, low-pass, luma, band-pass, linearity	Flat, IRE, chroma, ...	Flat, IRE, chroma, diff gain
Horizontal Time Base	2-line, 2-field, 2H/2V expanded	0.1/0.2/0.25/0.5/1μs 5/10μs, 2-field	1H/1V/2H/2V 2H/2V expanded	1-/2-line, 2-field, 1H/2H/2V expanded
Expansion Factor	1μs/division	2x, 5x, 10x, 50x	0.2μs, 0.5μs, 1μs/div	20x
RGB/YRGB Capable	Yes	Yes	Yes	Yes
dc Restore/Clamp	Back porch	Back porch, sync tip	Back porch	Back porch
VITS Line Selector	No	Digital & 15-line	Digital selection	Digital selection
Line Strobe Output	No	Yes	Yes	No
Test Probe Input	No	Yes	.....	No
Waveform Comparison	No	Yes	No	No
Bench Case	Yes	Yes	Yes	Yes
Rack Mount	2-wide	Full-width or 2-wide	2-wide	2-wide
Reader Service Number	**854**	**855**	**856**	**857**

TV DEMODULATORS

Manufacturer	Electroimpex	Philips T&MI	Plisch Electronics	Rohde & Schwarz
Model Number	TR-0771 Series	PM 5560M	FME465 with CRT	EKF-2 (EKF-2/D)
Frequency/Band	CCIR I/II/III/IV/V	IF/VHF/UHF	CCIR I/III/IV/V	VHF/UHF/IF (CATV)
Channel Selector	Push-button/vernier	Thumbwheel PLL	Synthesized	Fixed & tuned
Input Level Off-Air	18V max VHF & UHF	100mVrms VHF & UHF	30μV-10mV	250μV-150mV EKF-2
Input Level IF	9V max	70mVrms	0.32mV-100mV	5mV-100mV
Level Indicator	Multiscale meter	Meters	7-segment LEDs	Meter (LEDs)
Zero-Carrier Input	Integral pulse	Yes	Integral pulse	Yes
Envelope Detection	Yes	Yes	Yes	Yes
Quadrature Detection		Synchronous	Synchronous	Synchronous
ATS Compatible		Yes	Yes	.....
Number Video Outputs	2	3 composite/2 sync	2 composite	4
SAW Filtering	Nyquist filtering	.....	.....	.....
Aural Deviation Out	Yes	Yes	.....	Yes
Intercarrier Input	.....	Yes	.....	.....
Aural Signal Reject	Yes	Yes	Yes	Yes
Remote Control	No	Yes	No	Yes
	For CCIR B/G/M/OIRT GOST specifications	.....	.....	.....
Reader Service Number	881	882	883	884

Spec Note:
Performance specs are not directly comparable because of variations in references used by manufacturers in determining those specifications' values. Equipment performance should be discussed with the manufacturers' representatives before making final decisions.

TV DEMODULATORS

Manufacturer	Telemet	Tektronix	Videotek
Model Number	#3710	1450-1	DM-4RA (DM-40R)
Frequency/Band	IF/VHF/UHF	IF/VHF/UHF	VHF/UHF (& CATV)
Channel Selector	Fixed/crystal-tuned	Fixed or variable	Synthesized PPL
Input Level Off-Air	0.5mV to 50mV	−69dBm to 27dBm	>15μV
Input Level IF		−64dBm to −20dBm	.....
Level Indicator	7-segment LEDs	7-segment LEDs	None
Zero-Carrier Input	Yes	Yes	No
Envelope Detection	Yes	Yes	No
Quadrature Detection	Synchronous	Synchronous	Yes
ATS Compatible	Yes	.....	No
Number Video Outputs	4	2	2
SAW Filtering		Yes	Yes
Aural Deviation Out	Yes	Yes	DM-4RA only
Intercarrier Input		Yes	DM-40R only
Aural Signal Reject	Yes	Yes	No
Remote Control	No	Yes	DM-40R only
Reader Service Number	885	886	887

Service/Parts Centers

The manufacturers advertising in the 1984 SPEC BOOK have provided the addresses and telephone numbers of Service Centers and Parts Depots for your convenience.

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

Aristocart Division
Western International
505 Burrard St.
Vancouver, BC, Canada V7X 1M6
604-687-2844

Belar Laboratories
Box 76, Lancaster Ave. at Dorset
Devon, PA 19333
215-687-5550

Broadcast Systems
8222 Jamestown Drive
Austin, TX 78758
512-836-6011

BSI Great Lakes
(Livonia, MI)
313-464-2131

BSI Midwest
(El Dorado Springs, MO)
417-876-6254

BSI Northeast
(Woodbridge, VA)
703-494-4998

BSI Southeast
(Cropwell, AL)
205-525-5467

BSI West
(Nipomo, CA)
805-541-3080

Camera Mart
456 West 55th St.
New York, NY 10019
212-757-6977

Video Service Department
800 Tenth Ave.
New York, NY 10019
212-757-6997

Canon USA
One Canon Plaza
Lake Success, NY 11042
516-488-6700

West Coast Office
123 Paularino Ave. E.
Costa Mesa, CA 92626
714-979-6000

Cetec Vega
9900 Baldwin Place
El Monte, CA 91731
213-442-0782

Circuit Research Labs
2522 West Geneva Drive
Tempe, AZ 85282
602-438-0888
800-538-7648

Continental Electronics Mfg. Co.
P.O. Box 270879
Dallas, TX 75227
214-381-7161
214-327-4533 (24-hr parts/service)

FOR-A Corporation
49 Lexington St.
West Newton, MA 02165
617-244-3223

Fujinon Optical
672 White Plains Road
Scarsdale, NY 10583
914-472-9800

Fujinon Optical
(Carson, CA)
213-532-2861

Fujinon Optical
(Carrollton, TX)
214-385-8902

Sony Pro Audio
Sony Drive
Park Ridge, NJ 07656

Sony Broadcast Company
1600 Queen Anne Road
Teaneck, NJ 07666
201-883-5200

TASCAM
7733 Telegraph Road
Montebello, CA 90640
213-726-0303

TEAC
(Arlington Heights, IL)
312-640-6181

TEAC
(Little Ferry, NJ)
201-641-5600

TEAC
(Aiea, HI)
808-487-3588

TEAC
(Atlanta, GA)
404-458-2880

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

Videomedia Inc.
211 Weddell Drive
Sunnyvale, CA 94086-1674
408-745-1700

Videotek
125 N. York St.
Pottstown, PA 19464
215-327-2292

Videotek
9625 N. 21st Drive
Phoenix, AZ 85021
602-997-7523

Ward-Beck Systems
841 Progress Ave.
Scarborough, Ont., Canada M1H 2X4
416-438-6550

Ward Beck
(Annisquam, MA)
617-283-7507

Ward Beck
(Dallas, TX)
214-247-5999

Clifford B. Hannay & Son
402 Main St.
Westerlo, NY 12193
518-797-3791

Hughey & Phillips
3050 N. California St.
Burbank, CA 91504
213-849-1104

Interphase
2060 Menold Drive
Allison Park, PA 15101
412-366-3827

JBL Inc.
8500 Balboa Blvd.
P.O. Box 2200
Northridge, CA 91329
818-893-8411

JVC Company
41 Slater Drive
Elmwood Park, NJ 07407
800-526-5308

JVC Company
(Compton, CA)
213-537-6020

JVC Company
(Elk Grove Village, IL)
312-364-9300

JVC Company
(Houston, TX)
713-694-0666

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

K&H Products
Box 406
North Bennington, VT 05257
802-442-9118

Larcan Communications
6520 Northam Drive
Mississauga, Ontario
Canada L4V 1H9
416-678-9970

Leader Instruments
380 Oser Ave.
Hauppauge, NY 11788
800-645-5104

Midwest Corporation
One Sperti Drive
Edgewood, KY 41017
606-331-8990
800-543-1584

Midwest
(Atlanta, GA)
404-875-3753

Midwest
(Charlotte, NC)
704-399-6336

Midwest
(Columbus, OH)
216-447-9745

Midwest
(Indianapolis, IN)
317-251-5750

Midwest
(Miami, FL)
305-592-5355

Midwest
(Troy, MI)
313-689-9730

Midwest
(Nashville, TN)
615-331-5791

Midwest
(Nitro, WV)
304-722-2921

Midwest
(St. Louis, MO)
314-225-4655

Perrott Engineering Labs
7201 Lee Highway
Falls Church, VA 22046
703-528-5861

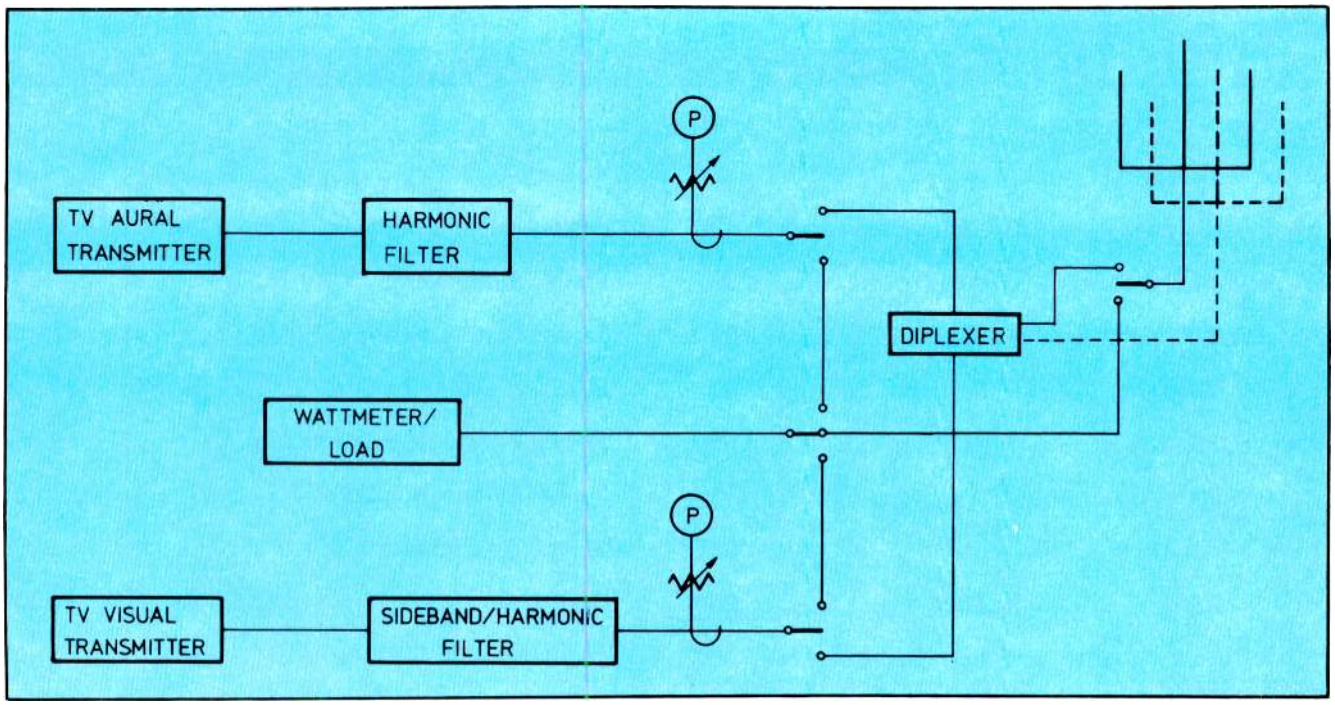


Figure 4. Power output measuring points for a TV transmission system. The patching arrangement shown allows accurate measurements of aural and visual transmitter power.

Continued from page 102

transmitted; and an all-white scene, the least power.

The power-indicating meter at the output of a TV visual transmitter would, thus, vary as the luminance and composition of the transmitted scene changed. For standardization, TV stations are licensed to operate at peak visual power, which is the power level occurring during the transmission of the synchronization pulses. The transmission line meter in the visual transmitter is designed to respond to the peak of the synchronizing pulses, rather than the average of the composite video signal.

The calibration procedure for this peak meter, using a standard RF power meter, is the same as for the TV aural meter previously outlined, except that a "black" video signal is transmitted. By knowing the composition of the video signal waveform, accurate calibration can be made. The actual peak video pulse power is 168% of the power indicated on the average indicating power meter. Therefore, when calibrating the transmitter meter for 100% of licensed power, the external (average responding) power meter will indicate 59.6% of the licensed visual power.

The calibration is to be made with the calibrating wattmeter connected after all filters in the output network. TV transmitters may use either internal or external vestigal sideband filters. Some systems combine the vestigal sideband filter with the aural transmitter output using a device called a filterplexer. And, although the aural and visual signals are radiated by the same antenna, some antenna systems use two transmission lines. This is further complicated with the use of new transmitter designs which feature a common amplifier for the aural and visual signals. Other transmitter systems parallel power amplifiers and feed the output to a diplexer. The connection of an external calibrating wattmeter must, therefore, be made only after careful consideration of the output system configuration.

The commission's rules specify that the visual operating power is to be determined following the system filters. The calibrating power meter can be substituted for the transmission line to the antenna, with the calibration made with the aural transmitter turned off. The RF power measured using this procedure is, thus, the visual signal with the lower sideband suppressed. If the calibration power meter is connected before the vestigal sideband filter, the calibration factors discussed previously would no longer be valid. When the vestigal sideband filter is internal to the transmitter, the calibration wattmeter should be connected in the circuit following as much of the filtering and diplexing equipment as possible.

Keep in mind that the losses through the various filters and other components of the diplexing system—if not correctly considered—will result in incorrect operating power determination. Although the FCC has relaxed the minimum power requirements and tolerance for TV aural transmissions, some stations prefer to operate with the maximum authorized facilities. An error of up to several decibels can result from incorrectly evaluating the filter and diplexing system configuration.

Conclusion

The FCC has issued a Notice of Proposed Rulemaking that will permit the use of alternative methods of power determination not limited by either current measurements or transmission system technology. Hopefully, many of the problems pointed out in this article—as well as some that may have been overlooked—will be brought to the commission's attention for resolution.

In the meantime, station engineers—particularly those at TV stations—should carefully review the metering of their transmission system. Through a careful study of the system, correction of errors and improvement in operating meter calibration procedures can be accomplished.

This article was adapted from a paper delivered by Reiser to the 4th annual WOSU Broadcast Engineering Conference, co-sponsored by the WOSU stations and **Broadcast Engineering** magazine.

ad index

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This advanced custom Ward-Beck 40-input stereo TV production console, combining mono and stereo mixing facilities, is now operating at WFMY-TV in Greensboro, North Carolina.

When WFMY decided to move into stereo television production they asked leading manufacturers to submit designs and bids on this project. Ward-Beck's inclusion in this select group brought Harte-Hanks Communications the benefits of innovative and extensive engineering expertise employing sophisticated modules well-proven under the rigorous demands of the major networks.

The fact that this comprehensive package actually came in at the most acceptable price made the ultimate choice very easy.

WBS

First by Design.

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