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Dear Readers:

The 1982 Spec Book continues the concept of specification comparison introduced in the 1981 issue. Users are not expected to make final decisions regarding purchases from information contained in this issue. It is provided as a means to initial location of sources for a variety of equipment. It must be pointed out that spec values included in this listing are those provided by the manufacturers. As a result, *exact comparison of performance specifications is not possible,* due to varying references used by manufacturers in their testing procedures. Space precludes a listing of the technical data required to make such exact comparisons more realistically possible.

The second issue of the Spec Book series has incorporated several new concepts to improve the information given. First, manufacturers were invited to indicate those models of their line that they felt were their most important products. As far as possible, the indicated models will be found within the tables. Second, the manufacturers were invited to provide the values for many of the spec items. When they accepted the invitation, that information is given, thus reducing the need for data interpretation which might otherwise be needed. Third, in order to better compare values, spec values have been listed for one model of a series (in some cases). References are made to additional models in the series. The approach seems more practical than a list of multiple models with the identical spec numbers, when the only real difference involves a power level or a number of microphone inputs.

Several new equipment categories are included, reflecting interests indicated by users of the 1981 issue. Original equipment areas are expanded somewhat to allow a wider span of information in a more compact volume. Where late breaking information became available, notes are included when actual data was not provided prior to press time.

Advertising companies in this volume are denoted throughout the listings by a red, blue or green field behind the company names depending on the chapter of the issue. Parts and service centers for those advertisers are listed on page 119 for your convenience. Also a bingo number has been assigned to each product to aid in obtaining further information from the manufacturers.

Look to **Broadcast Engineering** and **Spec Book** when you need information. If what you seek is not in the files, we'll find it or get you in touch with the proper people for the data you seek. For assistance, write: Spec Book Editor, **Broadcast Engineering,** P.O. Box 12901, Overland Park, Kansas 66212-9981.

Carl Bentz
Spec Book Editor

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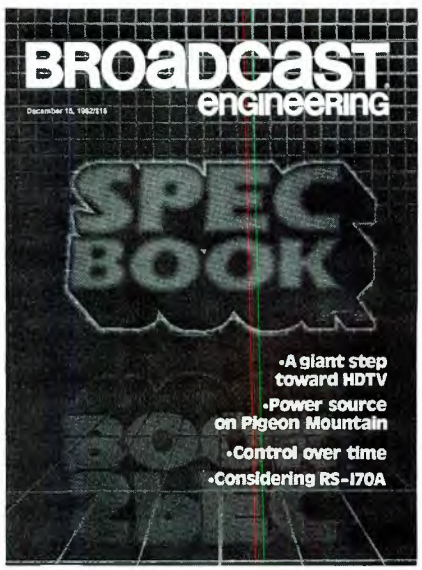

Damon Rarey, Aurora, worked from suggestions to create the cover design on an electronic graphics system. Grids represent the engineer's worksheet, from the equipment design to the station design point of view. The mirror imaging of the issue title reminds us to at least glance back, while looking forward to the many innovations pending in our future.

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Implementing RS-170A

By John Loughmiller, Midwest Corporation, Louisville, KY

In well-produced video material, any video manipulating, editing or other effects should not be apparent in themselves beyond the director's instructions. A properly phased video plant through use of RS-170A can remove some of the more *mechanical* technical problems toward *invisible video.*

When gas was 30 cents a gallon and TV pictures were just varying shades of gray, editing videotape was simpler from a conceptual standpoint. In those days, the process was much like editing film. First, you mixed a little powdered iron and naptha and painted it on the tape. The magnetic patterns recorded on the tape *developed* as the naptha evaporated. With close observation you could find the frame pulse. A little work with a razor blade and some Mylar tape, and presto—you had an edit! Then the electronic splicer came and with it the possibility of self-destruction via naptha explosion vanished.

If NTSC color television had never been invented, life might have remained simple for videotape editors. But with NTSC color came the infamous *non-color-framed edit* and slight horizontal picture shifts at the edit points. Non-color-framed edits occur because there are two monochrome fields per TV frame and four color fields that occupy two frames of vertical scan time. Stated another way, the time required for a given sample of subcarrier to rotate vectorially 360° in phase is the same as the time required for four monochrome fields of picture information to occur.

When an edit is made with disregard to this basic 4-field structure of the NTSC signal, there is a possibility of introducing a random instantaneous timing error at the edit point. Only when there is no subcarrier phase discontinuity at the edit point will there be no horizontal shift in the picture. Left to chance, there is a 50-50 probability that the edit will not be color-framed. The same 50-50 chance applies to the picture horizontal shift.

The premise of RS-170A recognizes that there are four color fields. It attempts to quantify the relationship in a manner calculated to enable equipment manufacturers to design around the problem.

Phased at last

One of the strong points for the PAL system used in much of the world has been the recognition of the 4-field relationship. With RS-170A, NTSC also recognizes the relationship, rectifying one of its most serious shortcomings. The manner is deceptively simple.

If one were to extend the reference burst 19 cycles toward the leading edge of horizontal sync (backward in time), it could be made to zero-cross at a point 50% down the leading sync

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edge. With that condition satisfied, if a reference point on Line 10 is observed through four fields, the zero-crossing of subcarrier could always be made positive-going on the first color field, negative-going on the second and third color fields and positive-going again on the fourth field. Under present RS-170, the burst can be almost anywhere with respect to horizontal sync. As a result, the zero-crossing condition is not reliably predictable with regard to any specific color field.

With the RS-170A parameters in mind, manufacturers can make certain that videotape recorders always make color-framed edits, because the subcarrier/horizontal phase relationship is solidly defined. Type C 1-inch recorders take advantage of this relationship by encoding a pulse on the control track to coincide with the start of Color Field 2. If RS-170A signals

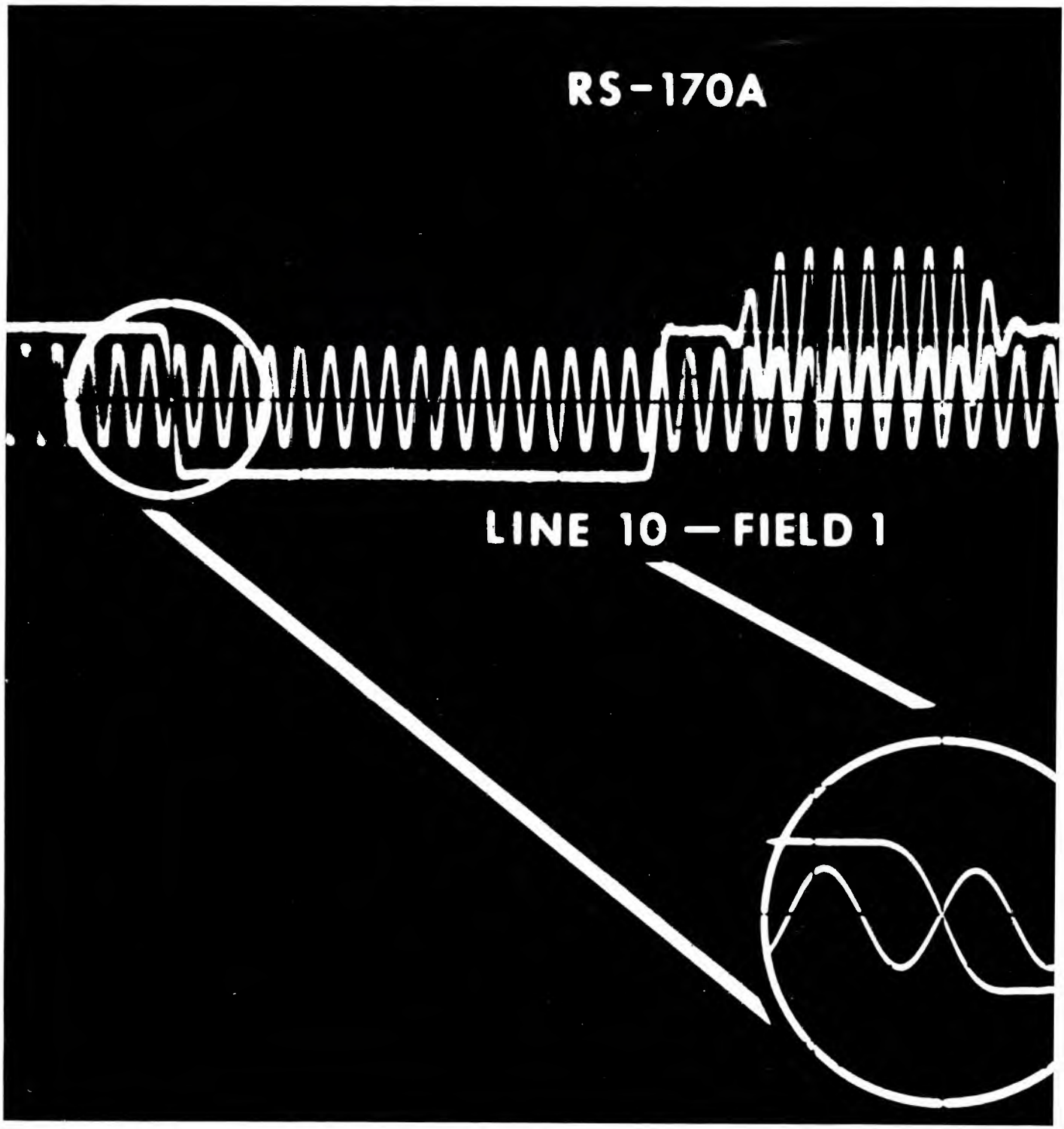


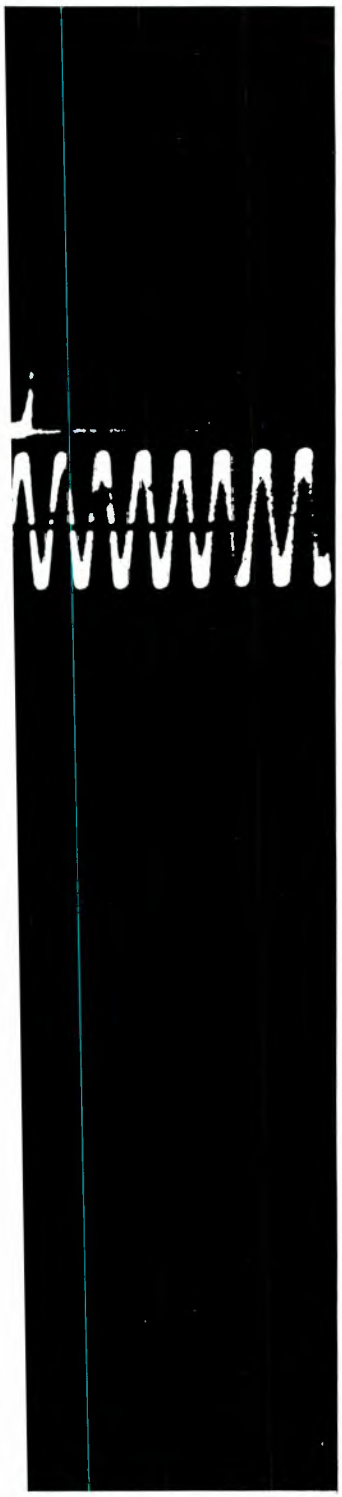
Figure 1. Extending the subcarrier signal backward in time by 19 cycles from the beginning of burst on Line 10 of Field 1, RS-170A causes the positive-going burst waveform to zero-cross at the 50% point on the leading edge of H-sync.

are being used, there is a high degree of probability that edits on these machines will be color-framed. That assumes that the manufacturer provides circuitry to correct non-color-framed conditions, for example, reframing the capstan servo.

Yes, but...

There always seems to be a "yes, but...," and RS-170A is no exception. The problem is to prove at the studio that each source complies with the RS-170A specification. Also, each source must be in total time and phase with all other sources.

Perhaps the greatest problem lies in identifying the color field being observed. Next in difficulty is artificially extending burst by 19 cycles toward a sync pulse that preceded it in time in order to examine the sync/burst phase relationship. The second problem is solved more easily through



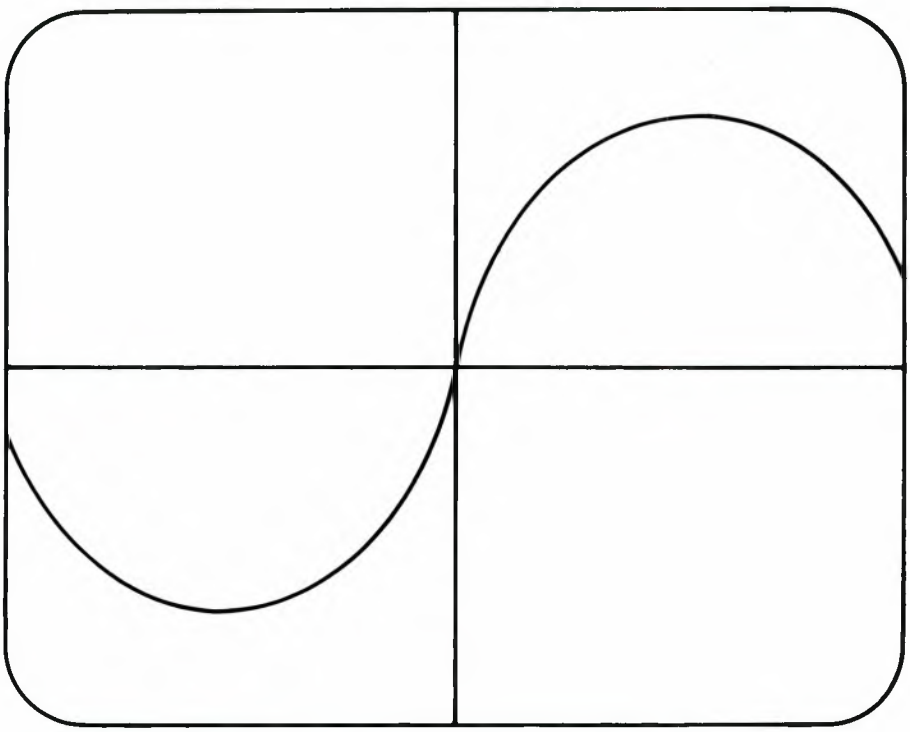


Figure 2. The display produced by Lenco's videoscope indicates that the subcarrier/horizontal phasing relationship is *certified.*

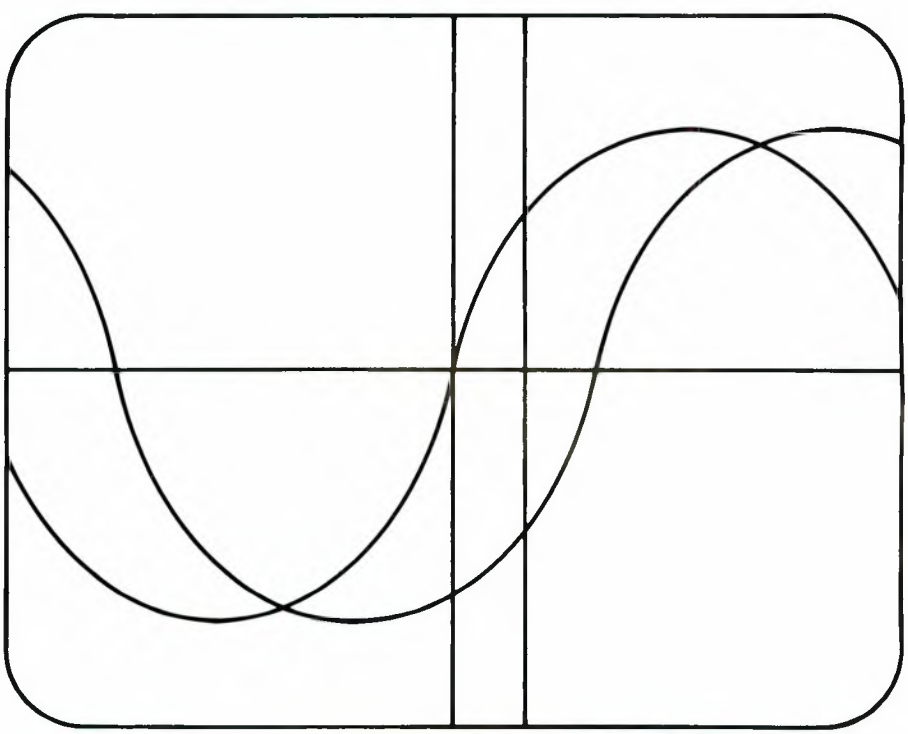


Figure 3. A compare mode of the videoscope allows two signals to be observed simultaneously, making the process of source-timing into a switcher much easier.

precise phase locking. A signal may be developed that can be checked for the zero-crossing position and the phase relationship to prove RS-170A.

Identifying the color fields remains the problem. Using an oscilloscope would require a 15Hz repetition rate on the horizontal axis, because a given color field occurs at a 15Hz rate. Further, one cycle of subcarrier resolving capability is required, because the parameter being checked is the zero-crossing of burst at the leading edge of sync. Few oscilloscopes can perform the miracle consistently.

Subcarrier/horizontal (SC/H) phase meters will indicate when a correct relationship exists on a given video signal. In using one of these meters, subcarrier phase is randomly changed until the meter indicates a phased condition. The drawback is that most SC/H phase meters only *read* near the leading edge of sync. Until the phase relationship nearly occurs, the meter gives no clue as to which way the phase is off. The acceptance range is narrow when compared to the possible error range.

The SC/H meter, never the less, is one of two practical means of certifying compliance with the RS-170A specification. A more efficient means shows the relationship visually. First manufactured and introduced at NAB-'81 by Lenco, Jackson, MO, the device, known as a *videoscope*, identifies and displays Line 10 of Color Field 1 on a standard video monitor.

Using the device to certify RS-170A compliance, or to compare two video sources simultaneously, is quite easy, according to Bill Bratton of WHAS-TV, Louisville, KY. WHAS-TV technicians used the device to certify their entire plant for RS-170A compliance. Its *compare mode* aided in timing their sources at the inputs to all switchers within the plant.

"The Lenco device greatly simplified the procedure," Bratton said. "Its display is easy to interpret and setup of the device itself is a snap."

RS-170A will work best *when* it becomes the industry standard, as it is intended to be, and when engineering personnel verify compliance as another part of their regular preventative maintenance schedules. Because rise times and pulse widths are tightly controlled, the overall technical quality of the NTSC product should improve in the future. Still, RS-170A does not solve all studio problems, a growing H-blanking time in multiple generations, for example. Yet, this tentative standard goes a long way down the path and is vastly superior to what has existed before.

Comments on RS-170A

By Dave Jurgensen and Bruce Penney,
TV Products Engineering, Tektronix, Beaverton, OR

RS-170A was proposed in 1975. Although the old RS-170 did not specify an industrywide standard for color framing, many people who were heavily involved in post-production were using their own color-framing standard even before the adoption of RS-170A. RS-170A is basically RS-170 with additional constraints on SC/H (subcarrier-to-horizontal sync) phasing added and a few pulse widths changed so that they would be within FCC specifications even after going through the program distribution and finally being transmitted. The significant difference with regard to color framing is that the 4-field sequence for NTSC was specified.

RS-170A will have no great effect on overall picture quality. What it will do is result in less picture disruption (color unlock and blanking and timing shifts) when switching or editing signals. The real thrust of RS-170A is getting picture information properly timed, especially when doing post-production editing.

PAL has the same need for color framing as NTSC. It was only in the last couple years that the EBU adopted a standard for the 8-field PAL color-frame sequence. SECAM does not have the color-frame question in the same sense, because it uses an FM, rather than PM and AM, color subcarrier. Most post-production for SECAM is done in PAL or component RGB.

A totally digital studio would not have color-framing problems. Even when the studio is converted to digital, transmission will still use analog signals for some time. Therefore some standard for analog timing will still be necessary, but the color-framing problem will largely be solved.

A philosophical shift in equipment design has occurred over the past few years. Horizontal timing information was once wrongly regarded as totally independent from subcarrier information. Proc amps inserted sync without regard for SC/H phasing and many problems developed. Horizontal information was locked only to sync, and only chrominance was referenced to burst. A shift in burst or sync caused timing disruptions when signals were switched or edited.

The new philosophy used in modern sync generators, proc amps and VTRs uses burst as part of establishing horizontal timing, as well as for a chrominance reference. These devices lock to burst and, based on burst, identify a number of possible locations for sync that are correctly SC/H-phased. Then instead of following the improperly SC/H-phased sync timing, they insert the nearest correctly SC/H-phased sync time. Burst is thus used to fine tune horizontal timing to guarantee that the output is properly SC/H-phased.

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Performance specifications are measured by the manufacturers using certain references for frequencies, impedances, levels, etc. Unfortunately the reference values are not the same from one manufacturer to another, nor are the procedures alike. Also, those references are not always provided even in the printed materials offered by the manufacturers. As a result, an exact comparison of equipment performance should not be made based only on published numbers. The manufacturers' representatives should be contacted to discuss performance tests and measurements before final purchasing decisions are made.

AUDIO MIXING CONSOLES, Studio/Production

For studio or production use, mic levels from −70 to −30dBm and line levels from −20 to +8dBm are considered typical. Ac power is required. Modular system refers to single or multiple mixing channel blocks, rather than individual amplifier cards which are exchangeable from one location to another. Multiple outputs are not necessarily intended for use with multi-track recording equipment.

Manufacturer	ADM Technology		AMEK	Ampro	Arrakis Systems
Model/Series	**2483 Series II**	**1600 Series II**	**M1000**	**AC-12**	**500SC Series**
Modular System	Yes	Yes	Yes	No	No
Mixing Channels	24	16	32 typical	12	8
Inputs, Maximum	120	48	64	48	16
Mixing Buses	8	4	8 + stereo	4	2
Multitrack Outputs	8	4	8 typical	.....	No
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	ADM Slidex	ADM Slidex	P&G	Rotary, slider	Rotary
VCA Design	Custom option	Option	Optional	No	Yes
Equalization	Option	Option	4-band	No	No
Filtering	Option	Option	High, low pass	No	No
Panpots	Option	Option	Yes	No	No
Submastering/Groups	8	4	8	No	No
Echo/Send-Returns	Send only	Send only	8	Possible	No
Solo Bus	Yes	.....	Yes	No	No
Cue System	2	2	Yes	Yes	Yes
Talkback System	Yes	Yes	With 2/way comm.	Yes	No
Speaker Muting	2, programmable	Yes	Yes	Yes	Yes
Tone Oscillator	Option	Option	Yes	No	No
Metering Types	VU, PPM option	VU, PPM option	VU, PPM, LED	VU	LED
Machine Controls	To 6 machines	To 6 machines	If required	Yes	Available
Editor/Automation Ready	No	No	No	No	No
Phantom Mic Powering	Option	Option	Yes	No	No
Input Z (Mic/Line)	2kΩ/10kΩ	2kΩ/10kΩ	1kΩ/10kΩ	2kΩ/10kΩ	1kΩ/10kΩ bal
Output or Load Z	600Ω, xfmr	600Ω, xfmr	⩽100Ω	600Ω	600Ω bal
Output Level (0VU)	+8dBm nom	+8dBm nom	+4dBm nom	+8dBm	+8dBm
Output Clip Level	+27dBm	+27dBm	+23.5dBm	+22dBm	+22dBm
AF Response (± dB/Hz)	1/20-20k	1/20-20k	1/20-20k	1.5/20-15k	1/20-20k
Harmonic Distortion	<0.15% THD +24dBm	<0.15% THD +24dBm	0.02% +10dBm	0.5% +18dBm	0.1% max +18dBm
Signal-to-Noise Ratio	−125.5dBu EIN	−125.5dBu EIN	−127dBV EIN	<−74dB	−70dB below +8dBm
Crosstalk Rating	>72dB	>72dB	−78dB, 2kHz	>68dB	−75dB, 1kHz
Special RF Shielding	Not required	Not required	Yes	Yes	.....
Other Models	2400 Series II	800 Series II	M500	AC Series	250SC Series
	3200 Series II	1200 Series II	M2500	LC Series	.....
Reader Service Number	**51**	**52**	**53**	**54**	**55**

Manufacturer	Arrakis Systems	Auditronics			AudioArts Eng.
Model/Series	**2000R Series**	**110-8 Grandson II**	**700 Series (710-16)**	**532-24 Memphis**	**Wheatstone Project**
Modular System	Yes	Yes	Yes	Yes	Yes
Mixing Channels	8	24	24	24	16
Inputs, Maximum	32	48	48	48	32
Mixing Buses	2 typical	8	16	24	24
Multitrack Outputs	No	Yes	Yes	Yes	Yes
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	Rotary	Slider	Slider	Slider	Slider
VCA Design	Yes	No	Yes	Yes	.....
Equalization	3-band	6-band	3-band	4-band	3-band
Filtering	No	High, low pass	High, low pass	High, low pass	High pass
Panpots	Yes	Yes	Yes	Yes	Yes
Submastering/Groups	Yes	Yes	To 9 groups	To 9 groups	8 groups
Echo/Send-Returns	No	2	4	4	4
Solo Bus	No	Yes	Yes	Yes	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Tone Oscillator	No	Yes	Yes	Yes	Yes
Metering Types	VU	VU	VU	VU	VU
Machine Controls	Yes	No	No	No	No
Editor/Automation Ready	No	No	Option	Yes	.....
Phantom Mic Powering	No	Yes	Yes	Yes	Yes
Input Z (Mic/Line)	1kΩ/10kΩ bal	20kΩ/15kΩ bal	20kΩ/15k bal	20kΩ/10kΩ	2kΩ/10kΩ
Output or Load Z	600Ω bal	600Ω	600Ω	600Ω bal.	10Ω
Output Level (0VU)	+8dBm	+4dBm	+4dBm	+4dBV	.....
Output Clip Level	+22dBm	+24dBm, xfmr	+24dBm	+24dBm	+20dBm
AF Response (± dB/Hz)	1/20-20k	1/20-20k	0, −3/6-43k	0, −3/6-43k	0.5/30-20k
Harmonic Distortion	0.1% max +18dBm	0.1% to +18dBm	0.02% max	0.02%, 2kHz	0.05%, +18dBm
Signal-to-Noise Ratio	−73dB below +8dBm	>75dB below +4dBm	78dB	78dB	−80dBm
Crosstalk Rating	−60dB, 16kHz	<−80dBm, 1kHz	60dB, 10kHz	−60dBm, 10kHz	.....
Special RF Shielding	.....	.....	.....	.....	.....
Other Models	1000R	110A Grandson	710, 720, 730,	.....	.....
	500R	.....	740, 750 Groups		
Reader Service Number	**56**	**57**	**58**	**59**	**60**

AUDIO MIXING CONSOLES

Manufacturer	Autogram	Broadcast Audio Corporation		Broadcast Electronics	
Model/Series	IC-10	System 14	System 20	10S350	ML-4000
Modular System	No	Yes	Yes	No	Yes
Mixing Channels	10	14	20	10	12
Inputs, Maximum	28 stereo	42	66	22	24
Mixing Buses	2	4	4	2	2
Multitrack Outputs	No	.....	.....	No	No
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	No
Fader Type	Rotary	Slider	Slider	Slider	Slider
VCA Design	No	No	No	No	No
Equalization	No	5-band	7-band	No	No
Filtering	No	No	High pass	No	No
Panpots	No	Yes	Yes	No	No
Submastering/Groups	No	Yes	Yes	No	No
Echo/Send-Returns	No	No	No	No	No
Solo Bus	No	No	Possible	No	No
Cue System	Yes	Dual	Dual	Yes	Yes
Talkback System	No	3-station	Yes	Yes	Yes
Speaker Muting	Yes	2 relays	2 relays	Yes	Yes
Tone Oscillator	No	Yes	Optional	No	No
Metering Types	VU	VU	VU	VU	VU
Machine Controls	.....	Yes	Yes	Possible	Possible
Editor/Automation Ready	No	No	No	No	No
Phantom Mic Powering	No	No	Possible	No	No
Input Z (Mic/Line)	200Ω/600-10kΩ	250Ω/600Ω	250Ω/600Ω	150Ω/54kΩ	150Ω/36kΩ
Output or Load Z	600Ω	600Ω	600Ω	600Ω bal.	600Ω bal.
Output Level (0VU)	+8dBm	+8dBm	+8dBm	+8dBm	+8dBm
Output Clip Level	+25dBm	+28dBm	+28dBm	+18dBm	+18dBm
AF Response (±dB/Hz)	0.5/30-15k	0.3/20-20k	0.3/20-20k	0.5/30-20k	0, – 1/50-15k
Harmonic Distortion	<0.5%	<0.09% +8dBm	<0.09% +8dBm	0.05% +18dBm	0.05% +18dBm
Signal-to-Noise Ratio	< – 65dB	– 125dBV EIN	– 125dBV EIN	70dB, +18dBm	65dB, +8dBm
Crosstalk Rating	– 67dB max 15kHz	>70dB	>70dB	.....	.....
Special RF Shielding	Yes	Yes	Yes	Yes	Yes
Other Models	.....	....	.....	10M350	SL-4100
Reader Service Number	61	62	63	64	65

AUDIO MIXING CONSOLES, Studio/Production

Manufacturer	Cetec Broadcast	Continental	Eela Audio/A&DR	Enertec/ Schlumberger	EV/TAPCO
Model/Series	8000 Console	Rock 10	Series 200	UPS 5168	C-12 Series 2
Modular System	Yes	No	Yes	Yes	Yes
Mixing Channels	16	10	16 + 8 groups	16	12 expands by 8s
Inputs, Maximum	48	30	32	64	88 expanded
Mixing Buses	3	2	8	6	5
Multitrack Outputs	No	No	Yes	Possible	Possible
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	P&G slider	Rotary	Duncan slider	Slider	Slider
VCA Design	No	No	No	.....	No
Equalization	No	No	3-band	Yes	3-band
Filtering	No	No	High pass	Yes	No
Panpots	No	No	Yes	Yes	Yes
Submastering/Groups	No	No	Yes	8	To 4
Echo/Send-Returns	No	No	4	Yes	Option
Solo Bus	No	No	Yes	Yes	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	No	Yes	Yes	No
Speaker Muting	Yes	Yes	Yes	.....	No
Tone Oscillator	No	No	Yes	Yes	No
Metering Types	VU	VU	VU, PPM	VU	LED ladder
Machine Controls	Yes	Yes	.....	Possible	No
Editor/Automation Ready	Yes	No	No	.....	No
Phantom Mic Powering	No	No	Yes	Yes	Yes
Input Z (Mic/Line)	150Ω/10kΩ	150Ω/600Ω	1.2kΩ/8kΩ bal.	1kΩ	150Ω/10kΩ
Output or Load Z	600Ω bal.	600Ω bal.	75Ω bal./20kΩ unbal.	20	175Ω bal.
Output Level (0VU)	+8dBm	+18dBm typical	+8dBm	−6, +12dBm nom.	+4dBm
Output Clip Level	+28dBm	.....	+21dBm	+22dBm	+18dBm
AF Response (±dB/Hz)	0, −1/20-20k	0.5/50-15k	0, −1/20-20k	0.5, −1/30-20k	1/20-20k
Harmonic Distortion	0.008% +27dBm	0.25%	0.03%	<0.2%	0.5%
Signal-to-Noise Ratio	−125dBV EIN	−125dB EIN	−126dBm EIN	−125dBm EIN	−129dBV EIN
Crosstalk Rating	.....	.....	>56dB	70dB	.....
Special RF Shielding	Yes	Yes	Yes	.....	.....
Other Models	.....	Mark 8	Series 100 S2000-L	UPS5104, 5124	.....
Reader Service Number	**66**	**67**	**68**	**69**	**70**

Manufacturer	EV/TAPCO	Farrtronics Ltd.	Girardin	Harris	
Model/Series	Series 72	M70 Series	CS 168	Micro Mac	Stereo 80
Modular System	Yes	Yes	Yes	Yes	No
Mixing Channels	4 expands by 4s	8	16	16	8
Inputs, Maximum	64 expanded	.....	.....	32	5 Mic/13 Line
Mixing Buses	5	2	8	3	2
Multitrack Outputs	Possible	No	Possible	No	No
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider	Slider	Slider	Slider/digital	Rotary
VCA Design	No	Yes	.....	Yes	Np
Equalization	3-band	2-band	Yes	No	No
Filtering	No	No	Yes	No	No
Panpots	Yes	Yes	Yes	Yes	No
Submastering/Groups	No	Possible	4	3	.....
Echo/Send-Returns	Option	No	2	No	No
Solo Bus	Yes	No	.....	No	No
Cue System	Yes	No	Yes	Yes	Yes
Talkback System	No	No	Yes	No	Yes
Speaker Muting	No	No	.....	Yes	Yes
Tone Oscillator	No	No	Yes	No	No
Metering Types	VU	VU	VU, bargraph	VU, peak LED	VU
Machine Controls	No	No	Possible	Yes	No
Editor/Automation Ready	No	Yes	.....	Possible	No
Phantom Mic Powering	Yes	No	.....	Yes	No
Input Z (Mic/Line)	150Ω/33kΩ	20kΩ bal.	.....	150Ω/600Ω	150Ω/600Ω
Output or Load Z	Low Z unbal.	600Ω bal.	.....	150, 600Ω	50, 600Ω
Output Level (0VU)	+4dBu	.....	.....	0, +4, +8dBm	+8dBm
Output Clip Level	+18dBm	+24dBm	.....	+31dBm	+36dBm
AF Response (±dB/Hz)	0.5/20-20k	0.25/20-20k	.....	0.25/20-20k	1/20-20k
Harmonic Distortion	0.04% +18dBu	0.5% +18dBm	.....	<0.1%, +30dBm	0.5% +18dBm
Signal-to-Noise Ratio	−130.5dBv EIN	73dB	.....	−125dBV EIN	−125dBV EIN
Crosstalk Rating	.....	−67dB max	.....	−70dB	Below noise
Special RF Shielding	.....	.....	.....	RFI proofed	RFI proofed
Other Models	Series 74	.....	C124S, C184S	....	Gatesway 80 Executive
Reader Service Number	**71**	**72**	**73**	**74**	**75**

AUDIO MIXING CONSOLES, Studio/Production

Manufacturer	Harrison	Harrison Systems	Logitek	LPB	MBI Broadcast Systems
Model/Series	TV4	MR-3	CAS-12	B-2000 Benchmark	Series 24A
Modular System	Yes	Yes	Yes	Yes	Yes
Mixing Channels	56 max	36	12	To 16	.....
Inputs, Maximum	3/channel	108	24	96	Unlimited
Mixing Buses	>16	29	4	12	6
Multitrack Outputs	Yes	24	No	Yes	Yes
Outputs (Stereo Mix)	4	Yes	Yes	Yes	3 pair
Fader Type	Slider P&G	P&G slider	P&G slider	P&G slider	Slider
VCA Design	Yes	Allison EGC101	No	Digital DPT	.....
Equalization	Yes	3-band	Optional	Yes	Option
Filtering	Yes	High pass	No	As required	Yes
Panpots	Yes	Yes	Optional	Yes	Yes
Submastering/Groups	8	9 VCA groups	Optional	As required	YEs
Echo/Send-Returns	Yes	4	Optional	2	Yes
Solo Bus	Yes	3 channels	No	Yes	Yes
Cue System	Yes	3	Yes	Yes	Yes
Talkback System	Yes	3	Optional	Optional	Yes
Speaker Muting	Yes	Yes	Yes	4, programmable	Yes
Tone Oscillator	Yes	Yes	Optional	Optional	Option
Metering Types	DS-1 video	LED VU/PPM	VU	VU, Peak LED, PPM	VU, PPM
Machine Controls	.....	No	Yes	Optional	Yes
Editor/Automation Ready	ARMS option	Yes	Yes	Optional	.....
Phantom Mic Powering	Yes	Yes	No	Yes	Yes
Input Z (Mic/Line)	8kΩ/10kΩ	8kΩ/10kΩ	200Ω/600Ω	150Ω/600Ω	1k/10kΩ
Output or Load Z	53Ω typical	53Ω nominal	600Ω	600Ω	600Ω
Output Level (0VU)	+4dB(0.775V = 0dB)	+4dB(0.775V = 0dB)	+4dBm	0, +4, +8dBm	0dBu
Output Clip Level	+26dB	+26dB(0.775V = 0dB)	+27dBm	+30dBm	+24dBu
AF Response (±dB/Hz)	0.5/20-20k	0.5/20-20k	0.5/20-20k	0.5/20-20k	0, −1/20-20k
Harmonic Distortion	.....	.....	0.07% typical	<0.2% +18dBm	<0.02%, max gain
Signal-to-Noise Ratio	−75.5dB typical	−75.5dB typical	72dB, @ −50 in	75dB below output	−127dBm
Crosstalk Rating	.....	.....	Below noise	<−70dB	Exceeds IBA code
Special RF Shielding	Yes	Yes	Yes	Yes	Yes
Other Models	TV3	MR-2 MR-4	CAS-8	B-3000	.....
Reader Service Number	**76**	**77**	**78**	**79**	**80**

Manufacturer	McCurdy Radio Industries		MCI/Sony		McMartin Industries
Model/Series	SS8800	SS8900	J-500D Series	J-600 Series	1000 Series
Modular System	Yes	Yes	Yes	Yes	No
Mixing Channels	To 22	To 32	56	52	8
Inputs, Maximum	To 44	To 96	.....	104	18
Mixing Buses	4	14	.....	16	2
Multitrack Outputs	No	8	32	24	No
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	P&G slider, rotary	Slider	Slider	Slider	Slider
VCA Design	No	No	Yes	Yes	No
Equalization	Yes	3 or 4-band	4-band	3-band	No
Filtering	.....	High pass	High pass	High, low pass	No
Panpots	.....	Yes	Yes	Yes	No
Submastering/Groups	.....	8	8	8	No
Echo/Send-Returns	Yes	Possible	6	6	No
Solo Bus	Optional	Yes	Yes	Yes	No
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	4-station	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Possible	Yes	Yes	Yes
Tone Oscillator	.....	Yes	Yes	Yes	No
Metering Types	VU, PPM	VU, PPM	VU, PPM, bargraph	VU, PPM	VU
Machine Controls	.....	Possible	.....	.....	Possible
Editor/Automation Ready	.....	.....	Yes	Yes	No
Phantom Mic Powering	Yes	Yes	Yes	Yes	No
Input Z (Mic/Line)	1.5kΩ/16kΩ	150Ω/20kΩ	2kΩ/7kΩ	1.5kΩ/7kΩ	150Ω/600Ω
Output or Load Z	600Ω	600Ω	<120Ω	<120Ω	600Ω bal.
Output Level (0VU)	+8dBm	+8dBm	+4dBV	+4dBV	+8dBm
Output Clip Level	+22dBm	+24dBm	+26dBV	+28dBV	+28dBm
AF Response (±dB/Hz)	−1/20-20k	1/20-20k	0.5/20-20k	0, −0.5/15-18k	0.5/30-15k
Harmonic Distortion	0.25%	0.5% +18dBm	0.5% max	<0.05%	0.5%, +18dBm
Signal-to-Noise Ratio	−126dB EIN	−125dB EIN	−129dBV EIN	<−129dBV EIN	−74dB, +18dBm
Crosstalk Rating	65dB, 15kHz	65dB, 15kHz	<−45dB, 18kHz	>70dB, 16kHz	Below noise
Special RF Shielding	Yes	Yes	Yes	Yes	Yes
Other Models	.....	.....	.....	.....	Series 500
Reader Service Number	**81**	**82**	**83**	**84**	**85**

AUDIO MIXING CONSOLES, Studio/Production

Manufacturer	Pacific Recording	Protech Audio	Quad Eight Electronics	Quantum Audio/Gotham	Raindirk Limited
Model/Series	BMX-14	1632	248 Component Series	Gamma A	Series III
Modular System	Yes	Yes	Yes	Yes	Yes
Mixing Channels	14	16	32 (expandable)	16	To 26
Inputs, Maximum	28	64	To 4 per channel	32	52
Mixing Buses	2	2	8 + 4 aux	14	12
Multitrack Outputs	No	No	Yes	Yes	Yes
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider P&G	Slider	Slider	Duncan slider	P&G slider
VCA Design	No	No	.....	No	.....
Equalization	No	Yes	3-band	3-band	3-band
Filtering	No	No	High, low pass	High pass	High, low pass
Panpots	No	No	Yes	Yes	Yes
Submastering/Groups	No	3	8	Yes	Yes
Echo/Send-Returns	No	Yes	Yes	Yes	Yes
Solo Bus	No	No	Yes	Yes	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Tone Oscillator	No	No	Yes	Yes	Yes
Metering Types	VU	VU	VU	VU	VU, bargraph
Machine Controls	Yes	No	Available	No	No
Editor/Automation Ready	Possible	No	.....	Option	.....
Phantom Mic Powering	Yes	No	Yes	.....	Yes
Input Z (Mic/Line)	150Ω/600Ω bal.	150Ω/600Ω bal.	150Ω/600Ω	1.2kΩ/30kΩ	1kΩ/22kΩ
Output or Load Z	600Ω bal.	600Ω bal.	600Ω	<25Ω	600Ω
Output Level (0VU)	+8dBm	+4, +8dBm	+4dBm	+4dBm	.....
Output Clip Level	+28dBm	+27dBm	+25dBm	+23dBm	+20dBu
AF Response (±dB/Hz)	0, –1/20-15k	0.5/30-20k	1/20-20k	0.5/30-20k	1/20-20k
Harmonic Distortion	0.3%, +28dBm	0.5%, +27dBm	<0.05%, +24dBm	<0.1% THD	0.1%
Signal-to-Noise Ratio	–127dBV EIN	–93dB	–129dBm EIN	–127dBm EIN	–125dBu EIN
Crosstalk Rating	–75dB, 20kHz	Below noise	>–80dB, 15kHz	70dB	.....
Special RF Shielding	Yes	.....	.....	.....	.....
Other Models	BMX22, BMX26	1642	Pacifica	QA-1010	Britannia
Reader Service Number	86	87	88	89	90

Manufacturer	Ramko Research	Ramsa/Panasonic	Rupert Neve		Solid State Logic
Model/Series	DC38-10S	WR8816	8108	5316	SL 4000 E
Modular System	No	Yes	Yes	Yes	Yes
Mixing Channels	10	16	To 56	To 36	32
Inputs, Maximum	40	32	144	72	96
Mixing Buses	2	4	48	24	.....
Multitrack Outputs	No	.....	Yes	Yes	32
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	Rotary	Slider	P&G slider	P&G slider	Slider
VCA Design	Yes	.....	Option	.....	Yes
Equalization	No	3-band	4-band	3-band	Yes
Filtering	No	High pass	High, low pass	High, low pass	Yes
Panpots	No	Yes	Yes	Yes	Yes
Submastering/Groups	No	4 groups	Yes	Yes	32
Echo/Send-Returns	No	Yes	Yes	Yes	Yes
Solo Bus	No	Yes	Yes	Yes	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Tone Oscillator	.....	Yes	Yes	Yes	Yes
Metering Types	LED	LED	LED bargraph	VU	VU, PPM, spectrum
Machine Controls	Option	No	Yes	Yes	.....
Editor/Automation Ready	No	No	Yes	Yes	Computer included
Phantom Mic Powering	.....	Yes	Yes	Yes	Yes
Input Z (Mic/Line)	250Ω/600Ω	5kΩ/10kΩ	1.2kΩ/10kΩ	1.2kΩ/10kΩ	1.2kΩ/10kΩ
Output or Load Z	600Ω	600Ω	600Ω	600Ω	20Ω actual
Output Level (0VU)	+8dBV nom.	+4dB	+4dBu	+4dBu	+4dBV nominal
Output Clip Level	+20dBm max	+22dB	+26dBu	+26dBu	+24dB headroom
AF Response (±dB/Hz)	0, –2/20-20k	1/20-20k	1/20-20k	1/20-20k	0, –0.5/20-20k
Harmonic Distortion	0.5%	0.5% +20dBm	0.08%, +20dBm	+20dBm	<0.1%
Signal-to-Noise Ratio	–63dB, +8dBm out	–128dB EIN	>60dB, 0VU	>60dB, 0VU	–129dBV EIN
Crosstalk Rating	–70dB, 1kHz	–60dB, 1kHz	.....	.....	<–64dB
Special RF Shielding	.....	.....	.....	.....	.....
Other Models	DC-12 Series	.....	.....	5315	.....
Reader Service Number	91	92	93	94	95

AUDIO MIXING CONSOLE, Studio/Production

Manufacturer	SoundCraft	Sound Workshop	Spectra Sonics	Studer Revox America	
Model/Series	Series 1600	Series 30	1024	Studer 900	Studer 369
Modular System	Yes	Yes	Yes	Yes	Yes
Mixing Channels	32	36	To 24	56	32 + 8
Inputs, Maximum	64	72	48	56	96
Mixing Buses	5	8	24x24 matrix	24 + 5 aux	8 max
Multitrack Outputs	Yes	32	24	48	8
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	P&G slider	P&G 3000	Cermet slider	Resistive slider	Slider
VCA Design	.....	TA101	No	Studer VCA	.....
Equalization	4-band	3-band	Yes	4-band	Yes
Filtering	High pass	Low cut	Yes	Low, high pass	Low cut
Panpots	Yes	Yes	Yes	Yes	Yes
Submastering/Groups	8 groups	Unlimited w/super gr	Yes	Flexible	To 8
Echo/Send-Returns	Yes	4	Yes	5	To 8
Solo Bus	Yes	Yes	Yes	3	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	Yes	Yes	Yes	Yes
Speaker Muting	Yes	Yes	Yes	Yes	Yes
Tone Oscillator	Yes	Yes	Yes	Yes	Yes
Metering Types	LED bargraph	LED, VU	VU	VU, PPM	VU, PPM
Machine Controls	.....	No	Yes	Yes	Yes
Editor/Automation Ready	.....	Yes	No	Yes	.....
Phantom Mic Powering	Yes	Yes	Optional	Yes	Yes
Input Z (Mic/Line)	2kΩ/10kΩ	1.2Ω/40kΩ bal.	600Ω	1.2Ω/10kΩ	1.2kΩ/10kΩ
Output or Load Z	<75Ω	<100Ω actual	600Ω to infinity	≤50Ω	600Ω
Output Level (0VU)	+ 4dBV	– 8, + 8dBu adj	+ 4dBV (opt + 8dBV)	0, + 10dBu adj	+ 6, + 16dBu adj
Output Clip Level	+ 21dBV	+ 21dBu	+ 24dBm	+ 24dBu	+ 20dBu
AF Response (± dB/Hz)	– 2/25-20k	0, – 0.25/20-20k	0.2/20-20k	0.5, – 1/31.5-16k	0.5, – 1/50-15k
Harmonic Distortion	0.05% max	<0.01%	<0.01%, + 18dBm	0.1% max	0.1%, + 6dBu
Signal-to-Noise Ratio	– 127dBV EIN	>82dB	>82.5dB, + 4dBm out	>98dB	>83dB
Crosstalk Rating	– 63dB	>70dB, 1kHz	>75dB, (90dB typ)	>85dB	< – 75dB
Special RF Shielding	.....	No	Not required	Yes	Yes
Other Models	Series 800B Series 2400	Series 40	1026, 1032	.....	.....
Reader Service Number	96	97	98	99	100

Manufacturer	Studiomaster		Tascam		Total Audio Concepts
Model/Series	16-8	12-2B	M-15	M-16	1682
Modular System	Yes	Yes	Yes	Yes	No
Mixing Channels	16	12	8 main	8 main	16
Inputs, Maximum	32	24	24	24	40
Mixing Buses	8	2	8	8	10
Multitrack Outputs	8	2	8, 24 direct	8, 24 direct	8 + direct out
Outputs (Stereo Mix)	Yes	Yes	Yes	Yes	Yes
Fader Type	Slider	Slider	Slider	Slider	P&G or alps
VCA Design	No	No	No	No	No
Equalization	3-band	3-band	Yes	4-band	4-band
Filtering	No	No	No	High, low pass	High pass
Panpots	Yes	Yes	Yes	Yes	Yes
Submastering/Groups	8	No	8	8	8
Echo/Send-Returns	2	2	Yes	Yes	4
Solo Bus	No	No	Yes	Yes	Yes
Cue System	Yes	Yes	Yes	Yes	Yes
Talkback System	Yes	No	Yes	Yes	Yes
Speaker Muting	No	No	Yes	Yes	Yes
Tone Oscillator	Yes	No	Yes	Yes	Yes
Metering Types	VU	VU	VU, peak LED	VU, peak LED	LED
Machine Controls	No	No	No	No	Optional
Editor/Automation Ready	No	No	No	No	No
Phantom Mic Powering	No	No	Yes	Yes	Yes
Input Z (Mic/Line)	2kΩ/6.8kΩ	2kΩ/6.8kΩ	600/50kΩ	1k/50kΩ	600Ω/1kΩ
Output or Load Z	1kΩ	1kΩ	≥600Ω	≥600Ω	100Ω
Output Level (0VU)	+ 4	+ 4	– 10dBV, 0dBu adj	– 10dBV, 0dBu adj	+ 4dBm
Output Clip Level	+ 19	+ 19	13V	13V	+ 23dBm
AF Response (± dB/Hz)	0, – 3/20-20k	0, – 3/20-20k	1/20-20k	1/20-30k	1/20-20k
Harmonic Distortion	0.015%, + 4	0.015%, + 4	0.03%, 1kHz	0.03%, 1kHz	0.02%, + 10dBV
Signal-to-Noise Ratio	– 125dB EIN	– 125dB EIN	76dB NAB wtd	80dB NAB A wtd	– 126.6 DIN
Crosstalk Rating	– 60dB	– 60dB	65dB, 1kHz	65dB, 1kHz	– 77dB, 1kHz
Special RF Shielding	No	No	Yes	Yes	Yes
Other Models	16-4, 8-4	.....	.....	.....	TAC 1042
Reader Service Number	101	102	103	104	105

AUDIO MIXING CONSOLE, Studio/Production

Manufacturer	Trident Audio Developments Ltd.		Yamaha Int'l. Corp.
Model/Series	T S 7	Trimix	PM 2000-32
Modular System	Yes	Yes	Yes
Mixing Channels	24	8	24
Inputs, Maximum	56	32	32M, 20L
Mixing Buses	24	24	14
Multitrack Outputs	48	24	Yes
Outputs (Stereo Mix)	Yes	Yes	8
Fader Type	Slider	Slider	P&G slider
VCA Design	Melkuist, Allison	Allison	.....
Equalization	4-band	4-band	Yes
Filtering	High, low pass	High pass	Yes
Panpots	Yes	Yes	Yes
Submastering/Groups	24	8	8
Echo/Send-Returns	6	4	Yes
Solo Bus	Yes	PFL	Yes
Cue System	Yes	Yes	Yes
Talkback System	Yes	Yes	Yes
Speaker Muting	Yes	Yes	.....
Tone Oscillator	Yes	Yes	Yes
Metering Types	Options	Options	VU
Machine Controls	Optional	Optional	.....
Editor/Automation Ready	Possible	Possible	.....
Phantom Mic Powering	Yes	Yes	Yes
Input Z (Mic/Line)	1.2kΩ/20kΩ	1.2kΩ/20kΩ	250Ω/600Ω
Output or Load Z	1kΩ	600Ω	600Ω
Output Level (0VU)	+4dBm	+4dBm	+4dB
Output Clip Level	+24dBm, 600Ω	+21dBm	+24dB
AF Response (±dB/Hz)	0.5/20-20k	.....	0, –3/20-20k
Harmonic Distortion	0.015%, +20dBm	0.05%, +20dBm	<0.5% +10dB
Signal-to-Noise Ratio	–75dBm A wtd	–75dBm	82dB typical
Crosstalk Rating	–75dBm	–65dB	–60dB 1kHz
Special RF Shielding	Yes	Available	Yes
Other Models	Series 80	.....	.....
Reader Service Number	106	107	108

Spec Note:

Performance specs are not directly comparable due to 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 MIXING CONSOLE, Portable

For remote or portable use. Powering provided from dc supply or ac line. Units generally provide limited output facilities and are intended for connection to recorders or ENG microwave and telephone links.

Manufacturer	AMEK Systems & Controls	Audio Services Corporation	AVAB America	Coherent Communications	Comrex
Model Number	BC01	ASC SELA 6F	FM 800 Mixer	MX80	SLX Sports Extender
Inputs (Mic/Line)	To 12, stereo	6/4	8	4/4	4/2
Mixing Channels	12	6	8	4	4
Modular Design	Yes	No	.....	No	No
Mixing Buses	4	4	3	1	1
Outputs (Mono)	Yes	3	Yes	2	4
Outputs (Stereo)	Yes	Possible	Yes	.....	0
Fader Type	P&G slider	P&G slider	Slider & Panpots	Rotary	Slider, plastic
VCA Design	No	No	No	No	No
Filter Circuits	No	High pass	Low, high pass	High pass, 12dB/octave	No
Equalization Circuits	3-band	3-band	Yes	Midrange ±6dB	No
Compression/Limiting	Available	On line outputs	No	Yes	Yes
Telephone Interface	Yes	No	No	No	Yes, 3 phone lines
Tone Oscillator	Yes	Yes	Yes	1kHz	Yes
Cueing System	Yes and PFL	Through Solo and PFL	Yes	No	Yes
Talkback System	Yes	Through Foldback	Yes	No	Yes
Echo/Foldback System	.....	Yes	No	No	No
Metering Type	VU or BBC-type PPM	VU or modulometer	VU meter	VU meter	VU or peak
Phantom Mic Facility	Yes	Yes	Yes	Yes	No
AC Powering	.....	With adapter	110Vac	No	110/220Vac
Battery, External	Yes	18-35Vdc	10-30Vdc	6-24Vdc	Yes
Battery, Internal	.....	12 D cells	Yes	C cells	No
Battery Life	.....	20 hours	.....	14 hours, alkaline	6 hours
Dimensions (Inches)	.....	18.5Wx5.25Hx25L	.....	9.25Wx3.5Hx7.75D	15x15.5x5.5
Weight (Pounds)	.....	21 lb	18 lb	5.25 lb	15 lb
Input Z (Mic/Line)	1kΩ, xfmr-balanced	200kΩ, balanced	10kΩ, balanced	>1kΩ, xfmr-balanced	150Ω/600Ω
Input Level (Mic/Line)	+4dBV/+44dBV	.....	.....	+28dBm max. line	–30dBu/+10dBu
Output Load Z	<100Ω	For Nagra and similar recorders	600Ω balanced	600Ω, 10kΩ Bridging	600Ω
Output Level (0 VU)	To +19dBV, ≤200Ω	.....	.....	±10dBm adj	+8dBm and –10dBm
Output Clip Level	Dependent on 0VU	.....	+18dBm	+22dBm	+20dBm
AF Response (±dB/Hz)	1/20-20k	0, –0.1/60-30k	1/30-20k	+0, –1/30-20k	0.5/50-15k
Harmonic Distortion	<0.02%, 1kHz, +6dBu	0.01% max	0.1%	<0.1%, +8dBm	0.5%, 50Hz-15kHz
Noise (Mic-to-Prog)	<–80dB	–123.1dBV equiv in	–129dBa equiv input	–129.2dB equiv input	–127dBm, A wtd.
Crosstalk Rating	<–70dB bus-to-bus	.....	.....	.....	Below noise
Reader Service Number	109	110	111	112	113

AUDIO MIXING CONSOLE, Portable

Manufacturer	Eela Audio	Enertec/Schlumberger	Logitek	McMartin Industries	MicroTrak
Model Number	S41 Minimixer	UPS 6105 Series	Audiorack	BR-400	Sport IV
Inputs (Mic/Line)	4	10	6 switchable	4/2 Phono-Line	5/2
Mixing Channels	4	10	6	4	4
Modular Design	No	Yes	No	No	No
Mixing Buses	1	4	2	2	2
Outputs (Mono)	1	4	2	2	1
Outputs (Stereo)	0	2	0	No	0
Fader Type	Recessed, plastic	Slider	Rotary, plastic	Rotary	Rotary
VCA Design	No	.....	No	No	No
Filter Circuits	Yes	Hi and lo pass	No	No	No
Equalization Circuits	No	Yes	No	No, except RIAA phono	No
	.....	.....	.....	.....	.....
Compression/Limiting	Yes	Yes	No	No	No
Telephone Interface	Optional	.....	No	No	Yes
Tone Oscillator	Yes	Yes	Yes	1kHz	No
Cueing System	No	Yes	Yes	Yes	Yes
Talkback System	No	Yes	Yes	No	Yes, studio viaphone
Echo/Foldback System	No	Yes	No	No	No
Metering Type	VU meter	VU	VU meter, peak LEDs	VU meter	VU meter
Phantom Mic Facility	Yes	.....	No, may be added	No	No
AC Powering	Yes	Yes	Yes	115Vac	110Vac
Battery, External	.....	Yes	Yes	13Vdc, 30mA	.....
Battery, Internal	Yes	Yes	No	9 D cells	4 9Vdc alkaline
Battery Life	10 hours	.....	.....	100 hours	5 hours
Dimensions (Inches)	9.5x6.5x2.25	.....	19Wx5.25Hx13D	14Wx3.5Hx10.5D	.....
Weight (Pounds)	10 lb	ca 25kg	25 lb	8 lb with batteries	7 lb
Input Z (Mic/Line)	1.2kΩ/10kΩ, Bal.	>1kΩ	200Ω/600Ω	150-250Ω/47kΩ, 600Ω	Low Z/600Ω
Input Level (Mic/Line)	– 44dB/ + 8dBm + 8dBm	– 70,0/ – 12, + 12dBm	– 60dBm/0dBm	– 60dBm/ – 20dBm – 20dBm	– 58, – 40dBm/ – 20dBm .....
Output Load Z	75Ω	>600Ω	150Ω mic, 600Ω line	600Ω balanced	600Ω balanced
Output Level (0 VU)	+ 4dBm nominal	+ 102dB gain	0dBm	+ 8dBm	+ 8dBm
Output Clip Level	+ 20dBm	.....	+ 20dBm	+ 18dBm	+ 15dBm
AF Response (± dB/Hz)	+ 0, – 3/27-22k	0.5, – 1/30-20k	0.3/20-20k	2/20-20k	.....
Harmonic Distortion	0.05%	<0.2% + 12dBm	0.1% typical	<0.5%, + 8dBm output	....
Noise (Mic-to-Prog)	·75dBm	– 125dBm EIN	76dB ref. – 50dBV	– 62dB below + 8dBm	....
Crosstalk Rating	– 76dBm	.....	Below noise	.....	.....
Reader Service Number	**114**	**115**	**116**	**117**	**118**

Manufacturer	ProTech Audio	RTS Systems	Rupert Neve	Russco	SATT Electronics
Model Number	Integra 3(30000)	HPM-41	5422 Portable	421 Mini-Mixer	SAM 82
Inputs (Mic/Line)	12	4 either, 1 line	8/8	6	10
Mixing Channels	5	4	8	4	10
Modular Design	No	No	Yes	No	Yes
Mixing Buses	3	1	3	1	8
Outputs (Mono)	2	1	2	2	2
Outputs (Stereo)	No	No	1	.....	2
Fader Type	Slider	Rotary	P&G slider	Rotary	Slider
VCA Design	No	No	.....	No	.....
Filter Circuits	No	High pass	High pass	2.6kHz	80, 140Hz
Equalization Circuits	No	No	Yes	No	Yes
Compression/Limiting	Option	Yes	No	No	.....
Telephone Interface	No	No	No	Yes w/dial	.....
Tone Oscillator	No	Yes	Yes	400Hz	Yes
Cueing System	Yes	No	Yes, through PFL	Yes	Yes
Talkback System	No	No	Yes	No	Yes
Echo/Foldback System	No	No	Possible	No	Yes
Metering Type	VU meter	VU meter	VU meter	VU	VU
Phantom Mic Facility	No	Yes	Yes	No	Yes
AC Powering	....	110Vac, 13W	110Vac, PS12100 supply	Yes	Yes .....
Battery, External	± 18Vdc	10-14Vdc, 500mA	.....	.....	Yes
Battery, Internal	.....	.....	34613 battery pack	8 9Vdc alk	(SAM42)
Battery Life	.....	.....	4 hours	10 hr alk typical	10 hr
Dimensions (Inches)	.....	.....	.....	10.75x11x4.5	.....
Weight (Pounds)	.....	7 lb	42 lb	5.5 lb	17.6 lb
Input Z (Mic/Line)	150-200Ω/600Ω bal.	To 4.7kΩ/47kΩ bal.	1.2kΩ/10kΩ bal.	250Ω/6kΩ	1kΩ10kΩ
Input Level (Mic/Line)	– 55dBm/ + 4dBm	– 35dBV/ – 5dBV	– 15dBu/ + 15dBm + 15dBm	– 70dBm/ – 10dBm typ.	– 70, 0dBm .....
Output Load Z	600Ω balanced	600Ω	600Ω	600Ω Telco	600Ω bal.
Output Level (0 VU)	+ 8dBm	+ 4dBm	.....	– 1dBm, Telco	4dBm
Output Clip Level	+ 27dBm	+ 28dBm	+ 20dBu	+ 18dBm	+ 20dBm
AF Response (± dB/Hz)	0.5/30-20k	0, – 1/30-20k	0.5/30-15k	2/20-20k	0.5/20-20k
Harmonic Distortion	0.25%, + 8dBm	0.1%, + 8dBm	0.05%, + 20dBu output	0.6%	0.5/20-20k .....
Noise (Mic-to-Prog)	– 128dBm equiv in	– 127dBV equiv in	– 125dBu equiv in	– 18dB + 18dBm	– 129dBA EIN
Crosstalk Rating	.....	– 80dB, 1kHz	– 60dB	.....	– 130dB, 16kHz
Reader Service Number	**119**	**120**	**121**	**122**	**123**

AUDIO MIXING CONSOLE, Portable

Manufacturer	Shure Brothers	Sony Corporation		Sound Workshop	Spectra Sonics
Model Number	M267	MX510	MX-670	Logex 8 L8/12	1100 Line/Mic Mixer
Inputs (Mic/Line)	4/4	5	6	12/2	6 Switchable
Mixing Channels	4	5	6	12	1
Modular Design	No	No	Expandable	Yes	No
Mixing Buses	1	1	1	8	1
Outputs (Mono)	2	1	1	.....	Yes
Outputs (Stereo)	No	1	1	4	No
Fader Type	Rotary	Slider, panpots	Slider	Alps	Rotary
VCA Design	Yes	No	No	No	No
Filter Circuits	Low cut	No	No	No	No
Equalization Circuits	No	No	No	3-band, Mid-sweep	YEs
Compression/Limiting	No	No	No	No	No
Telephone Interface	Yes	No	No	No	No
Tone Oscillator	Yes	No	Yes	No	No
Cueing System	Yes	No	No	Yes	No
Talkback System	No	No	No	Yes	No
Echo/Foldback System	No	No	No	Yes	No
Metering Type	VU meter	VU meter	VU meter	LEDs	VU meter
Phantom Mic Facility	Yes	No	No	Yes	No
AC Powering	Yes	AC12 adaptor	No	Yes	Yes
Battery, External	No	12Vdc	12Vdc	No	No
Battery, Internal	Yes	8 C cells	8 C cells	No	No
Battery Life	20 hours	.....	.....	.....	.....
Dimensions (Inches)	3x12.2x9	.....	.....	26.5Wx3.25Hx19.5D	19Wx3.5Hx8.25D
Weight (Pounds)	5.2 lb	6.75 lb	11 lb	43 lb	10 lb
Input Z (Mic/Line)	1kΩ/66kΩ actual	Low Z/100kΩ	Low Z/82kΩ	1.2kΩ/12kΩ	⩾600Ω
Input Level (Mic/Line)	– 75dBV/0dBV nom.	– 72dB/ – 22dB typical	0.31mV/98mV	⅔50dBu/ – 8, + 8dBu	– 50dBV/0dBV
Output Load Z	0.5/150Ω actual	10kΩ	10kΩ	<100Ω	⩾600Ω
Output Level (0 VU)	+ 4, + 8dBm	– 5dBV	– 5dBV(435mV)	– 8, + 8dBu, adj.	+ 4, + 8dBm
Output Clip Level	– 42dBm Mic/ + 18dBm	.....	.....	+ 20dBu	+ 24dBm .....
AF Response (± dB/Hz)	2/30-20k	Flat/30-25k	1/30-35k	+ 0, – 0.5/20-20k	0.75/20-20k
Harmonic Distortion	<0.35%	.....	.....	<0.01%	0.02% max.
Noise (Mic-to-Prog)	– 129.5dBm equiv input	60dB below output	60dB below output	< – 80dB	79dB S/N .....
Crosstalk Rating	>65dB	.....	.....	>70dB, 1kHz	.....
Reader Service Number	**124**	**125**	**126**	**127**	**128**

Manufacturer	SQN Sales Ltd.	Stellavox	Studer Revox America		Studio Master
Model Number	SQN-3 Type M	AMI 48	169 & 269	069	3-2 ENG
Inputs (Mic/Line)	3/1	5	16 & 32	2/2	3/3
Mixing Channels	4	5	16 + 4	2	2
Modular Design	No	No	Yes	Yes	No
Mixing Buses	1	2	4 + 2	2	2
Outputs (Mono)	3	Yes	1	2	No
Outputs (Stereo)	0	Yes	1 or 2	No	1
Fader Type	Rotary	Slider	Slider, plastic	Slider, plastic	Rotary
VCA Design	No	No	No	No	No
Filter Circuits	Bass cut	Bass, treble, LFA	Low cut, 12dB octave	Low cut, 60/120Hz	High, low pass
Equalization Circuits	No	No	Low, high shelving, mid var.	Presence 2.2, 3.3kHz	No .....
Compression/Limiting	Limiter (20:1) 14dB range	7 limiters	On master modules	On masters	No .....
Telephone Interface	No	No	No	Yes	No
Tone Oscillator	1.1kHz	880Hz	Yes	Yes	400Hz
Cueing System	No	Yes	Yes	Yes	Yes
Talkback System	No	No	Yes	Yes	No
Echo/Foldback System	No	No	Yes	No	No
Metering Type	VU meter	Peak meters	VU or PPM	VU or PPM	VU meter
Phantom Mic Facility	Yes	Yes	Yes	No	Yes
AC Powering	No	With adaptor	Yes	Yes	No
Battery, External	5.5-18.5Vdc	12-20Vdc	Yes	Yes	Yes
Battery, Internal	6 AA cells	15 AA cells	Yes	Yes	Yes
Battery Life	ca. 12 hours	4 hours	3-5 hours	4-5 hours	.....
Dimensions (Inches)	8.25x5x1.4	9x11x3	21.25x19x5.5(169)	12.2x13.8x5.4	.....
Weight (Pounds)	3 lb	9 lb	55 lb(169)	19 lb	.....
Input Z (Mic/Line)	200Ω/27kΩ	200Ω/10kΩ	1.2kΩ/5kΩ	1.2kΩ/>5kΩ	600Ω/5kΩ
Input Level (Mic/Line)	0.18mVrms/ – 10dBm min.	0.2-10Vrms	– 61, – 22dBu/ – 23, + 16dBu	– 71, – 28dBu/ – 30, + 16dBu	+ 3.5/ + 10 .....
Output Load Z	600Ω	200, 600Ω	600Ω	600Ω	<10 to 600Ω
Output Level (0 VU)	+ 8dBm	1.55Vrms	+ 6, + 16dBu adj.	+ 6, + 15dBu adj.	+ 8dBm
Output Clip Level	+ 18dBm	10Vrms	+ 10dBu	+ 24dBu	+ 24dBm
AF Response (± dB/Hz)	+ 0, – 1/30-20k	1/20-20k	+ 0.5, – 1/40-15k	+ 0.5, – 1/40-15k	+ 0, – 1/50-18k
Harmonic Distortion	<0.1% at + 15dBm	<0.05%	<0.1%, + 6dBu	<0.1%	0.05%
Noise (Mic-to-Prog)	3dB max. A wtd.	– 125dBm equiv	83dB	>82dB	– 125dBm equiv
Crosstalk Rating	>70dB	>80dB	– 75dB	>78dB	– 60dB
Reader Service Number	**129**	**130**	**131**	**132**	**133**

AUDIO MIXING CONSOLE, Portable

		TASCAM			TEAC
Manufacturer	**Studio Master**				
Model Number	**8-4 VPC**	**Model 35**	**Model 30**	**MM-20**	**M-2A**
Inputs (Mic/Line)	8	8/8, expand to 20/20	8/8	2 to 10/4	6/6
Mixing Channels	4	8 (20)	8 + 8x2 submixer	6	6
Modular Design	No	Yes	No	No	No
Mixing Buses	4	4, cue, echo send	4, 2 on submixer	6	4
Outputs (Mono)	1	4	4	6	4
Outputs (Stereo)	0	2	2	3	2
Fader Type	Linear slider	40mm carbon	40mm carbon	40mm carbon	40mm carbon
VCA Design	No	No	No	No	No
Filter Circuits	No	No	Boost/cut shelving	No	No
Equalization Circuits	3-band parametric	2-band, sweep	Sweep, shelving	Optional, PE-20	± 12dB shelving
Compression/Limiting	No	No	No	No	No
Telephone Interface	No	No	No	No	No
Tone Oscillator	No	60Hz slate	No	No	No
Cueing System	No	PF cue send	Yes	Yes	Yes
Talkback System	No	Optional	No	No	No
Echo/Foldback System	No	Echo/Efx send, 4 return	With submixer	Auxiliary	Cue out to bus in
Metering Type	.....	VU and peak LED	VU and peak LED	Option, MU-20	No
Phantom Mic Facility	.....	No	No	No	No
AC Powering	110/220Vac	Yes	Yes	Yes	Yes
Battery, External	Optional	No	No	No	No
Battery, Internal	No	No	No	No	No
Battery Life	.....	.....	.....	.....	.....
Dimensions (Inches)	19" rack mount	23.6Wx7.3Hx24.4D	18.3Wx6.3Hx20.5D	16.9Wx4.2Hx15.8D	13.4Wx3.5Hx14.4D
Weight (Pounds)	.....	61.1 lb	35.4 lb	9.2 lb	13.2 lb
Input Z (Mic/Line)	2kΩ/6.8kΩ	600Ω/30kΩ	600Ω/20kΩ	600Ω50kΩ	50kΩ/20kΩ
Input Level (Mic/Line)	– 4.5/ + 7	– 74, + 23dBV/ – 24, + 29dBV	– 60, + 10dBV/ – 10, + 14dBV	– 70, – 30dBV/ – 28, + 25dBV	– 40dBV/ – 10dBV nom
Output Load Z	600Ω	600Ω, 0dBu/10kΩ, – 10dBV	1kΩ	10kΩtypical	10kΩ
Output Level (0 VU)	+ 8dBm	0dBu and – dBV, adj.	– 10dBV, adj.	– 10dBV	– 10dBV
Output Clip Level	+ 24dBm	13V	13V	10V	10V
AF Response (± dB/Hz)	+ 0, – 3/20-20k	1/20-30k	2/30-20k	2/30-20k	2/30-20k
Harmonic Distortion	0.015% + 8dBm, 1kHz	<0.05%, 1kHz	<0.07T, 1kHz	<0.1%	0.1% max
Noise (Mic-to-Prog)	– 125dBm equiv	65dB NAB wtd.	62dB NAB A wtd.	>65dB NAB A wtd.	62dB NAB A wtd.
Crosstalk Rating	– 60dB	60dB, 1kHz	60dB, 1kHz	*>60dB, 1kHz*	≥50dB
Reader Service Number	**134**	**135**	**136**	**137**	**138**

AUDIO MIXING CONSOLE, Portable

Manufacturer	UREI	Yamaha International Corporation			
Model Number	MOD ONE (210)	M15xx Series	M508	MQ1202 (MQ series)	PM2000-24 (Series)
Inputs (Mic/Line)	3/7	To 32/32(M1532)	8	12/4	24/20
Mixing Channels	10	To 32	8	12	24
Modular Design	Yes	Yes	No	No	Yes
Mixing Buses	4	Pgm, Echo, FB	Pgm, Echo, FB	8	Pgm, Efx, FB
Outputs (Mono)	2	To 17	4	5	24
Outputs (Stereo)	Yes	4	2	2	8
Fader Type	Slider	Slider	Slider	Slider	Slider
VCA Design	No	.....	.....	No	No
Filter Circuits	No	Yes	Yes	No	Yes
Equalization Circuits	No	Yes	Yes	4-band & 9-band	Yes
Compression/Limiting	No	No	No	No	No
Telephone Interface	No	No	No	No	No
Tone Oscillator	No	Yes	No	No	Yes
Cueing System	Yes	Yes	Yes	Yes	Yes
Talkback System	No	Yes	No	No	Yes
Echo/Foldback System	No	Yes	Yes	Yes	2 echo, 4 FB
Metering Type	VU meter	VU meter	VU meter	Fluorescent bargraph	VU meter
Phantom Mic Facility	No	Yes	Yes	No	Yes
AC Powering	110Vac	110Vac	110Vac	110Vac	110Vac
Battery, External	±24Vdc, 1.5A	No	No	No	No
Battery, Internal	.....	No	No	No	No
Battery Life	.....	.....	.....	.....	.....
Dimensions (Inches)	.....	35.75x36.5x14.5 (M1516)	20.25x19.5x7.5	26.3x21.5x6.75	50.25x15.75x40.25 .....
Weight (Pounds)	.....	133 lb (M1516)	34 lb	35 lb	322 lb
Input Z (Mic/Line)	.....	50-250Ω/600Ω	50-250Ω/600Ω	50-250Ω/600Ω	50-250Ω/600Ω
Input Level (Mic/Line)	–50, +4dBm	–60, +4dB (60dB pad)	–60, +4dB (60dB pad)	–60, +4dB (60dB pad)	
Output Load Z	600Ω	600Ω	600Ω	600Ω	600Ω
Output Level (0 VU)	+4, +8dBm	+4dB	+4dB	+4dB	+4dB
Output Clip Level	+24dBm	+24dB	+24dB	+18dB	+24dB
AF Response (±dB/Hz)	1/30-20k	0, –3/20-20k	1, –3/20-20K	1, –3/20-20k	0, –20-20k
Harmonic Distortion	0.5%, +20dBm	0.5% @ +10dB	0.5% @ +10dB	0.05%, +4dB	<0.5%, +10dB
Noise (Mic-to-Prog)	70dB below output	68dB nom	–67dB nom	–66dB nom	82dB nom
Crosstalk Rating	–60dBm, 10kHz	–60dB @ 1kHz	–60dB @ 1kHz	.....	–60dB, 1kHz
Reader Service Number	**139**	**140**	**141**	**142**	**143**

Systems listed in Portable and Studio/Production categories may be applicable to On-Air uses as well. Also, many other models and manufacturers offer systems of interest for any application. The following list includes some of the additional equipment available.

ADM Technology
*CH-21, 22, VCA controlled editing switchers

Allen & Heath Brenell
*Mini Mixer, portable system
*Modular III series
*Syncon A, B series

Altec Corporation
*1690 Recording Console

AudioArts Engineering
*4000, 8000 series mixing systems for recording applications

Audio Developments Ltd.
*AD 045, 049, 060, portable mixers for ENG applications

Auditronics Inc.
*200 series, for various applications

Biamp Systems Inc.
*42, 21, 38 Series, multitrack systems

Cadac Electronics Ltd.
*Multitrack recording systems

Calrec Audio/A&DR
*L series TV broadcast systems
*M series automation systems

D&R Electronica BV
*MR series for recording systems
*ST1600 series for recording systems

Dynacord Electronic GmbH
*MC1200, 1600 series portable systems

Elektroimpex
*FIT-IC multitrack redording mixers

Fostex Corporation of America
*250AV portable system

Harris Broadcast
*Mono and Stereo 5 radio broadcast systems

Howe Audio Productions
*Howe 7000 series on-air broadcast systems

Interface Electronics
*16T8 multitrack and reinforcement systems

Kajaani Oy
*10EA series
*KAJAC multitrack recording systems

MTE Electronics
*Series 85 broadcast mixers
*Series 250 production systems

Neotek
*Series I, II, III multitrack systems

Peavey Electronics
*MR-7 portable systems
*Mark IV recording mixer system

Pye-TVT Ltd.
*SM8, 12, portable, studio and OB systems

SAIT Electronics
*ESM system for multrack recording

SAJE SA
*CSM 6 system for broadcast and multitrack recording

SELA Svenska Elektronic Apparator, AB
*2880-BT, ST, IS portable mixers

Sennheiser Electronic GmbH
*M101 portable mixer

Siemens AG
*C4 compact mixing system
*C8 for recording and OB van operation
*Sitral C multitrack recording system

Solidyne SRL
*Series 1000, radio and TV broadcast system

Sonetec
*CM series recording mixers

Sphere Audio
*Alpha series radio and TV broadcast mixers
*Eclipse C automation post/production systems

Rank Strand Sound
*System I mixer

TAB Tonographic Aparatebau
*Series 4 and ax for recording, sound reinforcement

Tecnicobel
*CARL 50 broadcast consoles
*RB60 recording and broadcast consoles

Thomson-CSF France
*TAV 2750 rackmount mixer

TOA Electric Company
*RX series for various applications

Tore Seem A/S
*SEESAM broadcast and recording systems

Tweed Audio Electronics
*BC82, M124 portable mixers
*B163, 164, 165 broadcast mixers

Ward-Beck Systems Ltd.
*Custom-built mixer systems for any application.

PHONOGRAPH TURNTABLE

Non-automatic, suitable for the broadcast/production studio environment. Platter typically aluminum. Operation from 115Vac, 60Hz. Tonearm and cartridge not included. Mounting method dependent upon installation.

Manufacturer	Broadcast Electronics				EMT-Franz
Model Number	QRK Galaxy	QRK 12C	QRK 16SA	QRK Custom 2	EMT 950(1)
Drive System	Rim idler	Rim idler	Rim idler	Rim idler	Direct
Motor Type	dc Hall effect	ac synchronous	ac synchronous	ac synchronous	dc servo
Speeds(rpm):	Variable(15-85)	3(78,45,33⅓)	2(45,33⅓)	2(45,33⅓)	3(78,45,33⅓)
Speed Display	LED	Lever position	Indicator lamps	Indicator lamp	Lighted push-button
Speed Accuracy	.....	99.5%	99.5%	99.5%	±0.1%
Pitch Control	±10% of speed	No	No	No	Limited
Start Time(33⅓rpm)	1/16rev.	1/16rev.	1/16rev.	1/16rev.	0.2s
Rumble	−55dB per NAB	−48dB per NAB	−48dB per NAB	−52dB per NAB	70dB, weighted
Wow/Flutter	0.06%/0.08%	0.1%	0.1%	0.1%	0.05%, DIN 45507
Platter Diameter	12"	12"	16"	12"	13"
Platter Weight	5 lb	5.5 lb	8.5 lb	5.5 lb	.....
Speed Change Control	Electronic	Mechanical lever	Mechanical lever	Mechanical lever	Push-button
Start/Stop Control	Push-button	Switch or lever	Switch or lever	Switch or lever	Push-button
Base Size	16¾"Wx17-1/16"D	15"Wx15.5"D	20"Wx18.75"D	15"Wx15.75"D	27.6"Wx18.4"Dx13.2"H
Clearance	2.5" below tabletop	5" below frame	6.25" below frame	5" below frame	.....
Tonearm Recommended	Any	Any	Any	Any	EMT 929
Dust Cover	No	No	No	No	Yes
Reader Service Number	**144**	**145**	**146**	**147**	**148**

(1) EMT systems include preamp electronics.

Manufacturer	EMT-Franz	Harris Broadcast	LPB Inc.	McMartin Industries	MicroTrak
Model Number	EMT 948(1)	CB 1201	S-7A	TT-12C	740
Drive System	Direct	Rim idler	Rim idler	Rim idler	Rim idler
Motor Type	dc servo	Hysteresis sychronous	ac synchronous	ac synchronous	ac synchronous
Speeds(rpm)	Variable & 3 fixed	3(78,45,33⅓)	3(78,45,33⅓)	3(78,45,33⅓)	3(78,45,33⅓)
Speed Display	Switch position	Position of lever	Position of lever	Position of lever	Position of lever
Speed Accuracy	±0.1% of fixed	±0.3%	.....	99.5%	.....
Pitch Control	Possible	No	No	No	No
Start Time(33⅓rpm)	0.5s	1/16rev.	1/16rev.	1/16rev.	1/16rev.
Rumble	70dB, DIN 45539	−45dB per NAB	−48dB per NAB	−48dB per NAB	−36dB per NAB
Wow/Flutter	±0.075%, DIN 45507	0.1%	0.1%	0.1%	0.3%
Platter Diameter	12.9"	12"	12"	12"	12"
Platter Weight	.....	6.9 lb	5.5 lb	5.5 lb	6.5 lb
Speed Change Control	Electronic	Mechanical lever	Mechanical lever	Mechanical lever	Mechanical lever
Start/Stop Control	Push-button	Switch or lever	Switch or lever	Switch or lever	Switch or lever
Base Size	18.3"Wx18.9"Dx9.4"H	16"Wx16"D	15.5"Wx15.5"D	15"Wx15.5"D	15.5"Wx15.5"D
Clearance	6.2" below panel	5.5" below chassis	5" below chassis	.....	7.5" below chassis
Tonearm Recommended	Included	Any	Any	Any	MicroTrak 303
Dust Cover	Yes	No	No	No	No
Reader Service Number	**149**	**150**	**151**	**152**	**153**

Manufacturer	MicroTrak	Ramko Research		Russco	
Model Number	720	SL-1500MK2/Technics	SP-10MKII/Technics	Mark V Broadcast	Studio-Pro
Drive System	Rim idler	Direct	Direct	Belt-isolated rim	Rim idler
Motor Type	ac sychronous	dc servo	dc servo	dc Hall effect	ac synchronous
Speeds(rpm)	3(78,45,33⅓)	2(45,33⅓)	3(78,45,33⅓)	2(45,33⅓)	2(45,33⅓)
Speed Display	Position of lever	LED	.....	LED	Indicator lamps
Speed Accuracy	.....	0.002% error	0.002% error	.....	.....
Pitch Control	No	±9.9%, 0.1% steps	.....	±10%	No
Start Time(33⅓rpm)	1/16rev.	0.7s	1/12rev.	1/36rev.	1/16rev.
Rumble	−36dB per NAB	−73dB per DIN B	−70dB per DIN B	−68dB per DIN B	−38dB per NAB
Wow/Flutter	0.3%	0.02%	0.025%	.075%	0.2%
Platter Diameter	12"	.....	.....	12"	12"
Platter Weight	5.5 lb	.....	.....	6.5 lb	6.5 lb
Speed Change Control	Mechanical lever	Electronic	Electronic	Electronic	Mechanical lever
Start/Stop Control	Switch or lever	Push-button	Push-button	Push-button	Switch or lever
Base Size	15.5"Wx15.5"D	.....	.....	15.5"Wx15.5"D	15.5"Wx15.5"D
Clearance	6.5" below chassis	.....	.....	4" below tabletop	7.5" below chassis
Tonearm Recommended	MicroTrak 303	Included	Any	Any	Any
Dust Cover	No	Yes	Optional	No	No
Reader Service Number	**154**	**155**	**156**	**157**	**158**

Manufacturer	Technics/Panasonic		Thorens/Gertatewerk
Model Number	SL-1015	SL-1025	TD126 Mk III
Drive System	Direct	Direct	Belt
Motor Type	dc heteropole	dc brushless	dc servo
Speeds(rpm)	3(78,45,33⅓)	2(45,33⅓)	3(78,45,33⅓)
Speed Display	LED	Strobe indicator	.....
Speed Accuracy	Quartz control	Quartz control	.....
Pitch Control	±9.9%	±6%	.....
Start Time(33⅓rpm)	0.4s	0.7s	.....
Rumble	−78dB per DIN B	−78dB per DIN B	−72dB per DIN
Wow/Flutter	0.008%	0.01%	0.04%
Platter Diameter	13-11/32"	13-11/32"	12"
Platter Weight	5.9 lb	4.4 lb	4.73 lb
Speed Change Control	Electronic	Electronic	Push-button
Start/Stop Control	Push-button	Push-button	Push-button
Base Size	22"Wx18"D	20.7"Wx16.5"D	.....
Clearance	.....	.....	.....
Tonearm Recommended	EPA-A501H included	EPA-A250 included	TP16 MkIII
Dust Cover	Optional	Optional	Available
Reader Service Number	**159**	**160**	**161**

Spec Note:
Performance specs are not directly comparable due to 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 PROCESSOR, Audio Frequency Extender

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

Manufacturer	C N Rood B V		Comrex Corporation	
System Number	BAX 110/111	BAX 112	PLX	SLX
Frequency Offset	+350, −2150Hz	−350, −2150Hz	250Hz	250Hz
AF Response (±dB/Hz)	−/50-5k	−/50-5k	0.5/50-15k	0.5/50-15k
Translation Accuracy	.....	.....	0.02Hz	0.02Hz
Transmitter Model	**BAX 110M/111M**	**BAX 112M**	**PLX Portable**	**SLX Sports**
Audio Input Level	−6, +6dBm	−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	19" rack-mount	Portable	Portable	4-channel console
Powering Requirement	110-220Vac	110-220Vac, 6Vdc	ac/battery	ac/battery
Receiver Model	**BAX 110D**	**BAX 111D**	**RLX**	**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	19" rack-mount	19" rack-mount
Powering Requirement	110/220Vac	110-220Vac	ac	ac
Reader Service Number	**162**	**163**	**164**	**165**

Manufacturer	Comrex Corp.	dbx Inc.	Kahn Communications	McCurdy Radio
System Number	TLX	Subharmonic Synthesizer	Lines Plus	ST1913/1916
Frequency Offset	250Hz	.....	+300Hz, −2.1kHz	250Hz
AF Response (±dB/Hz)	0.5/50-15k	1/20-20k	2/50-5k, notch at 2.5kHz	−/50-10k
Translation Accuracy	0.02Hz	.....	±1Hz	0.002%
Transmitter Model	**TLX Studio**	.....	.....	**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	**RLX**	**Model 500**	.....	**ST1916**
Input Level	−40, −4, +10dBm	300mV,7Vrms max	−20dBm	Compensates losses
Input Impedance	600Ω	47kΩ	600Ω	600Ω
Audio Output Level	+8, −10dBm	7Vrms max	0dBm	+8dBm
Audio Output Impedance	600Ω	470Ω	600Ω	600Ω
Packaging	19" rack-mount	Rack-mount	Rack-mount	Rack-mount
Powering Requirement	ac	110Vac, 10W	110Vac	ac
Reader Service Number	**166**	**167**	**168**	**169**

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the BE *Buyers' Guide* (annual September issue).

AUDIO PROCESSOR, Level Control

Systems for general level control of audio signals, including compression, limiting, clipping and expansion function. All systems are available in rack-mount configurations.

Manufacturer	Advancing Technology Corporation		Aphex Systems Ltd.	Audio & Design Recording	
Model Number	DAP III Processor	Maximod Digital Peak Limiter	CX-1 Compressor Expander	F760X-R Compex Limiter	Transdynamic Processor
Recommended Use	Any	Any	Any	Any	Air chain
Function(s):					
Compression	Yes	.....	Yes	Yes	Yes
Wideband Limit	.....	Yes	.....	Yes	Yes
Peak Limit	.....	Yes	.....	Yes	Yes
Assymetric Limit	.....	Yes	.....	.....	Yes
Expansion	Yes	Yes	Yes	Yes	Option
AGC Action	.....	.....	Yes	Yes	Yes
Stereo Tracking	Possible w/2 units	Yes	.....	Yes	Yes
Multiband Process	3-band	.....	No	.....	Yes
Metering Types	Gas discharge	LEDs	LEDs	Yes	LEDs
Attack Time	0.2-20msec	Minus seconds	.....	Switched	Fixed, pgm dep.
Release Time	0.1-2sec	Selectable	.....	2msec-3.2sec	Pgm dependent
Compression Ratio	2:1-30:1	Pgm dependent	Adjustable	1:1-20:1	Per compressor
Limiting Ratio	.....	.....	.....	20:1	20:1
Expansion Ratio	.....	.....	Adjustable	1:2	Per expander
Input Impedance	600Ω bal.	600Ω	.....	7kΩ	12kΩ
Output Impedance	600Ω	600Ω	.....	< 1Ω source	<2Ω source
Output Level Max.	+ 21dBm	+ 24dBm	+ 30dBm	+ 19dBm	+ 20dBm
AF Response (± dB/Hz)	0, – 5/20-20K	0.25	– /20-20k	0.5/20-20k	– /30-20k
Harmonic Distortion	0.03%	0.001%	0.1%	<0.1% + 8dBm 4dB L/C	<0.2% + 8dBm 4dB L
	.....	.....	.....		.....
Signal/Noise Ratio	84dB	>90dB	85dB	89dB	95dB
Reader Service Number	170	171	172	173	174

Manufacturer	Audio & Design Recording SCAMP	AudioArts Engineering 1200 Compressor	Audio Technology	Audio Processing Plus	Broadcast Controls
Model Number	System	Limiter	Emph-a-sizer	IMP 3 Processor	1000A Audio Mate
Recommended Use	Any	Any	Any	AM	AM
Function(s):					
Compression	Yes	Yes	Yes	Yes	Yes
Wideband Limit	Yes	.....	Yes	.....	.....
Peak Limit	Yes	.....	.....	Safety clip	.....
Assymetric Limit	.....	.....	.....	Yes	.....
Expansion	.....	.....	.....	Selected band	.....
AGC Action	Yes	.....	.....	.....	.....
Stereo Tracking	Yes	Yes	.....	Yes	.....
Multiband Process	.....	.....	.....	3-band	.....
Metering Types	LED	LED	LED	Meter, LED	Meter
Attack Time	Switched	Adjustable	.....	Factory set	Adjustable
Release Time	25msec-2sec	Adjustable	.....	Adjustable	Adjustable
Compression Ratio	1:1-10:1	.....	1:1-20:1	Pgm dependent	Adjustable
Limiting Ratio	20:1	.....	.....	.....	.....
Expansion Ratio	.....	.....	.....	6dB range	.....
Input Impedance	>12kΩ	20kΩ	10kΩ bal.	600Ω bal.	600Ω bal.
Output Impedance	<1Ω source	<10Ω	600Ω bal.	600Ω bal.	.....
Output Level Max.	+ 24dBm	+ 22dBm	+ 24dBm	+ 20dB	+ 21dB
AF Response (± dB/Hz)	0.5/20-20K	0.5/20-20k	0.25/30-20k	0.5/50-15k	0.5/10-20k
Harmonic Distortion	0.1% + 8dBm 4dB L/C	0.17% 10dB compress	0.2% + 22dBm output	0.4%	0.25%
				.....	.....
Signal/Noise Ratio	92dB	90dB	110dBm EIN	69dB operating	75dB
Reader Service Number	175	176	177	178	179

Spec Note:

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

Control over time:

The radio/TV producer's shoehorn

By Bebe F. McClain, president, B. F. McClain Productions, Asheville, NC

Time is of the essence, in terms of pacing a program and fitting program material into the intended time slot of the log. ABC and NBC staff members tell how one particular system is valuable to their programming needs.

Kevin Dauphinee, equipment planning engineer, ABC TV Network, adjusts equipment being tested in the engineering lab.

Whoever coined the phrase *less is more* must have had time compression in mind. Anyone who has found himself with a 32-second program that needed to be shoehorned into a 30-second slot realizes that time compression is a godsend.

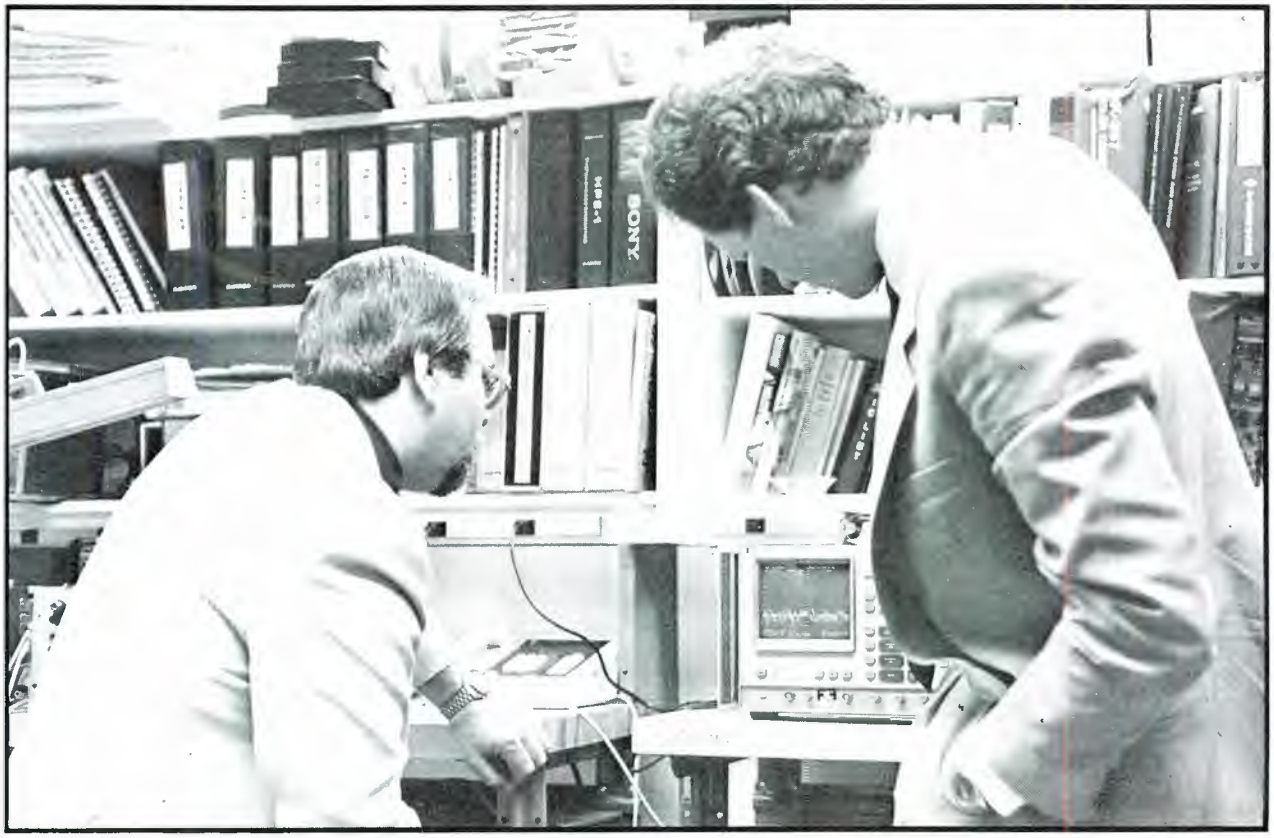
Still in its infancy, but coming on strong, is the entire concept of time compression in the broadcast industry. One unit that has brought this idea to fruition seems to be the Lexicon 1200, which offers time compression and expansion. The ABC Engineering Lab, noted for its hard-line evaluations, recognized the potential of this unit two years ago when the prototype was brought in for extensive testing. Likewise, WNBC Radio, after spotting the unit at the 1981 NAB Convention, realized that such a system could be an answer to a DJ's commercial production needs.

Kevin Dauphinee, equipment planning engineer for the ABC TV Network, evaluated the Lexicon model 1200 in 1980 for possible use in ABC's audio sweetening post-production rooms. Although the search was for a system that would be used to shorten music beds behind edited programs, Dauphinee found that the unit was satisfactory for use with telecines that offered variable speeds. The slight *vertical jitter* inherent in videotape when played at other than normal speeds can be avoided if a still store or certain TBCs are used in conjunction with a time compressor. Also, modifications have been developed to reduce that problem.

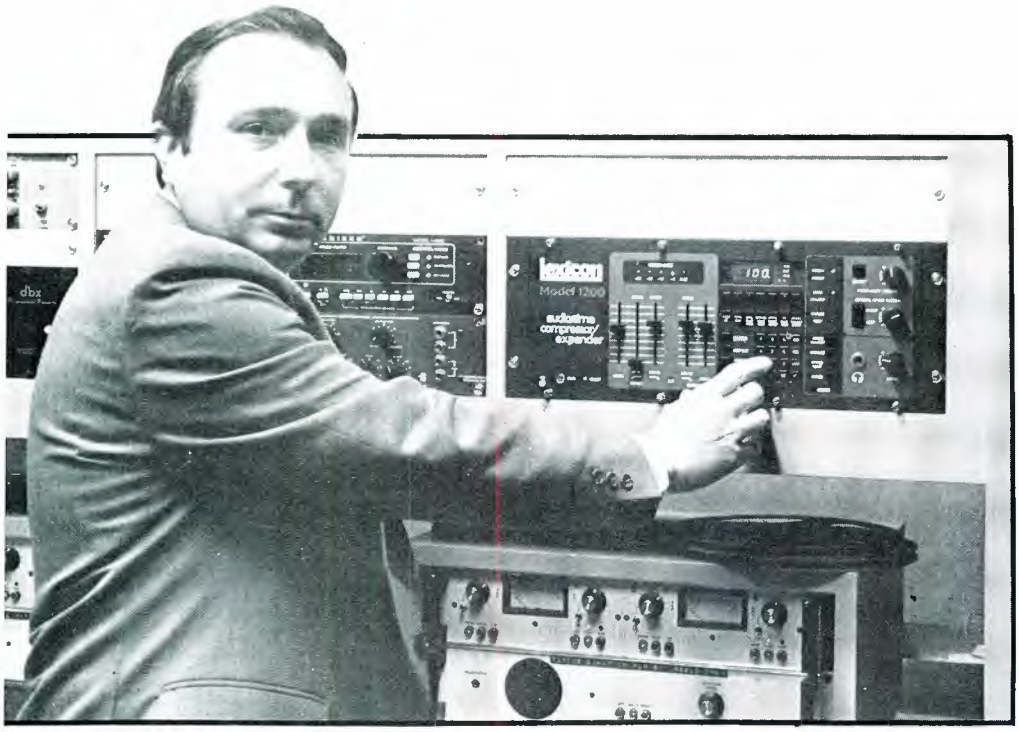
When evaluating the few time compressors on the market, Dauphinee said that the Lexicon 1200 best served the needs of ABC because it was the only single-piece all-in-one system, and it offered the superior quality of digital audio as opposed to analog systems. Others were multichassis systems or employed analog.

After the decision was made by ABC to use time compression, units were installed in each of the two audio sweetening rooms. Wayne Wilfong, technical manager of post-production for ABC, recalled the day the equipment arrived. His group was editing the music beds for use in news segments of the space shuttle coverage. The systems were hooked up and operational within 15 minutes, but Wilfong suggested that a couple of hours would be preferable, allowing

Editor's note: Readers are referred to an article by Dennis Ciapura, "Digital Audio Delay and Time Compression," in the May 1982 issue of **BE**.



Wayne Wilfong (left), technical manager of post-production, ABC Network; and Kevin Dauphinee, equipment planning engineer, ABC TV Network, monitor the spectrum analyzer during equipment tests.



Bill Krause, manager of technical operations, WNBC, points out the Lexicon 1200 system in the radio production room.

time for training. Generally, over a day's time several hours of production time can be saved, by using the Lexicon to compress the beds.

Since then time compression has been used on programs such as *20/20* and news programs produced by ABC such as *Teletone News* and *Where Were You* for ABC's owned and operated stations.

WNBC Radio, where music is king, uses time compression for narration only. Whereas ABC TV post-production receives the edited picture and narration and alters only the length of the music bed, WNBC Radio does the opposite. The station does not compress its all-important music, but rather compresses the dialogue used in commercials, announcements and certain types of programs.

Bill Krause, manager of technical operations for WNBC, said that the station's DJs do not have to be as preoccupied with the clock when preparing commercials as they were before the time compressing unit was installed. In the past, when an announcer was cutting a 30-second spot and it appeared to be falling behind, he would speed up the final portion. Now he can concentrate on the material instead of the clock. If he runs a few seconds overtime, the entire piece can be uniformly compressed by the Lexicon 1200.

Time compression is also a convenient remedy for out-of-house commercial tapes that are a second or two over the allotted 30-second or 60-second time slot. By compressing them 5% or less, they can be made to fit the slot with no discernible difference.

Before the use of time compression, when a taped public service program show ran longer than the time scheduled by WNBC, entire segments had to be removed. Now, if the producer thinks that all the material should be included, he can use the time compressor and pick up at least 3 to 6 minutes in a 30-minute show with no loss of quality.

ABC's Dauphinee said that time compression can be effectively used in movies edited for TV use. Long, drawn out scenes that had dramatic impact in the movie theater, but that might be considered too long for the

The Lexicon 1200 audio time compressor/expander system is a single-chassis device using digital techniques.

Model 1200 Manufacturer's Specifications

Speed Factor Range:
0.5X to 2.0X original recording speed (0.9X to 1.25X recommended for broadcast applications)

Pitch Shift Vernier Range:
±10% minimum from correct perceived pitch

Frequency Response:
40Hz to 10kHz, + 1-2dB at all tape playback speeds

Dynamic Range:
Greater than 72 dB, unweighted

THD Plus Noise:
Less than .05% at 1kHz, at +12dBm in and 1X

Input:
Max level adjustable from −4dBm to +22dBm. Transformer isolated, balanced, 15K ohm input impedance XLR-3 connector

Output:
Max level adjustable from −4dBm to +22dBm. Transformer isolated, balanced, 90 ohm output impedance. XLR-3 connector

Timer Limits:
Up to 999.9 seconds in sec mode. Up to 99 minutes and 59 seconds in Min/Sec mode

Tach Output:
TTL compatible square wave, opto-isolated. 50Hz to 19.2kHz nominal frequency, programmable from front panel

Tach Input:
AC coupled, sine or square wave input, .25V peak to 20V peak, 25Hz to 38.4kHz. Programmable from front panel

DC Output:
−12V to +12V, 10ma max. Range is easily modified by resistor change

AC Output:
Sine wave, 50Hz to 600Hz nominal, +10V peak, 50mW max.

Power:
100,115,230V switch selectable 50/60Hz, 125W. IEC 3 wire power cord

RFI Shielding:
AC power and input/output lines are RFI filtered

Size:
7" panel height in standard 19" rack mount, 15" deep

Weight:
33 lbs. (15kg); 48 lbs. (22kg) shipping

home TV environment, can be compressed, thus making them more entertaining.

It is difficult to distinguish an audiotape or a sound film that has been compressed 5% to 10% from the original version. Upon seeing or hearing the final result, a typical reaction is: "You're kidding—it hasn't been compressed." A built-in computer acts like an experienced editor, intelligently cutting out minute segments (milliseconds) in hundreds of places. The result is a tape with accelerated tempo but unchanged pitch. Actually, the Lexicon 1200 computer contains 16 user-selectable programs, each of which compresses and expands in a different manner, with some being more suitable for music and some for dialogue. ABC and WNBC use the computer's program that was factory-selected.

The producers of an ABC show bring edited videotapes, complete with dialogue, to one of the two ABC audio sweetening rooms, along with the musical selections to be used as beds under each segment. The audio operator alters each piece of music to fit the program segment. If the musical selection is on a record, it is transferred to a ¼-inch audiotape and then physically cut apart (edited) to the approximate time required. To make the music fit the video precisely, it is put through the Lexicon 1200 for compression. Although the unit can shorten the piece by 30%, it is rarely used for more than 20% compression, and 10% is a usual figure.

ABC has permanently installed the Lexicon 1200s above its Ampex AG-440 audiotape recorders. Installation consisted of running one cable from the Lexicon to the Ampex audio in, another to the audio out and a third to the remote control jack. It is through the control cable that the Lexicon computer talks to the Ampex unit to speed up or slow down the capstan.

Operation is simple. Once the existing length of the music bed is known and the final desired length has been determined, these two numbers are punched into the Lexicon 1200 and the START button is pressed. It is also possible to control the unit by selecting the speed factor, the percentage of playback time or the ratio by which the pitch is shifted. Also, a manual control knob enables the operator to increase the speed and determine, by listening to the changing tempo, what percentage of compression is desired. Input and output level controls, plus high- and low-cut filters, are standard features.

WNBC has mounted the Lexicon unit in a 19-inch rack in a control room. Many production houses and stations across the country keep the unit on a centrally located shelf or on a rolling cart so that it can be used with every production piece in the house, including telecines and videotape machines.

Clients and network products are beginning to think of time compression as just another form of editing. Special editing needs that were never possible before can now be done with time compression. For example, a recent segment of *20/20* incorporated a segment of a rock concert with beautiful video and poor quality audio. Using time compression, the producer transferred the song from a record made earlier by the artist, and lip synced it to the concert videotape. This would have been unthinkable with manual editing.

Dauphinee said that audio sweetening is just the entry point for time compression at ABC. The next area will probably be film-to-tape transfer. Wilfong is also enthusiastic.

"We have two audio rooms and we have two units. If I had three rooms, I'd have another. I wouldn't want an audio sweetening room without audio time compression," he said.

AUDIO PROCESSOR

Level Control

Manufacturer	Broadcast Electronics		Circuit Research Labs		Comrex Corporation
Model Number	AM500 Compressor Limiter Expander	FM600 AGC Limiter	AM-4 System	FM-2 System	AGA Auto Gain Adjuster
Recommended Use	AM	FM, TV	AM	FM	Any
Function(s):					
Compression	Yes	Yes	Yes	Yes	.....
Wideband Limit	.....	.....	Yes	Yes	.....
Peak Limit	Peak clip	Yes	Yes	Yes	.....
Assymetric Limit	Yes	.....	Option	Yes	.....
Expansion	Yes	Yes	.....	.....	.....
AGC Action	.....	Yes	Yes	Yes	Yes
Stereo Tracking	.....	Yes	Possible	Yes	.....
Multiband Process	.....	.....	Yes	Yes	.....
Metering Types	Meter	Meter	.....	LED	.....
Attack Time	Fixed	.....	Pgm dependent	Pgm dependent	33msec
Release Time	Adjustable	Adjustable	Pgm dependent	Pgm dependent	Pgm dependent
Compression Ratio	30:1 max	30:1 max	Adjustable	.....	,,,,,
Limiting Ratio	.....	.....	.....	Acjustable	30:1
Expansion Ratio	Gated	30:1	.....	.....	.....
Input Impedance	600Ω bal.	600Ω bal.	600Ω bal.	600Ω bal.	600Ω bal.
Output Impedance	600Ω bal.	600Ω bal.	<200Ω bal.	<200Ω bal.	150Ω source
Output Level Max.	+20dBm	+20dBm	+21dBm	+18dBm	0VU
AF Response (± dB/Hz)	1/30-15k	1/30-15k	1/50-10k	1/50-15k	1/20-15k
Harmonic Distortion	0.5% +20dBm output	0.5% +20dBm output	<0.4% operating	0.4% operating	<0.3% .....
Signal/Noise Ratio	60dB	70dB	60dB operating	63dB operating	70dB 30dB gain
Reader Service Number	**180**	**181**	**182**	**183**	**184**

Level Control

Manufacturer	dbx Professional Products		Elcom-Bauer		EMT-Franz
Model Number	165 Compressor Limiter	900 Series Processor	AGC Level Guard	AP50 InstaPeak II	EMT 266 Transient Limiter
Recommended Use	Any	Any	Any	Any	FM
Function(s):					
Compression	Yes	Yes	Yes	Yes	Yes
Wideband Limit	Yes	.....	Yes	Yes	.....
Peak Limit	.....	.....	.....	Yes	Yes
Assymetric Limit	.....	.....	.....	.....	.....
Expansion	Yes	.....	Yes	.....	.....
AGC Action	.....	.....	Yes	Yes	Yes
Stereo Tracking	Yes	.....	.....	.....	Yes
Multiband Process	.....	.....	.....	2-band	Adaptive
Metering Types	Meter, LED	LED ladder	Meter	Meter	LED
Attack Time	Adjustable	Pgm dependent	Fixed	Fixed	Controlled
Release Time	Adjustable	Fixed	Adjustable	Pgm dependent	Controlled
Compression Ratio	Adjustable	Adjustable	Adjustable	Adjustable	.....
Limiting Ratio	.....	.....	.....	.....	.....
Expansion Ratio	.....	1.5:1-5:1	.....	.....	.....
Input Impedance	22kΩ bal.	25kΩ bal.	10kΩ bal.	600Ω bal.	>5kΩ bal.
Output Impedance	47Ω source	22Ω bal.	600Ω bal.	600Ω bal.	<40Ω source bal.
Output Level Max.	+23dBm	+24dBm	+20dB	+20dB	+22dB
AF Response (± dB/Hz)	0, – 1/20-20k	1/20-20k	0.5/50-15k	1/50-15k	0.3, – 0.5/30-15k
Harmonic Distortion	0.2%	0.2%	0.5%	1%	<0.2%
Signal/Noise Ratio	90dB	– 82dB EIN	70dB	65dB	75dB unwtd
Reader Service Number	**185**	**186**	**187**	**188**	**189**

MANUFACTURERS' ADDRESSES

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AUDIO PROCESSOR

Level Control

Manufacturer	Eventide Clockworks	Furman Sound	Harris Broadcast		
	2830	LC-2 Limiter	MSP-90	MSP-90	MSP-90
Model Number	OmniPressor	Compressor	AM Limiter	FM Limiter	Tri-Band AGC
Recommended Use	Any	Any	AM	FM, TV	Any
Function(s):					
Compression	Yes	Yes	.....	.....	Yes
Wideband Limit	.....	.....	Yes	Yes	.....
Peak Limit	Yes	Yes	Yes	Yes	Yes
Assymetric Limit	.....	.....	Yes	.....	.....
Expansion	Yes	.....	.....	.....	Yes
AGC Action	Yes	.....	Yes	Yes	Yes
Stereo Tracking	Possible	Yes	Yes	Yes	Yes
Multiband Process	No	No	No	No	3-band
Metering Types	Meter	LED	LED	LED	LED
Attack Time	Adjustable	Adjustable	<40μsec	<40μsec	Adjustable
Release Time	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable
Compression Ratio	0-10:1	2:1-50:1	.....	.....	24:1-3:1
Limiting Ratio	Infinite	.....	18:1	30:1	.....
Expansion Ratio	0-10:1	.....	.....	.....	2:1
Input Impedance	10kΩ bal.	10kΩ bal.	600Ω term	600Ω term	600Ω term
Output Impedance	600Ω	600Ω	600Ω	600Ω	600Ω
Output Level Max.	+ 18dBm	+ 27dBm	+ 24dBm	+ 18dBm	+ 18dBm
AF Response (± dB/Hz)	.....	0.5/20-20k	1/20-20k	1/20-20k	1/20-20k
Harmonic Distortion	0.05%	0.07%	0.15%	0.25%	0.25%
Signal/Noise Ratio	– 90dBm	92dB unwtd	70dB	70dB	70dB
Reader Service Number	**190**	**191**	**192**	**193**	**194**

AUDIO PROCESSOR

Level Control

Manufacturer	Inovonics Inc.		Kahn Communications	LPB Inc.	Marti Electronics
Model Number	201 Audio Limiter	MAP II Processor	NSM-125 Processor	S-2 Limiter Compressor	CLA-40A Compressor Limiter
Recommended Use	Any	Any	AM	AM, FM	Any
Function(s):					
Compression	Yes	Yes	Proprietary	Yes	Yes
Wideband Limit	Yes	.....	processing is used	Yes	.....
Peak Limit	Yes	Yes	pending patent	Yes	Yes
Assymetric Limit	No	Yes	action	Yes	Yes
Expansion	.....	.....	.....	No	.....
AGC Action	.....	Gated	.....	No	Yes
Stereo Tracking	Possible	.....	.....	Yes	Yes
Multiband Process	.....	8-band	.....	No	.....
Metering Types	Meter, LED	Meter, LED	.....	VU meter	Meter
Attack Time	Adjustable	.....	.....	Fixed	Fixed
Release Time	Adjustable	.....	.....	Fixed	Adjustable
Compression Ratio	.....	Adjustable	.....	2:1	10:1
Limiting Ratio	Adjustable	.....	.....	.....	Adjustable
Expansion Ratio	.....	.....	.....	.....	.....
Input Impedance	100kΩ unbal.	600Ω bal.	600Ω bal/unbal	600Ω bal/bridge	600Ω bal.
Output Impedance	600Ω	600Ω bal.	600Ω bal/unbal	600Ω bal.	600Ω bal.
Output Level Max.	+ 24dBm	+ 24dBm	+ 10dBm	+ 19dBm	+ 20dBm
AF Response (± dB/Hz)	0.5/20-20k	1/50-15k	1/50-15k	0, – 0.7/20-20k	0.5/50-15k
Harmonic Distortion	<0.5%	<1%	<1%	<0.25%	1% w/compression
Signal/Noise Ratio	<75dB	>65dB	< 50dB	84dB	66dB
Reader Service Number	**195**	**196**	**197**	**198**	**199**

Manufacturer	McMartin Industries	Modular Devices	Moseley Associates		MXR Innovations
Model Number	BFM-1514R	7833 Control	TGR-340	TFL-280 Limiter	136 Dual Limiter
Recommended Use	Any	Any	Any	FM, TV	FM
Function(s):					
Compression	Yes	Yes	Yes	.....	.....
Wideband Limit	Yes	Yes	.....	Yes	Yes
Peak Limit	Yes	Yes	.....	Yes	.....
Assymetric Limit	.....	.....	Yes	.....	.....
Expansion	.....	.....	Yes	.....	.....
AGC Action	Yes	.....	Yes	.....	.....
Stereo Tracking	Yes	.....	Yes	Yes	Yes
Multiband Process	2-band	.....	Yes	Yes	.....
Metering Types	Meter	Meter	Meter	Meter	LED
Attack Time	Fixed	Fixed	2msec	Adjustable	Adjustable
Release Time	Adjustable	Pgm dependent	Adjustable	Adjustable	Adjustable
Compression Ratio	.....	Adjustable	60dB range	.....	.....
Limiting Ratio	.....	Adjustable	.....	50dB range	Adjustable
Expansion Ratio	.....	.....	.....	.....	.....
Input Impedance	600Ω	6kΩ bal.	600Ω	600Ω	20kΩ bal.
Output Impedance	1kΩ	600Ω bal.	600Ω	600Ω	200Ω
Output Level Max.	.....	+ 20dBm	+ 18dBm	+ 17dBm	+ 19dBV
AF Response (± dB/Hz)	1/30-15k	0.5/20-20k	1/30-15k	1/50-15k	0, – 1/20-20k
Harmonic Distortion	0.5%	1% 30dB control	<0.7% w/compression	<0.7% w/limiting	0.1% w/limiting
Signal/Noise Ratio	70dB	– 91dBm EIN	>70dB	>70dB	– 100dBV EIN
Reader Service Number	**200**	**201**	**202**	**203**	**204**

AUDIO PROCESSOR

Level Control

Manufacturer	Orban Associates			Protech Audio	RCA Broadcast
	8100A	8180A	9100A	663CL Compressor	BA-146
Model Number	Optimod-FM	Optimod-FM	Optimod-FM	Limiter	Limiter
Recommended Use	FM Stereo Gen.	TV	AM	Any	Any
Function(s):					
Compression	Yes	Yes	Yes	Yes	Yes
Wideband Limit	Yes	Yes	Yes	Yes	Yes
Peak Limit	Smart clipping	Smart clipping	Smart clipping	Yes	.....
Assymetric Limit	.....	.....	Phase scrambler	Yes	Yes
Expansion	Gated	Gated	Gated	.....	.....
AGC Action	Yes	Yes	Yes	.....	.....
Stereo Tracking	Yes	Yes	Possible	Yes	.....
Multiband Process	2-band	2-band	6-band	Yes	.....
Metering Types	Meters	Meters	Meters	.....	LED
Attack Time	Fixed, pgm dep	Fixed, pgm dep	Pgm dependent	Adjustable	Fixed
Release Time	Fixed, adjustable	Fixed, adjustable	Pgm dependent	Adjustable	Adjustable
Compression Ratio	.....	.....	>10:1	2:1	50:1
Limiting Ratio	Adjustable	Adjustable	Adjustable	20:1	.....
Expansion Ratio	.....	.....	.....	.....	.....
Input Impedance	>10kΩ bal.	>10kΩ bal.	>10kΩ bal.	600Ω bal.	600Ω bal/unbal
Output Impedance	470Ω source	370Ω source	290Ω source bal.	600Ω bal. xfmr	600Ω bal.
Output Level Max.	4Vp-p composite	+20dBm	<+20dBm	+27dBm	+24dBm
AF Response (±dB/Hz)	0.75/50-15k	0.75/50-15k	1/50-7.5k	0.5/30-20k	1/20-15k
Harmonic Distortion	<0.05% THD, IMD	<0.05% THD, IMD	<0.2% THD	0.4% 6dB	1% overall
	.....	.....	.....	compression	.....
Signal/Noise Ratio	81dB typical	81dB typical	>65dB	>78dB w/limiting	70dB
Reader Service Number	205	206	207	208	209

Level Control

Manufacturer	RCA Broadcast	Spectra Sonics		Thomson-CSF Broadcast	
		610	601 Compressor	4300	4450A
Model Number	BA-145S	Complimiter	Limiter	Volumax	Audimax
Recommended Use	Any	Any	Any	AM	Any
Function(s):					
Compression	Yes	Yes	Yes	.....	Yes
Wideband Limit	.....	Yes	Yes	Yes	Yes
Peak Limit	.....	Yes	Yes	Yes	.....
Assymetric Limit	.....	No	No	Yes	.....
Expansion	Yes	No	No	.....	Yes
AGC Action	Yes	Yes	Yes	.....	Yes
Stereo Tracking	Yes	Yes	No	.....	Yes
Multiband Process	.....	No	No	.....	.....
Metering Types	Meter, LED	Yes	No	Meter	Meter
Attack Time	Adjustable	Auto variable	Auto variable	Pgm dependent	.....
Release Time	Adjustable	Adjustable	Adjustable	Fixed	.....
Compression Ratio	30:1	1.1:1-100:1	1.1:1-100:1	.....	Pgm dependent
Limiting Ratio	.....	1.1:1-100:1	1.1:1-100:1	.....	.....
Expansion Ratio	.....	.....	.....	.....	Pgm dependent
Input Impedance	600Ω bal/unbal	600Ω	600Ω	600Ω bal/unbal	150/600Ω bal/unbal
Output Impedance	600Ω bal/unbal	120Ω	<6Ω	600Ω bal/unbal	150/600Ω bal/unbal
Output Level Max.	+24dBm	+4 or +8dBm	+12dBm	+22dBm	+26dBm
AF Response (±dB/Hz)	0.5/20-15k	0.5/20-20k	0.1/10-50k	0.5/50-15k	0.5/50-15k
Harmonic Distortion	1% overall	0.1% 30dB	<0.1% 30dB	1%	0.5% +16dBm
	.....	compress	compress	.....	.....
Signal/Noise Ratio	70dB	>80dB	>80dB	>70dB	>70dB
Reader Service Number	210	211	212	213	214

AUDIO PROCESSOR

Level Control

Manufacturer	United Recording Electronics Ind. (UREI)		Valley People		TTC/Wilkinson
Model Number	LA-4 RMS Limiter Compressor	1176LN Peak Limiter Compressor	610 Dual Compressor Expander	Gain Brain II	LA2-C Limiter
Recommended Use	Any	Any	Any	Any	Any
Function(s):					
Compression	Yes	Yes	Yes	Yes	Yes
Wideband Limit	Yes	Yes	.....	Yes	.....
Peak Limit	RMS	Yes	.....	Yes	Yes
Assymetric Limit	No	No	.....	.....	Yes
Expansion	No	No	Yes	.....	.....
AGC Action	Yes	Yes	Yes	Yes	.....
Stereo Tracking	Yes	Model 1178LN	Yes	.....	Model LA2-CS
Multiband Process	No	.....	.....	.....	.....
Metering Types	VU meter	VU meter	LED bargraph	LED	Meter
Attack Time	Pgm dependent	Adjustable	Switched	Adjustable	Fixed
Release Time	0.1-1sec	Adjustable	Adjustable	Adjustable	Level dependent
Compression Ratio	2, 4, 8:1	4, 8:1	1:1-60:1	1.3:1-∞	35:1
Limiting Ratio	12, 20:1	12, 20:1	.....	.....	.....
Expansion Ratio	.....	.....	1:2 and 1:20	.....	.....
Input Impedance	40kΩ	20kΩ	90kΩ bal.	50kΩ bal.	600Ω bal/unbal
Output Impedance	600Ω	600Ω	<50Ω bal.	2kΩ	600Ω bal/unbal
Output Level Max.	+24dBm	+24dBm	+24dBm	+21dBm	+18dBm
AF Response (±dB/Hz)	0.5/20-20k	1/20-20k	.....	2/5-100k	1/50-20k
Harmonic Distortion	<0.25%	<0.5%	0.015% dynamic THD	0.01%	2% 15dB limiting
Signal/Noise Ratio	<−90dBm EIN	<−81dBm	−89dB typical	−112dB +21dBv output	.....
	.....	.....	.....	.....	.....
Reader Service Number	**215**	**216**	**217**	**218**	**219**

AUDIO PROCESSOR, Noise Reduction

At the request of several manufacturers of noise reduction systems, no attempt has been made to develop detailed spec lists for comparison of noise reduction systems. Interested individuals may use the following information to contact the manufacturers or their major US representative for informative materials on noise reduction equipment.

AEG-Telefunken
Postfach 2154, D-7750
Konstanz, West Germany
*Telcom System
(Gotham Audio, NY)

BEL Electronic
73 Drayton Road, Newton
Longville, Milton, Keynes, UK
*BC3 Noise Reduction System
(The Mike Shop, NY)

DB Electronics
2 Ash St., Buxton
Derbyshire, SK17 6LL UK
*Codec System

dbx Inc.
71 Chapel Street
Newton, MA 02195
*Type I, Type II
*Model 21 Disc System

Deltamod Corporation
2823 Ninth St.
Berkeley, CA 94710
*Auto-matrix Dolby CNR-6

Dolby Laboratories
346 Clapham Road
London, SW9 UK
*Type A, Type B, Type C
(Dolby Labs, San Francisco)

MicMix Audio Products
2995 Ladybird Lane
Dallas, TX 75220
*Dynafex System

MXR Innovations Inc.
740 Driving Park Ave.
Rochester, NY 14613
*Compansion System

Peter Struven GmbH
Bornheide 19, D-2000
Hamburg 53, West Germany
*NLS-8 Noise Limiter

tts-Electronic GmbH
Dammuhlernweg 4, D-6270
Idstein, West Germany
*NR-2 High-Com System

UREI
8460 San Fernando Road
Sun Valley, CA 91352
*CX System for Discs

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AUDIO RECORDER, Cartridge

Recorder/player systems for endless-loop cartridges, typically NAB A and AA types. These remote control capable units are designed for stereo operation with both record and play capabilities. The standard cue tone is 1kHz. For mono and play only machines, interested individuals are directed to the manufacturers for more information. Measurements referenced to 160nWb/m unless noted.

Manufacturer	Ampro/Scully	Audi-Cord Corp.	Broadcast Electronics	D-B Electronics	Harris Broadcast
Model Number	**4500 Series**	**Modu-Cart 126**	**Series 3000**	**Model 2131**	**Criterion 90-2**
Other Cart Sizes	NAB B & C	Any	Any (3300RPS)	B	Any
Microprocessor Control	No	No	No	No	No
Relay Inhibit	No	Yes	.....	No	No
Multiple Decks	No	(Series A)	(5000 Series)	1R/P, 1P	(90-3)
Recording Timer	No	Option	No	No	No
Capstan Motor Type	Hysteresis sync	Hysteresis sync	Hysteresis sync	dc servo Hall	Synchronous
Drive System	Direct	Direct	Direct	Indirect	Direct
Metering	Yes	Yes	Yes	Yes	Yes
Secondary Cue Tone	150Hz option	Yes	150Hz option	150Hz	150Hz
Tertiary Cue Tone	8kHz option	Yes	8kHz option	8kHz	8kHz option
Input Impedance	.....	5.1kΩ bal. xfmr	150Ω/50kΩ bal. xfmr	.....	600Ω bal.
Input Level Max.	+20dBm	2.5V	7.7V line (+20dBm)	+20dBm	+18dBm
Output Impedance	150/600Ω bal.	150/600Ω	600Ω bal xfmr	150/600Ω unbal.	600Ω bal.
Output Level Max.	+20dBm	+20dBm	+20dBm	+18dBm	+18dBm
Cue Output Form	Electronic ground	Sink logic option	Relay closure	Relay closure	Relay closure
AF Response (±dB/Hz)	−4, +2/30-18k	2/50-15k	2/50-15k	2/50-15k	−4, +1/50-16k
Signal/Noise Ratio	58dB	−47dB	52dB	>52dB	50dB
Crosstalk (Cue/Pgm)	>50dB, 1kHz	.....	>50dB	>50dB	−50dB, 1kHz
Distortion	0.3%, +18dBm	1% (system)	≤2%	≤2%	1.5%, 1kHz
Wow & Flutter	0.15% peak wtd	0.15% wtd	≤0.2% rms unwtd	≤0.15% peak wtd	0.15%
Standard Packaging	Table-top, rack	Table-top, rack	Table-top, rack	Table-top, rack	Table-top, rack
Mono Available	Yes	Yes	Yes	Yes	Yes
Play Only Available	2500 Series	Yes	Yes	Yes	90-1
Reader Service Number	**220**	**221**	**222**	**223**	**224**

AUDIO RECORDER

Cartridge

Manufacturer	ITC/3M	Pacific Recorders and Engineering	Ramko Research	Telex	UMC Electronics Corporation
Model Number	Series 99B	Tom Cat	PhaseMaster Series	MC-PRS-3	Type 200
Other Cart Sizes	No	No	Yes	BB	Any
Microprocessor Control	Yes	Yes	.....	No	No
Relay Inhibit	Yes	Yes	Yes	Flashing LED	Yes
Multiple Decks	No	No	No	No	(Type 300)
Recording Timer	No	No	Yes	No	No
Capstan Motor Type	dc brushless servo	dc servo	dc servo	dc servo	Hysteresis sync
Drive System	Direct	Direct	Direct	Belt	Direct
Metering	Tautband VU	Yes	LED	VU	VU
Secondary Cue Tone	Yes	150Hz	Yes	Yes	Yes
Tertiary Cue Tone	Yes	8kHz	Yes	Yes	Yes
Input Impedance	20k bal.	20kΩ bal.	600Ω/20kΩ	150/600Ω	600Ω/10kΩ bal.
Input Level Max.	+28dBm	+9dBm	.....	+18dBm line	+21dBm
Output Impedance	150/600Ω bal.	600Ω bal.	150/600Ω	150/600Ω	150/600Ω bal.
Output Level Max.	+25dBm	+25dBm	+25dBm	+24dBm	+18dBm
Cue Output Form	Open collector/relay	Closure, dc level	.....	Relay closure	Closure
AF Response (±dB/Hz)	1/31.5-16k	−1,0.1/40-16k	≤1.5/50-16k	1/50-15k	1/40-20k
Signal/Noise Ratio	>56dB	59dB	<−60dB	60dB, 3% THD	53dB
Crosstalk (Cue/Pgm)	>48dB, 1kHz	−60dB	50dB	−50dB	−50dB
Distortion	<0.8% THD (system)	0.9%	0.3%	<0.5%	<0.06% +18dBm
Wow & Flutter	<0.15% DIN wtd R/P	0.1%	0.095% DIN wtd	<0.1%	<0.15%
Standard Packaging	Table-top, rack	Table-top, rack	Table-top, rack	Table-top, rack	Table-top
Mono Available	Yes	Not compatible with	RPM-1	MC-PR3	Yes
Play Only Available	Yes	other systems	PM-1, PS-1	MC-PS3, MC-P3	Yes
Reader Service Number	**225**	**226**	**227**	**228**	**229**

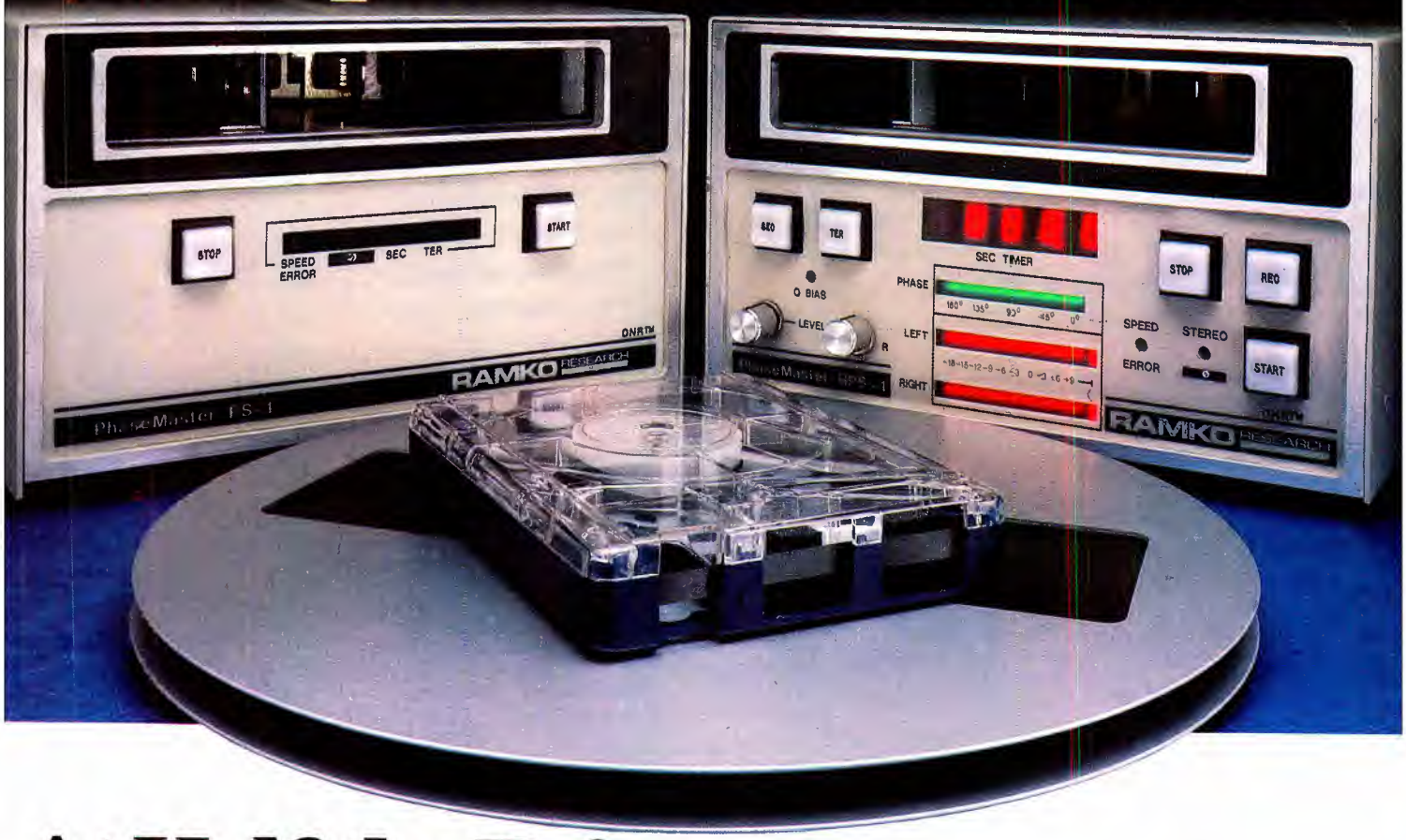
AUDIO RECORDER, Reel-to-Reel

Record/play decks using open reels. Remote control is available. Formats include ¼-, ½-, 1- and 2-inch tape. Studio and portable units present line levels between −20dBm and +8dBm typically. Analog recording technology is used. Tape play speeds are indicated as **A** (3.75ips), **B** (7.5ips), **C** (15ips) and **D** (30ips).

Manufacturer	AEG-Telefunken	AKAI Electric	Ampex Corporation		
Model Number	System M15A	GX-625	ATR-100 Series	ATR-800	ATR-124
Number of Tracks	1, 2, 4	4	1, 2, 4	1, 2, 4	16, 24(8)
Tape Width (inches)	¼, ½	¼	¼, ½	¼, ½	2(1)
Speeds	B/C, C/D	A/B	A/B/C/D	A/B/C/D	B/C/D
Speed Variable (range)	±50% option	±6%	−50, +200% option	±10%	−50, +200% option
Reel Size Max/Hub Type	−/DIN, NAB, Cine	10.5/NAB	14/NAB, DIN, EIA	10.5/EIA, NAB, DIN	16/NAB
Head Type	Vacodur	GX	Comp ferrite, metal	.....	Metal
Capstan Moters	dc servo	ac servo	dc servo	dc servo	dc servo
Reel Motors	Triac-control	Eddy current	.....	.....	dc servo
Metering	Optional bridge	Yes	VU, peak	ANSI VU/EBU peak	VU
Equalization	NAB, CCIR	.....	NAB, IEC	NAB, IEC	Various
Editor Interface	AZ15A option	No	Possible	Possible	Possible
Synchronizer	NS15A option	.....	Possible	Possible	Possible
Tape Timer	Electronic	Electronic	Yes	Electronic, driven	Electronic, driven
Cueing Feature	Yes, AL15A option	Yes	S-T-C(1)	S-T-C	S-T-C
Braking Method	Dynamic	Elect/mech	Dynamic	Dynamic, mech	Dynamic
Packaging	Case, console	Table-top	Rack, console	Rack, console	Console
Input Impedance	5kΩ	2.4kΩ	50kΩ	10kΩ	≥20kΩ resistive
Input Level Max.	+15dBm	70mV nom	+40dBm	+36dBm	26dB over ref.
Output Impedance	40Ω	20kΩ load	50kΩ	≤30Ω	≤50Ω
Output Level Max.	+24dBm	0.775V nom	+28dBm	+28dBm	+28dBm
AF Response (±dB/Hz)	1.5/30-16k, 15ips	3/30-26k, 7.5ips	0.75/100-10k	−/30-20k, 15ips	2/40-30k, 30ips
Harmonic Distortion	1%	0.5%	<0.03% 370nWb/m	<0.3%, 370nWb/m	<0.5%, 370nWb/m
S/N Ratio	65dB "A", 15ips	62dB	73dB "A" 2Tr 15ips	68dB 2Tr 15ips	>73dB 1040nWb/m
Crosstalk (Worst)	48dB	.....	−45dB 15ips	−57dB @ 1kHz	−57dB @ 15ips
Reader Service Number	**230**	**231**	**232**	**233**	**234**

(1) Search-To-Cue.

The Performance of an Open-Reel Recorder.



At Half the Price of Its Nearest Competitor.

Let's face it, the secret to better cart machine performance isn't in the cartridge, it's in the machine.

The new generation of improved cartridges and tapes alone can't solve the serious phase stability and noise problems. The plastic cart and its guiding system are highly imprecise, at best. The new "hot" tapes bring a slight decrease in audible noise, which is not terribly significant considering the noise base. The maintenance of precise machine-to-machine head phase alignment has been practically impossible in even the best installations.

The solution to the problem?

PhaseMaster. The industry's most advanced broadcast reproduction system. In the stereo units, our exclusive electronic solution utilizes variable delays in each of the output channels. A sample of the left program channel is encoded on the cue track (without interfering with the cue information), and upon decoding in the playback cycle is compared to its upper track (left program) mate. Thus, an apples-to-apples comparison which is used to correct for the time (phasing) differences due to head misalignment, tape skewing and jitter. It works flawlessly with any cartridge. It eliminates the compromise of unreliable and inconsistent electromechanical schemes; the tradeoffs imposed by noise-inducing and non-compatible matrixing approaches; the complex and inexact cross-correlation methods.

PhaseMaster gives you compatability with all your present, previously recorded carts too. An easy transition can be made at your own pace without having to immediately rerecord your station's entire library. Interestingly, even these carts will sound better due to our new noise-reduction circuitry.

Add to this the performance specifications that rival open-reel recorders and the best mechanical design you've ever seen in a cart machine.

Here's the best news yet: PhaseMaster can be performing in your studios for as little as $1,091.* At $2,600, our Stereo R/P is about half the price of the ITC/3M Series 99B. And the margin's even wider with Tomcat.** If you've given thought to adding the Phasechaser, you're now up to, or over the price of a new PhaseMaster with all of its inherent advantages.

Feature for feature, spec' to spec', dollar for dollar—the Phasemaster comes out on top.

The only way to fully appreciate a PhaseMaster is to get your hands (and ears) on one. To prove to yourself that PhaseMaster really has the performance of an open-reel recorder, that once and for all phase stability, noise and fidelity problems are a thing of the past, that there's a cart machine truly ready for FM & AM Mono or Stereo—write or call us now. We'll loan you a PhaseMaster at no obligation. Free, for two weeks.

Like we said, try it with anybody's cart.

You'll discover performance of an open-reel recorder, at half the price of its nearest competitor.

PhaseMaster's Numbers

Wow & Flutter:	0.095% max. DIN weighted (0.04 to 0.07% typical)
Signal-To-Noise Ratio: (Playback)	−68dB. @ 160 nWb/m (A weighted) −72dB. @ 250 nWb/m (A weighted)
Frequency Response:	Amplifier: +0.25 dB (NAB Curve) System: 50 Hz to 16kHz ± 1.5 dB
Phase Correction: (Stereo)	±738° correction range @ 16kHz
Separation (Stereo):	50 dB
Output Level:	+25 dBm
Distortion:	0.3% max. (amplifier)
Price:	$1,091 Model PM-1 Mono Playback $2,690 Model RPS-1 Stereo—Record/Play $2,000 Model RPM-1 Mono Record/Play $1,399 Model PS-1 Stereo Playback

*Model PM-1 mono playback.
All prices are introductory and subject to change without notice.
**Based upon manufacturer's suggested professional prices 7/82.
ITC/3M, trademark 3M Corp. Tomcat, trademark of Pacific Recorders & Engineering. Phasechaser, trademark of Howe Audio, Inc.

Engineered For Your Bottom Line.

RAMKO

Ramko Research, 11355-A Folsom Blvd.
Rancho Cordova, California 95670 (916) 635-3600

Circle (11) on Reply Card

AUDIO RECORDER

Reel-to-Reel

	Ampex	Enertec Schlumberger	Ferrograph	Fostex Corp.	ITC/3M
Manufacturer	**Corporation**				
Model Number	**MM-1200**	**F500**	**SP7S**	**A-series**	**770 (R/P or P)**
Number of Tracks	8, 16, 24	1, 2	4	2, 4, 8	1, 2, 4(2 ch)
Tape Width (inches)	1, 2	¼	¼	¼	¼
Speeds	B/C, C/D	A/B/C	A/B/C	B/C (C only on A-8)	B/C
Speed Variable (range)	−50, ±200% option	±7 half-ton opt.	Yes	±10%	No
Reel Size Max/Hub Type	16/NAB	11/NAB, CCIR	10.5/NAB, EIA	7	10.5/NAB, EIA
Head Type	.....	.....	.....	3	3 proprietary
Capstan Moters	dc servo	dc servo	dc servo	FG servo	dc servo
Reel Motors	dc servo	dc	.....	.....	Induction
Metering	VU	VU bridge option	Yes	VU	Taut band A VU
Equalization	NAB, IEC	CCIR, NAB	IEC, DIN, NAB, CCIR	IEC, NAB	NAB
Editor Interface	Possible	.....	No	No	No
Synchronizer	Possible	Nagra IV S	.....	.....	No
Tape Timer	Electronic, driven	Yes	Mechanical	Digital	No
Cueing Feature	S-T-C	Yes	Yes	Yes	Yes
Braking Method	Dynamic, mech	Dynamic, mech	Electronic	Dynamic	Mechanical
Packaging	Console	Case, rack, console	Cabinet, rack	Table-top	Rack, console
Input Impedance	20kΩ bal.	≥5kΩ bal.	20kΩ bal.	30kΩ(15kΩ A-8)	5kΩ bal.
Input Level Max.	+28dB over nom	+22dB	5V	.....	+8dBm
Output Impedance	600Ω bal.	≥600Ω load	50Ω bal.	≥10kΩ load	600Ω bal. xfmr
Output Level Max.	+27dBm	+18dB	2V	.....	+24dBm
AF Response (±dB/Hz)	2/50-18k, 30ips	2/31.5-18k, 15ips	2/30-20k, 15ips	≤3/≥45-18k	2/35-18k, 15ips
Harmonic Distortion	<1%, 260nWb/m + 3dB	<1% NAB, 15ips	2%	<1% 1kHz 0VU	0.2%, rms, 15ips
S/N Ratio	59dB 1040nWb/m 24Tr	61dB CCIR 2Tr	60dB	>63dB	52dB
Crosstalk (Worst)	45dB 24Tr	<40dB @ 10kHz	−75dB @ 1kHz	.....	<50dB @ 1kHz
Reader Service Number	**235**	**236**	**237**	**238**	**239**

Reel-to-Reel

	MCI/Sony		Nagra/Kudelski		Otari Corporation
Manufacturer					
Model Number	**JH-110C-8**	**JH-24 Series**	**T-Audio**	**Nagra E Portable**	**5050B-II**
Number of Tracks	8	8, 16, 24	1, 2	1	2
Tape Width (inches)	1	To 2	¼	¼	¼
Speeds	B/C/D	C/D	A/B/C/D	B	A/B/C
Speed Variable (range)	±20%	±20%	±6%/±10m/s	No	±7%
Reel Size Max/Hub Type	10.5/NAB	14/NAB	11.8/NAB, AEG	7/NAB (10.5)	10/NAB, EIA
Head Type	.....	.....	4	3	3 or 4
Capstan Moters	dc servo	dc servo	dc servo (two)	dc servo	dc servo
Reel Motors	.....	.....	.....	.....	Synchronous
Metering	Yes	Yes	.....	Yes	VU, peak LED
Equalization	NAB, IEC	NAB, IEC	CCIR, NAB	NAB, CCIR	IEC, NAB
Editor Interface	Yes	Yes	Integral editor	No	.....
Synchronizer	Yes	Yes	Possible	Yes	.....
Tape Timer	.....	.....	Electronic	.....	Yes
Cueing Feature	Autolocator	Autolocator	Yes	Yes	Yes
Braking Method	Electronic	Electronic	Electronic	.....	Mechanical
Packaging	Console	Console	Case, console, rack	Case	Table-top, rack
Input Impedance	10kΩ bal.	10kΩ bal.	>10kΩ bal.	150kΩ	10kΩ bal. active
Input Level Max.	.....	.....	+14dB	0.4V	+27dBm
Output Impedance	120Ω bal. source	120Ω bal. source	200Ω to ∞ load	600Ω load	5Ω bal. active
Output Level Max.	+24dBm	+24dBm	+24dBm	4.4V, 320nWb/m	+27dBm
AF Response (±dB/Hz)	0.75, −2/40-28k	1.5, −3/36-26k, 30ips	1/30-20k, 15ips	2/50-15k	2/30-20k, 15ips
Harmonic Distortion	0.35%	0.35%	0.7% NAB, 15ips	<0.9dB, 0dB	<0.5% 3rd harmonic
S/N Ratio	66dB, 30ips	67dB, 30ips	73.5dB NAB, 15ips	62dB wtd	71dB unwtd, 15 ips
Crosstalk (Worst)	.....	.....	40dB @ 10kHz	.....	55dB @ 1kHz
Reader Service Number	**240**	**241**	**242**	**243**	**244**

Schlumberger's

Know-how

Turnkey installations

(studios - broadcasting centres)

Equipment for :

- ***OB. vans***
- ***professional sound***
- ***broadcasting***
- ***television***

etc...

- ***Switching grid matrices***
- ***Talkback systems***
- ***Master F 462 tape recorders***
- ***F 500 tape recorders***
- ***UPS 5000 sound mixing desks***
- ***UPS 6000 sound mixing consoles***

ENERTEC

Schlumberger

ENERTEC DEPARTEMENT AUDIO-PROFESSIONNEL

1 rue Nieuport B.P. 54

78140 Velizy-Villacoublay Cedex France

TEL. (3) 946.96.50 TELEX ENERSON 697430 F

Circle (12) on Reply Card

AUDIO RECORDER

Reel-to-Reel

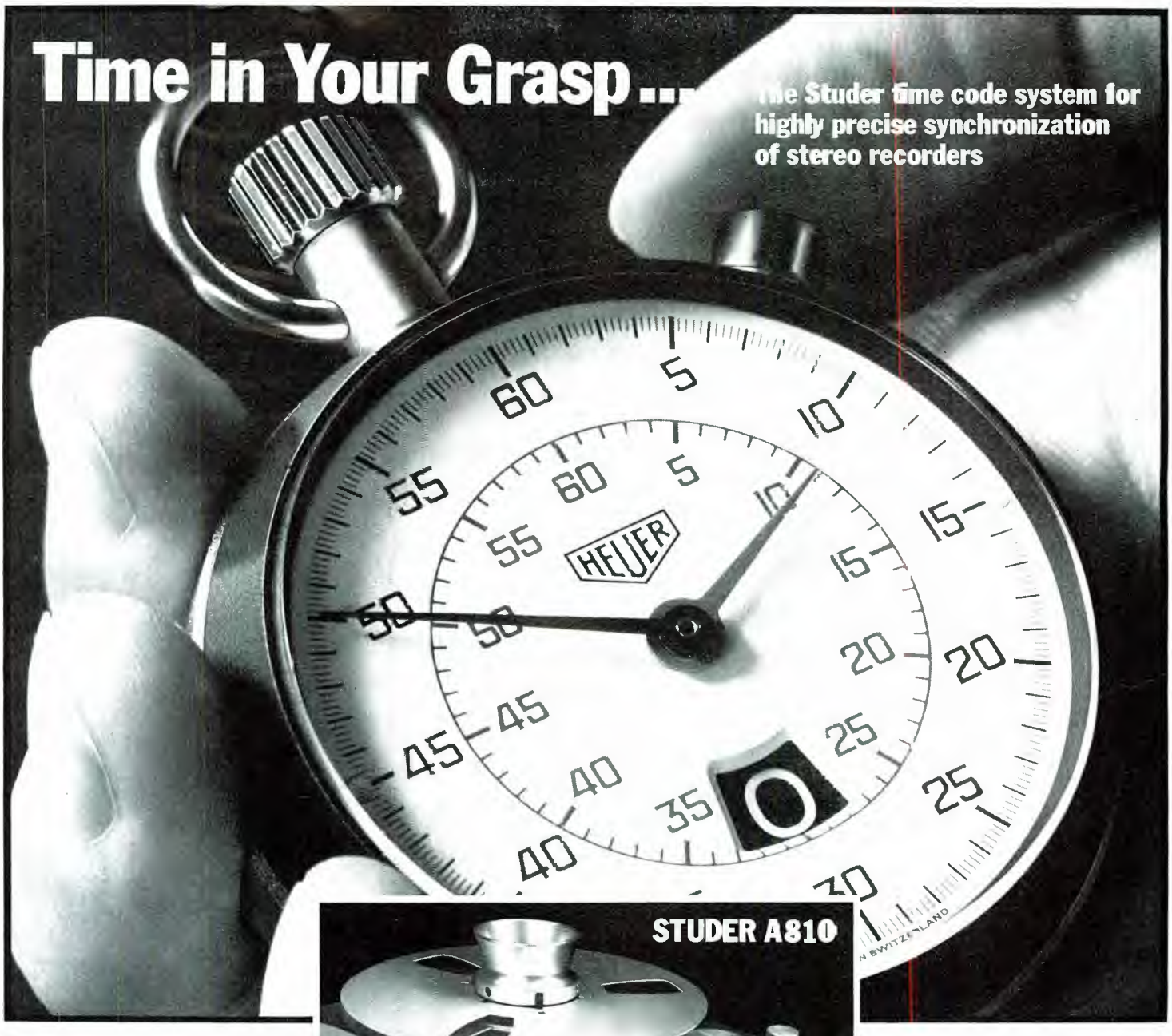
Manufacturer	Otari Corporation			Scully	Soundcraft
Model Number	**MTR-10 Series**	**MTR-90II-8**	**5050 Mk III Series**	**Model 250**	**SCM 381-8**
Number of Tracks	1, 2, 4	8	2 (4, 8)	1, 2, 4	8
Tape Width (inches)	¼, ½	1	¼ (½)	¼	1
Speeds	A/B/C/D	C/D	A/B/C (B/C)	A/B, B/C	C standard
Speed Variable (range)	±20%	±20%	±7%	Option	−50, +15%
Reel Size Max/Hub Type	12.5/NAB	14/NAB	10/NAB, EIA	10.5/NAB	.....
Head Type	3/Sendust, metal	3/metal	3 or 4	.....	3
Capstan Moters	dc servo	dc servo	dc servo	Hyst. synch.	dc servo
Reel Motors	dc servo	dc servo	Synchronous	Hyst. synch.	.....
Metering	VU, peak LED	VU	VU, peak LED	Yes	Yes
Equalization	NAB, IEC, AES	NAB, IEC	IEC, NAB	NAB, IEC	.....
Editor Interface	Yes	Yes	Possible	.....	.....
Synchronizer	Yes	Yes	For ½" units	.....	.....
Tape Timer	Yes	Yes	Yes	.....	On autolocator
Cueing Feature	Yes, S-T-C	Yes, S-T-C	Yes	Yes	Yes
Braking Method	Dynamic	Dynamic	Dynamic	Differential	Electronic
Packaging	Console, unmounted	Console	Table-top, rack	Rack	Console
Input Impedance	20kΩ	10kΩ	¼"-10k ,(½"-50kΩ)	10kΩ	10kΩ
Input Level Max.	.....	.....	+27dBm(+21dBm)	.....	+20dBm
Output Impedance	5Ω source	10Ω source	5Ω(40Ω)	600Ω unbal.	600Ω
Output Level Max.	+28dBm	+28dBm	+27dBm(+27dBm)	+17dBm	+22dBm
AF Response (±dB/Hz)	+0.5, −2/42-29k	+1.5, −3/42-29k	2/30-20k(2/40-25k)	2/50-18k, 15ips	−2, 1/30-20k
Harmonic Distortion	<0.15%, 3rd har.	0.015%, 3rd har.	<0.5% (<0.7%)	<3%, 3rd har.	.....
S/N Ratio	75dB unwtd	74dB unwtd	71dB (70dB)	66dB wtd, 15ips	63dB
Crosstalk (Worst)	40dB 63Hz-12kHz	45dB 220Hz-17kHz	55dB	.....	−55dB, 1kHz
Reader Service Number	**245**	**246**	**247**	**248**	**249**

Reel-to-Reel

Manufacturer	Stellavox		Studer Revox		
Model Number	**SP8**	**TD88**	**Revox PR99**	**A810**	**Studer A80VU**
Number of Tracks	1-3	To 8	1 or 2	1 or 2	1, 2, 4, 8, 16, 2A
TapeWidth (inches)	¼	¼, ½, 16mm	¼	¼	¼, ½, 1, 2
Speeds	B	A/B/C/D, 24/25fps	A/B, B/C	A/B/C/D	A/B, B/C, C/D
Speed Variable (range)	±10%	Yes	±7% semitones opt	±7 semitones	±7 semitones
Reel Size Max/Hub Type	5, Opt 12	14/NAB, DIN, Cine	10.5/NAB	11.1/NAB	12/NAB
Head Type	3 or 4	Plug-in block	3/ferrite, metal	3/ferrite, metal	3/ferrite, metal
Capstan Moters	dc servo	dc servo	Servo control	Servo control	Servo control
Reel Motors	.....	Patented	ac	ac	Servo control
Metering	Yes	.....	VU, peak LED	VU, PPM	VU
Equalization	Option	NAB option	NAB	NAB, CCIR	NAB, CCIR
Editor Interface	.....	.....	.....	Yes	Yes
Synchronizer	SQS option	Yes	.....	Option SMPTE	Option
Tape Timer	Mechanical	Yes	.....	Yes	Digital
Cueing Feature	.....	.....	Yes	Yes	Yes
Braking Method	.....	Electrical	Mechanical	Mech/elect	Mech/elect
Packaging	Portable case	Table-top, rack	Console, rack, case	Console, rack, case	Console
Input Impedance	200Ω mic	10kΩ	5kΩ	≥5kΩ	8kΩ
Input Level Max.	+7.5dB, ref 6dBm	0.7-10V	+22dBu	+22dBm	+22dBm
Output Impedance	200-600Ω	50Ω	50Ω	≤50Ω	30Ω
Output Level Max.	3.8V	4.4V	+22dBu, 600	+24dBm	+24dBm
AF Response (±dB/Hz)	2/30-18k stereo	2/30-20k	−3, +2/30-22k, 15ips	3/30-22k	2/50-20k
Harmonic Distortion	<2%	<1%, 15ips	0.3%, OVU	1% max	1% max
S/N Ratio	67dB	>65dB, 15ips	66dB, A wtd, 15ips	71dB, 1040nWb/m	70dB ¼" stereo
Crosstalk (Worst)	>45dB, 1kHz	.....	45dB	40dB	40dB stereo
Reader Service Number	**250**	**251**	**252**	**253**	**254**

Time in Your Grasp...

The Studer time code system for highly precise synchronization of stereo recorders



The new Studer A810 points the way to the future; now even two-channel ¼" stereo recorders may be perfectly synchronized. Precise SMPTE time code synchronization and maximum crosstalk rejection are attained by separating time code heads from audio heads, and by using a microprocessor-controlled delay. Studer has finally solved the problem of synchronizing stereo machines!

Until now SMPTE-code synchronizing of video-audio, film-audio, or audio-audio has been restricted to multi-channel machines. But such linkups pose no problem for Studer's A810 time code recorders. Designed for maximum system flexibility, the A810 has a fully digital control system for both the tape transport functions and audio electronic alignment. And, for the first time in the history of audio recording equipment, the A810 offers complete data exchange to peripheral equipment via serial interface. The bus-compatible A810 is ideally suited to complex automation tasks, and the A810's flexible modular concept allows simple, cost-effective changeover to specialized configurations.

We'll be glad to send you more information on the analog and digital capabilities of Studer's new A810 – the audio recorder with a grip on the future.

Circle (13) on Reply Card

STUDER REVOX

Studer Revox America, Inc. • 1425 Elm Hill Pike, Nashville, TN 37210 (615) 254-5651
Offices: Los Angeles (213) 780-4234 • New York (212) 255-4462 • Dallas (214) 760-8647 Canada: Studer Revox Canada, Ltd.

AUDIO RECORDER

Reel-to-Reel

Manufacturer	Studer Revox	TASCAM/Teac Production Products			
Model Number	**Studer B67 MKII**	**Series 50**	**30 Series**	**80-8**	**85-16B**
Number of Tracks	1 or 2	2, 8	2, 4, 8	8	16
Tape Width (inches)	¼	¼, ½	¼, ½	½	1
Speeds	A/B/C, B/C/D	C (52 at B)	B, C (38 at C)	C	C
Speed Variable (range)	±7 semitones opt	±15% pitch	±12%	Option	±10%
Reel Size Max/Hub Type	11.1/NAB	10.5, 7/NAB	10.5/NAB	10.5/NAB	10.5/NAB
Head Type	3 ferrite, metal	3/hyperbolic	Permalloy	Permalloy	Permalloy
Capstan Moters	Servo control	Slotless dc	FG servo	Synchronous std	dc
Reel Motors	ac servo	Slotless dc	Slotless dc	Synchronous std	dc
Metering	VU	VU, peak LED	VU	VU, peak LED	VU
Equalization	NAB, CCIR	IEC, CCIR, NAB	IEC std	IEC std	IEC std
Editor Interface	.....	Possible	No	No	Yes
Synchronizer	Option	Yes	No	No	Port available
Tape Timer	Digital	Yes	Digital	Digital	Yes
Cueing Feature	Yes	S-T-C, R-T-Z(2)	Yes	Yes	Yes
Braking Method	Mech/elect	Dynamic	Mech/elect	Mechanical	Mech/elect
Packaging	Console, rack, case	Table-top, rack	Table-rop, rack	Table-top/rack	Console
Input Impedance	≥5kΩ	50kΩ unbal.	50kΩ	20kΩ	50kΩ
Input Level Max.	+22dBm	+19dBV(8.9V)	8Vrms	Any to control	0.316V
Output Impedance	≤50Ω	500Ω unbal.	≥1kΩ	≥1kΩ	≥1kΩ
Output Level Max.	+22dBm	+19dBV(8.9V)	8V	13V	8V, 1kΩ
AF Response (±dB/Hz)	2/30-18k	3/40-20k	3/40-22k	3/40-18k	3/40-18k
Harmonic Distortion	1% max	0.8% 250nWb/m(0VU)	0.8% 250nWb/m	1% 250nWb/m(0VU)	1% 250nWb/m(0VU)
S/N Ratio	71dB, 1040nWb/m	69dB A wtd 3%THD	68dB A wtd 3%THD	65dB A wtd 3%THD	92dB 3%THD
Crosstalk (Worst)	40dB	>50dB, 1kHz	−50dB, 1kHz 0VU	45	45
Reader Service Number	**255**	**256**	**257**	**258**	**259**

(2) Return-To-Zero.

Reel-to-Reel

Manufacturer	Technics/Panasonic	Telex Communications	
Model Number	**RS-10A02**	**1400**	**3000**
Number of Tracks	2	1, 2, 4	1, 2, 4
Tape Width (inches)	¼	¼	¼
Speeds	A/B/C	A/B/C	A/B/C
Speed Variable (range)	±6% pitch	Yes	No
Reel Size Max/Hub Type	10.5/EIA, NAB	8.25/NAB B	10.5/NAB A or B
Head Type	3/Sendust, ferrite	.....	.....
Capstan Moters	dc brushless servo	dc servo	Synchronous
Reel Motors	dc brushless	Induction	Induction
Metering	Yes	VU	VU
Equalization	NAB, IEC, CCIR	Selectable	Selectable
Editor Interface	No	No	No
Synchronizer	No	No	No
Tape Timer	Mechanical	No	Counter
Cueing Feature	Yes	Yes	Yes
Braking Method	Dynamic	Elect/mech	Elect/mech
Packaging	Table-top, rack	Rack, portable	Rack
Input Impedance	10kΩ	600Ω line	600Ω line
Input Level Max.	+5dBm	+30dBm	15V, line
Output Impedance	600Ω	600Ω	150/600Ω
Output Level Max.	+8dBm(2.19V)	+14dBm	+20dBm
AF Response (±dB/Hz)	3/20-20k, 7.5ips	2/35-33k, 15ips	3/30-18k
Harmonic Distortion	<0.8% 185nWb/m(0VU)	<1%, +4dBm	<1% 0dBm
S/N Ratio	67dB A wtd (650nWb/m)	>60dB NAB wtd	60dB NAB wtd
Crosstalk (Worst)	>50dB, 1kHz	>50dB 1kHz	>50dB 1kHz
Reader Service Number	**260**	**261**	**262**

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

WIRELESS MICROPHONE SYSTEM

FM-modulated carrier system. Typical equipment uses hand-held, body-pack or pocket-size transmitting units with rack-mounted or table-top receiving sets for in-studio or limited distance on-set requirements. Intended for program audio quality.

Manufacturer	Cetec Vega				Coherent Communications
Model Number	**Professional ID**	**Professional IID**	**Performer ID**	**Performer IID**	**Model G/NR**
RF Frequency Band	150-216MHz	150-216MHz	150-216MHz	150-216MHz	150-240MHz
Diversity Receiving	No	Yes	No	Yes	No
Simultaneous Channels	1	1	1	1	1
Typical Useful Range	ca. 50 ft	ca. 50 ft	ca. 50 ft	ca. 50 ft	ca. 1100 ft
AF Response (± dB/Hz)	1/100-12k	1/100-12k	1/100-12k	1/100-12k	2/80-20k
Harmonic Distortion	1%	1%	1%	1%	2% max
Modulation Control	Compression "Dynex"	Compression "Dynex"	Compression "Dynex"	Compression "Dynex"	.....
Transmitter Number	**77B**	**77B**	**80**	**81**	**Model G**
RF Power Output	50mW	50mW	50mW	50mW	50mW
FM Deviation (±)	12kHz	12kHz	12kHz	12kHz	12kHz
Mic Type	Low Z	Low Z	EV 671A dynamic	Shure SM58	Shure SM58
Audio Input Level	0.22 to 39mV	0.22-39mV	.....	.....	– 60, – 30dB(0.775V)
Manual Level Control	Yes	Yes	Yes	Yes	Screwdriver adjust
Auto Level Range	45dB	45dB	45dB	45dB	30dB
Audio Input Impedance	150Ω	150Ω	.....	.....	1000Ω
Power Requirement	9Vdc alkaline	9Vdc alkaline	9Vdc alkaline	9vdc alkaline	9Vdc
Typical Battery Life	7-9 hrs	7-9 hrs	7-9 hrs	7-9 hours	10 hours
Unit Packaging	Pocket pack	Pocket pack	Hand-held	Hand-held	Hand-held
Dimensions (Inches)	3.8x2.8x1	3.8x2.8x1	10.2 long	10.5 long	9.5 long
Weight (Operating)	5 oz w/battery	5 oz w/battery	12 oz	14 oz	15.5 oz
Receiver Number	**58**	**63**	**58**	**63**	**Model NR**
Sensitivity	0.7μV, 20dB quieting	0.7μV, 20dB quieting	0.7μV, 20dB quieting	0.7μV, 20dB quieting	0.8μV, 12dB SINAD
Spurious Rejection	– 70dB	– 70dB	– 87DB	– 70dB	>85dB
AF Output Line Level	0dBm, 600Ω bal.	0dBm, 600Ω bal.	0dBm, 600Ω bal.	0dBm, 600Ω bal.	+ 10dBm max
AF Output Mic Level	– 52dBm, 150Ω bal.	– 52dBm, 150Ω bal.	– 52dBm, 150Ω bal.	– 52dBm, 150Ω bal.	Std dynamic mic level
Metering Scales	VU, RF, power	VU, RF, power	VU, RF, power	VU, RF, power	RF, power
Carrier Indicator	LED	LED	LED	LED	Meter
Power Requirement	115Vac, 12Vdc	115Vac, 12Vdc	115Vac, 12Vdc	115Vac, 12Vdc	110Vac, #NP supply
Battery Type	.....	.....	.....	.....	.....
Antenna	50Ω whip (#120)	50Ω, 2-#123 dipoles	50Ω whip (#120)	50Ω, 2-#123 dipoles	50-75Ω
Unit Packaging	Table-top	Table-top	Table-top	Table-top	Rack mount
Dimensions (Inches)	3.7x6.8x9	3.7x6.8x9	3.7x6.8x9	3.7x6.8x9	5.25x19
Weight (Operating)	3.25 lb	ca. 5 lb	3.25 lb	ca. 5 lb	.....
Reader Service Number	**263**	**264**	**265**	**266**	**267**

Manufacturer	Coherent Communications	Edcor			Ercona Corporation
Model Number	**Model A/J**	**E COM High Band**	**E COM High Band**	**E COM High Band**	**E03M/E13**
RF Frequency Range	150-240MHz	150-216MHz	150-216MHz	150-216MHz	30-50MHz
Diversity Receiving	No	.....	.....	Yes	No
Simultaneous Channels	1	1	1	1	1
Typical Useful Range	ca. 1100 ft	to 1500 ft	to 1500 ft	ca. 1500 ft	.....
AF Response (± dB/Hz)	2/80-20k	2/200-16k	2/200-16k	2/200-16k	2/60-10k
Harmonic Distortion	2% max	1%	1%	1%	2%
Modulation Control	.....	Soft compression	Soft compression	Soft compression	.....
Transmitter Number	**Model A**	**E COM 1 Lavalier**	**E COM 1 Hand-held**	**E COM 1 Hand-held**	**E03M**
RF Power Output	50mW	100mW	100mW	100mW	50mW
FM Deviation (±)	12kHz	7.5kHz	7.5kHz	7.5kHz	.....
Mic Type	Dynamic or electret	EV, Audio-Technica	EV 671	EV 671	Electret E611-M
Audio Input Impedance	1000Ω	150-250Ω	.....	.....	.....
Manual Level Control	Screwdriver adjust	Yes	No	No	.....
Auto Level Range	30dB	– 50, – 10dB	.....	.....	.....
Audio Input Impedance	100Ω	150-250Ω	.....	.....	.....
Power Requirement	9Vdc	9Vdc alkaline	12.6Vdc, E-289	12.6Vdc, E-289	9Vdc alkaline
Typical Battery Life	10 hours	4-5 hrs	.....	.....	15 hours
Unit Packaging	Pocket pack	Pocket pack	Hand-held	Hand-held	Pocket pack
Dimensions (Inches)	2.4x4.1x0.8	5.5x3x1.5	1.125x9 long	1.125x9 long	2.25x3.25x1.1
Weight (Operating)	10.5 oz	0.66 lb w/o battery	8.7 oz w/o battery	8.7 oz w/o battery	.....
Receiver Number	**Model J**	**E COM 3**	**E COM 7**	**E COM 5 Diversity**	**E13**
Sensitivity	0.8μV, 12dB SINAD	<1μV	1μV, 12dB SINAD	<1μV, 20dB quieting	0.5μV, 20dB quieting
Spurious Rejection	>85dB	+ 70dB	+ 60dB	>70dB	>80dB
AF Output Line Level	+ 10dBm max	3Vp-p	0.25W, 8Ω earphone	3Vp-p	Yes
AF Output Mic Level	Std dynamic mic level	100mV	.....	100mV	Yes
Metering Scales	RF, power	LEDs	.....	None	None
Carrier Indicator	Meter	LED	.....	LED	.....
Power Requirement	3 9Vdc batteries	115Vac, 12Vdc	9Vdc	115Vac, 12Vdc ext.	12Vdc, E13AC adapter
Battery Type	MN-1604	.....	Alkaline	.....	1.2AH NiCad
Antenna	50-75Ω	Telescoping on back	Furnished	2, cut to frequency	54" whip, 50Ω
Unit Packaging	Portable	Table-top	Body pac	Table-top	Table-top
Dimensions (Inches)	4x7.1x1	1.75x8.5x8	5.8x3x1.5	1.75x15x9	8x7.5x2.5
Weight (Operating)	1.5 lb	2.72 lb	0.66 lb w/o battery	4.16 lb	4 lb
Reader Service Number	**268**	**269**	**270**	**271**	**272**

WIRELESS MICROPHONE SYSTEM

Manufacturer	HME		Nady Systems		
Model Number	**22E, 22EF**	**25E, 25EF**	**VHF 600**	**VHF 700**	**VHF 610**
RF Frequency Band	150-216MHz	150-216MHz	150-216MHz	150-216MHz	150-216MHz
Diversity Receiving	With HME AD-5	With HME AD-5	No	Yes	No
Simultaneous Channels	1	1	1	1	1
Typical Useful Range	ca. 1000 ft	ca. 1000 ft	ca. 1500 ft	ca. 1500 ft	1500 ft
AF Response (±db/Hz)	2/100-12k	2/100-12k	3/25-20k	3/25-20k	3/25-20k
Harmonic Distortion	<1%	<1%	0.6%	0.6%	6% max
Modulation Control	Dynamic Expander	.....	Companion	Companion	Companion
Transmitter Number	**WM222**	**WM252A**	**VHF900**	**VHF900**	**VHF900**
RF Power Output	50mW	100mW	20/125mW	50/125mW	50/125mW
FM Deviation (±)	10kHz	20kHz	15kHz	15kHz	15kHz
Mic Type	Low Z	Dynamic, electret	Any	Any	Any
Audio Input Level	–65, –40dBm	–50dB	.....	.....	.....
Manual Level Control	.....	No	.....	.....	.....
Auto Level Range	.....	>95dB range	100dB	100dB	100dB
Audio Input Impedance	150Ω	10kΩ	1MΩ	1MΩ	1MΩ
Power Requirement	9Vdc alkaline	9Vdc alkaline	9Vdc, MN-1604	9Vdc, MN-1604	9Vdc, MN-1604
Typical Battery Life	6-8 hrs	6-8 hrs	20 hrs	20 hrs	20 hrs
Unit Packaging	Pocket pack	Hand-held	Pocket or Hand-held	Pocket or Hand-held	Pocket or Hand-held
Dimensions (Inches)	4x2.5x0.8	1x8 long + mic	4.2x2.7x0.9	4.2x2.7x0.9	4.2x2.7x0.9
Weight (Operating)	5 oz w/o battery	1 lb	2 oz	4 oz	4 oz
Receiver Number	**WM122B**	**WM152A**	**VHF 600 (Upgradable)**	**VHF 700**	**VHF 610**
Sensitivity	1μV, 30dB quieting	1μV, 30dB quieting	.....	.....	.....
Spurious Rejection	>40dB	>40dB	100dB	100dB	90dB
AF Output Line Level	+8dBm	+8dBm	0dBm, 600Ω bal.	0dBm, 600Ω bal.	0dBm, 600Ω unbal.
AF Output Mic Level	–12dBm	–12dBm	–52dBm, 150Ω bal.	–52dBm, 150Ω bal.	–52dBm, 150Ω bal.
Metering Scales	VU, power	VU, power	.....	.....	.....
Carrier Indicator	LED	LED	LED	LED	LED
Power Requirement	ac, Ext. dc	ac, Ext. dc	120Vac, 12-18Vdc	120Vac, 12-18Vdc	110Vac, external dc
Battery Type	9Vdc alkaline	9Vdc alkaline	.....	.....	12 AA cells
Antenna	Vertical whip	Vertical whip	50Ω whip	50Ω, 2 whips	50Ω whip
Unit Packaging	Table-top	Table-top	Table-top	Table-top	Body pack
Dimensions (Inches)	7x5.75x3	6x1.75x7	2.25x8.4x9	2.25x8.4x9	4.5x1.3x7.75
Weight (Operating)	2.5 lb	2 lb	.....	.....	1.5 lb
Reader Service Number	**273**	**274**	**275**	**276**	**277**

Manufacturer	Panasonic	RF Technology			
Model Number	**WX-9000**	**RM-101**	**RM-102**	**RM-100**	**RM-104**
RF Frequency Band	450.4-455.2MHz	947-952MHz	947-952MHz	947-952MHz	947-952MHz
Diversity Receiving	No	Yes	Yes	Yes	Yes
Simultaneous Channels	1	1	1	5	2
Typical Useful Range	.....	500 ft	500 ft	500 ft	500 ft
AF Response (± dB/Hz)	3/50-10K	1/50-10K	1/50-10K	1/50-10k	1/50-10k
Harmonic Distortion	.....	1% w/AGC	1% w/AGC	1% w/AGC	1% w/AGC
Modulation Control	Limiting	Soft limiting	Soft limiting	Soft limiting	Soft limiting
Transmitter No.	**WX-9000**	**Standard Unit**	**Standard Unit**	**Standard Unit**	**Standard Unit**
RF Power Output	30mW	50mW	50mW	50mW	50mW
FM Deviation (±)	35kHz max	50kHz max	50kHz max	50kHz max	50kHz max
Mic Type	Electret condenser	Low Z	Low Z	Low Z	Low Z
Audio Input Level	84-96dBspl	–60, –40dBm	–60, –40dBm	–60, –40dBm	–60, –40dBm
Manual Level Control	.....	Yes	Yes	Yes	Yes
Auto Level Range	.....	30dB	30dB	30dB	30dB
Audio Input Impedance	.....	3kΩ	3kΩ	3kΩ	3kΩ
Power Requirement	2 AA cells	.....	.....	.....	.....
Typical Battery Life	4 hours	5 hours	5 hours	5 hours	5 hours
Unit Packaging	Pocket pack	Pocket pack	Pocket pack	Pocket pack	Pocket pack
Dimensions (Inches)	3.5x2.6x0.7	5.4x3x0.8	5.4x3x0.8	5.4x3x0.8	5.4x3x0.8
Weight (Operating)	0.4 lb	12.5 w/batteries	12.5 w/batteries	12.5 oz w/battery	12.5 oz w/battery
Receiver Number	**WX-9200(1)**	**RM-101**	**RM-102**	**RM-100**	**RM-104**
Sensitivity	10dBμV	.....	.....	.....	.....
Spurious Rejection	>60dB, ±400kHz	70dB	70dB	70dB	70dB
AF Output Line Level	1mW, 8Ω earphone	.....	.....	+8dBm, 150/600Ω bal.	+8dBm, 150/600Ω bal.
AF Output Mic Level	–60dBm, 600Ω	–50dBm, 150Ω	–50dBm, 150Ω	–50dBm, 150/600Ω bal.	–50dBm, 150/600Ω bal.
Metering Scales	LEDs	.....	.....	.....	.....
Carrier Indicator	LED	.....	.....	.....	.....
Power Requirement	9Vdc, 90mA	12Vdc, Int/ext.	115Vac, 12Vdc	115Vac	12Vdc, 0.5A
Battery Type	6 AA cells	AA alkaline, NiCad	NiCad	.....	9 D cells
Antenna	Whip	50Ω, 2 diversity	50Ω, 2 Diversity	50Ω	50Ω, 2 diversity
Unit Packaging	Portable	Portable case	Portable case	Rack-mount	Portable case
Dimensions (Inches)	1.5x4x3.9	4x1.3x5.5	9x12x5	16x5.25x18	9x12x5
Weight (Operating)	1 lb	1.5 lb	13 lb	.....	12 lb
Reader Service Number	**278**	**279**	**280**	**281**	**282**

(1) Receiver WX-9250 may be used, slightly heavier and larger.

WIRELESS MICROPHONE SYSTEM

Manufacturer	Samson	Schaffer Group	Sennheiser		Sony Corporation
Model Number	**SMX-1**	**Schaffer-Vega**	**SK1010-9/EM1010-4**	**SK1007/EM1026**	**WRT27A/WRR-37**
RF Frequency Band	50MHz range	150-216MHz	181/205MHz(TV8-12)	30-45MHz	947-952MHz
Diversity Receiving	w/TR10-20M	Yes	w/2 EM1010-4	Possible	Yes
Simultaneous Channels	1	1	5	6	2 possible
Typical Useful Range	ca. 500 ft	300 ft	.....	.....	to 300 ft w/WP-27
AF Response (±dB/Hz)	1/30-10k, 10kHz dev.	2/30-15k	3/40-20k	3/40-20k	0.5/200-15k
Harmonic Distortion	1%	1%	3%	1.5%	<0.3%
Modulation Control	Companding	.....	Compression	Limiting	.....
Transmitter No.	**SMT-1**	**X-10**	**SK1010-9**	**SK1007**	**WRT27A w/WP-27 Amp**
RF Power Output	10μV at 3 meters	50mW	50mW	100mW	30mW (500mW w/Amp)
FM Deviation (±)	5kHz	.....	16kHz	40kHz	150kHz peak
Mic Type	Omnidirectional	.....	MKE2010 or 4010	MK12	Various
Audio Input Level	.....	.....	1-20mV	0.5-15mV	.....
Manual Level Control	.....	Yes	Yes	Yes	40dB range
Auto Level Range	20dB	.....	36dB	30dB	.....
Audio Input Impedance	.....	50kΩ	Low Z	.....	.....
Power Requirement	AA cells	9Vdc, MN-1604	9Vdc, alkaline	3 9Vdc alkaline	9Vdc, 12Vdc ext.
Typical Battery Life	8-10 hours	6-10 hours	8-48 hours	4-20 hours	.....
Unit Packaging	Hand-held	Pocket pack	Pocket pack	Pocket pack	Body or Belt pack
Dimensions (Inches)	9.5Lx2Dia.	3.8x2.8x1	6x1.8x1	6x3.5x1	2.4x3.6x8
Weight (Operating)	2.2 lb w/battery	5 oz w/battery	8 oz w/battery	14 oz	7 oz
Receiver Number	**SMR-1**	**63EX**	**EM1010-4(140-210MHz)**	**EM1026**	**WRR-37**
Sensitivity	15dB/μV	1μV, 20dB quieting	2.5μV	.....	.....
Spurious Rejection	.....	70dB	.....	.....	.....
AF Output Line Level	+6dBm	0dBm, 600Ωbal.	1.55V, 20Ωbal.	1.55V, 20Ω bal.	.....
AF Output Mic Level	.....	−46dBV, 150Ω, bal.	.....	.....	−64dBm, ±2.4kHz dev.
Metering Scales	RF, VU	VU, RF, power	VU, RF, power	VU, RF off tuned	VU, RF, power
Carrier Indicator	LED	LED or meter	LED	LED	Meter
Power Requirement	115Vac, 5.2W	120Vac, 12Vdc	110Vac, Int/Ext dc	110Vac, 55W	On-board battery
Battery Type	.....	.....	NEDA 1603 or 12V Auto	.....	.....
Antenna	1.2m rod	50Ω	60Ω TA203	50Ω GZA1000	Supplied
Unit Packaging	Table-top	Table-top	Table-top	Table-top	Table-top
Dimensions (Inches)	2x7.5x5.9	3.7x6.8x12	1.6x7.7x4	21.3x13x6.5	6x1.5x8
Weight (Operating)	2.2 lb	5 lb	7.3 lb	24.5 lb	2.8 lb
Reader Service Number	**283**	**284**	**285**	**286**	**287**

Manufacturer		Swintek		Telex Communications	
Model Number	**Mark 3-50A VHF**	**Mark 2L/50-dB UHF**	**dB-S 5000 Series**	**WT-100/FMR-1**	**WHM-300/FMR-1(2)**
RF Frequency Band	174-216MHz	400-470MHz	174-216MHz	150-176MHz	150-176MHz
Diversity Receiving	With Mark 9-2 Option	With Mark 9-2 Option	With Mark 9-2 Option	Yes	Yes
Simultaneous Channels	1	1	1	1	1
Typical Useful Range	ca. 2000 ft	ca. 2000 ft	ca. 2000 ft	1100 ft	1000 ft
AF Response (±dB/Hz)	2/30-10K	2/30-10K	2/30-12K	2/50-15K	2/50-15K
Harmonic Distortion	0.7%	0.7%	0.7%	1%	1%
Modulation Control	Compress/limit	Compres/limit	Compression	Compress/limit	Compres/limit
Transmitter Number	**WMS-111-50A**	**RMS-111-TS/UHF**	**Mark 50A/dBs**	**WT-100**	**WHM-300(2)**
RF Power Output	.....	25mW	50mW	50mW max	15mW
FM Deviation (±)	10kHz	10kHz	10kHz	12kHz	12kHz
Mic Type	Various	Various	Various	WLM-100 or Low Z	Electret, contained
Audio Input Level	−54dBV min	−54dBV min	−54dBV or line	.....	.....
Manual Level Control	Yes	Yes	Yes	Yes	Yes
Auto Level Range	30dB range	80dB range	80dB range	30dB	30dB
Audio Input Impedance	Low or High Z	Low or High Z	5kΩ and 100kΩ	100-300Ω	.....
Power Requirement	9Vdc MN-1604	9Vdc MN-1604	9Vdc	9Vdc NiCad	9Vdc NiCad
Typical Battery Life	10 hours	10 hours	15 hours	12-15 hours	20 hours
Unit Packaging	Body pack	Body pack	Body pack	Pocket pack	Hand-held
Dimensions (Inches)	3.75x2.25x0.85	5.6x2.25x0.85	3.75x2.25x9	2.75x4x1	1.75x11.75 long
Weight (Operating)	5 oz	10 oz	5 oz	5.4 oz w/o battery	11.5 oz w/o battery
Receiver Number	**Mark 3**	**2L/UHF/dBs**	**Mark I dBs**	**FMR-1**	**FMR-1**
Sensitivity	0.25μV, 12dB SINAD	0.4μV, 12dB SINAD	0.25μV, 12dB SINAD	<1μV, 12dB SINAD	<1μV, 12dB SINAD
Spurious Rejection	.....	70dB	70dB	>70dB	>70dB
AF Output Line Level	6dBV, 100Ω bal.	10dBV, 100Ω bal.	to 10dBV, 100Ω	+4dBm	+4dBm
AF Output Mic Level	−30dBV, 250Ω bal	−30dBV, 250Ω bal.	−36dBV, 250Ω bal.	−50dB, 200Ω	−50dB, 200Ω
Metering Scales	VU, RF, power	VU, RF, power	VU, RF, power	Relative VU	Relative VU
Carrier Indicator	LED	LED	LED	LED	LED
Power Requirement	12Vdc int/ext	110Vac, ext. dc	115Vac, ext. dc	110Vac, 12Vdc, 100mA	110Vac, 12Vdc, 100mA
Battery Type	8 AA cells	12-24Vdc	7.2Vdc NiCad	.....	.....
Antenna	Various	Various	Various	5/8 wave	5/8 wave
Unit Packaging	Table-top	Table-top	Table-top	Cabinet	Cabinet
Dimensions (Inches)	75x3.7x1.75	7x5.4x3	7x5.4x3	8.24x9x3.5	8.25x9x3.5
Weight (Operating)	3 lb	4 lb	3.5 lb	5.5 lb	5.5 lb
Reader Service Number	**288**	**289**	**290**	**291**	**292**

(2) WHM-400 Transmitter uses self-contained dynamic microphone.

WIRELESS MICROPHONE SYSTEM

Remote Pickup Unit. Portable and/or carriable transmitter equipment, battery-operated or ac-powered, for transmission of program audio from a remote location to receiving equipment at the studio.

Manufacturer	Comrex Corporation		Marti		
Model Number	**450 TA**	**HHT-1KA**	**RPT2-150/R-30/150**	**RPT2-450R/RR-50/450**	**RPT-15-450SS/R-100-450**
RF Frequency Band	450-451, 455-456MHz	450-451, 455-456MHz	152-172MHz	450-456MHz	450-456MHz
Diversity Receiving	No	No	No	No	No
AF Response (±dB/Hz)	1/100-6k	1/100-6k	1.5/50-7.5k	1.5/50-10.5k	1.5/50-7.5k
Signal/Noise Ratio	60dB	60dB	50dB	53dB	58dB
Harmonic Distortion	1%	1%	2%	2%	1%
Modulation Control	Automatic	Automatic	Compress/limit	Compress/limit	Compress/limit
Typical Useful Range	0.5 miles	2 miles	.....	.....	.....
Transmitter Model Number	**450 TA**	**HHT-1KA**	**RPT2-150L**	**FPT2-450R**	**RPT-15-450SS**
RF Power Output	150mW	1W	2.5W	2.5W	15W
Deviation (±)	5kHz	5kHz	5kHz	9kHz	22.5kHz
Mic Impedance	150Ω	Built-in electret	150-500	Low Z	Low Z
Line Impedance	.....	Line	8-600Ω	8-600Ω	8-600Ω
Input Levels	−65dBm	0.5V line	0.2-2V	0.2-2V	0.2-2V
Manual Control Range	.....	.....	.....	.....	.....
Power Requirement	2 9Vdc alkaline	6 AA alkaline	112Vac, 12.6Vdc	112Vac, 12.6Vdc	12.6Vdc, 2.25A
Typical Battery Life	3 hours	55 minutes	.....	.....	.....
Unit Packaging	Pocket pack(3x5x1)	Hand-held	Hand-carried	Hand-carried	Hand-carried
Operating Weight	11 oz	14 oz	5.25 lb	5.25 lb	9.25 lb
Receiver Model Number	**450 RA**	**RRB**	**R-30/150**	**RR-50/450**	**R-100-450**
Sensitivity	1μV	1μV	0.5μV, 20dB quieting	0.5μV, 20dB quieting	0.5μV, 20dB quieting
Spurious Rejection	80dB	80dB	90dB	90dB	90dB
AF Output Line Level	.....	−10,0dBm	+10dBm, balanced	+10dBm, balanced	+10dBm, balanced
AF Output Mic Level	−50dBm, 150Ω	.....	.....	.....	.....
Metering Scales	.....	.....	VU, RF, power, disc	VU, RF, power, disc	VU, RF, power, disc
Carrier Indicator	.....	LED	Meter	Meter	Meter
Power Requirement	2 9Vdc alkaline	110Vac, 12Vdc	115Vac, 3W	115Vac, 3W	110Vac, 30W
Battery Type	MN-1604	.....	.....	.....	.....
Unit Packaging	Camera mountable	Rack-mount	Rack-mount	Rack-mount	Rack-mount
Antenna	1/4 whip or external	External	50Ω	50Ω	50Ω
Reader Service Number	**293**	**294**	**295**	**296**	**297**

Manufacturer	McMartin		Moseley		Sennheiser
Model Number	**RPU-1403/RPU-1450R**	**RPU-1103/RPU-1150R**	**RPL-3A**	**RPL-4A(1)**	**SER1-4/ER-3**
RF Frequency Band	450-470MHz	150-175MHz	148-174MHz	450-470MHz	25-110MHz
Diversity Receiving	No	No	Possible	Possible	No
AF Response (±dB/Hz)	1/30-10k	0.75/50-7.5k	1.5/30-7.5k	1.5/30-7.5k(1)	3/30-12k
Signal/Noise Ratio	60dB	60dB	55dB min	55dB min	60dB
Harmonic Distortion	1%	1%	<1.3%, 1kHz	<1.3%kHz	3%
Modulation Control	Compression	Compression	Limiter	Limiter	Limiter
Typical Useful Range	.....	.....	To 20 miles	To 20 miles	.....
Transmitter Model Number	**RPT-1403**	**RPU-1103**	**RPL-3A**	**RPL-4A**	**SER1-4**
RF Power Output	3W	3W	10W, 13W max	10W, 13W max	10W
Deviation (±)	10kHz	5kHz	5kHz	5kHz	15kHz
Mic Impedance	Low Z	50, 150, 600Ω	150Ω	150Ω	Low Z
Line Impedance	8-600Ω	8-600Ω	100kΩ	100kΩ	To 600Ω
Input Levels	−20, +18dBm	−20, +18dBm	−15, +10dBm	−15, +10dBm	To 1.55V
Manual Control Range	.....	.....	25dB	25dB	36dB
Power Requirement	12Vdc rechargeable	12Vdc rechargeable	110Vac, 13.5Vdc	110Vac, 13.5Vdc	15Vdc, 2AH, GZB4-2
Typical Battery Life	.....	.....	.....	.....	2-3 hours
Unit Packaging	Hand-carried	Hand-carried	Hand-carried	Hand-carried	Hand-carried
Operating Weight	6 lb	6 lb	16 lb	16 lb	9.7 lb
Receiver Model Number	**RPU-1450R**	**RPU-1150R**	**RPL-3A**	**RPL-4A**	**ER-3**
Sensitivity	0.5μV, 20dB quieting	0.5μV, 20dB quieting	1μV, 20dB quieting	1μV, 20dB quieting	2.5μV, 26dB quieting
Spurious Rejection	65dB	65dB	65dB below carrier	65dB below carrier	80dB
AF Output Line Level	+10dBm, balanced	+10dBm, balanced	+10dBm	+10dBm	1.5V, 300Ω bal.
AF Output Mic Level	.....	.....	.....	.....	.....
Metering Scales	VU, RF	VU, RF	RF	RF	VU, RF, dc, squelch
Carrier Indicator	Meter	Meter	Meter	Meter	Meter
Power Requirement	120Vac, 25W	120Vac, 25W	110Vac	110Vac	12-16Vdc, 50mA
Battery Type	.....	.....	.....	.....	Rechargeable
Unit Packaging	Rack-mount	Rack-mount	Rack-mount	Rack-mount	Hand-carried
Antenna	50Ω	50Ω	Not provided	Not provided	50Ω
Reader Service Number	**298**	**299**	**300**	**301**	**302**

(1) RPL-4B provides response of 30Hz-10kHz, with special option to 15kHz.

Videodisc Systems

Cameras

- Portable/ENG
- Studio/EFP
- VRC/combo

Camera lenses

- ½-inch
- ⅔-inch
- 1-inch
- 1¼-inch

Camera tubes

Character generators/titlers

Color video monitors

Digital effects/manipulator systems

Editing controllers

Production switchers

TBCs/synchronizers/freeze-frames

Time code equipment

Video processors/proc amps

Videotape recorders

- ¾-inch, U-matic
- 1-inch B and C
- Manufacturer list of VRC compatible

Performance specifications are measured by the manufacturers using certain references for frequencies, impedances, levels, etc. Unfortunately the reference values are not the same from one manufacturer to another, nor are the procedures alike. Also, those references are not always provided even in the printed materials offered by the manufacturers. As a result, an exact comparison of equipment performance should not be made based only on published numbers. The manufacturers' representatives should be contacted to discuss performance tests and measurements before final purchasing decisions are made.

VIDEO

Experimenting at 12,290MHz

CBS HDTV Project D-2077

By Carl Bentz, technical editor

When the SMPTE, EBU and other organizations conclude their work on development of an HDTV standard, allowing high definition television to become a reality, the primary distribution will undoubtedly be via satellite. A secondary distribution system, however, will also be required. In a CBS experiment concluded in May 1982 in the San Francisco area, use of terrestrial transmissions in the 12GHz band proved to be a viable method.

In 1979 the World Administrative Radio Conference (WARC) allocated the 12.2-12.7GHz frequency band to the Broadcast Satellite Service. WARC '79 also concluded that the spectrum should be shared equally with terrestrial broadcasting. Since that time, the FCC has proposed that the terrestrial service should be deleted. CBS and others disagree. To show that 12GHz would provide a medium for future HDTV signal distribution, CBS requested and was granted an STA (Special Temporary Authority) in March 1982 to conduct experiments. The tests were carried out in the greater San Francisco area, which, it was thought, presented a variety of irregular terrains and climatic conditions.

The experiments, conducted by CBS in cooperation with the Westinghouse Broadcasting Company station KPIX-TV 5, a CBS affiliate, involved transmissions from the Mount Sutro tower. Two fixed receiver sites, at the KTVU-TV 2 and KCBS-FM studio locations, provided a means for long-term

Editor's note: This material was taken from the CBS TV engineering and development department report, Project No. D-2077, dated July 21, 1982.

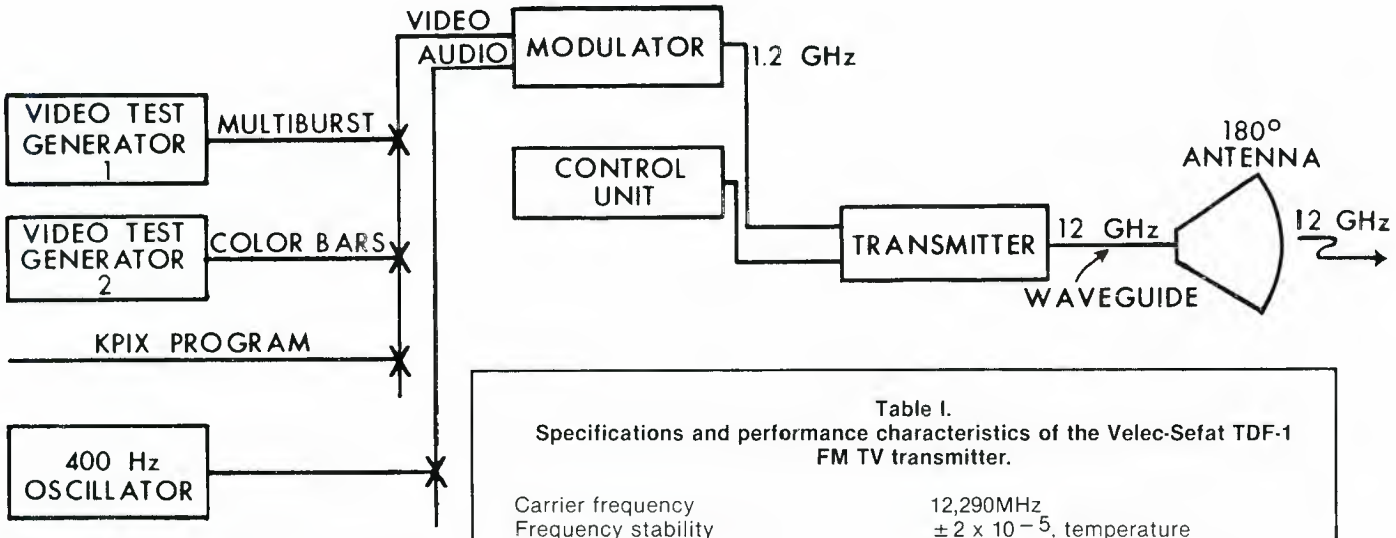


Figure 1. Block diagram of 12GHz test transmitter at Mount Sutro.

monitoring of the signals. Chart recorders tracked the receiver AGC to indicate received carrier levels. A mobile van provided facilities to measure signals detected at a variety of locations in the San Francisco area. All transmissions and receiving equipment was provided on loan by Telediffusion de France (TDF).

Equipment

Transmitting equipment was mounted on the candelabra tower on Mount Sutro. The transmitter, a Velec-Sefat TDF-1 FM TV transmitter was modulated with a sequenced set of four signals: multiburst; color bars; KPIX-TV video; and a terminated line. The aural section was fed a 400Hz tone at all times. Table I shows the transmitter specifications. Figure 1 indicates the transmission system used.

The 12GHz signal from the transmitter was applied to a Telediffusion de France TDF-1 antenna on the 550-foot level of the Mount Sutro tower. (See Table II for specifications from the antenna). Figure 2 shows the pattern characteristics. The signal was coupled to the antenna through 3 meters of Andrew WR75 rectangular waveguide, presenting a 0.44dB loss. The transmitter was adjusted for 9W (9.54dBW) into the antenna, producing a maximum EIRP of 226W (23.54dBW).

One fixed receiver site (KTVU-TV) was 9.3 miles east of Mount Sutro. A 1m parabolic dish antenna at 40 feet above ground level fed a Radiotechnique (RTC) receiver, tuning from 11.7-12.5GHz. Figure 3 shows the receiving system used at KTVU-TV.

The second fixed receiver was placed at the KCBS-FM studios, 4

Table I.
Specifications and performance characteristics of the Velec-Sefat TDF-1 FM TV transmitter.

Carrier frequency	12,290MHz
Frequency stability	$\pm 2 \times 10^{-5}$, temperature range $-15°C$ to $+45°C$
Deviation/visual	±6MHz
Deviation/aural	±100kHz
Aural subcarrier	5.5MHz, ±50Hz
Output power	15W max (adjusted to 10W)
Out-of-band emissions	−100dBW/MHz
Out-of-channel emissions	60dB below carrier level
Channel bandwidth	20MHz

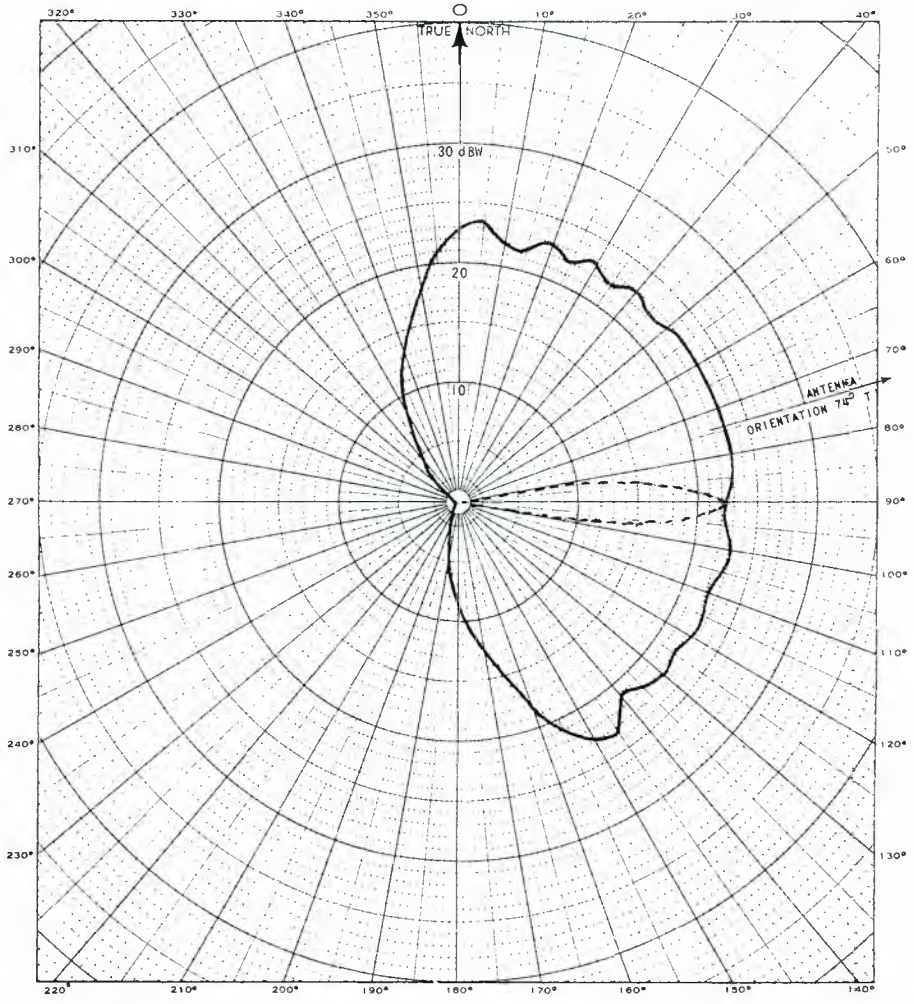


Figure 2. Measured horizontal and vertical radiation pattern of 12GHz horn transmitting antenna.

miles northeast of the antenna site. A 1m parabolic antenna, 550 feet above ground, was first connected to a Societe Nouvelle d'Equipment du Calvados (SNEC) receiver. An intermittent problem in the SNEC device required eventual replacement with a second RTC receiver. Figure 4 shows the final receiving system used at KCBS-FM.

One mobile van used a pneumatic mast, adjustable to a height of 24 feet above ground. The operator could select a 1m dish or a horn antenna. The horn was found to be more practical, although the parabolic antenna was employed at some test locations. A second van allowed the antenna to be raised to 30 feet above ground and used a horn for all measurements. Figures 5 and 6 show the mobile van receiving systems.

Measurement results

From the KTVU-TV receiver, a test period of 1488 hours resulted in the March 17-May 18, 1982 experiment. Charts from the receiver were analyzed to illustrate changes in power flux density during the test. Maximum fades of 9dB occurred during heavy rain, with 6dB attenuation caused by moderate rains. At all times the subjective quality of the received signal was considered TASO Grade 1 (excellent).

From the KCBS-FM site, a total of 828 test hours were analyzed, after the receiver change was made. Fades of 2dB occurred, although no precipitation occurred during the period from April 13 to May 17. The received signal remained TASO Grade 1 throughout.

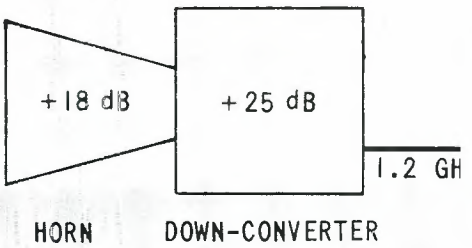


Table II.
Specifications for the Telediffusion de France TDF-1 antenna.

Maximum gain	14dBi
Polarization	Horizontal
Horizontal ½-power beamwidth	162°
Vertical ½-power beamwidth	6°
Orientation	N 74°E

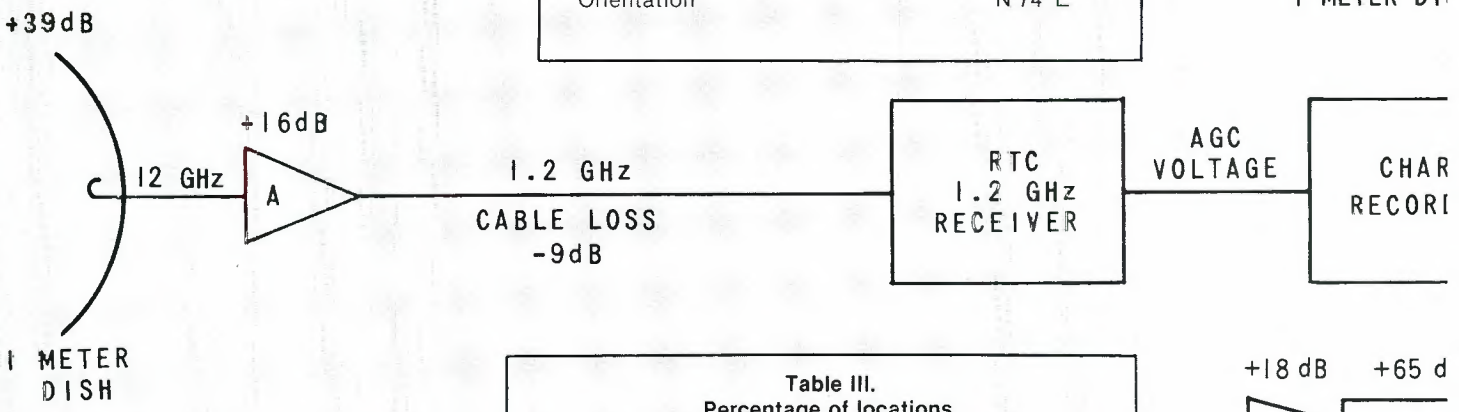


Figure 3. Fixed receiver installation at KTVU in San Francisco.

Table III.
Percentage of locations receiving the indicated signal grades.

TASO grade	Random sites (%)	Statistical sites (%)
1—Excellent	42.5	43.5
2—Fine	17.5	21
3—Passable	10	4.8
4—Marginal	5	9.7
5—Inferior	2.5	14.5
6—Unusable	10	6.5
No signal	12.5	—

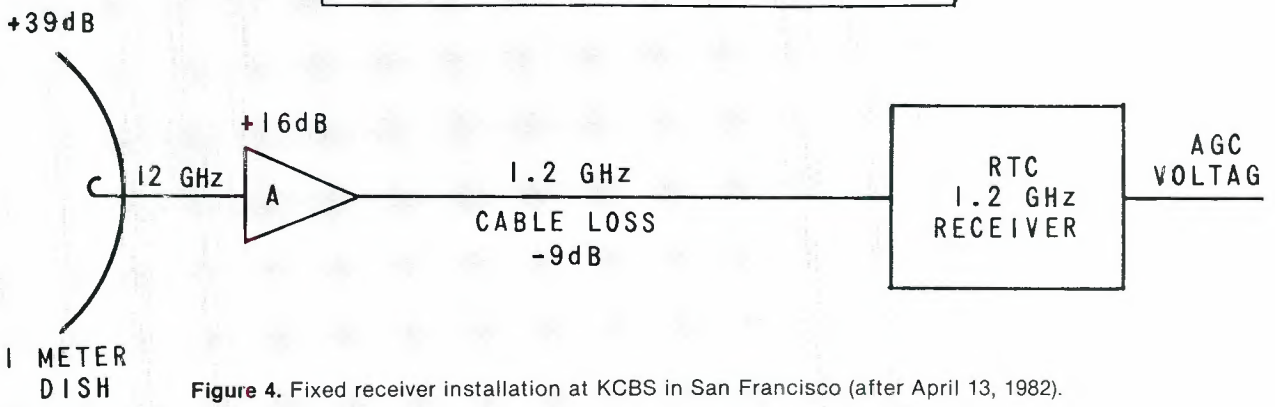


Figure 4. Fixed receiver installation at KCBS in San Francisco (after April 13, 1982).

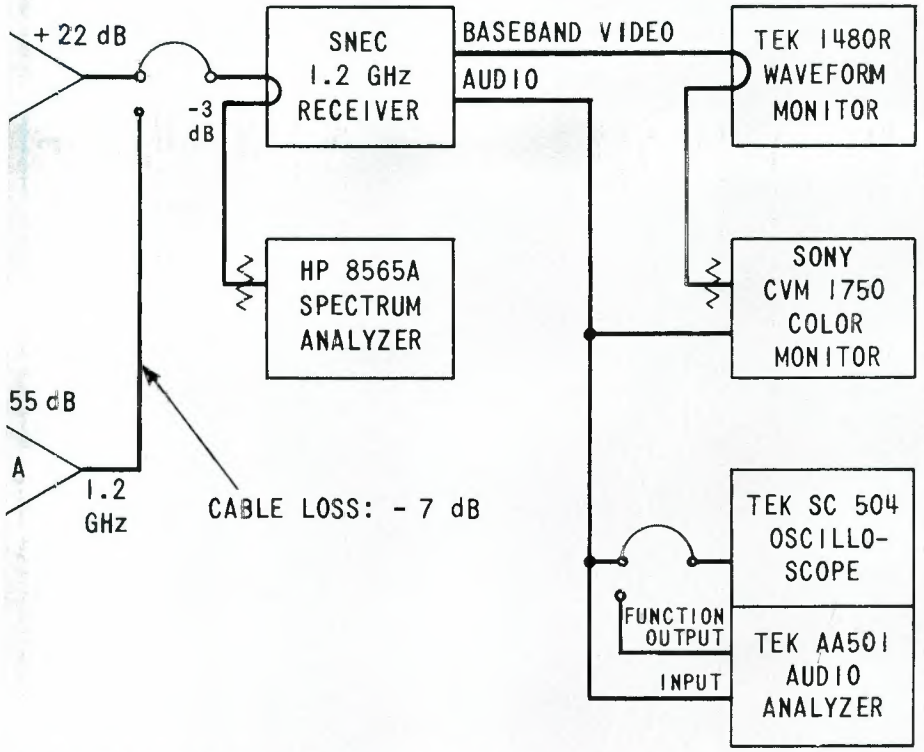


Figure 5. Mobile van test setup for random 12GHz measurements.

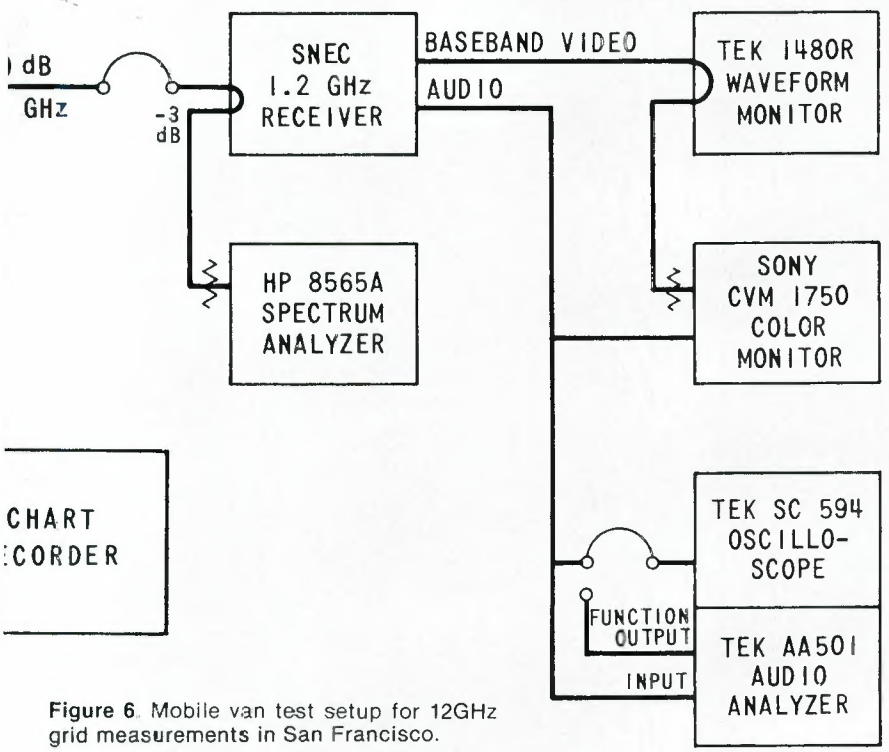


Figure 6. Mobile van test setup for 12GHz grid measurements in San Francisco.

Some mobile van observations were made under conditions somewhat different than the specified TASO conditions. The CBS Technology Center developed an approach to determine am ambient field at the receive antenna site, expressed as power flux density in dBW/m², as well as the resulting picture quality of that field. Random measurements at 40 locations included three site conditions: complete line-of-sight with no nearby obstructions; line-of-sight with nearby obstructions; and fully obstructed signal paths. Seventy percent of the observations resulted in a signal quality of TASO 3 (passable) or better. A second set of 62 measurements from the mobile units involved statistically selected sites according to the TASO procedures. Each location was approximately 0.6 miles apart, representing about one-tenth the square root of the population in thousands within the signal illuminated area.

Table III combines the test results for the two mobile measurement units, showing that 69.3% of the statistically selected locations also received a TASO 3 or better signal.

Conclusions

The purpose of the experiment was to obtain preliminary first-hand experience with the concept of wide area broadcasting in the 12GHz frequencies. Although the antenna had only a 160° horizontal beamwidth, there would appear to be no limitations precluding omnidirectional antennas. A receiving installation, regarded as roughly equivalent to a home NTSC system but using FM techniques, provided passable reception at 70% of the test sites, both randomly selected and statistically chosen.

Line-of-sight paths were required, as was expected. Very little diffraction around or penetration through objects occurred. Reflections proved useful to reception in some situations. Rain attenuation was found significant and suggests the need for some considerations in system design, particularly in the area of transmitter powers.

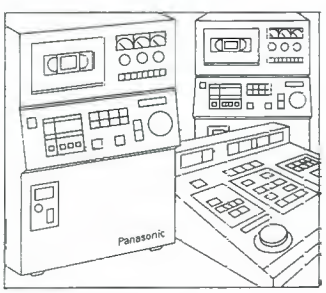
The results of this experiment cannot be extrapolated to terrestrial broadcast of HDTV entirely, because the parameters that will be required for HDTV are not yet totally determined. The findings are considered encouraging, however, by the CBS Technology Center in that a broadcast carrier is capable of satisfactory signal recovery in a large percentage of locations throughout an area such as San Francisco.

The brilliance in its design shows up in its picture. Introducing Panasonic Recam.

Total freedom from video cables isn't the most important reason to buy Panasonic Recam. Recam's exciting combination of a new recording system and a 3-tube prism optics camera is. Especially when you consider the result: Broadcast quality from ½" VHS™ recording tape.

Recam: The System

The Recam system consists of the AU-100 portable VCR, the AK-100 3-tube prism optics camera and the AU-300 playback editing system. Together they add a new dimension



to ENG and EFP.

Here's how: Unlike conventional recording systems, Recam records frequency modulated luminance signals on a single-slant track. At the same time, I and Q signals are recorded on another parallel track. By assigning separate FM frequencies to the I and Q signals, color noise, streaking and other two-phase color problems are eliminated because only the final product is NTSC encoded.

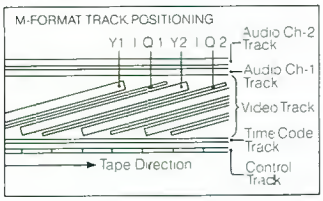
The AU-100 has a direct-drive motor for precise tape movement and a capstan motor designed for reduced gyro effect. And for accurate assembly edits after every shot, the AU-100 backspaces 30 frames every time the VTR trigger is released.

The AU-100 also records audio on two longitudinal tracks and time code on a third track. The AU-100 supplies a constant read-out of vital operating conditions including drum and capstan lock status, slack tape detection, dew warning detection and a lot more.

Proven Prism Optics Performance

The AK-100 camera gives you the choice of ⅔" diode-gun Plumbicon® tubes or ⅔" Saticon® tubes. So you can shoot under a wide variety of lighting conditions without worrying about lag, blooming or burn-in.

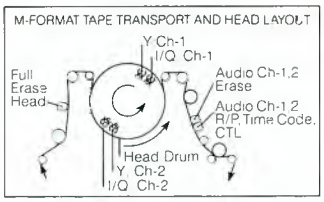
Resolution with the Plumbicon configuration is 600 lines with a S/N ratio of 59dB, while the Saticon version produces 550 lines and a S/N ratio of 58dB. For added dynamic range



and reduced comet tailing, the AK-100 includes feedback beam control. Dynamic focus and corner registration compensation circuitry add to picture quality as do horizontal and 2-line vertical contouring. There's also switchable black stretch and knee circuits for detail retention in dark or bright areas of the image. An eight-bit A/D and D/A converter with memory automatically adjusts white and black balance.

Better Chrominance Than ¾"

Recam looks even better when you look at the AU-300 playback editing system. In fact, a Recam dub is actually superior to a ¾" master. The reason: The AU-300's six-head scanner plays and records the separate Y and I/Q tracks so there's virtually no loss of luminance or chroma information during



dubbing or insert and assembly editing. At the same time, two rotary erase heads and vertical head switching make for clean, accurate edits.

Panasonic Recam. It gives you the convenience of a recorder/ camera with the picture to measure all recorder/cameras by.

Plumbicon is a registered trademark of N.V. Philips for TV camera tubes. Saticon is a registered trademark of NHK (Japan Broadcasting Corp.).

Panasonic
VIDEO SYSTEMS DIVISION

For additional information on the Panasonic Recam, mail to

Panasonic Industrial Company
Video Systems Division
One Panasonic Way
Secaucus, N.J. 07094

Name_____ (Please Print)
Title_____
Company_____
Address_____
City_____
State_____ Zip_____
Phone (_____)_____

BESB-1282

Circle (14) on Reply Card

VIDEODISC SYSTEM

Equipment using magnetic disc materials for use with slow motion, slide storage, animation or graphics systems. Video signals are 1V P-P, 75Ω input and output. Pulse and reference signals are 4V P-P or 1V P-P, 75Ω.

Manufacturer	ADDA Corporation		Ampex Corporation	Eigen	Harris Video
Model Number	ESP-150C Portable Still Processor	ESP-750C Electronic Still Processor	ESS-2 Digital Video Production System	Model 16-20 Videodisc	IRIS II
Reference Input	Composite video	Composite video	Composite video	Sync drives	Composite video
Video Outputs	2/channel	2/channel	2/channel	1	1/channel
Output Channels	A and B	A and B	3, independent	1	6
Video Response	.....	.....	0.5/to 4.2M	To 4.2M	0.2/to 4.2M luma.
Signal-to-Noise Ratio	56dB	56dB	>50dB	42dB	55dB
Differential Phase/Gain	2°/2%	2°/2%	<3°/<3%	3°/3%	1°/1.5%
K Factors	1% 2T	1% 2T	<1% 2T	1%	1% 2T
Chroma/Luminance Delay	.....	.....	20nsec, 12.5T	.....	17nsec
Editing Capability	Yes	Yes	Yes	Yes	Yes
Disc Type & Size	Winchester 14"	Rigid disc	Ampex DM331	Flexible	Winchester
Number of Drives	4 max	4 max	3 max	1	8 SMD or FMD
Frames/Sequence	600	1984	2442	10/sec	.....
Frames/Disc	150	750	814	1200 tracks	3198/drive(HVS 630)
Frame Storage	600	3000	2442	600	23,500 on-line (630)
Sequences, Programmable	50	100	Yes	.....	Yes
Worst Case Access Time	450msec	450msec	70msec	.....	.....
External TBC Required	Included	Included	Included	Yes	Included (630/632)
Heterodyne Chroma	.....	.....	.....	Yes	.....
Moire Rating	.....	.....	.....	−41dB, 75% bars	.....
FM Carrier Frequency	.....	.....	.....	7.06-10MHz	.....
Time Base Stability	.....	.....	3nsec	2msec	.....
Unit Packaging	Floor & rack	Floor & rack	Floor & rack	Table-top	Floor & rack
Separate Control Unit	Yes	Yes	Yes	Yes	Yes
Remote Control Unit	Yes	Yes	7/system	Yes	6 max (PAL available
Reader Service Number	**800**	**801**	**802**	**803**	**804**

Manufacturer	MCI/Quantel	Oktel Corporation	Precision Echo		Asaca/ShibaSoku
Model Number	DLS 6030 System	DM3000 Series	EFS-1B Frame Bank	EFS-2 Image Maker	680/1 Digital Video Memory
Reference Input	Composite video	Composite video	Composite video	Composite video	Composite video
Video Outputs	2/channel	2	1	1	3
Output Channels	3	2	1	1	1
Video Response	0.3/to 4.2M	−3/5.5M	15Hz-4.2M	15Hz-4.2M	0.5/to 4.5M
Signal-to-Noise Ratio	58dB	45dB	>42dB	>42dB	52dB
Differential Phase/Gain	1°/1%	3°/3%	.....	.....	.....
K Factors	.....	2%	4% 2T	4% 2T	2% 2T
Chroma/Luminance Delay	.....	.....	.....	.....	.....
Editing Capability	Yes	Yes	On-line update	On-line update	Yes
Disc Type & Size	Winchester	Oktel	13" floppy	13" floppy	Flexible
Number of Drives	8 max	1	1	1	1
Frames/Sequence	.....	.....	.....	Variable	.....
Frames/Disc	800	1200	400, 200/side	512	2
Frame Storage	6400	1200	.....	.....	2
Sequences, Programmable	.....	Yes	.....	Yes	.....
Worst Case Access Time	.....	2sec	3.5sec/200 frames	4.3sec/512 frames	.....
External TBC Required	.....	Yes	Yes	Yes	.....
Heterodyne Chroma	.....	.....	Yes	Yes	.....
Moire Rating	.....	−40dB	.....	.....	.....
FM Carrier Frequency	.....	.....	.....	.....	.....
Time Base Stability	.....	.....	1μsec long term	1μsec long term	.....
Unit Packaging	Rack-mount	.....	Table-top	Table-top	Rack-mount
Separate Control Unit	Yes	Yes	Yes	Yes	Optional
Remote Control Unit	Yes	Yes	Yes	Yes	Optional
Reader Service Number	**805**	**806**	**807**	**808**	**809**

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the **BE** *Buyers' Guide* (annual September issue).

COLOR TV CAMERA, ENG, EFP, Portable, Hand-held

3-tube design TV camera, typically not requiring the use of a camera control unit. Operation is possible directly to a VTR or microwave link. Weights are less than 30 pounds.

Manufacturer	Ampex	Bosch	Harris Broadcast	Hitachi Denshi	
Model Number	BCC-20 Digicam	KCA 100	TC-90	FP-40SS	SK-91
Pickup Tube Type	DGP, S, LO	P	P, S	S	S, P
Pickup Tube Size	⅔-inch	⅔-inch	½-inch	⅔-inch	⅔-inch
Pickup Tube Number	XQ-1427/2427/3427	XQ-2427	80XQ, BC4398	H8393	.....
Optics	BK-7 prism	Prism	Prism, λ/4 plate	Prism	Prism
Sensitivity	200fc, f/4	1250 lux, f/2.8, 66%	56fc, f/1.4, 60%	2000 lux, f/4	2000 lux, f/4, 89.9%
Maximum Sensitivity	6fc, +12dB	75 Lux, f/1.4, +12dB	7fc	100 lux, f/1.6, +12dB	20 lux, f/1.4, +18dB
Video Gain Boost	0, 6, 12dB	0, 6, 12dB	+18dB	0, 6, 12dB	0, 9, 18dB
Signal-to-Noise Ratio	53dB NTSC (51dB PAL)	53dB NTSC (51dB PAL)	55dB NTSC	52dB	57dB .....
Horizontal Resolution	45%, 400TVL	45%, 5MHz	600TVL	550TVL	550TVL
Registration (Z1, 2, 3)	0.05% all zones	40, 80nsec	0.1, 0.2, 0.3%	0.1, 0.3, 0.6%	0.1, 0.2, 0.4%
Enhancement	H/V, aperture crx	H/V comb & core	H/V comb & core	H/V 2H delay line	H/V 2-line comb/core
Contours Taken From	Green	Green	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes	Yes
Viewfinder Sizes	3, 5 in	1.5, 6 in	1.5, 5 in	1.5, 5 in	1.5, 5 in
Intercom System	3, 4-wire	2-channel	RTS compatible	1-channel	1-channel
Program Audio System	Yes	Yes	Amplified	Yes	Yes
Optional CCU	Yes	Yes	Digital	Yes	Yes
Auto White Balance	Yes	Yes	Yes	Yes	Yes
Auto Black Balance	Yes	Yes	Yes	No	Yes
Auto Iris Control	Yes	Yes	Yes	Yes	Yes
Auto Centering	Yes	Option	Option	No	No
Beam Optimizing	Yes	Yes	Yes	.....	Yes
Sync Drives Required	No	No	Int. RS-170A	No	Yes
Gen-lock Video Input	Yes	Yes	Yes	Yes	Yes
VTR Remote Controls	Yes	Yes	.....	.....	Yes
Multicore Cable	1000 ft	1500 ft	.....	1000 ft	900 ft
Triaxial Cable	I mile	6000 ft	5000 ft COAX	.....	No
Optical Fiber Cable	1.2 mile	12,000 ft	.....	.....	No
Battery Operation	Yes	Yes	2AH, 4AH NiCad	Yes	Yes
Voltage, External	.....	11-15Vdc	12.6Vdc	12Vdc	12Vdc
Battery Use Life	.....	.....	1-2 hr	.....	1 hr w/BP-91
Weight Without Lens	18 lb	13 lb	7 lb	13.2 lb	9.7 lb
Color Standards	NTSC, PAL, SECAM,	NTSC, PAL, SECAM,	NTSC, PAL-M/B	NTSC	NTSC
Reader Service Number	303	304	305	306	307

*Pickup tube type designations: ACT P—Anti Comet Tail Plumbicon, C—Chalnicon, DGP—Diode Gun Plumbicon, HOP—Highlight Overload Protected, L—Leddicon, LO—Lead Oxide Vidicon, LOC—Low Output Capacitance Plumbicon, P—Plumbicon, S—Saticon.

COLOR TV CAMERA

ENG, EFP, Portable, Hand-held.

Manufacturer	Ikegami Electronics (USA)		JVC Company	
Model Number	**HL-79D(HL-790A)**	**ITC-730**	**KY1900U**	**KY2700U**
Pickup Tube Type	P, S, DGP, LOC DGP	S	S	S
Pickup Tube Size	⅔-inch	⅔-inch	⅔-inch	⅔-inch
Pickup Tube Number	XQ1427/2427, H8393	H4104	H4101	H4101
Optics	Prism	Prism	Dichroic mirrors	Dichroic mirrors
Sensitivity	2000 lux, f/5	2000 lux, f/4, 89.9%	2500 lux, f/4	2500 lux, f/4
Maximum Sensitivity	20 lux, f/1.4, +18dB	60 lux, f/1.4, +12dB	150 lux, f/1.6, +9dB	100 lux, f/1.6, +12dB
Video Gain Boost	0, 9, 18dB	0, 6, 12dB	0, 9dB	0, 6, 12dB
Signal-to-Noise Ratio	57dB	54dB	>52dB	>54dB
Horizontal Resolution	600TVL, RETMA	600TVL	500TVL	600TVL
Registration (Z1, 2, 3)	0.1, 0.2, 0.5%	0.1, 0.2, 0.4%	0.1, 0.4, 0.8%	0.1, 0.2, 0.4%
Enhancement	Core, comb, slicer	2H/V	2H/V	2H/2V dual-edged
Contours Taken From	Green	.....	Green	Green
Internal ND Filters	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes
Viewfinder Sizes	1.5, 4.5 in	1.5, 5 in	1.5, 5 in	1.5, 5 in
Intercom System	1-channel	Yes	1-channel	1-channel
Program Audio System	Yes	Yes	Yes	Yes
Optional CCU	Yes	CCU-730	Yes	Yes
Auto White Balance	Yes	Yes	Yes	Yes
Auto Black Balance	Yes	No	Yes	Yes
Auto Iris Control	Yes	Yes	Yes	Yes
Auto Centering	.....	No	No	No
Beam Optimizing	Yes	Yes	Yes	Yes
Sync Drives Required	No	No	No	No
Gen-lock Video Input	Yes	Yes	Yes	Yes
VTR Remote Controls	Yes	No	Yes	Yes
Multicore Cable	1000 ft to MA-79 base	330 ft	195 ft	980 ft
Triaxial Cable	7500 ft to TA-79 base	.....	No	No
Optical Fiber Cable	.....	.....	No	No
Battery Operation	Yes	Yes	Yes	Yes
Voltage, External	12Vdc	12Vdc	12Vdc	12Vdc
Battery Use Life	.....	.....	1 hr w/DC-C19U	1.5 hr
Weight Without Lens	15 lb	11.4 lb	7.7 lb w/o VF	12.6 lb w/o VF
Color Standards	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**309**	**310**	**311**	**312**

Manufacturer	Marconi Broadcast Mark IX	NEC America Inc	Panasonic Video Systems		
Model Number	**Portable (B3270)**	**MNC-80A Series**	**AK710**	**AK760**	**WV-777**
Pickup Tube Type	LO	P, S, DGP	S	DGP	S
Pickup Tube Size	1-inch	⅔-inch	⅔-inch	⅔-inch	⅔-inch
Pickup Tube Number	XQ-1427/2427, H8397A	H8399	XQ-2427	S4101	
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	1100 lux, f/2.8, 60%	2000 lux, f/4, 60%	2150 lux, f/3.5	2150 lux, f/4	190fc, f/4
Maximum Sensitivity	.....	.....	140 lux, f/1.8, +12dB	54 lux, f/1.8, +18dB	8fc, f/1.6, +12dB
Video Gain Boost	12dB	0, 6, 12dB	0, 6, 12dB	0, 9, 18dB	0, 6, 12dB
Signal-to-Noise Ratio	49dB NTSC (47dB PAL)	54dB NTSC (53dB PAL)	52dB	54dB	54dB
Horizontal Resolution	100%, 5MHz	500TVL	500TVL	600TVL	550TVL
Registration (Z1, 2, 3)	40, 80, 120nsec	0.1, 0.2, 0.4%	0.1%, 0.4, 0.8%	0.1, 0.2, 0.5%	0.1, 0.3, 0.6%
Enhancement	Green	2-line	H/1-line V	2-line V	1-line V/H
Contours Taken From	Yes	Green	Green	Green	.....
Internal ND Filters	.....	.....	Yes	Yes	Yes
Color Temperature Filters	.....	Yes	Yes	Yes	Yes
Viewfinder Sizes	1, 3, 7 in	1.5, 5 in	1.5, 4.5 in	1.5, 4.5 in	5 in
Intercom System	Yes	1-channel	1-channel	1-channel	Yes
Program Audio System	Yes	Yes	Yes	Yes	Yes
Optional CCU	Required	Yes	Yes	Yes	Yes
Auto White Balance	Yes	Yes	Yes	Yes	Yes
Auto Black Balance	Yes	Yes	No	.....	Yes
Auto Iris Control	Yes	Yes	Yes	Yes	Yes
Auto Centering	Yes	Yes	No	.....	.....
Beam Optimizing	Yes	Yes	Yes	Yes	Yes
Sync Drives Required	Yes	No	No	No	Int. RS-170A
Gen-lock Video Input	Yes	Yes	Yes	Yes	Yes
VTR Remote Controls	.....	.....	.....	Pause	Pause
Multicore Cable	2400 ft	900 ft	1000 ft to AK7260	1000 ft to AK7260	1000 ft
Triaxial Cable	4500 ft	3000 ft COAX	2000 ft COAX	2000 ft COAX	No
Optical Fiber Cable	.....	9000 ft	.....	.....	No
Battery Operation	ac only	Yes	Yes	Yes	Yes
Voltage, External	.....	12Vdc, H2791	12Vdc, BP-130	12Vdc, BP-110	12Vdc
Battery Use Life	.....	1.7 hr	.....	.....	1.5 hr
Weight Without Lens	To 26 lb	11 lb	11.7 lb	13.6 lb	10.1 lb
Color Standards	NTSC, PAL	NTSC, PAL, SECAM	NTSC	NTSC	NTSC
Reader Service Number	**313**	**314**	**315**	**316**	**317**

COLOR TV CAMERA

ENG, EFP, Portable, Hand-held.

Manufacturer	Panavision Electronics	Philips Broadcast	RCA Broadcast	Sharp	Sony Broadcast
Model Number	**CEI 340**	**LDK 14S(SL)**	**TK710**	**XC-800**	**BVP-300A**
Pickup Tube Type	DGP, S, P	LOC, DGP, P	S	S	P, S
Pickup Tube Size	⅔-inch	⅔-inch	⅔-inch	⅔-inch	⅔-inch
Pickup Tube Number	.....	XQ-1427/3427	H8399	.....	.....
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	680 lux, f/1.7, 60%	750 lux, f/2.8, 89.9%	200fc, f/3.5, 60%	200fc, f/4	2000 lux, f/4, 69%
Maximum Sensitivity	65 lux, f/1.4, + 12dB	24 lux, f/1.4, + 18dB	13fc, f/1.8, + 12dB	.....	20 Lux, f/1.4, + 18dB
Video Gain Boost	x1, x2, x4	0, 6, 12 or 9, 18dB	0, 6, 12dB	0, 9, 18dB	0, 9, 18dB
Signal-to-Noise Ratio	52dB	57dB NTSC	52dB	55dB	56dB
	.....	55dB PAL	.....	.....	.....
Horizontal Resolution	500TVL, 100%	700TVL	.....	600TVL	500TVL
Registration (Z1, 2, 3)	0.1, 0.2, 0.3%	0.1, 0.8, 0.4%	0.1, 0.4, 0.8%	0.1, 0.2, 0.4%	0.1, 0.2, 0.5%
Enhancement	H/V coring	2-line coring, comb	H/V	2-line, comb/core	Level dependent, comb
Contours Taken From	Green	Green	.....	.....	Green
Internal ND Filters	Yes	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes	Yes
Viewfinder Sizes	3, 5 in	1.5, 5 in	1.5 in	1.5, in	1.5 in
Intercom System	1-channel	1-channel	Yes	.....	Yes
Program Audio System	.....	Yes	Yes	Yes	Yes
Optional CCU	Yes	Yes	Yes	Rmt Ctl	.....
Auto White Balance	Yes	Yes	Yes	Yes	Yes
Auto Black Balance	Yes	Yes	No	Yes	Yes
Auto Iris Control	Yes	Yes	Yes	.....	Yes
Auto Centering	Yes	Yes	.....	.....	.....
Beam Optimizing	Yes	Yes	Yes	Yes	Yes
Sync Drives Required	No	No	Int. RS-170A	No	.....
Gen-lock Video Input	Yes	Yes	Yes	Yes	Yes
VTR Remote Controls	.....	Yes	Yes	.....	Yes
Multicore Cable	2400 ft	100 ft to RCU	1000 ft	1000 ft	.....
Triaxial Cable	.....	6500 ft to RCU	26,000 ft RG-11/U	.....	.....
Optical Fiber Cable	.....	.....	.....	.....	.....
Battery Operation	Yes	Yes	Anton/Bauer	Yes	Yes
Voltage, External	12Vdc	12Vdc	11-15.2Vdc	11-17.4Vdc	12Vdc, BP-90
Battery Use Life	.....	2 hr	.....	.....	2 hr
Weight Without Lens	21 lb	13 lb	11.6 lb	12.6 lb	12.4 lb
Color Standards	NTSC, PAL, SECAM,	NTSC, PAL, SECAM,	NTSC	NTSC	NTSC
Reader Service Number	**318**	**319**	**320**	**321**	**322**

Manufacturer	Sony Broadcast		Thomson-CSF		
Model Number	**BVP-330**	**BVP-250**	**MC-301**	**MicroCam 501**	**MicroCam 601A**
Pickup Tube Type	DGP	S	S	S	P
Pickup Tube Size	⅔-inch	⅔-inch	⅔-inch	⅔-inch	⅔-inch
Pickup Tube Number	.....	.....	.....	.....	.....
Optics	Prism	Prism	Dichroic mirrors	Prism	Prism
Sensitivity	2000 lux, f/4, 69%	2200 lux, f/4, 69%	2500 lux, f/4	2150 lux, f/4, 60%	200fc, f/4.7, 89.9%
Maximum Sensitivity	25 lux, f/1.4, + 18dB	30 lux, f/1.4, + 18dB	100 lux, f/1.6, + 12dB	.....	2fc, f/1.4, + 18dB
Video Gain Boost	0, 9, 18dB	0, 9, 18dB	0, 6, 12dB	.....	0, 9, 18dB
Signal-to-Noise Ratio	57dB	54dB	54dB	54dB	56dB
Horizontal Resolution	600TVL	500TVL	500TVL	600TVL	600TVL
Registration (Z1, 2, 3)	0.1, 0.2, 0.5%	0.1, 0.4, 0.8%	0.1, 0.2, 0.4%	0.1, 0.4, 0.8%	0.1, 0.2, 0.5%
Enhancement	H/V	2H, level dependent	H/V dual-edged	2-line H/V Comb	.....
Contours Taken From	Green	Green	Green	Green	.....
Internal ND Filters	Yes	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes	Yes
Viewfinder Sizes	1.5, 5 in	1.5, 5 in	1.5 in	1.5, 5 in	1.5 in
Intercom System	Yes	1-channel	1-channel	Yes	.....
Program Audio System	Yes	.....	Yes	Yes	Yes
Optional CCU	CCU-330	CCU-300	Yes	Yes	Yes
Auto White Balance	Yes	Yes	Yes	Yes	Yes
Auto Black Balance	Yes	Yes	Yes	Yes	Yes
Auto Iris Control	Yes	Yes	Yes	.....	.....
Auto Centering	Yes	.....	No	No	.....
Beam Optimizing	Yes	Yes	Yes	.....	Yes
Sync Drives Required	No	Yes	No	No	No
Gen-lock Video Input	Yes	.....	Yes	Yes	Yes
VTR Remote Controls	Yes	Yes	Yes	.....	Yes
Multicore Cable	2000 ft	2000 ft	984 ft	.....	.....
Triaxial Cable	.....	.....	.....	.....	.....
Optical Fiber Cable	.....	.....	.....	.....	.....
Battery Operation	Yes	Yes	Yes	Yes	Yes
Voltage, External	12Vdc, BP-90	12Vdc, Yuasa 3/50	12Vdc	12Vdc	12Vdc
Battery Use Life	2 hr	2 hr	.....	.....	.....
Weight Without Lens	11.8 lb	12.4 lb	13.3 lb	12.3 lb	12.4 lb
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**324**	**325**	**326**	**327**	**328**

COLOR TV CAMERA

ENG, EFP, Portable, Hand-held.

		Toshiba Corporation	
Manufacturer	**Thomson-CSF**		
Model Number	**MC701**	**PK-40H**	**PK-60**
Pickup Tube Type	DGP	LOC P	S, P, DGP
Pickup Tube Size	⅔-inch	⅔-inch	⅔-inch
Pickup Tube Number	.....	.....	.....
Optics	Prism	Prism	Prism
Sensitivity	2150 lux, f/4.5, 60%	2000 lux, f/4	2000 lux, f/4, 60%
Maximum Sensitivity	26 Lux, f/1.4, + 18dB	.....	.....
Video Gain Boost	0, 9, 18dB	.....	0, 9, 18dB
Signal-to-Noise Ratio	57dB	57dB	54dB
Horizontal Resolution	600TVL	400TVL, 60%	600TVL
Registration (Z1, 2, 3)	0.1, 0.2, 0.5%	0.05, 0.1, 0.2%	0.1, 0.2, 0.5%
Enhancement	.....	Coring	H/V 2-line coring
Contours Taken From	Green	Green	Green
Internal ND Filters	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes
Viewfinder Sizes	1.5, 5 in	7 in	1.5 in
Intercom System	Yes	.....	Yes
Program Audio System	.....	.....	Yes
Optional CCU	Yes	Yes	Yes
Auto White Balance	Yes	.....	Yes
Auto Black Balance	Yes	.....	.....
Auto Iris Control	Yes	.....	Yes
Auto Centering	Yes	.....	.....
Beam Optimizing	Yes	Yes	Yes
Sync Drives Required	No	Yes	No
Gen-lock Video Input	Yes	Yes	Yes
VTR Remote Controls	.....	.....	Yes
Multicore Cable	1800 ft	2000 ft	1000 ft digital
Triaxial Cable	4000 ft	4600 ft	5000 ft
Optical Fiber Cable	.....	.....	.....
Battery Operation	Yes	.....	Yes
Voltage, External	12Vdc	.....	12Vdc
Battery Use Life	.....	.....	.....
Weight Without Lens	12.7 lb	8.6 lb	9.3 lb
Color Standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC
Reader Service Number	**329**	**330**	**331**

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

COLOR TV CAMERA, Studio/Field Production

3-tube design TV camera, typically requiring the use of a camera control unit (CCU), with an included intercommunications system between camera operator and director. The camera accepts a variety of zoom lens assemblies.

Manufacturer	Ampex	Bosch Television System Division		Harris Broadcast	
Model Number	**BCC-21 Digicam**	**KCI 90 System**	**KCP 60**	**TC-50B**	**TC-85**
Pickup Tube Type	P, L, S	DGP	P	P	P, ACT P, S
Pickup Tube Size	⅔-inch	⅔ & 1-inch	⅔-inch	1-inch	1-inch
Pickup Tube Number	XQ-1427/2427/BC4399	XQ-2474/2070-02	XQ-1427/2427	XQ-1070/1073	XQ-1070(73)/2070(73)
Optics	BK-7 prism	Prism	Prism	Prism	Prism
Sensitivity	200fc, f/4	1400 lux, f/4, 60%	1250 lux, f/2.8, 60%	130 lux, f/2.1, 60%	800 lux, f/2.8
Resolution	400TVL, 100%	40%, 5MHz	40%, 5MHz	40%, 5MHz	600TVL
Registration (Z1, 2, 3)	0.05% all zones	30, 70, 120nsec	0.1, .2%	0.05, .1, .2%	0.05, .1, .2%
Signal-to-Noise Ratio	53dB NTSC	51dB NTSC	52dB NTSC (50dB PAL)	50dB	52dB NTSC (49dB PAL)
Contours Taken From	Green	Green	Green	Green	Green
Enhancement	H/2-line V, aperture	Yes	Comb, coring	H/V comb, coring	H/V comb, coring
ND Filters Available	Yes	.....	Yes	Yes	Yes
Color Temperature Filters	Yes	.....	Yes	Yes	Yes
Beam Optimizing Circuitry	Yes	Yes	Yes	No	Yes
Viewfinder Size	7 in	1.5, 4.5, 7 in	6 in	6 in	6 in
Return Video Circuits	Yes	Yes	Yes	Yes	Yes
Sync Drives Needed	No	.....	Yes	Yes	Yes
Gen-lock Video Input	Yes	Yes	Yes	.....	Option
Setup Manually	Yes	Yes	Yes	Yes	Yes
Setup by Computer	Yes	Yes	Yes	No	Yes
Digital Operation	Yes	Yes	Yes	No	No
Multicore Cable	1000 ft	.....	1650 ft	300 ft, 1500 option	2000 ft, 3000 option
Triax Cable	1 mile	4500 ft	.....	.....	5000 ft
Camera Head Weight	75 lb	85 lb	50 lb	75 lb	85 lb
Color Standards	NTSC, PAL SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL	NTSC, PAL
Reader Service Number	**332**	**333**	**334**	**335**	**336**

*Pickup tube type designations: ACT P—Anti Comet Tail Plumbicon, C—Chalnicon, DGP—Diode Gun Plumbicon, HOP—Highlight Overload Protected, L—Leddicon, LO—Lead Oxide Vidicon, LOC—Low Output Capacitance Plumbicon, P—Plumbicon, S—Saticon.

Manufacturer	Hitachi Denshi			Ikegami Electronics	
Model Number	**FP-50S**	**SL-96**	**SK-100**	**HK-302**	**HK-312**
Pickup Tube Type	S, P, C	S	P, S	LOC P, DGP	P
Pickup Tube Size	⅔-inch	⅔-inch	1 or 1.2-inch	⅔-inch	1.2-inch
Pickup Tube Number	H9311A, XQ-1428, E5061D	H8397	XQ-1430/2070, H9369	XQ-1427/2427	XQ-1430/1410/1530
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	2000 lux, f/4, 90%	1350 ux, f/2.8, 60%	2000 lux, f/5.6	2000 lux, f/4.5	1500 lux, f4
Resolution	550TVL	500TVL	600TVL	400TVL	400TVL
Registration (Z1, 2, 3)	0.2, .4, .8%	0.05, .2, .3%	0.05, .15, .3%	0.1, .3, .5%	0.05, .2, .3%
Signal-to-Noise Ratio	53dB	51dB NTSC (49dB PAL)	54dB NTSC (52dB PAL)	57dB	53dB
Contours Taken From	Green	Green	Green, red	Green	Green
Enhancement	H/V option	2H comb filter	.....	2H delay line	.....
ND Filters Available	Yes	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes	Yes
Beam Optimizing Circuit	.....	Yes	Yes	Yes	Yes
Viewfinder Size	5 in	7, 1.5 in	7 in	6, 7 in	7 in
Return Video Circuits	.....	Yes	Yes	Yes	Yes
Sync Drives Needed	Yes	.....	Yes	Yes	.....
Gen-lock Video Input	Option	Yes	Option	Yes	Yes
Setup Manually	Yes	Yes	Yes	Yes	Yes
Setup by Computer	.....	.....	Yes	.....	Option
Digital Operation	.....	.....	Yes	.....	.....
Multicore Cable	1000 ft	300 ft	5000 ft digital	28 conductor	1800 ft
Triax Cable	.....	.....	.....	.....	4500 ft
Camera Head Weight	15 lb	53 lb	85 lb	57 lb	94 lb
Color Standards	NTSC, PAL	NTSC, PAL	NTSC, PAL	NTSC	NTSC
Reader Service Number	**337**	**338**	**339**	**340**	**341**

MANUFACTURERS' ADDRESSES

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COLOR TV CAMERA

Studio/Field Production

Manufacturer	Ikegami Electronics Inc.		Marconi Broadcasting		Panavision Electronics*
Model Number	**HK-322**	**HK-357**	**Mark IX (B3265)**	**Mark IX B**	**Americam**
Pickup Tube Type	DGP, ACT P, P	DGP, ACT P	LO, L	L, P	DGP, P, LO, S
Pickup Tube Size	1-inch	1-inch	1.2-inch	1.2-inch	⅔-inch
Pickup Tube Number	.....	XQ-1070/1073/1500	.....	P8130, XQ1410	.....
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	1000 lux, f/2.8	1000 lux, f/2.8	800 lux, f/4, 60%	800 lux, f/4, 60%	860 lux, f/1.7, 60%
Resolution	400TVL	400TVL	100%, 5MHz	100%, 5MHz	500TVL
Registration (Z1, 2, 3)	0.5% overall	0.05, .3, .4%	40, 80, 120nsec	40, 80, 120nsec	0.1, .2, .3%
Signal-to-Noise Ratio	56dB	53dB	51dB NTSC	51dB NTSC	53dB
	.....	.....	(49dB PAL)	(49dB PAL)	.....
Contours Taken From	Red, blue, green	Green	Green	Green	Green
Enhancement	Automatic	Automatic	2-line, core, comb	1-line, comb, coring	H/V 2-line, coring
ND Filters Available	Yes	Yes	Yes	Yes	Yes
Color Temperature Filters	Yes	Yes	Yes	Yes	Yes
Beam Optimizing Circuitry	Yes	Yes	Yes	Yes	Yes
Viewfinder Size	7 in	7 in	7 in	7 in	5 in
Return Video Circuits	Yes	Yes	Yes	Yes	Yes
Sync Drives Needed	Yes	Yes	Yes	Yes	.....
Gen-lock Video Input	Yes	Yes	.....	.....	Yes
Setup Manually	Yes	Yes	Yes	Yes	Yes
Setup by Computer	Yes	Yes	Yes	Yes	.....
Digital Operation	Yes	Yes	.....	Yes	.....
Multicore Cable	1800 ft	1800 ft	3000 ft	3000 ft	200 ft
Triax Cable	4500 ft	4500 ft	4500 ft	4500 ft	5000 ft
Camera Head Weight	83 lb	88 lb	75 lb	75 lb	75 lb
Color Standards	NTSC	NTSC	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL
Reader Service Number	**342**	**343**	**344**	**345**	**346**

*Data for Foton I unavailable at press time.

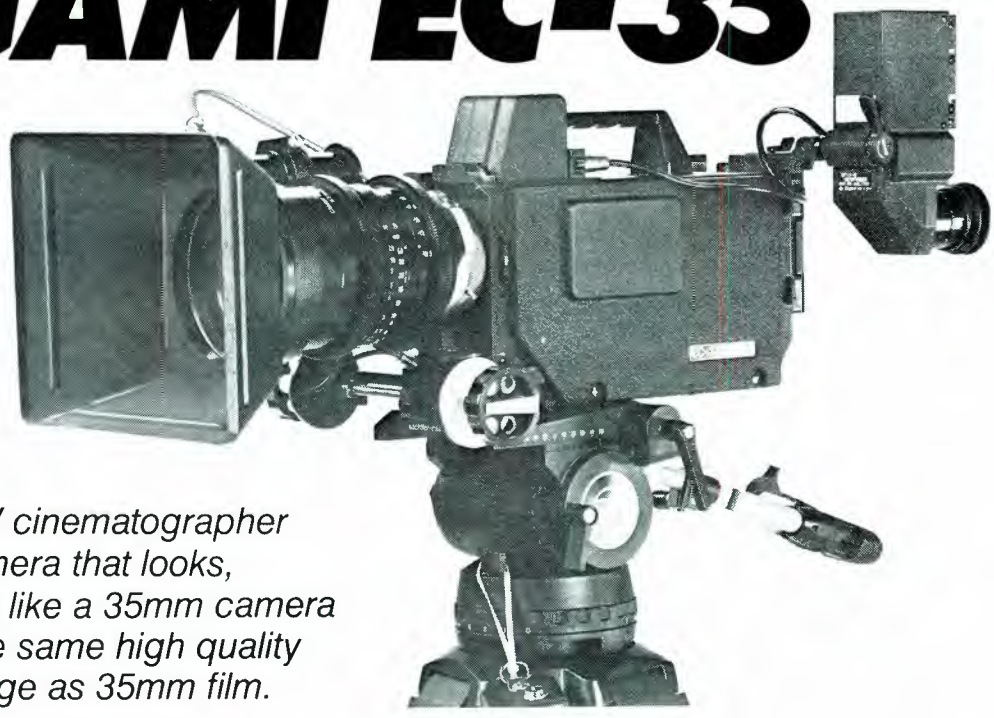
Studio/Field Production

Manufacturer	Philips Broadcast			RCA Broadcast	
Model Number	**LDK 6 System**	**LDK 25B**	**LDK 44 System**	**TK-47B(BT)**	**TK-761**
Pickup Tube Type	DGP, ACT P, P	ACT P, DGP, P	P, LOC P	P, L	V, S
Pickup Tube Size	1 or 1.2-inch	1-inch	⅔-inch	1.2-inch	⅔-inch
Pickup Tube Number	XQ1500/1410/2070	XQ1500, XQ1070	XQ-1427/1428	XQ-1410, 1415R	.....
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	900 lux, f/2.8, 60%	1000 lux, f/2.8, 60%	800 lux, f/2.8, 89.9%	1250 lux, f/4	1250 lux, f/2.8, 60%
Resolution	65%, 5MHz	65%, 5MHz	65%, 5MHz	400TVL, 100%	.....
Registration (Z1, 2, 3)	25nsec, zone 1	25, 65, 125nsec	60, 80, 150nsec	0.05, 0.05, .1%	0.1, .2, .5%
Signal-to-Noise Ratio	56dB NTSC	56dB	56dB	55dB NTSC	54dB NTSC
	(54dB PAL)	.....	.....	(49dB PAL)	(52dB PAL)
Contours Taken From	Green	Green	Green	Green, red	Green
Enhancement	(1)	(2)	Lvl dependent, comb	H/V comb	H/V comb, coring
ND Filters Available	Yes	Yes	Yes	Yes	.....
Color Temperature Filters	Yes	Yes	.....	Yes	.....
Beam Optimizing Circuitry	Yes	Yes	Yes	Yes	Yes
Viewfinder Size	7 in	7 in	1.5, 4.5 in	7 in	5 in
Return Video Circuits	Yes	Yes	Yes	Yes	Yes
Sync Drives Needed	.....	Yes	No	No	.....
Gen-lock Video Input	Yes	No	Yes	Yes	Yes
Setup Manually	Yes (CLUE)	Yes (CLUE)	Yes	Yes	Yes
Setup by Computer	Yes	.....	.....	Yes	.....
Digital Operation	Yes, distributed	.....	.....	Yes	.....
Multicore Cable	.....	2000 ft	500 ft	2000 ft	3000 ft
Triax Cable	6500 ft	.....	.....	11,000 ft	.....
Camera Head Weight	70 lb	75 lb	20 lb	88 lb	38 lb
Color Standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Reader Service Number	**347**	**348**	**349**	**350**	**351**

(1). 2-line, coring, comb, level dependent, edge. (2) 2-line, coring, comb, level dependent.

New! The first electronic cinematography camera that MATCHES 35mm QUALITY.

IKEGAMI EC-35

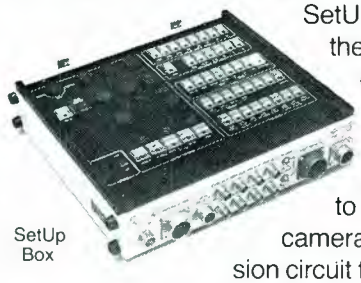


Now for the TV cinematographer a video camera that looks, feels and functions like a 35mm camera and delivers the same high quality television image as 35mm film.

Only the new Ikegami EC-35 gives you all the dynamic range, resolution and clarity of 35mm film for commercials, made-for-TV movies, TV dramas, concerts...plus the economy, convenience, and assurance of video.

Follow-Focus Assembly

Use the EC-35 just as if you were shooting film for television. And here's what you'll get: Selectable gamma curves matching those of film and video; white compression capability and gray scale latitude. • Fully automated SetUp Box sets up and aligns the camera in seconds—eliminating the ongoing need for a video engineer. • Contrast ratio of 100:1, compared to only 20:1 for other video cameras. • A knee compression circuit that compresses signals from 600% of the rated signal to 100%. • A Dynamic Beam Stretch circuit stabilizes highlight signals as much as four stops in excess of normal peak video level. • Dynamic Beam focus gives sharper corner to corner detail.



SetUp Box

Other features: extremely high resolution and low noise (S/N over 57 db rms). • Full range of five interchangeable fixed focal-length lenses, and zoom lenses.

A full line of film style accessories manufactured by Cinema Products, including matte box, follow-focus assembly, zoom lens motor drive, etc. are available.

J-4 Power Zoom Control

At Last: 35mm Film Quality in Video.

The CAMERA MART, Inc.
456 W. 55th Street, New York, N.Y. 10019
(212) 757-6977/Telex: 1-2078
East Coast Distributor

Circle (19) on Reply Card

COLOR TV CAMERA

Studio/Field Production

		Thomson-CSF		Toshiba Corporation	
Manufacturer	**RCA Broadcast**				
Model Number	**TK-781**	**TTV 1525**	**TTV 1525B**	**PK31A**	**PK-40B**
Pickup Tube Type	V, S	DGP	P, L	P, ACT P	LO, DGP
Pickup Tube Size	⅔-inch	1 & ⅔-inch	1 & ⅔-inch	1.2-inch	1-inch
Pickup Tube Number	.....	XQ2070, XQ2427	XQ-2070/2427, P8190	.....	.....
Optics	Prism	Prism	Prism	Prism	Prism
Sensitivity	1250 lux, f/2.8, 60%	800 lux, f/2.8, 60%	800 lux, f/2.8, 60%	2000 lux, f/5.6, RETMA	1350 lux, f/4
Resolution	.....	50%, 5MHz	50%, 5MHz	600TVL	400TVL, 60%
Registration (Z1, 2, 3)	0.1, .2, .5%	30, 70, 120nsec	30, 70, 120nsec	0.05, .15, .3%	0.05, .1, .2%
Signal-to-Noise Ratio	54dB NTSC (52dB PAL)	49dB	49dB	53dB	53dB
		.....	.....	.....	.....
Contours Taken From	Green	Green	Green	Green, red	Green or R/G/B
Enhancement	H/V comb, coring	Adjustable	.....	Comb filter	Coring
ND Filters Available	.....	Yes	Yes	Yes	Yes
Color Temperature Filters	.....	Electronic	Electronic	Yes	Yes
Beam Optimizing Circuitry	Yes	Yes	Yes	Yes	Yes
Viewfinder Size	5 in	1.5, 5, 7 in	7 in	7 in	7 in
Return Video Circuits	Yes	Yes	Yes	Yes	Yes
Sync Drives Needed	.....	Yes	No	Yes	Yes
Gen-lock Video Input	Yes	Yes	Yes	Yes	Yes
Setup Manually	Yes	Yes	Yes	Yes	Yes
Setup by Computer	.....	Yes	Yes	Yes	Yes
Digital Operation	.....	Yes	Yes	Yes	Yes
Multicore Cable	5000 ft	1800 ft	.....	1800 ft	2000 ft
Triax Cable	.....	4500 ft	4500 ft	.....	4600 ft
Camera Head Weight	50 lb	18 lb	.....	82 lb	.....
Color Standards	NTSC, PAL, SECAM,	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Reader Service Number	**352**	**353**	**354**	**355**	**356**

VIDEO RECORDING CAMERA (VRC)

Video recorder-camera combo systems, designed for single unit operation; that is, recorder attaches to camera. VRC units are battery-operated for remote/portable ENG use. Units may be operated separately for use with other recorders if desired or in other configurations.

Manufacturer	**Ampex**	**Fernseh**	**Hitachi**	**Ikegami**
System Number	**ARC-10/FPC-10**	**KBF-1**	**SR-10**	**HL-83**
Camera Number	FPC-10P(S)	KBF-1	SK-1	HL-83
Camera Tubes	3	3	3	3
Size	⅔-inch	½-inch	.....	⅔-inch
Type	P(S)	.....	MOS CCD	P, S
Sensitivity	200fc, f/4	.....	2000 Lux, f/3.5	2000 Lux, f/4.5
Signal/Noise Ratio	59dB	.....	49dB	55dB
Resolution	600TVL	.....	>450TVL	>500TVL
Recorder Number	ARC-10	.....	.....	.....
Cassette Type	VHS ½-inch	CVC ¼-inch	.....	VHS ½-inch
Time/Cassette	20 min	20 min	.....	20 min
Recording Format	M-format	Component	.....	M-format
Luminance	0, – 1/to 3MHz	.....	.....	– 1dB/to 3MHz
Chrominance	0, – 1/to 1MHz	.....	.....	– 1dB/to 1MHz
Signal/Noise Ratio:				
Luminance	47dB	.....	.....	47dB
Chrominance	48dB	.....	.....	48dB
Audio Channels	2	.....	.....	2
AF Response	± 3dB/50Hz-15kHz	.....	.....	± 3dB/50-15kHz
Signal/Noise Ratio	50dB	.....	.....	50dB
System Notes:				
Units Operate Separately	Yes	Yes	Yes	Yes
Color Standards Available	NTSC	NTSC, PAL, SECAM	NTSC	NTSC
Recommended Studio VCR	ARC-40	.....	.....	.....
Camera Gen-Lock Adapter	Option	.....	.....	Option
Remote Camera CCU	No	.....	.....	MA-83 Option
Wireless Control Adapter	.....	.....	.....	ML-83 Option
Time Code Generator	.....	.....	.....	.....
Reader Service Number	**357**	**358**	**359**	**360**

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VIDEO RECORDING CAMERA (VRC)

Manufacturer	Nippon TV	Panasonic	RCA	Sony
System Number	CV-1	RECAM B-100P(S)	Hawkeye System	Betacam BVW-1
Camera Number	CV-1	AK-100P(S)	HC-1	BVW-1
Camera Tubes	3	3	3	1
Size	⅔-inch	⅔-inch	½-inch	⅔-inch
Type	MOS CCD	P(S)	P, S	HBST
Sensitivity	2000 Lux, f/3.5	.....	700 Lux, f/1.4, 60%	2000 Lux, f/4
Signal/Noise Ratio	49dB	59dB	52dB	53dB
Resolution	>450TVL	600TVL	35%, 400TVL	400TVL
Recorder Number	.....	AU-100	HR-1	.....
Cassette Type	CVC ¼-inch	VHS ½-inch	VHS ½-inch	Beta, ½-inch
Time/Cassette	8 min	20 min	20 min	20 min
Recording Format	.....	M-format	ChromaTrack	Component
Luminance	.....	To 3MHz	To 3MHz	±3dB/to 4MHz
Chrominance	.....	To 1MHz	To 1MHz	.....
Signal/Noise Ratio:				
Luminance	45dB	47dB	47dB	46dB
Chrominance	.....	48dB	48dB	.....
Audio Channels	2	2	2	2
AF Response	50Hz-10kHz	±3dB/50Hz-15kHz	±3dB/50Hz-15kHz	−3dB/50Hz-15kHz
Signal/Noise Ratio	50dB	50dB	50dB	50dB
System Notes:				
Units Operate Separately	.....	Yes	Yes	Yes
Color Standards Available	NTSC	NTSC	NTSC, PAL, SECAM	NTSC
Recommended Studio VCR	.....	AU-300	HR-2	BVW-10
Camera Gen-Lock Adapter	.....	AK-1090	Yes	.....
Remote Camera CCU	.....	No	.....	.....
Wireless Control Adapter	.....	No	.....	.....
Time Code Generator	.....	No	Option	Yes
Reader Service Number	**361**	**362**	**363**	**364**

TV CAMERA LENS

Image Format ⅔-inch (8.8x6.6mm)

Optical lens systems for use, and adaptable, with various models of TV cameras. This listing is in order of increasing zoom ratio.

Manufacturer	Angenieux			Canon	
Model Number	15x9	15x9.5	25x10	J13x9B*IE II	
Type	ENG/EFP Lens	ENG/EFP Lens	Studio/EFP Lens	TV Zoom Lens	J15x8.5BIE
Zoom Range (mm)	9 to 135	9.5 to 142	10 to 250	9 to 117	8.5-128mm
Relative Aperture (F)	1.5 to 1.9	1.8 to 2.7	1.4 to 2.8	1.6, past 99mm 1.9	1.6
Transmission Stop (T)	1.65 to 2.1	.....	.....	.....	.....
Photometric Factor	1.1	1.2	.....	.....	.....
Minimum Object Distance	0.8m/31 in	.6m/24 in	.9m/36 in	.8m/31 in	0.6m/1.7ft
M.O.D. Area (mm)	48x36	35x27	27x20	56x42	.....
Horizontal Field Angle	51° to 3.75°	54° to 4°	46° to 2°	52.1° to 4.3°	54.1° to 3.9°
Back Focal Distance (mm)	Adjustable	Adjustable	Adjustable	1, 3, 4, 6, 7, 8*	.....
Clear Aperture Front (mm)	.....	.....	.....	72.6	.....
Clear Aperture Rear (mm)	.....	.....	.....	.....	.....
Integral Range Extenders	x2	.....	Attachments	x2	x2
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes	Yes
Lens Assembly Weight	2.1Kg/4.7 lb	2.5Kg/5.5 lb	6.2Kg/13.7 lb	1.45Kg/3.2 lb	20.9 lb
Reader Service Number	**365**	**366**	**367**	**368**	**369**

	Canon		Fujinon	
Manufacturer		Canon		
Model Number	J20x8.5B*IE	J25x11.5B*IE		A10x11*RM
	J15x9.5	TV Zoom Lens	TV Zoom Lens	A3.5x6.5*RM	ENG Zoom Lens
Zoom Range (mm)	9.5-143mm	8.5 to 170	11.5 to 288	6.5-23mm	11 to 110
Relative Aperture (F/)	1.8-2.3	1.6, past 129mm 2.1	1.6, past 219mm 2.1	1.7	1.6, past 95mm 1.9
Transmission Stop (T/)	.....	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
M.O.D. (meters/feet)	1m/3.3ft	.6m/24 in	1.5m/59 in	0.3m/.98ft	1m/39.3 in
M.O.D. Area (mm)	.....	39x30	41x31	.....	74x56
Horizontal Field Angle	49.7° to 3.5°	54.7° to 3°	41.9° to 1.8°	68°11' to 21°39'	43°36' to 4°35'
Back Focal Distance (mm)	.....	1, 2, 3, 4, 6, 7*	1, 2, 3, 4, 6, 7*	B, C, F*	B, C, F*
Clear Aperture Front (mm)	.....	132.9	137	61mm	60
Clear Aperture Rear (mm)	.....	.....	.....	.....	.....
Integral Range Extenders	.....	x2	x2	.....	.....
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	.....	Available	Available	Yes	Yes
Servo Zoom	.....	Available	Available	Yes	Yes
Lens Assembly Weight	3.75 lb	8Kg/17.6 lb	10Kg/22 lb	3.2 lb	1.2Kg/2.6 lb
Reader Service Number	**370**	**371**	**372**	**373**	**374**

TV CAMERA LENS

Manufacturer	Fujinon				
Model Number	A12x9*RM	A12x9*ERM		A14x9.5*ERM	A17x8.5*ESM
Type	ENG/EFP Zoom Lens	ENG/EFP Zoom Lens	A14x9ERM	ENG/EFP Zoom Lens	EFP Lens
Zoom Range (mm)	9 to 109	9 to 108	9-126mm	9.5 to 133	8.5 to 145
Relative Aperture (F)	1.7, past 90mm 1.9	1.7, past 90mm 1.9	1.7-2.0	1.7, past 109mm 2	1.5, past 80mm 2.
Transmission Stop (T)	.....	.....	1.9	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	.8m/31 in	.8m/31 in	0.8m/2.6ft	.8m/31 in	0.7m/27.6 in
M.O.D. Area (mm)	59.7x44.8	60x45	.....	49.3x37	51x39
Horizontal Field Angle	52°06' to 4°40'	52°06' to 4°40'	52°6' to 4°	49°40' to 3°47'	54°44' to 3°28'
Back Focal Distance (mm)	–, B, C, F, G, H, K*	B, C, F, H, K*	.....	.....	.....
Clear Aperture Front (mm)	71	71	.....	A, B, C, F, G, H, K*	–, B, C, F, K*
Clear Aperture Rear (mm)	.....	.....	.....	72.5	131
Integral Range Extenders	.....	x2.2	x2	x2	x2
Closeup Diopters	.....	.....	Macro	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes	Yes
Lens Assembly Weight	1.8Kg/4 lb	1.9Kg/4.2 lb	3.3 lb	1.7Kg/3.7 lb	10.8Kg/24 lb
Reader Service Number	**375**	**376**	**377**	**378**	**379**

Manufacturer	Fujinon			Schneider	
Model Number	A17x9*ERM	A22x12.5*ERM	A30x11*ESM	Variogon 1.8/10-100	Variogon 1.7/9-126
Type	ENG/EFP Lens	ENG/EFP Lens	EFP Lens	TV41 ENG Lens	TV44 ENG/EFP Lens
Zoom Range (mm)	9 - 153	12.5 to 275	11 - 330	10 to 100	9 to 126
Relative Aperture (F)	1.7, past 114mm 2.3	2, past 196mm 2.8	1.6, past 220mm 2.4	1.8	1.7, past 100mm 2.1
Transmission Stop (T)	.....	.....	.....	2.2	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	.9m/35.4 in	1.8m/71 in	1.7m/67 in	1m/39.3 in	0.8m/31 in
M.O.D. Area (mm)	48x36	54x41	41x31	85x64	54x41
Horizontal Field Angle	52°06' to 3°17'	38°47' to 1°50'	43°36' to 1°32'	46°to 5.2°	54° to 4°
Back Focal Distance (mm)	.....	A, B, C, F, G, H, K*	–, B, C, F*	40.8	42.5 to 47.6
Clear Aperture Front (mm)	A, B, C, F, G, H, K*	98	136	66	72
Clear Aperture Rear (mm)	80	.....	.....	23.7	29.5
Integral Range Extenders	x2	x2	x2	x2	x2
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Available	Yes	Yes	Yes
Servo Zoom	Yes	Available	Yes	Yes	Yes
Lens Assembly Weight	2.3Kg/5 lb	3.98Kg/8.8 lb	9.2Kg/20.3 lb	2.3Kg/5.1 lb	1.5Kg/3.3 lb
Reader Service Number	**380**	**381**	**382**	**383**	**384**

Manufacturer	Schneider				
Model Number	Variogon 1.7/8.5-125	Variogon 1.4/12-240	Variogon 1.4/87-260	Variogon 1.4/11-330	Variogon 1.4/18.5-550
Type	TV43 ENG/EFP Lens	TV27B EFP Lens	TV46 EFP Wide Angle	TV45 EFP Standard	TV47 EFP Tele
Zoom Range (mm)	8.5 to 125	12 to 240	8.7 to 260	11 to 330	18.5 to 550
Relative Aperture (F)	1.7, past 95mm 2.1	1.4, past 120mm 2.8	1.4, past 104mm 3.5	1.4, past 132mm 3.5	1.4, past 220mm 3.5
Transmission Stop (T)	.....	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	.8m/31 in	1.5m/59 in	.4m/15.7 in	.85m/33.5 in	2.9m/10 ft
M.O.D. Area (mm)	55.7x41.7	52x39	19.3x14.4	30x22	45x34
Horizontal Field Angle	53° to 4.1°	.....	52.5° to 2°	42.5° to 1.6°	26.4° to 1°
Back Focal Distance (mm)	41.6	40.9	41.1	41.1	41.1
Clear Aperture Front (mm)	71	98	180	132	180
Clear Aperture Rear (mm)	25.2	34	38.4	38.4	38.4
Integral Range Extenders	x2	.....	.....	.....	.....
Closeup Diopters	.....	.67	.....	1.17	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	.....	Yes	Yes	Yes
Lens Assembly Weight	3.1Kg/6.9 lb	7.8Kg/17.2 lb	17.5Kg/38.5 lb	16Kg/35.2 lb	19.5Kg/42.9 lb
Reader Service Number	**385**	**386**	**387**	**388**	**389**

Manufacturer	Tamron Company		Taylor Hobson		
Model Number	665H	466H	Varotal MRL	Varotal MRL	Varotal MRL
Type			Wide Angle	Standard	Narrow Angle Tele
Zoom Range (mm)	10-100mm	9-126mm	9 to 90	11 to 110	18 to 180
Relative Aperture (F)	1.6	1.6-1.9	1.8 maximum	1.8 maximum	1.8 maximum
Transmission Stop (T)	.....	.....	2.0 maximum	2.0 maximum	2.0 maximum
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	1m/3.3ft	1m/3.3ft	.6m/2 ft	1.2m/4 ft	2.1m/7 ft
M.O.D. Area (mm)	.....	.....	.....	.....	.....
Horizontal Field Angle	47.5° to 5°	52.6° to 4°	52° to 5.6°	44° to 4.8°	28° to 2.8°
Back Focal Distance (mm)	39.03mm	38.98mm	Adjustable	Adjustable	Adjustable
Clear Aperture Front (mm)	64.2mm	76.5mm	.....	.....	.....
Clear Aperture Rear (mm)	24.3mm	24.8mm	.....	.....	.....
Integral Range Extenders	.....	.....	x1.4, x2, x2.8	x1.4, x2, x2.8	x1.4, x2, x2.8
Closeup Diopters	1:8.8	1:9.9	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes	Yes
Lens Assembly Weight	1.7 lb	2.08 lb	7.5Kg/16.5 lb	5Kg/11 lb	9Kg/19.8 lb
Reader Service Number	**390**	**391**	**392**	**393**	**394**

Performance advantages beyond specifications and statistics.

The specs are outstanding, but your studio monitors will provide all the proof you need. Your productions will be sharper and clearer with high definition performance from edge-to-edge and throughout the zoom range. You'll see truer color and higher contrast. What you won't see is distortion. Or a high price.

Fujinon's new P17x16.5ESM outperforms the competition with better color focus tracking, better corner registration, lower distortion and better MTF. And it maintains the Fujinon tradition of high speed (to help you keep your light levels reasonable) with excellent ramping characteristics. You can maintain the F2.1 maximum aperture from 16.5mm out to 218mm.

When you have to get in close, the MOD is only 0.75m. If you're up against the back wall, you have a choice of two range extenders (a Fujinon exclusive) which provide a maximum range of 16.5 out to 560mm. And if you use computerized camera setup, the built-in Fujinon diascope delivers the accuracy you expect.

- Short MOD — only 0.75m
- Two built-in range extenders give you three zoom ranges:

(X1)	16.5 to 280
(X1.5)	24.8 to 420
(X2.0)	33.0 to 560

- Outstanding ramping characteristics — zoom out from 16.5 to 218 mm at a constant F 2.1 aperture.
- At 16.5mm, the horizontal field angle is 54°50' for virtual wall-to-wall coverage.

- A full range of accessories, including Fujinon's microprocessor shot boxes, give you unexcelled flexibility with total control over zoom speed, direction and focal lengths.

With all its performance advantages, you'd expect Fujinon's new P17x16.5ESM to cost a lot more than the competition. Unfortunately for the competition, it costs the same. And for 1-inch format the new R17x12.5 offers equal performance and value advantages. For more information, talk to your Fujinon representative or contact:

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Fujinon's New 17x16.5*

Circle (20) on Reply Card

*F & F Productions took the 17X outside and down to Guayaquil, Ecuador for its 14-camera coverage of the 4th World Swimming & Diving Championship. George Orgera (F & F vice president and general manager) picked the 17X because "We knew it would deliver the performance we needed under lighting we couldn't control. Then again, the only lenses we use are Fujinon."

TV CAMERA LENS

Image Format 1-inch (12.8x9.6mm)

Optical lens systems for use, and adaptable, with various models of TV cameras. This listing is in order of increasing zoom ratio.

Manufacturer	Angenieux				Canon
Model Number	**15x12.5**	**15x14**	**42x12.5**	**Tele 42x24**	**PV10x15BIE**
Type	.....		**Studio/OB**	**Sports/OB**	**Studio**
Zoom Range (mm)	12.5-188mm	14-210mm	12.5 to 525	24 to 1000	15 - 150
Relative Aperture (F)	2.5-3.5	1.6-2.4	1.5 to 5.3	1.7 to 5.7	1.8
Transmission Stop (T)	.....	.....	.....	.....	2.0
Photometric Factor	1.2	1.21	1.26	1.26	.....
Minimum Object Distance	0.6m/2ft	0.64m/2.1ft	.64m/25 in	4m/13 ft	1.6m/63 in
M.O.D. Area (mm)	27x35mm	41x55mm	22x17	50x37	.....
Horizontal Field Angle	54° to 4°	49° to 3.5°	56° to 1.5°	30° to .7°	46.2° to 5°
Back Focal Distance (mm)	.....	.....	Adjustable	Adjustable	67.59
Clear Aperture Front (mm)	.....	.....	.....	.....	.....
Clear Aperture Rear (mm)	.....	.....	.....	.....	.....
Integral Range Extenders	x1.6, tele	x1.5, 2, 2.5	.....	.....	x1.7, x2
Closeup Diopters	.....	.....	Available	Available	.....
Servo Iris	Yes	Yes	Yes	Yes	.....
Servo Zoom	Yes	Yes	.....	.....	.....
Lens Assembly Weight	5.5 lb	42 lb	26Kg/58 lb	34Kg/75 lb	5Kg/11 lb
Reader Service Number	**395**	**396**	**397**	**398**	**399**

Manufacturer	Canon			Fujinon	
Model Number	**PV18x12B**	**PV25x20B**	**PV40x13.5BIE**	**K10x15RW**	**K12x14ERM**
Type	**TV Zoom Lens**	**Field Lens**		**BCTV Zoom Lens**	**BCTV Zoom Lens**
Zoom Range (mm)	12 to 216	20 to 500	13.5-540mm	15 to 150	14 to 168
Relative Aperture (F)	1.6, past 172mm 2	1.8, past 297mm 3	1.7	1.8	1.9
Transmission Stop (T)	1.9, past 172mm 2.4	2, past 297mm 3.4	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	.6m/23.6 in	2.5m/8.2 ft	2.5m/8.2ft	1.3m/51 in	.95m/37.4 in
M.O.D. Area (mm)	32x24	.....	.....	1034x775	66x49
Horizontal Field Angle	38.5° to 2.3°	35.5° to 1.5°	50.7° to 1.7°	46°12' to 4°53'	46°08' to 4°22'
Back Focal Distance (mm)	62.65	64.98	.....	60.47	59.47
Clear Aperture Front (mm)	176.4	.....	.....	88.5	86.5
Clear Aperture Rear (mm)	42.1	.....	.....	.....	.....
Integral Range Extenders	x1.5, x2	x1.5, x2	x2	.....	x2
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	.....	Yes
Lens Assembly Weight	24.5Kg/54 lb	28Kg/61.7 lb	66 lb	4Kg/8.8 lb	2.9Kg/6.4 lb
Reader Service Number	**400**	**401**	**402**	**403**	**404**

Manufacturer	Fujinon				Schneider
Model Number	**R14x12.5ESM**	**R14x14ESM**	**R17x12.5ESM**	**R28x11ESM**	**Variogon 2/17-170**
Type	**High Resolution**				**TV24 Studio Lens**
Zoom Range (mm)	12.5 to 175	14-200mm	12.5-212mm	11-310mm	17 to 170
Relative Aperture (F)	1.6, past 165mm 1.7	1.6	1.6-2.0	1.6-3.1	2
Transmission Stop (T)	.....	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	0.75m/29.5 in	1m/3.3ft	0.75m/2.46ft	0.95m/3.12ft	1.5m/59 in
M.O.D. Area (mm)	69x52	57.2x42.9mm	.....	.....	108x81
Horizontal Field Angle	54°13' to 4°11'	49°8' to 3°40'	.....	.....	41° to 4.4°
Back Focal Distance (mm)	60.61	60.1mm	.....	.....	60
Clear Aperture Front (mm)	173	147mm	.....	.....	98
Clear Aperture Rear (mm)	.....	.....	.....	.....	33.1
Integral Range Extenders	x2	x2	x1.5, 2	x1.7	x1.5, x2, x2.5
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes	.....
Lens Assembly Weight	25Kg/55.1 lb	21.6 lb	52.9 lb	60.6 lb	6.5Kg/14.3 lb
Reader Service Number	**797**	**405**	**406**	**407**	**408**

Manufacturer	Schneider		Taylor Hobson		
Model Number	**Variogon 1.7/12.5-375**	**Variogon 1.7/26-800**	**Varotal MRL**	**Varotal MRL**	**Varotal MRL**
Type	**TV35 Wide Angle Lens**	**TV39 Tele/OB Lens**	**Wide Angle**	**Standard**	**Narrow Angle Tele**
Zoom Range (mm)	12.5 to 375	26 to 800	13 to 130	16 to 160	26 to 260
Relative Aperture (F)	1.7, past 125mm 5.1	1.7, past 260mm 5.1	2	2	2
Transmission Stop (T)	.....	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	0.4m/15.7 in	2.9m/9.5 ft	.6m/2 ft	1.2m/4 ft	2.1m/7 ft
M.O.D. Area (mm)	19x14.5	96x72	75x56	80x60	104x78
Horizontal Field Angle	53° to 1.9°	27° to .92°	52° to 5.6°	44° to 4.6°	28° to 2.8°
Back Focal Distance (mm)	59.7	59.7	Adjustable	Adjustable	Adjustable
Clear Aperture Front (mm)	130.5	180	.....	.....	.....
Clear Aperture Rear (mm)	40	40	.....	.....	.....
Integral Range Extenders	x1.7	x1.7	x1.4, x2, x2.8	x1.4, x2, x2.8	x1.4, x2, x2.8
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	.....	.....	Yes	Yes	Yes
Lens Assembly Weight	17.5Kg/38.5 lb	19.5Kg/43 lb	17.5Kg/38.6 lb	15Kg/33 lb	20.5Kg/45.2 lb
Reader Service Number	**409**	**410**	**411**	**412**	**413**

TV CAMERA LENS

Image Format 1¼-inch (7.1x12.8mm)

Optical lens systems for use, and adaptable, with various models of TV cameras. This listing is in order of increasing zoom ratio.

Manufacturer	Angenieux		Canon	
Model Number	**42x16**	**Tele 42x32**	**P12x18BIE**	**P18x16B**
Type	**Studio/OB Lens**	**Sports OB Lens**	**Studio Lens**	**Studio/Field Land**
Zoom Range (mm)	16 to 675	32 to 1350	18 - 216	16 - 288
Relative Aperture (F)	2 to 6.8	2.3 to 7.6	2.1	2.1, past 230mm 2.7
Transmission Stop (T)	.....	.....	2.3	2.3, past 230mm 3
Photometric Factor	1.24	1.24	.....	.....
Minimum Object Distance	.64m/25 in	4m/13 ft	.9m/35 in	.6m/23.6 in
M.O.D. Area (mm)	22x17	50x37	.....	.....
Horizontal Field Angle	56° to 1.5°	30° to .7°	50.8° to 1.5°	55.3° to 3.4°
Back Focal Distance (mm)	Adjustable	Adjustable	78.27	78.08
Clear Aperture Front (mm)	.....	.....	.....	.....
Clear Aperture Rear (mm)	.....	.....	.....	.....
Integral Range Extenders	.....	Available	x1.5, x2	x1.5, x2
Closeup Diopters	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes
Lens Assembly Weight	26Kg/58 lb	35Kg/77 lb	20Kg/44 lb	27Kg/60 lb
Reader Service Number	**415**	**416**	**417**	**418**

Manufacturer	Canon	Fujinon			Schneider
Model Number	**P25x27B**	**P14x16.5ESM**	**P17x16.5ESM**	**P30x20ESM**	**Varlogon 2.1/33-1000**
Type	**Field Lens**	**BCTV Zoom Lens**		**Field Zoom Lens**	**TV37 Tele/OB Lens**
Zoom Range (mm)	27 - 675	16.5 to 230	16.5-280mm	20 to 620	33 to 1000
Relative Aperture (F)	2.4, past 400mm 4.1	2.1, past 221mm 2.2	2.1-2.7	2.2, past 418mm 3.3	2.1, past 330mm 6.3
Transmission Stop (T)	2.7, past 400mm 4.6	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	2.5m/8.2 ft	.75m/29.5 in	0.75m/2.46ft	2.5m/8.2 ft	2.9m/10 ft
M.O.D. Area (mm)	.....	72x54	.....	65x49	102x76
Horizontal Field Angle	35.2° to 1.5°	54°50' to 4°16'	54°50' to 3°30'	46°20' to 1°35'	29° to .98°
Back Focal Distance (mm)	79.63	66.36	.....	91.39	63.5
Clear Aperture Front (mm)	.....	173	.....	190	180
Clear Aperture Rear (mm)	.....	.....	.....	.....	38.6
Integral Range Extenders	x1.5, x2	x2	x1.5, 2	x2	x1.7
Closeup Diopters	.....	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	Yes	Yes	Yes	Yes	.....
Lens Assembly Weight	28Kg/62 lb	25Kg/55 lb	46.3 lb	28Kg/61.7 lb	19.5Kg/43 lb
Reader Service Number	**419**	**420**	**421**	**422**	**423**

Manufacturer	Schneider		Taylor Hobson		
Model Number	**Varlogon 2.1/20-600**	**Varlogon 2.1/16-480**	**Varotal MRL**	**Varotal MRL**	**Varotal MRL**
Type	**TV25 Standard Lens**	**TV31 Wide Angle Lens**	**Standard**	**Wide Angle**	**Narrow Angle Tele**
Zoom Range (mm)	20 to 600	16 to 480	21.5 to 215	17.5 to 175	35 to 350
Relative Aperture (F)	2.1, past 200mm 6.3	2.1, past 418mm 3.3	2.7	2.7	2.7
Transmission Stop (T)	.....	.....	.....	.....	.....
Photometric Factor	.....	.....	.....	.....	.....
Minimum Object Distance	.85m/33.5 in	0.4m/15.7 in	1.2m/4 ft	.6m/2 ft	2.1m/7 ft
M.O.D. Area (mm)	32x24	20.5x15.5	80x60	75x56	104x78
Horizontal Field Angle	45° to 1.6°	56° to 2°	44° to 4.6°	52° to 5.6°	28° to 2.8°
Back Focal Distance (mm)	61.7	61.7	Adjustable	Adjustable	Adjustable
Clear Aperture Front (mm)	130	130.5	.....	.....	.....
Clear Aperture Rear (mm)	38.6	38.6	.....	.....	.....
Integral Range Extenders	x1.7	x1.7	x1.4, x2, x2.8	x1.4, x2, x2.8	x1.4, x2, x2.8
Closeup Diopters	1.17	.....	.....	.....	.....
Servo Iris	Yes	Yes	Yes	Yes	Yes
Servo Zoom	.....	.....	Yes	Yes	Yes
Lens Assembly Weight	16Kg/35 lb	17.5Kg/38.5 lb	15Kg/33 lb	17.5Kg/39 lb	20.5Kg/45.2 lb
Reader Service Number	**424**	**425**	**426**	**427**	**428**

CAMERA PICKUP TUBE

Vacuum tube device for TV camera and telecine systems for optical sensing. See Buyers Note below.

Manufacturer	Amperex Electronics Corporation				
Series/Number	**80XQ**	**XQ1427(1)**	**XQ1070(2)**	**XQ1080**	**XQ1410**
Suffix Letters	.....	B/G/R	L/B/G/R	L/B/G/R	L/B/G/R
Type (Target Mat'ls.)	DG Plumbicon*	Plumbicon	Plumbicon	Plumbicon	Plumbicon
Image Format (Diameter)	½-inch	⅔-inch	1-inch	1-inch	1.2-inch
Heater (Volts/mA)	6.3V/95mA	6.3V/95mA	6.3V/95mA	6.3V/95mA	6.3V/300mA
Bias Lighting	Suggested	Suggested	Suggested	Suggested	Suggested
Dark Current	1nA	1.5nA	3nA	3nA	2nA
Target Voltage	45V	45V	45V	45V	45V
Modulation Depth	45%/700TVL	50%/750TVL	40%/700TVL	40%/700TVL	55%/750TVL
Infrared Filter	.....	.....	(XQ 2075)	.....	(XQ 1415)
Antihalation Disk	Yes	Yes	Yes	Yes	Yes
Extended Red Mat'l.	.....	.....	(XQ2073, 75)	.....	(XQ1413, 15)
Low Capacitance	Yes	(XQ3427)	(XQ3070)	.....	.....
Magnetic Focus	.....	Yes	Yes	Yes	Yes
Front Loading	.....	Yes	Yes	No	Yes
Beam Optimizing	Yes	Yes	Yes	Yes	Yes
Integral Yoke	Yes	No	No	No	No
Reader Service Number	**429**	**430**	**431**	**432**	**433**

*Plumbicon is a registered trademark of N.V. Philips of the Netherlands.

(1)The XQ1427 series includes 2427 with a diode-gun structure and the 3427 with a low capacity output. (2) The XQ1070 series includes 2070 with a diode-gun structure and the 3070 with a low capacity output.

Buyer's Note: Tube requirements must be discussed with the manufacturer. Special designators may be in use for characteristics such as extended red, infrared filter, antihalation disk low capacity output and front loading.

Manufacturer	English Electric Valve Company Ltd. (EEV Ltd.)				
Series/Number	**P8470**	**P8460(8462)**	**P8022**	**P8147**	**P8190**
Suffix Letters	.....	L/R/B/G	L/R/B/G	L/R/B/G	L/R/B/G
Type (Target Mat'ls.)	Leddicon	Leddicon, DG	Leddicon	Leddicon	Leddicon, DG
Image Format (Diameter)	½-inch	⅔-inch	1-inch	1-inch	1-inch
Heater (Volts/mA)	Reduced	6.3V/95mA	6.3V/95mA	6.3V/190mA	.....
Bias Lighting	.....	.....	In socket	In socket	In socket
Dark Current	.....	.....	1nA	1nA	.....
Target Voltage	.....	45V	45V	45V	45V
Modulation Depth	.....	45% typical	50% typical	52% typical	.....
Infrared Filter	.....	Available	(P8024RF)	(P8148RF)	(P9191RF)
Antihalation Disk	.....	Yes	Yes	Yes	.....
Extended Red Mat'l.	Yes	.....	(P8024AR)	(P8148AR)	(P8191AR)
Low Capacitance	.....	(P8462)	.....	.....	.....
Magnetic Focus	Yes	Yes	Yes	Yes	Yes
Front Loading	.....	Yes	Yes	No	Yes
Beam Optimizing	Yes	Yes	.....	Yes	.....
Integral Yoke	MA817A	No	No	No	No
Related	.....	P8461/8463	P8142, rear-load	P8145/8146	P8196, rear-load
Reader Service Number	**434**	**435**	**436**	**437**	**438**

*Leddicon is the trademark of EEV Ltd.

Manufacturer	English Electric Valve Company Ltd. (EEV Ltd.)				
Series/Number	**P8038/B**	**8541A**	**8507A(P841)**	**8572A(P843)**	**8134V1(4811)**
Suffix Letters	B	.....	.....	.....	.....
Type (Target Mat'ls)	Vidicon	Vidicon	Vidicon	Vidicon	Vidicon
Image Format (Diameter)	1-inch	1-inch	1-inch	1-inch	1-inch
Heater (Volts/mA)	6.3V/95mA	6.3V/95mA	6.3V/mA600	6.3V/600mA	6.3V/95mA
Bias Lighting	.....	.....	.....	.....	.....
Dark Current	10nA	0.02uA	0.02uA	0.02uA	ca. 0.035uA
Target Voltage	15-35V	20-40V	20-40V	25-60V	10V max
Modulation Depth	80%, TVL	60-70%, 400TVL	60-70%, 400TVL	60-70%, 400TVL	17%, 400TVL
Infrared Filter	.....	.....	.....	.....	.....
Antihalation Disk	.....	.....	.....	.....	.....
Extended Red Mat'l.	.....	.....	.....	.....	.....
Low Capacitance	.....	.....	.....	.....	.....
Magnetic Focus	Yes	Yes	Yes	Yes	Yes
Front Loading	Yes	Yes	Yes	Yes	No
Beam Optimizing	.....	.....	.....	.....	.....
Integral Yoke	.....	.....	.....	.....	.....
Reader Service Number	**439**	**440**	**441**	**442**	**443**

Request information on further Vidicons of interest: 1-inch, P893/894(4493/4494); 1.5-inch, 8480V1(4811).

See Calvert advertisement on page 7.

CAMERA PICKUP TUBE

Manufacturer	Hitachi Ltd.				
Series/Number	**H9366/9366B**	**H9311A/9311B**	**H8399(H4101)**	**H8362A**	**H9369/9369B**
Suffix Letters	.....	.....	.....	.....	.....
Type (Target Mat'ls)	Saticon*	Saticon	Saticon	Saticon	Saticon
Image Format (Diameter)	⅔-inch	⅔-inch	⅔-inch	1-inch	1-inch
Heater (Volts/mA)	6.3V/95mA	6.3V/95mA	6.3V/95mA(9/85)	6.3V/95mA	6.3V/95mA
Bias Lighting	Suggested	Suggested	Suggested	Suggested	Suggested
Dark Current	0.3nA	0.3nA	0.3nA	0.6nA	0.6nA
Target Voltage	75V	50V	50V	50V	75V
Modulation Depth	48-56%, 400TVL	45%, 400TVL	43%, 400TVL	60%, 400TVL	60%, 400TVL
Infrared Filter	.....	.....	.....	.....	.....
Antihalation Disk	.....	.....	.....	.....	.....
Extended Red Mat'l.	Enhanced	Enhanced	Enhanced	Enhanced	Enhanced
Low Capacitance	Yes	3.5pf	3.5pf	.....	Yes
Magnetic Focus	Yes	Yes	No	Yes	Yes
Front Loading	Yes	Yes	Yes	Yes	Yes
Beam Optimizing	Yes	Yes	Yes	Yes	Yes
Integral Yoke	.....	.....	.....	.....	.....
Reader Service Number	**444**	**445**	**446**	**447**	**448**

*Saticon is the trademark of Hitachi Ltd. and NHK, Tokyo.

Manufacturer	RCA Electro Optics & Devices				
Series/Number	**BC4398**	**BC4391**	**BC4396**	**BC4392**	**BC4992**
Suffix Letters	.....	B/G/R	B/G/R	L/B/G/R	LB/G/R
Type (Target Mat'ls.)	Saticon	Saticon	Saticon	Vistalite*	Vistacon*
Image Format (Diameter)	½-inch	⅔-inch	1-inch	1.2-inch	1.2-inch
Heater (Volts/mA)	6.3V/95mA	6.3V/95mA	6.3V/95mA	6.3V/0.4A	6.3V/0.3A
Bias Lighting	Recommended	Recommended	Recommended	Int. fixed	Int. fixed
Dark Current	0.2nA	0.3nA	0.3nA	.....	3nA
Target Voltage	50V	50V	65V	50V	50V
Modulation Depth	40%	35%	55%	.....	30%/700TVL
Infrared Filter	.....	.....	.....	(BC4394)	(BC4993/R)
Antihalation Disk	.....	.....	.....	Yes	Yes
Extended Red Mat'l.	.....	.....	.....	(BC4393/R, 4394)	(BC4993/R, 4994)
Low Capacitance	.....	Yes	Yes	.....	.....
Magnetic Focus	Yes	Yes	Yes	Yes	Yes
Front Loading	Yes	Yes	Yes	Yes	Yes
Beam Optimizing	Recommended	Recommended	Recommended	Recommended	Recommended
Integral Yoke	.....	.....	.....	.....	.....
Reader Service Number	**449**	**450**	**451**	**452**	**453**

*Vistalite and Vistacon are registered trademarks of the RCA Corporation.

Manufacturer	RCA Electro Optics	Thomson-CSF Components Division			Thorn EMI Electron Tubes
Series/Number	**BC4809/B**	**TH9806**	**TH9830**	**TH9828**	**9677(9628)**
Suffix Letters	/B	.....	.....	.....	F1/F1(B)Telecine
Type (Target Mat'ls.)	Vidicon	Vidicon	Vidicon	Silicon target	Vidicon
Image Format (Diameter)	1-inch	1-inch	1.5-inch	1-inch	1-inch
Heater (Volts/mA)	6.3V/0.1A	6.3V/0.2A	6.3V/0.2A	6.3V/90mA	6.3V/100(300)mA
Bias Lighting	Recommended	.....	.....	.....	.....
Dark Current	10nA	100nA max	100nA max	4nA max	5-10nA
Target Voltage	35V max	60V	60V	10V max	15-30V
Modulation Depth	45%	50%/1000TVL	90%/1500TVL	40%/700TVL	60-70%/400TVL
Infrared Filter	.....	.....	.....	.....	.....
Antihalation Disk	.....	.....	.....	.....	(9628)
Extended Red Mat'l.	.....	.....	.....	.....	.....
Low Capacitance	.....	.....	.....	.....	.....
Magnetic Focus	Yes	Yes	Yes	Yes	Yes
Front Loading	Yes	Yes	Yes	Yes	Yes
Beam Optimizing	.....	.....	.....	.....	.....
Integral Yoke	.....	.....	.....	.....	.....
Reader Service Number	**454**	**455**	**456**	**457**	**458**

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. Titler.

Manufacturer	Aston Electronic Designs Ltd.	Beston Electronics (BEI)	Chyron		Computer Video Systems
Model Number	**Aston 3**	**Marquee 2000**	**Chyron IV Graphics/ Titling System**	**Chyron RGU-2**	**Compuvid CDD-10**
Page Format C/L	40/21	Variable	Variable	Variable	Variable
Character Format	18-84TVL/0.5-8μsec	Variable	420TVL max vertical	420TVL max vertical	16x16 matrix
Inter-row Spacing	4-36 line pairs	Variable by row	Yes	Yes	.....
Character Resolution	31.25nsec	31.25nsec H	27nsec	27nsec	.....
Character Manipulation	Character lift	Individual H/V	Yes	Yes	By line
Italicizing	Row-by-row	By lines, 11° slope	Yes	No	No
Surround Edging	Yes	Yes	Yes	Yes	H only
Drop-Shadow Edging	Yes	Yes	Yes	Yes	Yes
Edge Luminance-Color	Yes	Yes	Yes	Yes	.....
Color Pallette	4096	8	512	64	8
Background Coloring	Row-by-row	Horizontal zones	512	Yes	Horizontal zones
Character Coloring	Word-by-word	By character	7/character	Yes	Black, white
Display Flashing	Word-by-word	By words	Character/word/page	Character/word/page	By character
Tabulate Positions	16	16	256	256	Yes
Auto Centering	Row, page	Line	Yes	Yes	Lines
Roll Speeds	8	4, pause	5	5	4
Roll Window	No	No	Yes	Yes	No
Crawl Speeds	8	4, stop	5	5	4
Subtitling	Option/time code	1050 3-line/disc	Yes	Yes	Possible
Resident Fonts	4	4, 92-character	6	4	16
Internal Page Memory	2	1	No	No	27 pages
Disc Memory Storage	150 pages/8" floppy	150 pages/disc	Yes	Yes	Disc, RAM, bubble
Disc Drives	Option	2nd optional	Yes	Yes	1 optional
Worst Case Access	<1sec	.....	1.5 sec	1.5 sec	.....
Edit Channel	1	Yes	2	2	Yes
Output Channels	1 set RGB	2nd channel option	2	2	1
Colorizer/Keyer	No	Yes	Yes	Yes	Yes
RS232 Interface	Yes	Yes	Yes	Yes	News & weather wire
Separate Keyboard	Yes	Yes	Yes, multiple	Yes, multiple	Yes
Font Compose Input	Option	Option	Yes	No	No
Graphics Option	Possible	.....	Yes	No	.....
Reader Service Number	**459**	**460**	**461**	**462**	**463**

Manufacturer	Dubner Computer Systems	Fernseh/Bosch	For-A Company	Knox Video Products	Laird Telemedia
Model Number	**Model CBG-2(1) Dual Plane**	**Compositor I**	**VTW-600 Video Typewriter**	**K128/MOD16**	**7200 Communicator**
Page Format C/L	To 100/30 rows	32/12	32/8	24/8	Variable
Character Format	485TVL V/1024 pixel H	Variable	24x24 matrix	32x48 matrix	Variable
Inter-row Spacing	Adjustable	In 4TVL increments	.....	Fixed	Variable
Character Resolution	.....	30nsec	.....	.....	35nsec
Character Manipulation	Yes	Individually H & V	By line	No	Yes
Italicizing	Positive/negative	No	No	By page	Yes, 12° slope
Surround Edging	Variable thickness	Yes	Option	Color Box option	Yes
Drop-Shadow Edging	Variable, 3-D & 2-color	Yes	Option	Color Box option	Yes
Edge Luminance-Color	Any color	Yes	Option	No	Yes
Color Pallette	512, 64 at a time	28, black & white	6, black & white	Color Box option	32, 768
Background Coloring	64, 32k changes/screen	In 4TVL bands	.....	Color Box option	32 resident
Character Coloring	To 64/character	Individually selected	Individually selected	Color Box option	32 resident
Display Flashing	Yes	By character	By character	Yes	Adjustable
Tabulate Positions	8/page	4	.....	No	4
Auto Centering	Row, page	Line, page	Line, page	Yes	Line, page
Roll Speeds	9	5	Variable	3	10
Roll Window	Any shape	Adjustable	No	No	.....
Crawl Speeds	9	5	Variable	3	10
Subtitling	Requires options	Option	Option	Yes	Yes
Resident Fonts	6 on line, 255 on disc	8	1	3 uc/2 lc	4 128-character
Internal Page Memory	Display only	Display only	9	16 pages	100 rows
Disc Memory Storage	Dual 5M-Byte rigid	999 pages/disc	Disc & mag card	Option	Dual floppy
Disc Drives	Optional dual floppy	2nd optional	.....	No	.....
Worst Case Access	0.5sec	0.25sec	.....	1.2sec	.....
Edit Channel	1/display plane	Yes	Yes	Yes	Yes
Output Channels	2 on-air, 2 prvw	2nd channel option	1	1 pgm, 1 prvw	1 RGB
Colorizer/Keyer	Yes	Yes	Required	Option	.....
RS232 Interface	Yes	Yes	.....	By request	.....
Separate Keyboard	Multiple, but 1/time	To 7	.....	No	Yes
Font Compose Input	Yes, tablet	Option	Light pen	No	Yes
Graphic Option	Yes	EBGG option	.....	No	Yes
Reader Service Number	**464**	**465**	**466**	**467**	**468**

(1) CBG-1 is single plane only.

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offering
Service • Economy • Flexibility

THE BASIC SYSTEM
has multi-user capabilities and will support as many as 16 devices.

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- Newsroom Editing
- Election Reporting
- Wire Capture Capability
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- Tape Indexing
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- Assignments
- Show Formatting

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Circle (21) on Reply Card

CHARACTER GENERATOR

Manufacturer	MPB Technologies	Quanta Corporation			Shintron
Model Number	Vista 80 216/3FX	Microgen	Q7B	Q8	515 FonTex Graph-Titler
Page Format C/L	Variable	32/16	32/16	64/24	Per font
Character Format	Variable	32/16	Variable	Variable	Variable
Inter-row Spacing	.....	Adjustable	Adjustable	Adjustable	.....
Character Resolution	To 384TVLx40μsec	.....	.....	.....	20nsec
Character Manipulation	.....	No	Selected tucks	Yes	.....
Italicizing	Per font	No	No	Yes, all fonts	.....
Surround Edging	Yes	Yes	Yes	Yes	Yes
Drop-Shadow Edging	.....	No	Yes	Yes	Yes
Edge Luminance-Color	Yes	Black	Adjustable	Adjustable	Yes
Color Pallette	6	Option, 10 or 256	No	16 million	Yes
Background Coloring	6	Option	Yes	Yes	8
Character Coloring	6	Option	Yes	Yes	Yes
Display Flashing	Yes	Yes	Yes	Yes	Yes
Tabulate Positions	Yes	No	32	32	Yes
Auto Centering	Line, page	Yes	Yes	Yes	Yes
Roll Speeds	6, ±, pause	9	9	9	Yes
Roll Window	Adjustable	No	No	Yes	.....
Crawl Speeds	6, ±	9	2	9	Yes
Subtitling	Yes	No	Option	No	.....
Resident Fonts	6 92-character	1 (2 widths)	16	>96	16
Internal Page Memory	2 pages	16 pages	10 pages	Yes	20 pages
Disc Memory Storage	Yes	No	Option	Yes	Yes
Disc Drives	2	.....	Option	Yes	.....
Worst Case Access	.....	.....	.....	.....	.....
Edit Channel	Yes	Yes	Yes	Yes	Yes
Output Channels	2	1 pgm, 1 key	2 pgm, 1 key	2 pgm, 2 key	1
Colorizer/Keyer	Yes	Colorizer optional	Yes	Yes	Yes
RS232 Interface	Yes	No	Option	Yes	.....
Separate Keyboard	Yes	No	Option	Yes	No
Font Compose Input	Yes	No	No	Option	.....
Graphic option	Option	No	No	Future	.....
Reader Service Number	469	470	471	472	473

Manufacturer	Teledac Inc.	Texscan/MSI	Thomson-CSF Broadcast		3M Company
Model Number	T-1016	Flexicaster II	Vidifont IVA	Graphics V	D-3016
Page Format C/L	28 char/line	32/8	Font dependent	Variable	22/10
Character Format	7x12 matrix	4 heights, 2 width	Variable	Variable	Variable
Inter-row Spacing	1-4 lines	.....	Programmable	.....	No
Character Resolution	.....	.....	45nsec	48nsec	40nsec
Character Manipulation	Yes	.....	Individually H, V	Individually H, V	No
Italicizing	No	Yes	Yes	Yes	No
Surround Edging	No	Yes	Yes	Yes	Yes
Drop-Shadow Edging	No	Yes	Yes	Yes	No
Edge Luminance-Color	Lead/trail edges black	Yes	Selectable	Selectable	No
Color Pallette	Yes (6)	32	Color bars, B/W	4096	No
Background Coloring	Line-by-line	Yes	Yes	From 1TVLx90nsec	No
Character Coloring	Any of six	Yes	Also see-through	To 16 quads of 3	No
Display Flashing	Yes	Yes	3 rates	Infinite control	Yes
Tabulate Positions	No	Yes	4	Unlimited H & V	No
Auto Centering	Yes	No	Line, page	Line, page	Yes
Roll Speeds	.....	.....	8 and pause	7, pause, 2 directions	3
Roll Window	No	No	Selectable	Selectable	1
Crawl Speeds	.....	3 and pause	8, pause	7 pause, 2 directions	3
Subtitling	No	Yes	Auto lower 1/3s	Auto lower 1/3s	Yes w/D-4500
Resident Fonts	128-character uc/lc	2 and 2 optional	Multiple	48 max	1
Internal Page Memory	16 & 37	58, 740 optional	1	Multiple plane	16
Disc Memory Storage	No	2000 floppy	Floppy	Dual density floppy	w/D-4500 option
Disc Drives	.....	To 4	2nd optional	2nd optional	2nd optional
Worst Case Access	.....	1sec	0.3sec	0.5sec average	0.3sec
Edit Channel	.....	Yes	Yes	Yes	Yes
Output Channels	1	15 displays	Dual available	Multiple	1
Colorizer/Keyer	.....	No	Optional unit	Per channel	No
RS232 Interface	.....	Yes	.....	.....	Yes, also parallel
Separate Keyboard	.....	Yes	Multiple, delegatable	To 8 simultaneously	No
Font Compose Input	.....	No	.....	Yes	No
Graphic Option	.....	With keyboard symbols	.....	Yes	No
Reader Service Number	474	475	476	477	478

CHARACTER GENERATOR

Manufacturer	3M Company	Unitel			
Model Number	D-8800 System	Scriptel "P"	Scriptel "PWP"	Scriptel "V"	Ecritel
Page Format C/L	75/25 max	32/16	32/16	32/12	32/12
Character Format	Variable	4 sizes	4 sizes	4 sizes	4 sizes
Inter-row Spacing	Yes	.....	.....	.....	.....
Character Resolution	35nsec	.....	.....	.....	.....
Character Manipulation	Horizontal	Yes	Yes	Yes	Yes
Italicizing	Yes, 12°, 2 directions	No	No	No	No
Surround Edging	7 variations	Yes	Yes	Yes	No
Drop-Shadow Edging	7 variations	Yes	Yes	Yes	No
Edge Luminance-Color	8 variations	.....	.....	.....	No
Color Pallette	8 colors	8	8	.....	No, b/w only
Background Coloring	8	Yes	Yes	.....	.....
Character Coloring	8	Yes	Yes	.....	.....
Display Flashing	By character	Yes, underscore	Yes, underscore	Yes, underscore	
Tabulate Positions	10	1	1	1	1
Auto Centering	Line, page	Yes	Yes	Yes	Yes
Roll Speeds	10 up or down	3	3	2	2
Roll Window	8 masks	.....	.....	.....	.....
Crawl Speeds	10 left or right	3	3	2	2
Subtitling	Yes w/option	w/SUBTEL	w/SUBTEL	Yes	Yes
Resident Fonts	4 at a time	1 and soft fonts	2	1 and 1 uc	1 and 1 uc
Internal Page Memory	2	16 or 32	16 or 32	16	16
Disc Memory Storage	2000/disc	250 or 500 pages	250 or 500 pages	500 pages	500 pages
Disc Drives	4 max	1 or 2	1 or 2	No	No
Worst Case Access	0.3sec	4sec	4sec	4sec	4sec
Edit Channel	Yes	1, RGB	1, RGB	1	Yes
Output Channels	2nd optional	1 RGB	1 RGB	Yes	1
Colorizer/Keyer	Yes	.....	.....	.....	No
RS232 Interface	Yes, also parallel	Option	Option	Option	No
Separate Keyboard	4 max	Yes	Yes	.....	No
Font Compose Input	Yes	GRAPHTEL	.....	.....	No
Graphic Option	From camera only	DRCS TEXTEL	.....	.....	.....
Reader Service Number	479	480	481	482	483

Manufacturer	Unitel	Video Data Systems	Videomedia Systems
Model Number	Scriptel "800"	TPT-2500	KR-6000
Page Format C/L	Font dependent	Variable per font	Variable per font
Character Format	Selectable	Variable	Variable
Inter-row Spacing	Yes	.....	.....
Character Resolution	.....	.....	35nsec
Character Manipulation	.....	Horizontal	Yes
Italicizing	Yes	.....	.....
Surround Edging	Yes	Yes	Yes
Drop-Shadow Edging	Yes	Yes	Yes
Edge Luminance-Color	Yes	Variable	Variable
Color Pallette	4000	Black/white	16
Background Coloring	Yes	Input video	Possible
Character Coloring	16 of 4000/time	B/W	By character
Display Flashing	Yes, underscore	By character	Yes
Tabulate Positions	8	32	.....
Auto Centering	Yes	Line, page	Yes
Roll Speeds	4	.....	Yes
Roll Window	Yes	.....	.....
Crawl Speeds	4	Yes	Yes
Subtitling	Yes	Possible	Possible
Resident Fonts	4	3	4
Internal Page Memory	Font dependent	32 pages	2000 characters
Disc Memory Storage	Yes	Cassette tape	Option
Disc Drives	Yes	.....	.....
Worst Case Access	.....	.....	.....
Edit Channel	Yes	.....	Yes
Output Channels	1	1	1
Colorizer/Keyer	No	.....	Yes
RS232 Interface	Option	Yes	To Z-6000 Edit Control
Separate Keyboard	Yes	.....	Yes
Font Compose Input	Yes	.....	.....
Graphic Option	Yes	.....	.....
Reader Service Number	484	485	486

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

COLOR VIDEO MONITOR

Monitors using P22 phosphor materials, for video signals of 1V P-P, 75 Ohm. May accept .714V non-composite signals if external sync is available. The display format has 3V:4H aspect ratio. Color temperature factory set 6500°K. Not including TV receiver/monitors.

Manufacturer	Amtron Corporation				Asaca ShibaSoku
Model Number	AM-8 (AM Series) NTSC Monitor	AM-26 NTSC Monitor	7819 (High Resolution)	Universal Color Display (8) RGB	CMM14-7 Series
CRT Diagonal	8 in (also 5/12/17)	26 in	19 in	8 in (also 12/19/25)	14 in
CRT Type	Trinitron*	Trinitron	.....	Delta dot	Dot/black matrix
Resolution (TVL)	.....	.....	500	512x512 pixel	600 center
Convergence Accuracy	.....	.....	0.02 in	0.4mm	0.4mm center
Raster Regulation	1/6"H, 1/8"V	1/6"H, 1/8"V	1%, 0-100%APL	<1%	.....
Luminance Bandwidth	.....	.....	±3dB/to 10MHz	To 50MHz	±1dB/6MHz
Chrominance Bandwidth	.....	.....	.....	.....	±0.5dB/1.3MHz
Blue Gun Only	.....	.....	Yes	.....	.....
NTSC Matrix Test	.....	.....	.....	.....	.....
AFC Time Constants	.....	.....	0.5, 7msec	Switched scan rate	0.5, 2, 7msec
Aperture Correction	.....	.....	Yes	.....	Yes
Demodulation Axis	.....	.....	.....	.....	R-Y, B-Y
X-Y Outputs	.....	.....	Yes	.....	Option
Underscan	.....	Yes	Yes	.....	95%
Delay/Pulse Cross	Option	Yes	Yes	.....	Yes
Video Inputs	2	2	2	.....	2
RBG Inputs	.....	(AM-26RGB only)	.....	Yes	Option
External Sync Inputs	Yes	Yes	Yes	Yes	Yes
Weight	24 lb	180 lb	.....	ca. 26 lb	25kg
19-inch Rack or Cabinet	Either	Cabinet, yoke mt.	Either	Either	Both
Color Standards	NTSC, PAL	NTSC, RGB	NTSC	RGB, NTSC to be available	NTSC, PAL, SECAM
	.....	.....	.....		.....
Reader Service Number	487	488	489	490	491

*Trinitron is a registered trademark of the Sony Corporation.

Manufacturer	Asaca ShibaSoku Company			Barco Electronics NV	
Model Number	CMM14-11 Series	CMM20-11 Series	CMM20-7 Series	CM 51 HRB	CM 66
CRT Diagonal	14 in	20 in	20 in	19 in	25 in
CRT Type	Dot/black matrix	Dot/black matrix	In-line/black matrix	In-line gun	In-line gun
Resolution (TVL)	600 center	600 center	600 center	710	ca. 400
Convergence Accuracy	0.4mm center	0.4mm center	0.4mm center	0.6mm center	1.2mm center
Raster Regulation	.....	.....	.....	1%	3%
Luminance Bandwidth	±0.5dB/7MHz	±0.5dB/7MHz	±1dB/6MHz	+1,3dB/7MHz	5MHz
Chrominance Bandwidth	−2dB/1.3MHz	−2dB/1.3dB	±0.5dB/1.3MHz	1.5MHz	1.5MHz
Blue Gun Only	.....	.....	.....	Yes	No
NTSC Matrix Test	.....	.....	.....	No	No
AFC Time Constants	0.5, 7msec	0.5, 7msec	0.5, 2, 7msec	2, 7msec	2, 7msec
Aperture Correction	Yes	Yes	Yes	No	No
Demodulation Axis	I, Q	I, Q	R-Y, B-Y	U, V	U, V
X-Y Outputs	Option	Option	Option	No	No
Underscan	95%	95%	95%	Switchable	No
Delay/Pulse Cross	Yes	Yes	Yes	Yes	No
Video Inputs	2	2	2	2	1
RBG Inputs	Option	Option	Option	Option	No
External Sync Inputs	Yes	Yes	Yes	Option	No
Weight	30kg	46kg	37kg	77 lb	75 lb
19-inch Rack or Cabinet	Both	Both	Both	Yes	Cabinet
Color Standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
	.....	.....	.....	.....	or P/S/N4.43
Reader Service Number	492	493	494	495	496

BARCO INDUSTRIES
VIDEO SYSTEMS' Master Control Monitors:
tailored to your needs

CTVM 3 Colour monitors.
In order to satisfy the variety of monitor applications the CTVM 3 series allows you to choose your colour monitor corresponding exactly to your specific wishes regarding screen size. CRT type, resolution, special facilities, decoders and mechanical construction.
- Screen sizes: 37 cm (15") or 51 cm (20") screen.
- Cathode ray tubes: delta gun shadow mask CRT or slot mask CRT.
- Resolution (for delta gun): Standard, semi high or high resolution.
- Versions:
A version: Most sophisticated grade I monitor incorporating special feautures such as pulse cross, switchable notch filter, split screen, RGB switches, RGBS output, R-Y and B-Y output.
B version:
Master control grade I colour monitor incorporating standard features
C version: «Encoded only» Grade I monitor
- Decoders: the CTVM 3 accepts composite NTSC, PAL or SECAM signals (Combfilter optional on NTSC and PAL)
- Mechanical construction: conversion from cabinet to rack, VTR bridge, inwall or ceiling mounting is easily accomplished without dismantling the monitor through the optional special mounting kit.

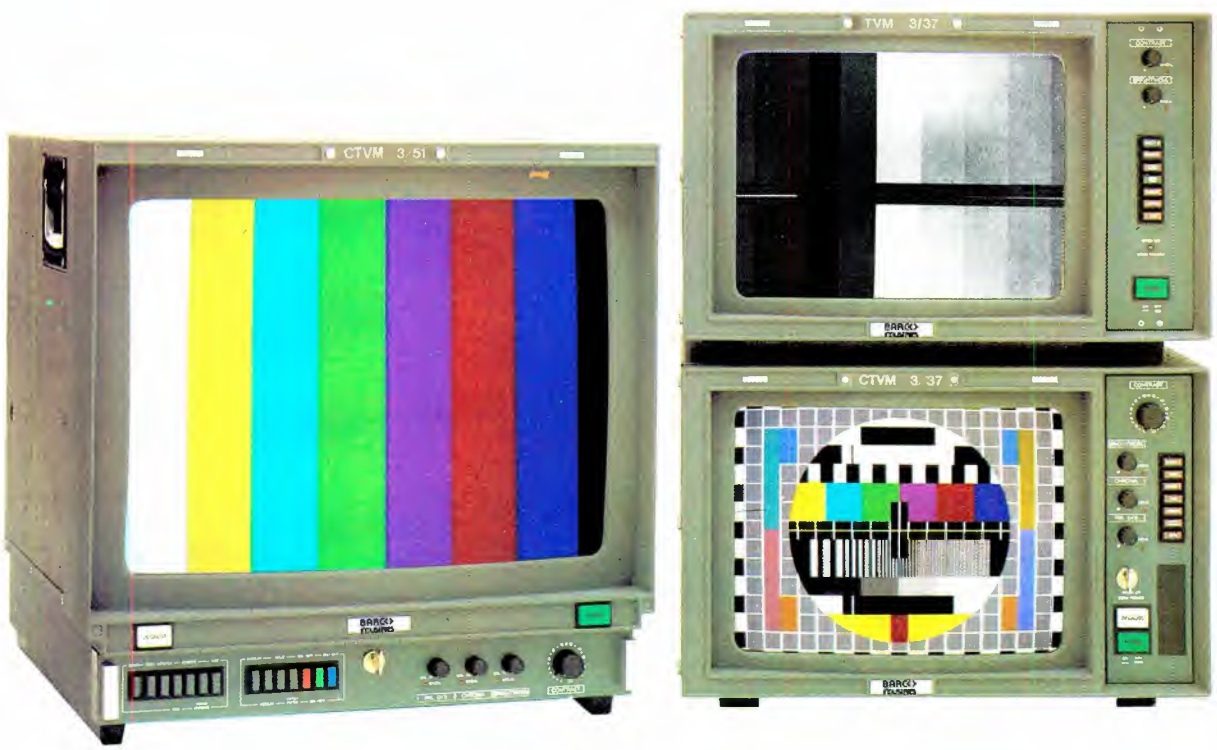
NEW OPTIONS
- Cross hatch and full white generator
- S.I.S.: sound in sync
- C.P.D.A.: Chroma phase display adjustment

TVM 3 monochrome monitors.
The BARCO professional monochrome monitors are measuring instruments for use in broadcasting, industrial and educational applications where quality and reliability are most required.
Facilities to be essential including colour subcarrier filter, pulse cross, size switch, remote control, internal/-external sync. offer broadcast-oriented operating features and controls.

As regards to the CRT a choice is offered between WA (6500°K illuminant D) and W (9.300°K) phosphors. Screen size and mechanical construction can be chosen as with the colour monitors.

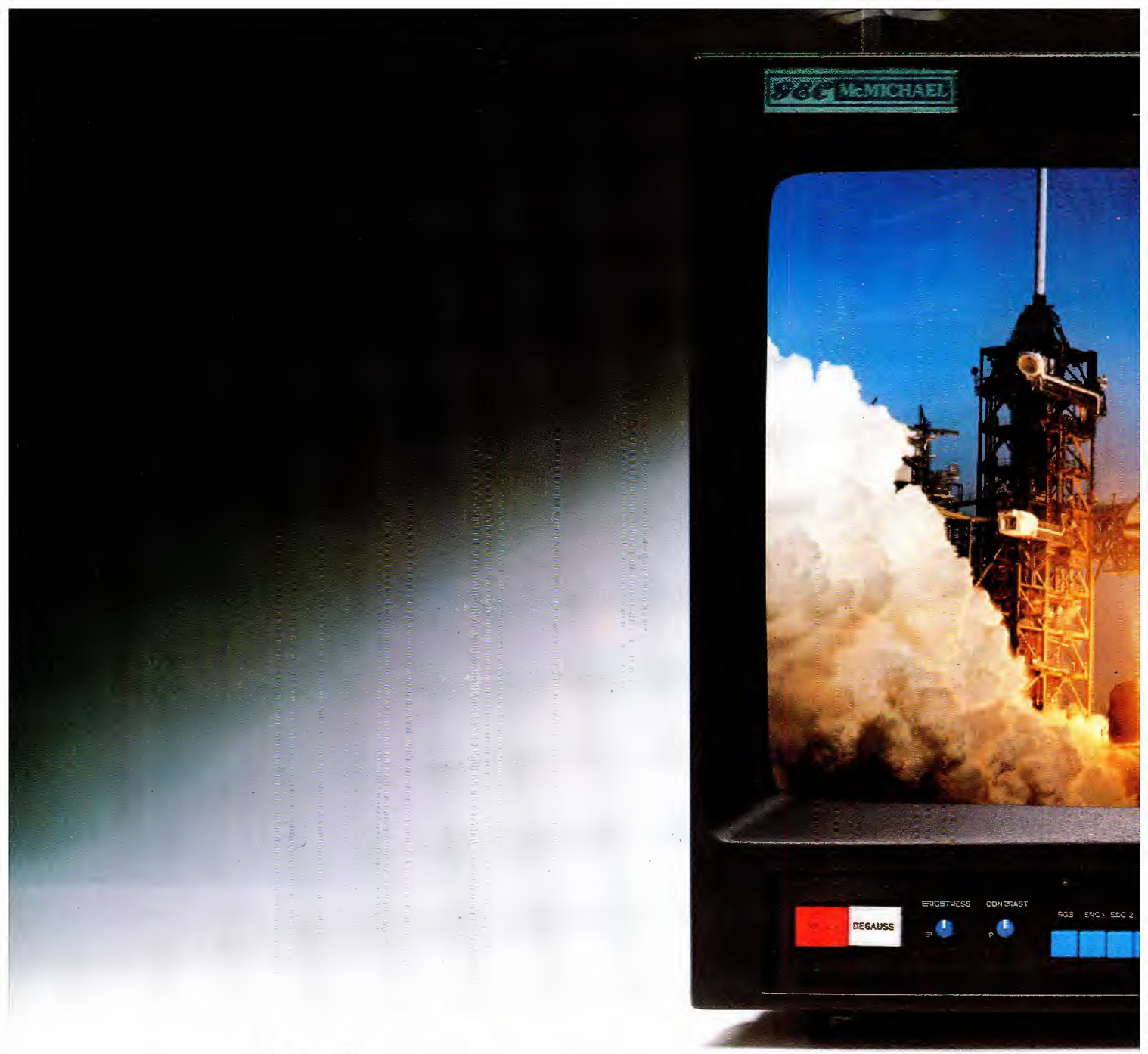
BARCO INDUSTRIES VIDEO SYSTEMS

Barco Video Systems
Th. Sevenslaan, 106
B 8500 Kortrijk
Belgium
Tel. (0) 56/21.11.24
Tlx 85.842 barind b



GRAPHICOLOR

Circle (22) on Reply Card



This is no time to be s

Quite simply, the McMichael ACE Digital Standards Converter is regarded by those who know as the best in the world.

For a start, it's the only one to offer four fields of digital storage.

What's more, it offers bi-directional conversion between any internationally recognised T.V. standards.

Naturally, it performs brilliantly. You won't find a flicker on the horizontal edge.

While neither vertical nor horizontal motion will give you the judders.

For more information about broadcast equipment, clip the coupon and mail to GEC McMichael, Sefton Pa

Simulated picture.

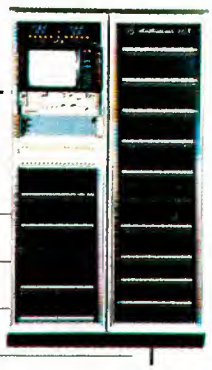
uck with second best.

What you will find is rock-steady, pin-sharp detail. Even on panning.

With all that going for it, you won't be surprised to learn that the McMichael Standards Converter isn't exactly cheap.

But then the best never is.

Circle (23) on Reply Card



Please send me further details on the GEC McMichael ACE Digital Standards Converter.

Name_____

Title_____

Company_____

Co. Address_____

City_____ State_____ Zip_____

GEC McMICHAEL

lls Hill, Stoke Poges, Slough, Berks. SL2 4HD, England. ACE Digital Standards Converter.

COLOR VIDEO MONITOR

Manufacturer	Barco Electronic NV	Conrac Corporation			
Model Number	**CM 33 HRB**	**5700C13**	**6100C19**	**5300C19**	**7211C19**
CRT Diagonal	13 in	13 in	19 in	19 in	19 in
CRT Type	In-line gun	Delta gun	Delta gun	Shadow mask	PIL
Resolution (TVL)	520	500	600	450	1080x809 pixel
Convergence Accuracy	0.8mm center	0.02 in	0.02 in	0.03 in	0.01 in
Raster Regulation	1%	1%, 0-100%APL	0.4%, 0-100%APL	1%, 0-100%APL	1%, 0-100%APL
Luminance Bandwidth	+1, −3dB/7MHz	±1dB/to 5.5MHz	1dB/to 6.5MHz	1dB/to 5.5MHz	3dB/to 40MHz
Chrominance Bandwidth	1.5MHz	.....	.....	.....	.....
Blue Gun Only	Yes	No	Yes	No	.....
NTSC Matrix Test	No	Yes	Option	Yes	.....
AFC Time Constants	2, 7msec	0.5, 7msec	0.5, 2msec	0.5, 7msec	.....
Aperture Correction	No	6dB at 3.2MHz	Yes	6dB at 3.2MHz	.....
Demodulation Axis	U, V	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y	.....
X-Y Outputs	No	Option	.....	.....	.....
Underscan	Switchable	Yes	Yes	Yes	.....
Delay/Pulse Cross	Yes	Yes	Yes	Available	.....
Video Inputs	2	2	3	2	.....
RBG Inputs	Option	No	No	No	Yes
External Sync Inputs	Option	Yes	Yes	Yes	Yes
Weight	37 lb	50 lb	88 lb	99 lb	80 lb
19-inch Rack or Cabinet	Yes	Either	Either	Either	Either
Color Standards	NTSC, PAL, SECAM	NTSC, PAL	NTSC, PAL	NTSC, PAL, SECAM	RGB
Related Models	Also CM 22	5711C13 is RGB only	.....	5200C19 similar	.....
Reader Service Number	**497**	**498**	**499**	**500**	**501**

Manufacturer	Conrac Corporation	Electrohome Ltd/JVC	Fernseh Inc./Bosch		Hitachi Denshi
	7111C13 RGB	**ECM1301 RGB**			
Model Number	**Display**	**Display**	**MC-37BA**	**MC-51BB**	**CM-182**
CRT Diagonal	13 in	13 in	15 in	20 in	18 in
CRT Type	PIL	Matsushita	Toshiba in-line	RCA PIL	In-line gun
Resolution (TVL)	503 pixel	512 pixel	625	625	370
Convergence Accuracy	0.02 in	0.4mm	0.25%	0.25%	.....
Raster Regulation	1%, 0-100%APL	1%	0.5%, 0-100%APL	0.4%, 10-90%APL	.....
Luminance Bandwidth	3dB/to 40MHz	25MHz	0.5dB/to 5MHz	1dB/to 5MHz	.....
Chrominance Bandwidth	.....	.....	.....	.....	.....
Blue Gun Only	No	No	Yes	.....	No
NTSC Matrix Test	No	No	No	No	No
AFC Time Constants	.....	.....	1, 3msec	.....	.....
Aperture Correction	.....	.....	.....	.....	Yes
Demodulation Axis	.....	.....	R-Y, B-Y	.....	3 axis
X-Y Outputs	No	.....	Yes	.....	.....
Underscan	No	5% (overscan 10%)	Yes	Yes	.....
Delay/Pulse Cross	No	No	Yes	No	.....
Video Inputs	.....	1	3	2	1
RBG Inputs	Yes	Yes	Yes	Option	On CM1822 only
External Sync Inputs	Yes	Yes	Yes	Yes	Yes
Weight	62 lb	52 lb	50 lb	65 lb	66 lb
19-inch Rack or Cabinet	Either	Cabinet	Either	Either	Either
Color Standards	RGB Only	RGB	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, RGB
Related Models	.....	M1301-RS170	MC-37BB	MC63-BA	.....
Reader Service Number	**502**	**503**	**504**	**505**	**506**

COLOR VIDEO MONITOR

Manufacturer	Ikegami Electronics		JVC Company	
Model Number	TM14-2RHA	TM14-9RH	TM20-8R	TM-90U	TM-14PSN
CRT Diagonal	14 in	14 in	20 in	9 in	13 in
CRT Type	Shadow mask	In-line gun	.....	In-line	In-line, black matrix
Resolution (TVL)	.....	.....	600	Medium	270(NTSC)/300(P,S)
Convergence Accuracy	0.02 in	0.02 in	0.02 in	.....	.....
Raster Regulation	.....	.....	.....	.....	.....
Luminance Bandwidth	1, – 2dB/to 8MHz	1,3dB/to 8MHz	1, – 2dB/to 5MHz	.....	.....
Chrominance Bandwidth	1, – 3dB/3-4MHz	1, – 3dB/2.3-4.1MHz	1, – 3dB/3-4MHz	.....	.....
Blue Gun Only	No	No	No	No	No
NTSC Matrix Test	No	Yes	No	No	No
AFC Time Constants	No	3 AFC, switched	No	No	No
Aperture Correction	No	Yes	No	No	No
Demodulation Axis	R-Y, B-Y	I, Q	.....	No	No
X-Y Outputs	Option	No	.....	No	No
Underscan	Yes	Yes	Yes	No	No
Delay/Pulse Cross	Yes	Yes	Yes	No	No
Video Inputs	2	3	2	2	2 & EIAJ
RBG Inputs	Option	Option	Option	Yes	No
External Sync Inputs	Yes	Yes	Yes	No	No
Weight	62 lb	55 lb	99 lb	9.3kg	29.9 lb
19-Inch Rack or Cabinet	Either	Either	Either	Cabinet	Cabinet
Color Standards	NTSC, RGB	NTSC, RGB	NTSC, RGB	NTSC	NTSC-3.58/4.43, PAL
Related Models	20-inch available	.....	14, 25 in available	.....	SECAM-CCIR/French
Reader Service Number	**507**	**508**	**509**	**510**	**511**

Manufacturer	JVC Company	Lenco			
Model Number	TM22U	PCM 519-3	PCM 519-4	PCM 514-3	PCM 514-6
CRT Diagonal	5 in	20 in	20 in	13 in	13 in
CRT Type	In-line	PIL	PIL	PIL	PIL
Resolution (TVL)	.....	800	700	800	625
Convergence Accuracy	.....	0.2%	0.2%	0.2%	0.2%
Raster Regulation	.....	1%, 10-90%APL	1%, 10-90%APL	1%, 10-90%APL	1%, 10-90%APL
Luminance Bandwidth	.....	10MHz	10MHz	10MHz	10MHz
Chrominance Bandwidth	.....	6MHz, comb	6MHz, comb	6MHz, comb	6MHz, comb
Blue Gun Only	No	Yes	Yes	Yes	Yes
NTSC Matrix Test	No	No	No	No	No
AFC Time Constants	No	.....	.....	.....	.....
Aperture Correction	No	Yes	Yes	Yes	Yes
Demodulation Axis	No	.....	.....	.....	.....
X-Y Outputs	No	No	No	No	No
Underscan	No	Yes	Yes	Yes	Yes
Delay/Pulse Cross	No	Yes	Yes	Yes	Yes
Video Inputs	2 & EIAJ	2	2	2	2
RBG Inputs	No	Yes	Yes	Yes	Yes
External Sync Inputs	Yes	Yes	Yes	Yes	Yes
Weight	9 lb	93 lb	93 lb	45 lb	45 lb
19-inch Rack or Cabinet	Portable cabinet	Either	Either	Either	Either
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
	.....	.....	519-6, 625TVL	.....	514-4, 700TVL
Reader Service Number	**512**	**513**	**514**	**515**	**516**

COLOR VIDEO MONITOR

Manufacturer	McMichael Ltd.		Panasonic Company		
Model Number	**MCA37**	**MCA51**	**CT-1320M**	**CT-1350MG**	**CT-1920M**
CRT Diagonal	14-inch	20-inch	13 in	13 in	19 in
CRT Type	In-line, dot trios	In-line, dot trios	Quintrix II in-line	Quintrix II in-line	Quintrix II in-line
Resolution (TVL)	0.43mm pitch	0.43mm pitch	230	.....	.....
Convergence Accuracy	0.6mm error	0.7mm error	.....	.....	.....
Raster Regulation	.....	.....	.....	.....	.....
Luminance Bandwidth	7MHz	7MHz	.....	.....	.....
Chrominance Bandwidth	0,6MHz	.....	.....	.....	Comb filter
Blue Gun Only	Yes	Yes	No	No	No
NTSC Matrix Test	No	No	No	No	No
AFC Time Constants	.....	.....	.....	2	.....
Aperture Correction	.....	.....	Yes	Yes	Yes
Demodulation Axis	.....	.....	.....	.....	.....
X-Y Outputs	No, RGB	No, RGB	.....	.....	.....
Underscan	5% overscan	5% overscan	.....	.....	No
Delay/Pulse Cross	For PAL only	For PAL only	.....	.....	No
Video Inputs	2	2	2	2	2
RBG Video Inputs	Yes	Yes	No	Yes, EIAJ	No
External Sync Inputs	Yes	Yes	No	No	No
Weight	36 lb	57 lb	30.25 lb	26.9 lb	52 lb
19-inch Rack or Cabinet	Either	Cabinet	.....	.....	.....
Color Standards	All or RGB	All or RGB	NTSC	NTSC	NTSC
Reader Service Number	**517**	**518**	**519**	**520**	**521**

Manufacturer	Panasonic Company		Philips	Sony Broadcast	
Model Number	**BT-S1300N**	**CT-2000M**	**LDH 6200**	**BVM-1201**	**BVM-4050**
CRT Diagonal	13 in	19 in	14 in	12 in	3.75 in
CRT Type	.....	Quintrix II in-line	In-line gun	Trinitron	Trinitron
Resolution (TVL)	.....	.....	0.61mm pitch	550	270
Convergence Accuracy	.....	.....	0.5mm	0.04 in	<1%
Raster Regulation	.....	.....	.....	1%, 0-100%APL	<3%, 0-100%APL
Luminance Bandwidth	.....	.....	To 5MHz	1dB/to 6.5MHz	.....
Chrominance Bandwidth	.....	.....	.....	.....	.....
Blue Gun Only	Yes	No	.....	No	Yes
NTSC Matrix Test	No	No	.....	No	No
AFC Time Constants	.....	.....	Fast, slow, 3 scans	Fast, slow	.....
Aperture Correction	Yes	Yes	.....	Yes	No
Demodulation Axis	.....	.....	.....	R-Y, B-Y	.....
X-Y Outputs	.....	.....	No	No	No
Underscan	Yes	No	Yes	90% of full screen	No
Delay/Pulse Cross	Yes	No	Yes	Yes	Yes
Video Inputs	2	2	2	2	2
RBG Video Inputs	No	No	Yes	Yes	No
External Sync Inputs	No	No	Yes	Yes	No
Weight	.....	54 lb	40 lb	58 lb	6.3 lb
19-inch Rack or Cabinet	.....	.....	Either	Either	Portable
Color Standards	NTSC	NTSC-3.58/4.43	NTSC, PAL, SECAM,	NTSC	NTSC
	.....	PAL, SECAM	RGB	BVM-1901	.....
Reader Service Number	**522**	**523**	**524**	**525**	**526**

COLOR VIDEO MONITOR

Manufacturer	Tektronix		Videotek Inc.		
Model Number	650HR	TEK 690SR	CD-13HR	RGB/VM-25	VM-8PT
CRT Diagonal	12 in	19 in	13 in	25 in	8 in
CRT Type	Trinitron	Delta gun/dot	PIL	Trinitron	Trinitron
Resolution (TVL)	550	1280x1024 pixel	712	350	.....
Convergence Accuracy	0.04 in	0.02 in	0.02 in	0.04 in	0.04 in
Raster Regulation	1%, 0-100%APL	1%/0-100%APL	0.5%, 0-100%APL	1%, 0-100%APL	1%, 0-100%APL
Luminance Bandwidth	To 6MHz	To 8MHz	To 20 MHz	3dB/to 3.2MHz	3dB/to 3.2MHz
Chrominance Bandwidth	1.2MHz	1.3MHz	.....	Comb filter	.....
Blue Gun Only	Yes	.....	.....	Yes	Yes
NTSC Matrix Test	Yes	Yes	.....	.....	.....
AFC Time Constants	Fast, slow	Fast, slow	.....	.....	.....
Aperture Correction	Yes	Yes	No	No	No
Demodulation Axis	R-Y, B-Y (U/V)	R-Y, B-Y	.....	R-Y, B-Y	R-Y, B-Y
X-Y Outputs	Yes	No	No	No	No
Underscan	90% of full screen	90% of full screen	Permanent	90%	Option
Delay/Pulse Cross	Yes	Yes	.....	Option	Option
Video Inputs	2	2	.....	2	2
RBG Video Inputs	Option	Option 42	Yes	Yes	No
External Sync Inputs	Yes	Yes	Yes	Yes	Yes
Weight	52 lb	110 lb	40 lb	123 lb	25 lb
19-inch Rack or Cabinet	Either	Either	Cabinet	Cabinet	Either
Color Standards	NTSC, PAL, RGB	NTSC, PAL	RGB	NTSC, RGB (digital)	NTSC, PAL
	.....	.....	CD-19HR similar	VM-26P NTSC similar	VM-5PT NTSC only
Reader Service Number	527	528	529	530	531

Manufacturer	Videotek Inc.	World Video Inc.	
Model Number	Studio-12	CP8000A	CR 1700
CRT Diagonal	12 in	8 in	17 in
CRT Type	Trinitron	Trinitron	Trinitron
Resolution (TVL)	.....	.....	.....
Convergence Accuracy	0.04 in	0.04 in	0.04 in
Raster Regulation	1%, 0-100%APL	2%/0-100%APL	.....
Luminance Bandwidth	3dB/to 3.2MHz	.....	.....
Chrominance Bandwidth	.....	.....	.....
Blue Gun Only	Yes	No	No
NTSC Matrix Test	.....	No	No
AFC Time Constants	Slow, fast	.....	.....
Aperture Correction	Yes	.....	Yes
Demodulation Axis	R-Y, B-Y	R-Y, B-Y	R-Y, B-Y
X-Y Outputs	No	No	No
Underscan	90%	80% of full screen	80% of full screen
Delay/Pulse Cross	Yes	Yes	.....
Video Inputs	2	2	2
RBG Video Inputs	No	.....	.....
External Sync Inputs	Yes	Yes	Yes
Weight	55 lb	26 lb	80 lb
19-inch Rack or Cabinet	Either	Portable	Rack
Color Standards	NTSC, PAL	NTSC	NTSC
	VM-12PRO similar	CDR800/Rack	.....
Reader Service Number	532	533	534

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

DIGITAL VIDEO EFFECTS SYSTEM

Equipment of digital design capable of visual image manipulation, aspect alteration, and/or dimensional distortions. Simple wipe and key effects may also be in the repertoire. Intended for video signals of 1V P-P, 75 Ohm. Manipulative effects are listed, not technical specifications.

Manufacturer	ADDA Corporation	Ampex Corporation	Digital Services Corp.	MCI/Quantel	
System Name	VIP	ADO	Digifex	DPE 5000/SP	DPE 5000/PLUS
Video Channels	1	To 4	1	1	5
Image Size Change:					
Compression	Yes	Infinite	Infinite	Infinite	Infinite
Expansion	.....	x8	Yes	x2	x4
Horizontally	Yes	Yes	Yes	Yes	Yes
Vertically	Yes	Yes	Yes	Yes	Yes
Rotation:					
X-axis	Flip	Yes	Yes	Yes	Yes
Y-axis	Flip	Yes	Yes	Yes	Yes
Z-axis	No	Yes	Yes	Yes	Yes
Z-axis Offset	No	Yes	Yes	Yes	Yes
Perspective Along:					
Horizontal Plane	No	Yes, simul w/V	No	.....	Yes
Vertical Plane	No	Yes, simul w/H	No	.....	Yes
Elastic Sheet	No	Yes	No	.....	Yes
Page Turning	No	Yes	Yes	.....	.....
Multiple Image Freeze	Yes	Yes	No	Yes	Yes
Image Trail Freeze	.....	Yes	Yes	.....	Yes
Image Positioning	Yes	Yes	Yes	Yes	Yes
Picture Splits	Yes	No	Yes	.....	Yes
Key Tracking	.....	No	No	.....	Yes
Mirror Imaging	.....	Yes	Yes	.....	Yes
Image Inversion	Yes	Yes	Yes	Yes	Yes
Push-Pull Wipe	Yes	No	Yes	No	Yes
Posterization	.....	No	Yes	No	No
Mosaic Effect	.....	No	Yes	No	No
Programmable Effects	Yes	Yes	Yes	Yes	Yes
Programmed Sequences	Yes	Yes	Yes	Yes	Yes
Disc Memory Storage	No	Yes	Yes	.....	Yes
Bubble Memory Storage	No	No	No	.....	.....
Auto Transitions	.....	Yes	Yes	Yes	Yes
Manual Transitions	Yes	Yes	Yes	Yes	Yes
Reader Service Number	**535**	**536**	**537**	**538**	**539**

Manufacturer	MCI/Quantel	NEC America Inc.		Precision Echo	Vital Industries
System Number	Mirage	DME-2	E-Flex	Squeezer	SqueeZoom
Video Channels	Multiple	2	2	1	1 to 4
Image Size Change:					
Compression	Yes	Yes	Yes	x1/4,1/9,1/16,1/25	1:1 to infinity
Expansion	Yes	Yes	.....	No. Variable crop	Infinite
Horizontally	Yes	Yes	.....	Yes	Yes
Vertically	Yes	Yes	.....	Yes	Yes
Rotation:					
X-axis	Yes	Yes	Yes	No	Yes
Y-axis	Yes	Yes	Yes	No	Yes
Z-axis	Yes	Yes	Yes	No	No
Z-axis Offset	Yes	.....	.....	No	Yes
Perspective Along:					
Horizontal Plane	Yes	.....	.....	No	No
Vertical Plane	Yes	.....	.....	No	No
Elastic Sheet	Or geometrics	.....	.....	No	No
Page Turning	Yes	.....	.....	No	Yes
Multiple Image Freeze	Yes	Yes	Yes	No	Yes
Image Trail Freeze	Yes	Yes	Yes	No	Yes
Image Positioning	Yes	Yes	Yes	Yes	Yes
Picture Splits	Yes	Yes	Yes	No	Yes
Key Tracking	Yes	Yes	Yes	No	Yes
Mirror Imaging	Yes	Yes	Yes	Yes	Yes
Image Inversion	Yes	Yes	Yes	Horizontal	Yes
Push-Pull Wipe	Yes	Yes	Yes	No	Yes
Posterization	Yes	Yes	Yes	No	Yes
Mosaic Effect	Yes	Yes	Yes	No	Yes
Programmable Effects	Yes	Yes	Yes	Yes	Yes
Programmed Sequences	Yes	Yes	Yes	No	Yes
Disc Memory Storage	Yes	.....	.....	No	No
Bubble Memory Storage	.....	.....	Yes	No	No
Auto Transitions	Yes	Yes	Yes	No	Yes
Manual Transitions	Yes	Yes	Yes	No	Yes
Reader Service Number	**540**	**541**	**542**	**543**	**544**

EDITING CONTROLLER

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

Manufacturer	Ampex Corporation		Bosch/Fernseh	Cezar International	CMX/ORROX
Model Number	**ACE**	**HPE-104**	**Mach One**	**EA-3x**	**340X**
Specific VTR/VCRs	AVR/VPR/BVU/ BVH/BCN	VPR/BVU	BCN/VPR/AVR/ BVH/RCA	Various	All 1, 2-inch Most ¾-inch
Number of Recorders	16	1	1	1	To 7
Number of Players/Sources	16	3	5	1	To 7
Microprocessor Control	Yes	Yes	Yes	Yes	Yes
Internal Event Storage	Yes	Yes	Yes	.....	To 999
Disc Event Storage	Yes	Yes	Option	.....	Yes
Paper Tape Storage	Option	Option	Yes	.....	Yes
CRT Edit Data Display	Yes	Yes	Yes	.....	Yes
Edit Decision List	Yes	Yes	Yes	Option	Yes
Printer Output (RS232)	Yes	Option	Yes	Option	Yes
Assemble Edit Mode	Yes	Yes	Yes	Yes	Yes
Insert Edit Mode	Yes	Yes	Yes	Yes	Yes
Animation Edit Mode	Yes	Option	Yes	Possible	No
A/B Roll Edit Mode	Yes	Yes	Yes	No	Yes
Split A/V Edit Mode	To 3 channels	Yes	Yes	Yes	Yes
On-Fly Edit Marking	Yes	Yes	Yes	Yes	Yes
Frame Trimming	Yes	Yes	Yes	Yes	Yes
Drop/Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
SMPTE Time Reference	Yes	Option	Yes	Option	Yes
SMPTE Reader/Generator	Yes	Read only option	Reader in interface	Option	Yes
VITC Time Reference	No	No	No	No	Yes
Other Timing Reference	Control track	Control track	.....	Micro-loc	No
Color Framing Capable	Yes	Yes	Yes	.....	Yes
Editing Accuracy (Frames)	0	0 with time code	0	.....	0
VTR Speed Control	Joystick	Joystick	Yes	In search	Yes
VTR Direction Control	Joystick	Joystick	Yes	In search	Yes
Additional Signal Sources	Per switcher	Two max	Yes	.....	Two
Video Switcher Interface	Yes	Option	Yes	Fade-to-black	Yes
Audio Mixer Interface	Yes	In video switcher	Yes	.....	Yes
Reader Service Number	**545**	**546**	**547**	**548**	**549**

Manufacturer	CMX/ORROX	Control Video	Convergence Corporation		Datatron Inc.
Model Number	**The Edge**	**LF 2000 Light-finger Plus**	**ECS-104**	**ECS-90**	**Vanguard**
Specific VTR/VCRs	VPR, BVH, BVU, BCN HR-200, TT-7000, HR-2	Various VTR, ATR and videola	Various 1, ¾, ½	Various ¾, ½-inch	Various .....
Number of Recorders	1	Multiple	1	1	1
Number of Players/Sources	2	31 max	3	1	4
Microprocessor Control	Yes	Z 80A	Yes	Yes	Yes
Internal Event Storage	Yes	To 99	Yes	In/out, last point	To 320
Disc Event Storage	Yes	No	Yes	No	.....
Paper Tape Storage	Yes	Yes	Yes	No	.....
CRT Edit Data Display	Yes	Touch active	Yes	Yes	Yes
Edit Decision List	Yes	CMX or CVC	Yes	No	Yes
Printer Output (RS232)	Yes	Yes	Yes	No	Yes
Assemble Edit Mode	No	Yes	Yes	Yes	Yes
Insert Edit Mode	Yes	Yes	Yes	Yes	Yes
Animation Edit Mode	Yes	Possible	Option	Yes	Yes
A/B Roll Edit Mode	Yes	Yes	Yes	No	Yes
Split A/V Edit Mode	Yes	Yes	Yes	Yes	Yes
On-Fly Edit Marking	Yes	Yes	Yes	Yes	Yes
Frame Trimming	Yes	Yes	Yes	.....	Yes
Drop/Non-Drop Frame	Yes	Yes	Yes	Yes	Yes
SMPTE Time Reference	Yes	Yes	Yes	Yes	Yes
SMPTE Reader/Generator	Reader	Generator option	Reader option	Option	No
VITC Time Reference	Yes	Option	No	No	Yes
Other Timing Reference	Pulse	Control track	Control track	Control track	No
Color Framing Capable	Yes	Yes	Yes	No	Yes
Editing Accuracy (Frames)	0	0	0 SMPTE, 1 ctl trk	0 SMPTE, 1 ctl trk	1
VTR Speed Control	Yes	Yes	Yes	Yes	Yes
VTR Direction Control	Yes	Yes	Yes	Yes	Yes
Additional Signal Sources	.....	Yes	Two	No	No
Video Switcher Interface	Yes	Yes	Yes	No	No
Audio Mixer Interface	No	.....	Yes	No	No
Reader Service Number	**550**	**551**	**552**	**553**	**554**

EDITING CONTROLLER

Manufacturer	Harris Video	Jatex		JVC Company	
Model Number	**EPIC**	**VSEC-62TMX(CA)**	**VSEC-45TDX**	**VE-90**	**RM88**
Specific VTR/VCRs	Various	Various	Various	Tape Handlers	Tape Handlers
Number of Recorders	1	1	1	1	1
Number of Players/Sources	2, expand to 7	2 (2-4 CA)	1	1	1
Microprocessor Control	Yes	In CA only	No	Yes	Yes
Internal Event Storage	Yes	1 (to 999 CA)	1	1	1
Disc Event Storage	Yes	CA model	No	No	No
Paper Tape Storage	Option	CA model	No	No	No
CRT Edit Data Display	Yes	CA model	No	Yes	No
Edit Decision List	Yes	CA model	No	No	No
Printer Output (RS232)	Yes	CA model	No	No	No
Assemble Edit Mode	Yes	Yes	Yes	Yes	Yes
Insert Edit Mode	Yes	Yes	Yes	Yes	Yes (V, A1, A2)
Animation Edit Mode	Yes	Yes	Yes	Possible	No
A/B Roll Edit Mode	Yes	Yes	No	No	No
Split A/V Edit Mode	Yes	CA model	No	Manually	Yes
On-Fly Edit Marking	Yes	Yes	Yes	Yes	Yes
Frame Trimming	Yes	Yes	Yes	Yes	Yes
Drop/Non-Drop Frame	Yes	No	No	.....	.....
SMPTE Time Reference	Yes	Yes	No	Option	.....
SMPTE Reader/Generator	Yes	No	No	Option	.....
VITC Time Reference	No	No	No	No	.....
Other Timing Reference	.....	Scene-Dex	Scene-Dex	.....	.....
Color Framing Capable	Yes	No	No	Field selector	.....
Editing Accuracy (Frames)	0	1	No	2	+4, −0
VTR Speed Control	Yes	Dial	Dial	Joystick	Yes, search
VTR Direction Control	Yes	Dial	Button	Yes	Yes, search
Additional Signal Sources	Yes	Yes	Yes	Yes, black built-in	No
Video Switcher Interface	Yes	Yes	No	No	No
Audio Mixer Interface	8x2 switcher	CA model	No	No	No
Reader Service Number	**555**	**556**	**557**	**558**	**559**

Manufacturer	Panasonic Company		RCA Broadcast	Sony Broadcast
Model Number	**NV-A970**	**NV-A500**	**AE-800**	**BVE-800**
Specific VTR/VCRs	AU-700, NV series	NV series	TR-800/600, TH-200	BVU-800/200, BVH
Number of Recorders	1	1	1	1
Number of Players/Sources	1	3 (w/NV-A505, J500)	To 7	2
Microprocessor Control	Yes	Yes	Yes	Yes
Internal Event Storage	No	No	Unspecified	To 128
Disc Event Storage	No	No	.....	.....
Paper Tape Storage	No	No	.....	.....
CRT Edit Data Display	No	No	Yes	No
Edit Decision List	No	No	Yes	Yes
Printer Output (RS232)	No	No	Option	Available
Assemble Edit Mode	Yes	Yes	Yes	Yes
Insert Edit Mode	Yes	Yes	Yes	Yes
Animation Edit Mode	No	No	Yes	Possible
A/B Roll Edit Mode	No	w/NV-A505, J500 opt	Yes	Yes
Split A/V Edit Mode	Yes	Yes	Yes	Yes
On-Fly Edit Marking	Yes	Yes	Yes	Yes
Frame Trimming	Yes	Yes	Yes	Yes
Drop/Non-Drop Frame	No	No	Yes	.....
SMPTE Time Reference	Yes	Yes	Yes	Yes
SMPTE Reader/Generator	Yes	No	Option	Option
VITC Time Reference	No	No	Yes	.....
Other Timing Reference	.....	Control track	.....	Control track
Color Framing Capable	No	No	Yes	Yes
Editing Accuracy (Frames)	2	2	0	0 SMPTE
VTR Speed Control	In search	In search	Yes	Yes
VTR Direction Control	In search	In search	Yes	Yes
Additional Signal Sources	No	No	Yes	.....
Video Switcher Interface	No	No	Yes	BVS-500 option
Audio Mixer Interface	No	No	Yes	BVS-500 option
Reader Service Number	**560**	**561**	**562**	**563**

EDITING CONTROLLER

Manufacturer	Sony Broadcast	United Media	Videomedia/SED	
Model Number	BVE-5000	Commander II	Z6000-E (D)	Z6000-C
Specific VTR/VCRs	BVH, BVU	2, 1, ¾-inch	¾, 1(C)-inch ATR	¾, 1(C)-inch ATR
Number of Recorders	2	1	1	1
Number of Players/Sources	4	7	2 (8 optionally)	1 (8 optionally
Microprocessor Control	Yes	Yes	Z80s (dist. intel.)	Z80 (dist. intel.)
Internal Event Storage	Yes	Yes	250 (8 on D model)	250
Disc Event Storage	.....	Option	15,000	15,000
Paper Tape Storage	Yes	Yes	.....	.....
CRT Edit Data Display	Yes	Yes	Yes	Yes
Edit Decision List	Yes	Yes	From 8" disc	From 8" disc
Printer Output (RS232)	Option	Option	Yes	Yes
Assemble Edit Mode	Yes	Yes	Yes	Yes
Insert Edit Mode	Yes	Yes	Yes	Yes
Animation Edit Mode	Possible	Possible	Yes	Yes
A/B Roll Edit Mode	Yes	Yes	Yes	No
Split A/V Edit Mode	Yes	Yes	Yes	Yes
On-Fly Edit Marking	Yes	Yes	Yes	Yes
Frame Trimming	Yes	Yes	Yes	Yes
Drop/Non-Drop Frame	Yes	Yes	Yes	Yes
SMPTE Time Reference	Yes	Yes	Yes	Yes
SMPTE Reader/Generator	Generator optional	Available	Option	Option
VITC Time Reference	Yes	.....	No	No
Other Timing Reference	.....	.....	Micro-Loc	Micro-Loc
Color Framing Capable	Yes	Yes	Yes	8 and 4 field
Editing Accuracy (Frames)	.....	0	0	0
VTR Speed Control	Yes	Yes	Yes	Yes
VTR Direction Control	Yes	Yes	Yes	Yes
Additional Signal Sources	Yes	Yes	Yes	Yes
Video Switcher Interface	Yes	Yes	Yes	Option
Audio Mixer Interface	Yes	Yes	Yes	Option
Reader Service Number	**564**	**565**	**566**	**567**

VIDEO PRODUCTION SWITCHER

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	American Data Corporation		Ampex Corporation		ASACA/Shibasoku
Model/Series	3101-20	3104A	4100(H1) Series	AVC(33) Series	ASW-100
Number of Video Inputs	20 primary	20	26	32	6 (3 w/CCU)
Video Black	Yes (Mstr F-B)	Yes (Mstr F-B)	Yes	Yes	Yes
Color Backgrounds	Yes	Yes	Yes	Yes	No
Non-Synchronous Detect	Yes	Yes	Yes	Yes	No
Titler Input	Yes	Yes	9 possible	8 possible	Yes
Key Source	Int/Ext	Int/Ext	27 possible	32 possible	Yes
Chroma Key (Encoded)	Option	Optional modules	No	Yes	No
Chroma Key (RGB)	Option	Optional modules	Yes	Yes	No
Down Stream Key	Option	Optional modules	Yes	Yes	Yes
Switching Buses	4	5	8	8	2
Auxiliary Buses	2 optional	5 optional	2	16 possible	.....
Mix/Effects Amplifiers	4-ch processor	4-ch processor	3	3	Yes
Auto Transitions	.....	Optional module	Yes	Yes	No
Pattern Generator	Yes	Yes	3	3	Yes
Rotary Wipe Patterns	No	Yes	Yes	Yes	No
Soft Wipe Capability	Yes	Yes	Yes	Yes	Yes
Spotlighting Effect	Yes	Yes	Yes	Yes	No
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	Yes	Yes	Yes	.....
Quad Split System	One-bus option	One-bus option	Yes	Yes	No
Border Effects	Yes	Yes	Yes	Yes	No
Re-Entry Facility	Yes	Yes	Yes	Yes	No
Automation System	No	ACTS system	No	Yes	No
Programmable System	No	Optional	No	Yes	No
Digital Effects Port	No	For Quantel system	Yes	Yes	No
Gen-lock to Video	No	No	Yes	Yes	Yes
Sync Drives Required	Yes	Yes	Composite video	Composite video	No
Program Outputs	2	2	2	2	2
Related Models	Series 3100	.....	Series 4100A	AVC31, 21, 11	ASW-200
	.....	.....	Series 4100E	AVC23	.....
	.....	.....	Series 4100L	.....	.....
Reader Service Number	**568**	**569**	**570**	**571**	**572**

VIDEO PRODUCTION SWITCHER

Manufacturer	Beaveronics		Bosch/Fernseh	Central Dynamics	
Model/Series	**BI-156**	**J&D 705**	**R 102 ME**	**CD-480 6S**	**CD-480 Model 10**
Number of Video Inputs	15	5	24	To 24	To 32
Video Black	Yes	Yes	Yes	Yes (Mstr F-B)	Yes
Color Backgrounds	Yes	Yes	Yes	Yes	Yes
Non-Synchronous Detect	Yes	No	.....	Yes	Yes
Titler Input	Yes	No	4 possible	Available	Yes
Key Source	Int/Ext	Int/Ext	11 possible	Int/Ext	Int/Ext
Chroma Key (Encoded)	Option	No	Option	Option	In SFX units
Chroma Key (RGB)	Option	No	Yes	Option	Option
Down Stream Key	Option	No	Yes	Option	Yes
Switching Buses	6	4	10	6	10
Auxiliary Buses	2 optional	No	Yes	6 possible	2
Mix/Effects Amplifiers	2	1	2	SFX 4-ch	2 SFX
Auto Transitions	No	No	Possible	Option	Yes
Pattern Generator	Yes	Yes	Yes	Yes	Yes
Rotary Wipe Patterns	No	No	Yes	.....	Yes
Soft Wipe Capability	Yes	Yes	Yes	Yes	Yes
Spotlighting Effect	Yes	Yes	Yes	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	Yes	Yes	Yes	Yes
Quad Split System	Option	No	.....	One-bus option	Optional Quadplexer
Border Effects	Yes	No	Yes	Option	Option
Re-Entry Facility	Yes	Yes	Yes	Yes	Yes
Automation System	No	No	Option	CAP system	CAP system
Programmable System	No	No	Option	w/CAP	Yes
Digital Effects Port	No	No	Option	Yes	Yes
Gen-lock to Video	No	Yes	Yes	.....	.....
Sync Drives Required	Yes	No	.....	Yes	Yes
Program Outputs	2	2	.....	2	2
Related Models	BI-154	J&D 712	R 61 ME	CD 480 Series	.....
Reader Service Number	**573**	**574**	**575**	**576**	**577**

Manufacturer	Crosspoint Latch Corp.		EchoLab	Grass Valley Group	
Model/Series	**Model 6139**	**6104 Portable**	**SE/3**	**Series 300-2A (3A)**	**Series 1680-24K(16K)**
Number of Video Inputs	To 24	5	12	24	24 (16)
Video Black	Yes	Yes	Yes	Yes	Yes
Color Backgrounds	Yes	Yes	Dual mattes	Yes	Yes
Non-Synchronous Detect	Yes	Yes	Yes	Yes	Yes
Titler Input	.....	Possible	Yes	5 possible	4
Key Source	Yes	Yes	Yes	Primaries, 6 ext.	2 ext., primaries
Chroma Key (Encoded)	Option	No	Option	Yes	Available
Chroma Key (RGB)	Option	No	No	Yes	Yes
Down Stream Key	Yes	No	Yes	Yes	Yes
Switching Buses	6	2	4	12(16)	8
Auxiliary Buses	.....	No	.....	7 (2) and options	.....
Mix/Effects Amplifiers	3	Yes	3	2(3)	3
Auto Transitions	Yes	Yes	Yes	Yes	w/E-Mem opt
Pattern Generator	Yes	Yes	Yes	Yes	Yes
Rotary Wipe Patterns	.....	No	Yes	Yes	Yes
Soft Wipe Capability	Yes	Yes	Yes	Yes	Yes
Spotlighting Effect	Yes	Yes	.....	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	.....	Yes	Yes	Yes
Quad Split System	No	No	Yes	Yes	Yes
Border Effects	Yes	.....	Yes	Yes	Yes
Re-Entry Facility	Yes	No	Yes	Yes	Cascading
Automation System	Auto drive option	No	.....	E-Mem	E-Mem
Programmable System	Option	No	Yes	Yes, serial	Yes, serial
Digital Effects Port	.....	No	.....	Yes	Yes
Gen-lock to Video	Option	Yes	Yes	No	No
Sync Drives Required	Yes	.....	.....	Yes	Yes
Program Outputs	2	2	2	4	3
Related Models	6112, 6114	6118, 6107	.....	300-2B, 3B	1680-24F, 16F
	6124, 6142	.....	.....	.....	1680-10V, 10X
	.....	.....	.....	.....	1600-1A, 1L, 1X
Reader Service Number	**578**	**579**	**580**	**581**	**582**

VIDEO PRODUCTION SWITCHER

Manufacturer	Image Video Ltd.	Industrial Science		JVC Company	Marconi
Model/Series	SEG-801	210	1208	KM-2000	B3730
Number of Video Inputs	6	10	20	9	22
Video Black	Yes	Yes	Yes	Yes	Yes
Color Backgrounds	Yes	Yes	Yes	Yes	Yes
Non-Synchronous Detect	.....	Yes	Yes	No	Yes
Titler Input	Possible	Yes	Yes	Yes	Yes
Key Source	External	Yes	Yes	Yes	Int/ext
Chroma Key (Encoded)	No	Option	Option	No	Yes
Chroma Key (RGB)	No	Option	Option	Yes	.....
Down Stream Key	Yes	Yes	Yes	Yes	.....
Switching Buses	3	4	8	3	5
Auxiliary Buses	No	Yes	Option	No	.....
Mix/Effects Amplifiers	Yes	1	3	Yes	Yes
Auto Transitions	.....	Yes	Yes	Cuts	No
Pattern Generator	Yes	Yes	Yes	Yes	Yes
Rotary Wipe Patterns	.....	Yes	Yes	No	.....
Soft Wipe Capability	.....	Yes	Yes	Yes	Yes
Spotlighting Effect	.....	Yes	Yes	No	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	.....	Yes	Yes	Limited	Yes
Quad Split System	.....	Option	Option	No	.....
Border Effects	.....	Yes	Yes	No	.....
Re-Entry Facility	.....	Yes	Yes	No	Yes
Automation System	.....	No	Option	No	.....
Programmable System	.....	Yes	Option	No	.....
Digital Effects Port	.....	No	Yes	No	.....
Gen-lock to Video	Yes	No	No	Yes	No
Sync Drives Required	.....	Yes	Yes	Possible	Yes
Program Outputs	2	4	4	3	2
Related Models	.....	200 Series 900 Series	1200 Series	.....	.....
Reader Service Number	583	584	585	586	587

Manufacturer	NEC	Panasonic Company		Ross Video Ltd.	
Model/Series	TAKS-1000 Series	AS-6100	WJ-5500B	RVS 508	RVS 514 (500-series)
Number of Video Inputs	20	17	11	24 possible	20 possible
Video Black	Yes	Yes	Yes	Yes	Yes
Color Backgrounds	Yes	Yes	No	Yes	Yes
Non-Synchronous Detect	Yes	No	No	Yes	Yes
Titler Input	Yes	No	No	Yes	Yes
Key Source	Int/Ext	No	External	Int/Ext	Int/Ext
Chroma Key (Encoded)	Yes	No	No	Option	Option
Chroma Key (RGB)	Option	No	No	Option	Option
Down Stream Key	Option	Yes	No	Option	.....
Switching Buses	8 on C models	5	4	8	4
Auxiliary Buses	.....	.....	.....	Option	Option
Mix/Effects Amplifiers	Yes	Yes	Yes	Yes	Yes
Auto Transitions	.....	.....	Cut	Option	Option
Pattern Generator	Yes	Yes	Yes	Yes	Yes
Rotary Wipe Patterns	Option	No	No	Option	Option
Soft Wipe Capability	Yes	Yes	Yes	Yes	Yes
Spotlighting Effect	.....	Yes	No	Yes	Yes
Effects Positioning	Yes	Yes	Yes	Yes	Yes
Effects Modulation	Yes	No	No	Yes	Yes
Quad Split System	Option	No	No	Option	Option
Border Effects	Option	No	No	Yes	Yes
Re-Entry Facility	Yes	Yes	Yes	Yes	Yes
Automation System	.....	No	No	Scene-Store option	Scene-Store option
Programmable System	.....	No	No	Yes	Yes
Digital Effects Port	Yes	No	No	Yes	Yes
Gen-lock to Video	No	No	Yes	No	.....
Sync Drives Required	Yes	Yes	No	Yes	Yes
Program Outputs	4	3	2	2	2
Related Models	TAKS-1000A, B, C	.....	WJ-4600A	.....	.....
Reader Service Number	588	589	590	591	592

VIDEO PRODUCTION SWITCHER

Manufacturer	Shintron	Sony Broadcast	Viscount Industries	Vital Industries	
Model/Series	375 SuperSwitcher	SEG-2000 series	1150B	250P/N Portable	VIX-114-4A1
Number of Video Inputs	10	6	8	10	24 possible
Video Black	Yes	Yes	Yes	Yes	Yes
Color Backgrounds	Yes	Yes	Yes	Yes	Yes
Non-Synchronous Detect	Yes	Possible	Yes	Yes	Yes
Titler Input	Yes	Possible	Yes	Yes	Yes
Key Source	Int/Ext	Int/Ext	Int/Ext	Int/Ext	Int/Ext
Chroma Key (Encoded)	Yes	No	Yes	Yes	Yes
Chroma Key (RGB)	.....	No	Yes	Yes	Yes
Down Stream Key	Yes	Yes	.....	Yes	Yes
Switching Buses	4	3	4	4	.....
Auxiliary Buses	.....	.....	Yes	2	.....
Mix/Effects Amplifiers	Yes	Yes	Yes	Yes	3 on 4A1
Auto Transitions	.....	.....	.....	Yes	Yes
Pattern Generator	Yes	Yes	Yes	Yes	Yes
Rotary Wipe Patterns	No	No	No	No	Yes
Soft Wipe Capability	Yes	.....	Yes	Yes	Yes
Spotlighting Effect	No	.....	Yes	No	Yes
Effects Positioning	Yes	.....	Yes	Yes	Yes
Effects Modulation	Yes	.....	.....	Yes	Yes
Quad Split System	No	.....	No	No	Yes
Border Effects	Limited	No	No	Yes	Yes
Re-Entry Facility	Yes	No	Yes	No	Yes
Automation System	.....	.....	No	Yes	PSAS
Programmable System	.....	.....	No	Yes	PSAS
Digital Effects Port	.....	.....	No	Yes	Yes
Gen-lock to Video	No	Yes	Yes	No	Yes
Sync Drives Required	Yes	.....	No	Yes	Possible
Program Outputs	2	3	2	2	4
Related Models	373, 374	SEG-1210	1150A, 1127	.....	VIX-114-10A1,
	.....	.....	.....	.....	16A1, 1A1, 2A1
Reader Service Number	**593**	**594**	**595**	**596**	**597**

Production Switcher/TBC/Synchronizer

TIME BASE CORRECTOR/SYNCHRONIZER

Equipment for stabilizing video signals. Systems may use inputs from station master sync generators to allow a VTR/VCR or remote camera signal to be synchronized to station video.

Manufacturer	ADDA Corporation		Ampex Corporation	Apert-Herzog Corp.	Digital Video Systems
Model Number	AC20 Dual TBC	VW-1/VW-2 TBC/ Synchronizer	TBC-2B TBC	Model A	DPS-103 Component TBC/Synchronizer
TBC Function	Yes, dual channel	Yes	Yes	.....	Yes
Field/Frame Synchronizer	Future option	Field & frame	No	Field & frame	DPS-106 option
Digital Sample Rate	14.3MHz	14.3MHz	10.7MHz	14.3MHz	14.3MHz
Quantizing Bits	8	8	8	8	8
Correction Window	16TVL	1 TV Frame	12TVL	.....	Infinite option
Video Bandwidth	±0.5dB/to 4.2MHz	±0.5dB/to 5MHz	±0.25dB/to 4.2MHz	.....	.....
Signal/Noise Ratio	55dB	56dB	56dB	.....	.....
Differential Phase/Gain	2°/2%	2°/2%	2°/2%	.....	.....
K-Factor, 2T Pulse	2%	1%/(4% heterodyne)	1%	.....	.....
Residual Error (Mono)	±10nsec	±20nsec	±10nsec	.....	.....
Sync Coherent 3.58 Out	Yes	Yes	Yes	.....	.....
Advanced Sync Output	Yes	Yes	Yes	.....	.....
Composite Video Outputs	2	2	3	.....	.....
Input Reference Signal	Black, composite	Composite video	Composite video	Composite video	Composite video
Velocity Compensation	.....	Yes	Yes	.....	.....
Heterodyne Processing	Yes	Yes	Yes	.....	Yes
Non-Servo'd Capstan VTR	No	Yes	Yes	.....	.....
Drop Out Compensation	.....	VW-2 only	1 line	.....	.....
Dynamic Tracking Control	.....	No	Yes	.....	.....
Noise Reduction	.....	No	No	.....	.....
Color Correction	.....	No	No	.....	.....
Image Enhancement	.....	No	No	.....	.....
Hot Switch Capable	.....	Yes	No	Yes	.....
Remote Controllable	.....	.....	Yes	.....	.....
Front Panel Control					
Video Gain	1 each channel	Yes	Yes	Yes	Yes
Chroma Gain	1 each channel	Yes	Yes	Yes	Yes
Setup Level	1 each channel	Yes	Yes	Yes	Yes
Hue Phase	1 each channel	Yes	Yes	Yes	Yes
Subcarrier Phase	1 common	.....	Yes	Yes	Yes
Horizontal Phase	1 common	.....	Yes	Yes	Yes
Color Standards	NTSC	NTSC	NTSC, PAL, SECAM	NTSC	NTSC
Reader Service Number	**598**	**599**	**600**	**601**	**602**

Note: Information from **Bosch** for the **HD SY** synchronizer and from **Marconi** on the **B3565** unavailable.

TIME BASE CORRECTOR/SYNCHRONIZER

Manufacturer	Digital Video Systems			Fortel Inc.	
Model Number	**DPS-1 TBC(1)**	**Phaser IV(2)**	**Phaser V/Phaser VI**	**Y-688[32] Total Error Corrector**	**DIGIBLOC TBC/ Synchronizer**
TBC Function	Yes	.....	.....	No	Yes
Field/Frame Synchronizer	.....	Yes	Yes	.....	Field & frame
Digital Sample Rate	14.3MHz	14.3MHz	14.3MHz	.....	14.3MHz
Quantizing Bits	8	8	8	9	8 or 9
Correction Window	32TVL	1 TV field	512TVL	32TVL	16TVL, 2 frames
Video Bandwidth	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.2HMz	−3dB at 4.5MHz	−3dB at 5MHz
Signal/Noise Ratio	58dB	56dB	56dB	59dB	61dB, 9-bit
Differential Phase/Gain	2°/2%	2°/2%	2°/2%	1.5°/1.5%	1°/1%, 9-bit
K-Factor, 2T Pulse	1%	1% 2T	1% 2T	1.5%	1% 2T direct
Residual Error (Mono)	±15nsec	.....	.....	±25nsec	±20nsec
Sync Coherent 3.58 Out	Yes	.....	.....	Yes	Yes
Advanced Sync Output	Yes	.....	.....	Yes	Yes
Composite Video Outputs	2	3	3	2	1
Input Reference Signal	Composite video	Composite video	Composite video	Sync/composite video	Composite video
Velocity Compensation	Line-by-line	.....	.....	Look-ahead	Look-ahead
Heterodyne Processing	Option	.....	.....	Yes	Yes
Non-Servo'd Capstan VTR	Yes	.....	.....	Yes	.....
Drop Out Compensation	Option	Last complete field	Last complete field	Yes	Yes
Dynamic Tracking Control	No	.....	.....	Yes	Yes
Noise Reduction	.....	No	Adaptive 3-line	To 10dB	Optional 3-line
Color Correction	.....	No	Comb filter in	Yes	Adaptive filter
Image Enhancement	.....	No	Phaser VI only	Yes	.....
Hot-Switch Capable	.....	Yes	Yes	No	Yes
Remote Controllable	Yes	Yes	Yes	.....	Yes
Front Panel Control					
Video Gain	Yes	Yes	Yes	Yes	Yes
Chroma Gain	Yes	Yes	Yes	Yes	Yes
Setup Level	Yes	Yes	Yes	Yes	Yes
Hue Phase	Yes	Yes	Yes	Yes	Yes
Subcarrier Phase	Yes	Yes	Yes	Yes	Yes
Horizontal Phase	Yes	Yes	Yes	Yes	Yes
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**603**	**604**	**605**	**606**	**607**

(1) The DPS-1 system also includes modules to develop a synchronizer. (2) The Phaser series includes the Phaser II TBC/synchronizer.

Manufacturer	Fortel Inc.	Harris Video			MCI/Quantel
Model Number	**CCD2H Series TBC**	**HVS-516 TBC(3)**	**HVS-630 Synchronizer**	**HVS 690 Synchronizer**	**DSF1550 TBC/ Synchronizer**
TBC Function	Yes	Yes	.....	Yes	Yes
Field/Frame Synchronizer	.....	No	Field & frame	Field & frame	Yes
Digital Sample Rate	.....	.....	14.3MHz	14.3MHz	10.7MHz
Quantizing Bits	.....	.....	8	9	.....
Correction Window	2TVL	2TVL, opt 16TVL	1 TV frame	Infinite	1.5TV field
Video Bandwidth	To 2.6MHz heterodyne	−3dB/to 5.5MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz	±0.5dB/to 4.2MHz
Signal/Noise Ratio	58dB	55dB	57dB	59dB	58dB
Differential Phase/Gain	0.5°/1.5%	1.5°/1.5%	1.5°/1.5%	2°/2%	1°/1%
K-Factor for 2T Pulse	4%	2%	1%	1%	.....
Residual Error (Mono)	±25nsec	±20nsec	±20nsec	±20nsec	<2nsec
Sync Coherent 3.58MHz	Yes	Yes	.....	Yes	Yes
Advanced Sync Output	Yes	Yes	.....	.....	Yes
Composite Video Outputs	2	1	2	2	Yes
Input Reference Signal	Sync	Composite video	Composite video	Composite video	Composite video
Velocity Compensation	No	.....	.....	Look-ahead	Look-ahead
Heterodyne Processing	Yes	Yes	.....	Yes	Yes
Non-Servo'd Capstan VTR	Yes	Yes	.....	.....	.....
Drop Out Compensation	Yes	Yes	Option	Yes	Yes
Dynamic Tracking Control	.....	.....	.....	.....	.....
Noise Reduction	To 8dB	Option to 5dB	Option to 12dB	.....	.....
Color Correction	.....	.....	.....	.....	.....
Image Enhancement	Yes	Option, H	Option, effects	.....	.....
Hot Switch Capable	No	No	Yes	Yes	Yes
Remote Controllable	.....	Yes	Yes	Yes	Yes
Front Panel Control					
Video Gain	Yes	Yes	Yes	Yes	Yes
Chroma Gain	Yes	Yes	Yes	Yes	Yes
Setup Level	Yes	Yes	Yes	Yes	Yes
Hue Phase	Yes	.....	Yes	Yes	Yes
Subcarrier Phase	.....	.....	.....	Yes	.....
Horizontal Phase	.....	.....	.....	Yes	.....
Color Standards	NTSC, PAL	NTSC	NTSC, PAL, SECAM	NTSC	NTSC
Reader Service Number	**608**	**609**	**610**	**611**	**612**

(3) Model HVS-517 accepts PAL/SECAM signals for correction. The HVS-520 is available for NTSC and PAL.

TIME BASE CORRECTOR/SYNCHRONIZER

Manufacturer	MCI/Quantel	Microtime, Inc.			
Model Number	DSF1750 Frame Synchronizer(4)	T-120 TBC	S-130 System Synchronizer(5)	2020 Signal Processor	2525 Signal Synchronizer
TBC Function	Yes	Yes	.....	Yes	Yes
Field/Frame Synchronizer	Yes	No	Frame	No	Frame
Digital Sample Rate	14.3MHz	14.3MHz	14.3MHz NTSC	10.7MHz	10.7MHz
Quantizing Bits	.....	8	8	8	8
Correction Window	1 TV frame	15TVL	.....	4, 24TVL	Infinite
Video Bandwidth	±0.5dB/to 4.2MHz	To 5.2MHz	To 5.5MHz	To 4.5MHz	4.5MHz
Signal/Noise Ratio	58dB	58dB	58dB	58dB	58dB
Differential Phase/Gain	1°/1%	2°/2%	2°/2%	2°/2%	2°/2%
K-Factor, 2T Pulse	.....	1%	1%	1%	1%
Residual Error (Mono)	<2nsec	±10nsec	.....	±10nsec	±12nsec
Sync Coherent 3.58 Out	Yes	Yes	.....	Yes	Yes
Advanced Sync Output	Yes	Yes	.....	Yes	Yes
Composite Video Outputs	Yes	2	2	2	2
Input Reference Signal	Composite video	Composite video	Composite video	Composite video	Composite video
Velocity Compensation	Yes	Averaging	.....	Line-by-line	Yes
Heterodyne Processing	Yes	Yes	.....	Yes	Yes
Non-Servo'd Capstan VTR	.....	Yes	.....	Yes	Yes
Drop Out Compensation	.....	No	.....	Yes	Yes
Dynamic Tracking Control	.....	No	.....	No	No
Noise Reduction	.....	No	No	To 6dB	No
Color Correction	.....	No	No	No	No
Image Enhancement	.....	No	No	Yes	No
Hot Switch Capable	Yes	No	Yes	No	Yes
Remote Controllable	Yes	Yes	Yes	Yes	Yes
Front Panel Control					
Video Gain	Yes	Yes	Yes	Yes	Yes
Chroma Gain	Yes	Yes	Yes	Yes	Yes
Setup Level	Yes	Yes	Yes	Yes	Yes
Hue Phase	Yes	Yes	Yes	Yes	Yes
Subcarrier Phase	Yes	Internal	Internal	Internal	Internal
Horizontal Phase	Yes	Internal	Internal	Internal	Internal
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**613**	**614**	**615**	**616**	**617**

(4) Also available is a DFS-3000 series of synchronizers. (5) The S-130 is available for PAL and PAL-M.

Manufacturer	Microtime Inc.		NEC		
Model Number	2080 System(6)	2520 TBC/ Synchronizer	NTC-10 Time Base Corrector	NTC-5000 Time Base Corrector	FS-15 (FS-25) Synchronizer
TBC Function	Yes	Yes	Yes	Yes	Yes
Field/Frame Synchronizer	No	Frame	No	No	Field & frame
Digital Sample Rate	13.3MHz PAL/SECAM	10.7MHz	14.3MHz	.....	.....
Quantizing Bits	8	8	10	.....	.....
Correction Window	4, 16H	Infinite	16 TV lines	1/2/4 TV lines	1 TV frame
Video Bandwidth	To 5.5MHz	>4.5MHz	Flat to 5.5MHz	Flat to 5.5MHz	0.2dB to 4.2MHz
Signal/Noise Ratio	53dB	58dB	65dB	55dB	56dB
Differential Phase/Gain	3°/3%	2°/2%	1°/1%	1°/1.5%	.....
K-Factor, 2T Pulse	1%	1%	1%	1%	1%
Residual Error (Mono)	±10nsec	±12nsec	10nsec	25nsec	10nsec
Sync Coherent 3.58 Out	Yes, 4.43MHz	Yes	.....	Yes	Yes
Advanced Sync Output	Yes	Yes	Yes	Yes	.....
Composite Video Outputs	2	2	4	4	2
Input Reference Signal	Composite video	Composite video	Either	Either	Either
Velocity Compensation	No	No	Line-by-line	Look-ahead	Option
Heterodyne Processing	Yes	Yes	.....	Option	.....
Non-Servo'd Capstan VTR	Yes	Yes	.....	Option	.....
Drop Out Compensation	Yes	No	Yes	Yes	Option
Dynamic Tracking Control	No	No	Yes	.....	.....
Noise Reduction	Yes	No	To 5dB	To 3dB	.....
Color Correction	No	No	.....	.....	.....
Image Enhancement	Yes	No	.....	.....	.....
Hot Switch Capable	.....	Yes	.....	.....	.....
Remote Controllable	No	Yes	Yes	Yes	Yes
Front Panel Control					
Video Gain	Yes	Yes	Yes	Yes	Yes
Chroma Gain	Yes	Yes	Yes	Yes	Yes
Setup Level	Yes	Yes	Yes	Yes	Yes
Hue Phase	Yes	Yes	Yes	Yes	Yes
Subcarrier Phase	Internal	Internal	Yes	Yes	Yes
Horizontal Phase	Internal	Internal	Yes	Yes	Yes
Color Standards	PAL/SECAM	NTSC	NTSC	NTSC	NTSC, PAL, SECAM
Reader Service Number	**618**	**619**	**620**	**621**	**622**

(6) 2080M is available for PAL-M.

TIME BASE CORRECTOR/SYNCHRONIZER

Manufacturer	NEC	Sony Broadcast			Thomson-CSF
Model Number	FS-16 Synchronizer	BVT-800 TBC	BVT-2000 Digital Video TBC	BVX-30 Digital Video Processor	9100 Processor
TBC Function	No	Yes	Yes	Yes	Yes
Field/Frame Synchronizer	Field & frame	No	No	Yes	Field & frame
Digital Sample Rate	14.3MHz	10.7MHz	14.3MHz	14.3MHz	14.3MHz
Quantizing Bits	9	8	9	.....	8
Correction Window	1 TV frame	15TVL floating	1 TV frame	4 lines, expandable	Infinite
Video Bandwidth	0.2dB to 5.5MHz	±0.4dB/to 4.2MHz(SC)	0.3dB to 4.2MHz	0.5dB to 5MHz	−3dB at 5.5MHz
Signal/Noise Ratio	56dB	54dB	58dB	51dB	>56dB
Differential Phase/Gain	2°/2%	2°/2%	2°/2%	2°/3%	2°/2%
K-Factor, 2T Pulse	1%	1%	1%	1%	1%
Residual Error (Mono)	.....	±2.5nsec (color)	15nsec	.....	.....
Sync Coherent 3.58 Out	.....	Yes	.....	Yes	Yes
Advanced Sync Output	.....	Yes	Yes	Yes	Yes
Composite Video Outputs	4	1	3	3	3
Input Reference Signal	Sync	Composite video	Video	Video	Composite video
Velocity Compensation	.....	.....	Line-by-line	.....	.....
Heterodyne Processing	.....	Yes	Option	Yes	Yes
Non-Servo'd Capstan VTR	.....	No	.....	Yes	.....
Drop Out Compensation	Last video or black	Yes	For BVH equipment	Yes	.....
Dynamic Tracking Control	.....	Yes	Yes for BVH	.....	.....
Noise Reduction	.....	.....	Color	60%	15dB S/N improvement
Color Correction	.....	.....	.....	Option BK-31	Comb filtering
Image Enhancement	.....	.....	.....	H and V	.....
Hot Switch Capable	Yes	.....	.....	.....	Yes
Remote Controllable	Yes	Yes	.....	Yes	Yes
Front Panel Control					
Video Gain	Yes	Yes	Yes	Yes	Yes
Chroma Gain	Yes	.....	Yes	Yes	Yes
Setup Level	Yes	.....	Yes	Yes	Yes
Hue Phase	Yes	Yes	Yes	Yes	Yes
Subcarrier Phase	Yes	.....	Yes	Yes	.....
Horizontal Phase	Yes	.....	Yes	Yes	.....
Color Standards	NTSC	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**623**	**624**	**625**	**626**	**627**

TIME CODE EQUIPMENT

Generating units of 80-bit serial or 90-bit vertical interval time code data for use as an editing reference or automation control cue. If no reader capability is integral, dealer model number is indicated.

Manufacturer	Adams-Smith	Ampex Corporation	Amtel Systems		Audio Kinetics, Ltd.
Model Number	2600GR(1)	VPR-2/2B Module	3800A Edit Code Master(2)	3500 Portable Reader/Generator	Q-Lock 210 Synchronizer
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	Yes	.....	.....	.....	Yes
25 Frame/Sec	Yes	.....	.....	Yes	Yes
Color Frame	Yes	.....	Yes	.....	Yes
Jam Sync	Yes	Yes	Yes	Yes	Yes
Timing Reference:					
External Video	Yes	Yes	Yes	Yes	Yes
External 60Hz	Yes	.....	.....	No	.....
Internal Crystal	No	.....	.....	Yes	Yes
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	Yes	Yes	Yes	.....
Data Display:					
Time Code Data	LED	LED	LED	LED	LED
User Bit Data	LED	LED	LED	LED	LED
Character Generator	Option	Option	Output	No	No
Reader Function	Yes	Yes	Yes	Yes	Yes
Computer Interface	Option	.....	.....	No	Yes
VITC Format Output	Option (or 2602)	No	No	No	No
Output Load Z	500Ω	75 or 600Ω bal.	600Ω	600Ω	600Ω
Output Signal Level	+10dBm adj	+10dBm	0, +10dBm	5Vp-p	+20dBm adj
Portable/Rack-mount	Rack-mount modular	Module	Rack-mount	Portable	Rack & keyboard
Power Requirement	115/230Vac	From VPR-2/2B	115/230Vac	C cells or Vac	115/240Vac
Color Standards	NTSC, CCIR	NTSC, CCIR	NTSC	EIA, EBU	NTSC, PAL
Reader Service Number	**628**	**629**	**630**	**631**	**632**

(1) Adams-Smith system includes VITC option, in modular concept. (2) Amtel also offers separate readers and generators.

TIME CODE EQUIPMENT

Manufacturer	The BTX Corporation		Coherent Communications	Control Video	Datametrics/ Dresser Ind.
Model Number	**Model 5400(3)**	**Cypher**	**TC-100A(4)**	**IC 2110**	**722A System**
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	Yes	Yes	Yes	Yes	Yes
25 Frame/Sec	Yes	Yes	Yes	Yes	Yes
Color Frame	Yes	Yes	No	Yes	Yes
Jam Sync	Yes	Yes	No	Yes	Yes
Timing Reference:					
External Video	Yes	Yes	Sync	Yes	Yes
External 60Hz	No	.....	No	No	No
Internal Crystal	Yes	Yes	Yes	No	Yes
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	Yes	Yes	Yes	Yes
Data Display:					
Time Code Data	LED	LED	LED	LED	LED
User Bit Data	LED	LED	LED	LED	LED
Character Generator	Option	Output	No	Option	Output
Reader Function	Yes	Yes	Yes	Yes	Yes
Computer Interface	Yes	RS232C/422	No	Yes	Yes
VITC Format Output	.....	Compatible	No	(IC 2110 V)	No
Output Load Z	600Ω	.....	600Ω	100Ω unbal.	600Ω
Output Signal Level	2Vp-p nominal	.....	2.5V adj	+12dBm max	+4dBm
Portable/Rack-mount	Rack-mount	Rack-mount	Portable	Rack-mount	Rack-mount
Power Requirement	115Vac	110Vac	8-16Vdc, 50ma	110Vac	110Vac
Color Standards	NTSC	NTSC, PAL	NTSC, CCIR	NTSC, PAL	NTSC
Reader Service Number	**633**	**634**	**635**	**636**	**637**

(3) The SHADOW synchronizer includes reader capabilities. (4) Also available: TC-200 for audio recorder, TC-300 for cine cameras.

Manufacturer	Datametrics/ Dresser Ind.	Datatron Inc.	EECO Inc.		Elector
Model Number	**Model 766**	**Model 5152**	**VIG-850(5)**	**MTG-550**	**TCG Mk III**
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	Yes	.....	No	Yes	.....
25 Frame/Sec	Yes	.....	Yes	Yes	Yes
Color Frame	Yes	Yes	Yes	Yes	.....
Jam Sync	Option	Yes	Yes	Yes	.....
Timing Reference:					
External Video	Yes	Yes	Yes	Yes	Yes
External 60Hz	.....	Yes	No	Yes	No
Internal Crystal	Yes	.....	No	No	Yes
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	.....	Yes	Yes	Yes
Data Display:					
Time Code Data	LED	LED	LED	LED	LED
User Bit Data	LED	LED	LED	LED	LED
Character Generator	(760)	(5254)	(VCG-750)	(TCR-650)	No
Reader Function	(760)	Yes	Yes	Yes	Option
Computer Interface	.....	.....	Yes	Yes	No
VITC Format Output	Yes	No	Yes	No	No
Output Load Z	.....	600Ω	30Ω	15Ω	600Ω
Output Signal Level	5V	6Vp-p adj	1Vp-p	10V adj	2Vp-p
Portable/Rack-mount	Rack-mount	Rack-mount	Rack-mount	Rack-mount	Portable
Power Requirement	110Vac	115/230Vac	115/230Vac	115/230Vac	6 Ni-Cad
Color Standards	SMPTE, EBU	SMPTE	NTSC, EBU	NTSC, EBU	NTSC, PAL, SECAM
Reader Service Number	**638**	**639**	**640**	**641**	**642**

(5) The EECO line includes readers, generators, and the MQS-100A MultiQue Synchronizer.

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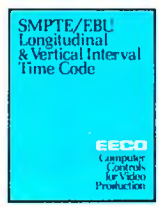

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TIME CODE EQUIPMENT

Manufacturer	Elector	Evertz Microsystems	FOR-A Company Ltd.		Gray Engineering Labs Inc.
Model Number	TCG/D-2	TCG-10	TCG-3200	TCG-3100	DR-107 Reader
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	.....	.....	.....	.....	Yes
25 Frame/Sec	Yes	.....	Yes	Available	Yes
Color Frame	Yes	.....	.....	.....	Yes
Jam Sync	Yes	Yes	.....	.....	No
Timing Reference:					
External Video	Yes	Yes	Yes	Yes	Yes
External 60Hz	Yes	.....	.....	.....	Yes
Internal Crystal	No	.....	.....	Yes	No
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	.....	Yes	Yes	Yes	Yes
Data Display:					
Time Code Data	LED	LED	LED	LED	No
User Bit Data	.....	LED	LED	LED	No
Character Generator	.....	Output	No	(TG-160)	Output
Reader Function	(TCR/VCG/D-2)	Yes	No	(TCR-3100)	Yes
Computer Interface	.....	.....	No	No	Yes
VITC Format Output	No	No	No	No	(VID-225)
Output Load Z	600Ω	600Ω	600Ω	600Ω	.....
Output Signal Level	+10dBm adj	+10dBm	0dBm	0VU	.....
Portable/Rack-mount	Rack-mount	Rack-mount	Portable	Rack-mount	Rack-mount
Power Requirement	115/230Vac	115Vac/8-14Vdc	8-20Vdc, 25ma	110Vac	115/230Vac
Color Standards	NTSC, PAL	NTSC	NTSC, PAL	NTSC, PAL	NTSC, PAL
Reader Service Number	**643**	**644**	**645**	**646**	**647**

Manufacturer	Gray Engineering Labs Inc.	JVC Company	MCI/Sony	Skotel Corporation	
Model Number	DT-104F Generator	TGP-47 Generator	JH-45 Autolock	PTC-100	TCG-80N(P)
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	Yes	No	Yes	Yes	.....
25 Frame/Sec	Yes	No	Yes	Yes	.....
Color Frame	Yes	No	(JH-48)	Yes	Yes
Jam Sync	Yes	No	.....	Yes	Option
Timing Reference:					
External Video	Yes	No	Yes	Yes	Yes
External 60Hz	Yes	No	Yes	No	Yes
Internal Crystal	No	Yes	Yes	Yes	.....
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	6 digits	Yes	Yes	Yes
Data Display:					
Time Code Data	Yes	Yes/LED	LED	LED	LED
User Bit Data	Yes	.....	LED	LED	LED
Character Generator	No	No	.....	No	Option
Reader Function	No	No	And synchronizer	Yes	(TCR-80)
Computer Interface	Yes	No	Possible	No	.....
VITC Format Output	(VIE-224)	No	No	No	(VITC)
Output Load Z	600Ω	10kΩ	.....	2kΩ	600Ω load
Output Signal Level	+8dBm adj	0dB	−3dBv	+10dBm	+8dBm
Portable/Rack-mount	Rack-mount	Portable	Table-top	Portable	Rack-mount
Power Requirement	115/230Vac	From CR4700U VCR	115Vac	4 AA cells	115/230Vac
Color Standards	NTSC, PAL	.....	SMPTE, EBU	NTSC, PAL	NTSC (PAL)
Reader Service Number	**648**	**649**	**650**	**651**	**652**

TIME CODE EQUIPMENT

Manufacturer	Sony Broadcast		Telcom Research	United Media	
Model Number	**BVG-1600**	**BVG-100**	**T-7000**	**Model 210**	**Model 205**
Operation Modes:					
Drop Frame	Yes	Yes	Yes	Yes	Yes
24 Frame/Sec	Yes	Yes	.....	Yes	Yes
25 Frame/Sec	Yes	Yes	Yes	Yes	Yes
Color Frame	Yes	Yes	Yes	Yes	Yes
Jam Sync	Yes	Yes	Option	.....	.....
Timing Reference:					
External Video	Yes	Yes	.....	Yes	Yes
External 60Hz	.....	.....	.....	.....	.....
Internal Crystal	.....	.....	.....	.....	
Data Entry:					
Time Set/reset	Yes	Yes	Yes	Yes	Yes
User Bits	Yes	.....	Yes	Yes	Yes
Data Display:					
Time Code Data	LED	LED	LED	LED	LED
User Bit Data	LED	.....	LED	LED	LED
Character Generator	Yes	.....	.....	(Model 215)	Output
Reader Function	Yes (also BVG-1500)	Yes	Option	(Model 310)	(Model 305)
Computer Interface	Yes	.....	.....	Possible	Possible
VITC Format Output	Yes	Yes	No	.....	.....
Output Load Z	.....	.....	600Ω	600Ω	600Ω
Output Signal Level	.....	.....	+11dBm	+8dBm	+8dBm
Portable/Rack-mount	Rack-mount	Portable	Portable	Rack-mount	Rack-mount
Power Requirement	110Vac	.....	Battery	110Vac	110Vac
Color Standards	NTSC, PAL	NTSC, PAL	NTSC, PAL	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Reader Service Number	**653**	**654**	**655**	**656**	**657**

VIDEO PROCESSOR

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

Manufacturer	Bosch/Fernseh	Canter-Redman Technologies Corp.	Faroudja Labs	For-A Corporation	Grass Valley Group
Model Number	**TDF-2 Digital Noise Filter**	**VPA-100 Processor**	**Image System**	**CCS-4200 Color Corrector**	**3240-10 Processor**
Major Function:					
Image Enhancement	Option, ±50%	Aperture correction	Yes	.....	.....
Noise Reduction	To 18dB	.....	6dB, L and C	.....	.....
Color Correction	Option	.....	Yes	Yes	.....
Sync Regeneration	To RS-170A	Yes	Yes	Yes	Yes
Recommended Use For	Dubbing	Any use	U-Matic and ½-inch	Tape playback	Any
Video Bandwidth	5MHz	.....	±1dB/to 5MHz	±0.5dB/to 8MHz	±0.2dB/to 6MHz
Signal/Noise Ratio	58dB	.....	65dB	.....	70dB
Differential Phase/Gain	<2°/2%	.....	1.5°/1.5%	0.5°/0.5%	0.25°/0.2%
Chroma/Luminance Delay	Option, −490, +560ns	.....	±300ns correction	.....	10ns
K Factor, 2T Pulse	2%	.....	2% max	1%	1% T
Parameter Controls					
Video Level	.....	Yes	Automatic	Yes	±6dB
Chroma Level	.....	Yes	Controls	Yes	±6dB
Setup Level	.....	Yes	.....	Yes	±15IRE
Hue Phase	.....	Yes	.....	Yes	±13°
Subcarrier Phase	.....	Yes	.....	Yes	±13°
Subcarrier Level	.....	Yes	.....	.....	−6, +3dB
Sync Level	.....	Yes	.....	.....	−6, +3dB
Reader Service Number	**658**	**659**	**660**	**661**	**662**

Manufacturer	Leitch Video Ltd.	Lenco Inc.	Michael Cox Electronics Ltd.	Philips	Tektronix
Model Number	**VPA-330N Processor**	**PRC-365 Processor**	**339 Color Balance Corrector**	**LDM 3001 Noise Reducer**	**1440 Auto Corrector**
Major Function:					
Image Enhancement	.....	.....	.....	.....	.....
Noise Reduction	.....	Comb filter	.....	Adaptive, digital	.....
Color Correction	Auto AGC	Noise reduction	Yes	.....	.....
Sync Regeneration	Per RS-170A	Per RS-170A	Yes	Yes	Yes
Recommended Use For	Any	Any	U-matic tape	Any	Any
Video Bandwidth	±0.2dB/to 5MHz	±0.5dB/to 10MHz	±0.2dB/to 5.5MHz	.....	.....
Signal/Noise Ratio	60dB	.....	.....	.....	60dB
Differential Phase/Gain	0.5°/1%	0.2°/0.2%	0.2°/0.2%	0.5°/0.55%	.....
Chroma/Luminance Delay	.....	.....	.....	.....	10ns
K Factor, 2T Pulse	.....	0.5%	<0.97	.....	1%
Parameter Controls					
Video Level	−2, +11dB	0.5-2Vp-p	±20% of input	±3dB	6dB
Chroma Level	±2dB	−30, +6dB	±90% of input	.....	3dB
Setup Level	±10IRE	±40IRE	±20% of input	.....	10IRE
Hue Phase	.....	.....	Yes	.....	.....
Subcarrier Phase	±20°	±45°	Yes	.....	25°
Subcarrier Level	±10IRE	±40IRE	Yes	.....	6dB
Sync Level	±10IRE	20-80IRE	Yes	.....	3dB
Reader Service Number	**663**	**664**	**665**	**666**	**667**

VIDEO PROCESSOR

Manufacturer	Telemet	Thomson-CSF	
	4600	8010	5500A
Model Number	Corrector	Image Enhancer	Color Corrector
Major Function:			
Image Enhancement	High Frequency	Yes	.....
Noise Reduction	.....	Yes	.....
Color Corrector	.....	No	Yes, ±20dB
Sync Regeneration	Yes	.....	No
Recommended Use For	Any	Any	Any, film
Video Bandwidth	±0.5dB/to 8MHz	0, −1dB/to 5MHz	−0.4, +0/to 8MHz
Signal/Noise Ratio	60dB	55dB	.....
Differential Phase/Gain	0.5°/0.1dB	1°/0.5%	0.25°/0.5%
Chroma/Luminance Delay	.....	.....	.....
K Factor, 2T Pulse	.....	.....	1% max
Parameter Controls			
Video Level	Yes	±1dB	R,G,B
Chroma Level	.....	.....	Yes
Setup Level	.....	.....	R,G,B
Hue Phase	.....	.....	.....
Subcarrier Phase	.....	.....	.....
Subcarrier Level	.....	.....	.....
Sync Level	.....	.....	.....
Reader Service Number	**668**	**669**	**670**

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

VIDEOTAPE RECORDER, ¾-inch U-matic

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

Manufacturer	JVC			Panasonic	
Model Number	CR4700U Portable	CR8250U Editor	CR6650U	AU-700	NV-9600
Video Response (±dB/Hz)	.....	.....	.....	.....	.....
Signal/Noise Ratio	>46dB	49dB	>48dB	L:50dB/C:46dB	L:50dB/C:46dB
Horizontal Resolution	>260TVL	260TVL chroma	240TVL	L:330/C:260TVL	L:330/C:260TVL
Video AGC System	Yes	Yes	Yes	Yes	And manual
Video Metering	Of FM carrier	No	No	Yes	Yes
Advanced Sync Input	.....	No	.....	.....	Yes
Composite Sync Input	Yes	Yes	Yes	Yes	.....
Subcarrier Input	Yes	Yes	Yes	Yes	Yes
Dubbing Input/Output	No	Yes	Yes	Yes	Yes
RF Signal Output	.....	.....	Yes	Yes	Yes
Tracking Metering	Yes	Yes	No	Yes	Yes
Audio Line Input (Ohms)	600 bal.	600/10k	600/10k	600 bal.	100k unbal.
Audio Line Level Input	−20dB/−60dB	−10/−20/−6dBm	−70/−20/−6dBm	−20/−6/+4dB	−20dB
Line Output Load (Ohms)	Low bal.	Low	Low	600 bal.	600 unbal.
Line Output Level Max	0dB	−6dB	−6dB	+4dBm	.....
AF Response (±dB/Hz)	50-15k	50-15k	50-15k	50-15k	50-15k
Signal/Noise Ratio	>48dB	>48dB	48dB	>48dB	>48dB
Harmonic Distortion	.....	<3%	<3%	.....	.....
Audio Metering	Yes	Yes	Yes	Yes	Yes
Time Code Track	Yes	Yes	No	Yes or audio 1	On audio 1
Normal Tape Speeds	3.75ips	3.75ips	3.75ips	3.75ips	3.75ips
Search Tape Speeds	x10 F/R	x15 F/R	x5 F/R	.....	per controller
Recording Time Max	20 min	60 min	60 min	60 min	60 min
Integral Editor System	.....	Yes	Yes	Yes	Yes
Assemble/Insert Editing	.....	Yes	Assemble	Yes	Yes
Specific Edit Controller	.....	Various	RM-82/88, VE-90	AU-A70, NV-A970	NV-A500/A970
ac Powering	No	Yes	Yes	Yes	130W
External Battery	12Vdc	.....	.....	.....	.....
Internal Battery	AAP47U	.....	.....	.....	.....
Weight (Portable Models)	19.6 lb	.....	.....	.....	.....
Reader Service Number	**671**	**672**	**673**	**674**	**675**

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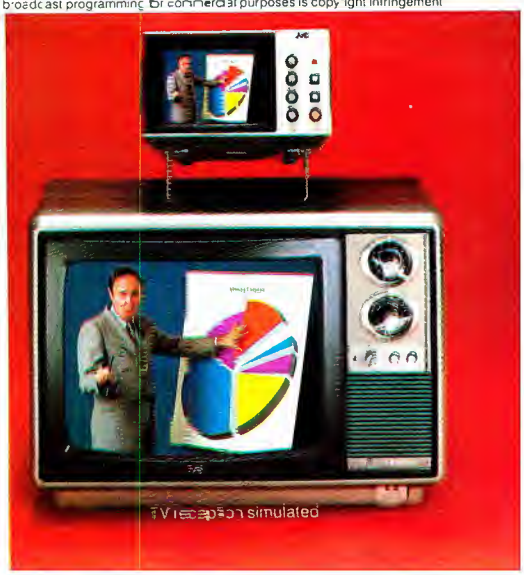

VIDEOTAPE RECORDER

¾-inch U-matic

Manufacturer	Sony Broadcast			TEAC	
Model Number	BVU-110 Portable	BVU-800	BVU-820	V-1000AB-R Record Only, Airborne	V-1000AB-F Airborne
Video Response (± dB/Hz)	.....	.....	.....	−5/to 3.58M	−/10-5M
Signal/Noise Ratio	C:45dB	L:50dB/C:46dB	L:50dB/C:46dB	43dB	40dB
Horizontal Resolution	C:260TVL	L:330/C:260TVL	L:330/C:260TVL	340TVL	420TVL
Video AGC System	Yes	Yes	Yes	Yes	Yes
Video Metering	Yes	Yes	Yes	.....	.....
Advanced Sync Input	.....	Yes	Yes	.....	.....
Composite Sync Input	.....	.....	.....	.....	.....
Subcarrier Input	Yes	Yes	Yes	.....	.....
Dubbing Input/Output	.....	Yes	Yes	.....	.....
RF Signal Output	Off tape for DOC	.....	.....	.....	.....
Tracking Metering	.....	Yes	Yes	.....	.....
Audio Line Input (Ohms)	3k/10k/600 bal.	3k/10k/600 bal.	3k/10k/600 bal.	5k, adjustable	600 bal.
Audio Line Level Input	−60/+4dB	−60/+4dB	−60/+4dB	0.1-10V w/AGC	0dBm
Line Output Load (Ohms)	600 bal.	Low bal.	Low bal.	100k	600 bal.
Line Output Level Max	+4dB	+4dB	+4dB	−6dBs in E-E	0dBm
AF Response (± dB/Hz)	50-15k	50-15k	50-15k	3/80-12.5k	3/80-10k
Signal/Noise Ratio	>48dB	48dB	48dB	40dB	40dB
Harmonic Distortion	.....	<3%	<3%	2.5%	3%
Audio Metering	Yes	Yes	Yes	.....	.....
Time Code Track	Yes	Yes	Yes	Event marker	On audio 1
Normal Tape Speeds	3.75ips	3.75ips	3.75ips	3.75ips	3.75, 1.5ips
Search Tape Speeds	Yes	1/30 to x10	1/30 to x10	.....	To x7 F/R
Recording Time Max	20 min (KCS-20)	60 min (KCA-60)	60 min (KCA-60)	30 min	30 min
Integral Editor System	Yes	Yes	Yes	.....	.....
Assemble/Insert Editing	Assembly only	Yes	Yes	.....	.....
Specific Edit Controller	Sony	BVE-5000, BVE-800	BVE-5000, BVE-800	.....	.....
ac Powering	.....	130W	130W	.....	115Vac, 400Hz
External Battery	12Vdc	.....	.....	28Vdc unreg	28Vdc unreg
Internal Battery	BP-90 NiCad	.....	.....	.....	.....
Weight (Portable Models)	10 lb	.....	.....	23 lb	28.6 lb
Reader Service Number	**676**	**677**	**678**	**679**	**680**

VIDEOTAPE RECORDER, 1-inch Type B and 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			Bosch-Fernseh	
Model Number	VPR-2B	VPR-3	VPR-80	BCN 21*	BCN 41/51*
Video Response (± dB/Hz)	0.5/to 4.2M	0.5/to 4.2M	0.5/to 4.2M	0.5/to 4.5M	0.5/to 4.5M
Signal-to-Noise Ratio	−46dB	−46dB	−46dB	47dB	47dB
Differential Phase/Gain (±)	4°/4%	4°/4%	4°/4%	.....	4°/4%
K Factors	1% 2T	1% 2T	1% 2T	.....	1.5% 2T
Chroma Luminance Delay	20nsec	20nsec max	20nsec	.....	.....
Moire Rating	−40dB, 75% bars	−40dB, 75% bars	−40dB, 75% bars	.....	−37dB, 75% bars
Input Video Reference	Yes	Video or sync	Yes	.....	Yes
Advanced Sync Input	Not required	Not required	Not required	.....	.....
DOC Output Signal	Yes	.....	.....	.....	On 51
System Time Base Corrector	TBC-2B	TBC-3	TBC-2B	.....	Integral on 51
AF Response (± dB/Hz)	2/50-15k	2/50-18k	2/50-15k	1, −3/40-14k	1, −3/40-14k
AF Signal-to-Noise Ratio	−56dB	−56dB	−56dB	56dB	56dB
Harmonic Distortion	1% max	1% max, +8dBm	1%	3%	3%
Crosstalk (Worst Case)	−50dB	−60dB	.....	60dB	60dB
Audio Output Load (Ohms)	30	60	50	600 unbal.	600 unbal.
Audio Output Level Max	+8dBm nominal	+24dBm	+25dBm	+6dBm nominal	+6dBm nominal
Integral Editing System	Yes	Yes	Yes	Yes	Yes
Assemble/Insert Editing	Yes	Yes	Yes	Yes	Yes
Edit Controller Interface	For ACE or HPE-104	Various or 4 VPR3s	.....	Yes	Yes
SMPTE Time Code Generator	Available	Option	.....	Option	Option
VITC Time Code Generator	.....	.....	.....	.....	.....
Still Frame/Slow Motion	Yes	And w/SMC-100	Yes	.....	Option
Maximum Reel Size	10.5 in	14 in	11.75 in	10.5 in	10.5 in
Record Time for Max Reel	92 min.	190 min.	120 min.	90 min.	98 min.
Standard Packaging	Table-top, rack	Console, rack	Table-top, rack	Portable case	Cabinet
Weight (Portable Models)	120 lb	650 lb console	.....	20 lb	.....
Color Standards	NTSC	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Reader Service Number	**681**	**682**	**683**	**684**	**685**

*Only Bosch-Fernseh uses SMPTE "B" format. It is not compatible with Type C.

VIDEOTAPE RECORDER

1-inch Type B and C.

Manufacturer	Bosch-Fernseh	Hitachi Denshi Ltd.			Marconi Broadcast
Model Number	BCN 100 Multicassette*	HR-100 Portable	HR-200 Editing	HR-300 Long Play	B4600-MR2 Recorder
Viceo Response (±dB/Hz)	0.5/to 4.5M	0.5/to 4.2M	0.5/to 4.2M	0.5/to 4.2M	Flat/to 4.2M
Signal-to-Noise Ratio	47dB	48dB	48dB	48dB	46dB
Differential Phase/Gain (±)	4°/4%	4°/4%	3°/3%	3°/3%	4°/4%
K Factors	1.5% 2T	1% 2T	1% 2T	1% 2T	1% 2T
Chroma Luminance Delay	.....	.....	.....	20nsec	20nsec
Moire Rating	−37dB, 75% bars	−40dB, 75% bars	−40dB, 75% bars	−40dB	−40dB
Input Video Reference	Yes	.....	Yes	Yes	Yes
Advanced Sync Input	.....	.....	Yes	Yes	.....
DOC Output Signal	Included	.....	Yes	Yes	.....
System Time Base Corrector	Yes	TC200	TC200	TC200	MTBC2
AF Response (±dB/Hz)	1, −3/40-14K	2/50-15K	2/50-15K	1.5, −3/50-15K	2/50-15K
AF Signal-to-Noise Ratio	53dB	56dB	56dB	56dB	56dB
Harmonic Distortion	3%	1%	1%	1%	1% +8dBm
Crosstalk (Worst Case)	−60dB	−50dB, 1kHz	−56dB, 1kHz	−50dB, 1kHz	−50dB, +8dBm
Audio Output Load (Ohms)	To 5K	600 unbal.	600 Bal	600 bal,	600 bal.
Audio Output Level Max	+24dBm	−20dBm nominal	+8dBm nominal	+8dBm nominal	+25dBm
Integral Editing System	Yes	Yes	Yes	Yes	Back-space only
Assemble/Insert Editing	Yes	Assemble	Yes	Yes	Assemble
Edit Controller Interface	.....	.....	Yes	.....	.....
SMPTE Time Code Generator	Yes	Yes	Option	.....	.....
VITC Time Code Generator	.....	.....	.....	.....	.....
Still Frame/Slow Motion	Yes	.....	Option	Possible	Yes
Maximum Reel Size	Cassette	9 in	10.5 in	14 in	10.5 in
Record Time for Max Reel	30 min.	64 min.	96 min.	180 min.	92 min.
Standard Packaging	Rack-mounted	Portable case	Cabinet	Console	Table-top cabinet
Weight (Portable Models)	.....	42 lb	.....	.....	.....
Color Standards	NTSC, PAL, SECAM	NTSC, PAL	NTSC, PAL	NTSC	NTSC, PAL, SECAM
Reader Service Number	**686**	**687**	**688**	**689**	**690**

*Only Bosch Fernseh uses SMPTE "B" format. It is not compatible with Type C.

Manufacturer	Marconi Broadcast	Philips Broadcast Equipment Company		RCA Broadcast Systems	
Model Number	B4600-MR20 Portable	PVR2 Editing Recorder	PVR20 Portable	TR-800 System	TH200A
Video Response (±dB/Hz)	Flat/to 4.2M	Flat/to 4.2M	Flat/to 4.2M	Flat/to 4.2M	0.5/to 4.2M
Signal-to-Noise Ratio	46dB	46dB	46dB	48dB	48dB
Differential Phase/Gain (±)	4°/4%	4°/4%	4°/4%	3°/3%	4°4%
K Factors	1% 2T	1% 2T	1% 2T	1% 2T	1% 2T
Chroma Luminance Delay	20nsec	20nsec	20nsec	20nsec	25nsec
Moire Rating	−40dB	−40dB, 75% bars	−40dB, 75% bars	−43dB	−40dB
Input Video Reference	Yes	Sync or video	.....	Yes	Video or sync
Advanced Sync Input	.....	.....	.....	.....	Yes
DOC Output Signal	.....	.....	.....	.....	Yes
System Time Base Corrector	.....	PVC2	.....	TBC8000	TBC200
AF Response (±dB/Hz)	2/50-15k	2/50-15k	2/50-15k	2/40-16k	1.5, −3/50-15k
AF Signal-to-Noise Ratio	56dB	56dB	56dB	57dB	56dB
Harmonic Distortion	1%, +8dBm	3%, +16dBm	3%, +16dBm	1% max	1%, 1kHz
Crosstalk (Worst Case)	−50dB, +8dBm	−50dB max	−50dB max	−50dB	−60dB
Audio Output Load (Ohms)	.....	600 Bal	.....	150, 600 Bal	600 Bal
Audio Output Level Max	.....	+25dBm	.....	+24dBm, 600Ω	+31dBm
Integral Editing System	Back-space only	Yes	Back-space only	Yes	Yes
Assemble/Insert Editing	Assemble	Yes	Assemble	Yes	Yes
Edit Controller Interface	.....	Yes	.....	AE800	AE600
SMPTE Time Code Generator	.....	.....	.....	Yes	Option
VITC Time Code Generator	.....	.....	.....	Yes	Option
Still Frame/Slow Motion	.....	.....	.....	Yes	Option
Maximum Reel Size	9 in	10.5 in	9 in	11.75 in	10.6 in
Record Time for Max Reel	60 min.	90 min.	60 min.	120 min.	96 min.
Standard Packaging	Portable case	Table-top cabinet	Portable case	Studio console	Table-top cabinet
Weight (Portable Models)	45 lb	.....	45 lb	.....	.....
Color Standards	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC, PAL, SECAM	NTSC	NTSC
Reader Service Number	**691**	**692**	**693**	**694**	**810**

VIDEOTAPE RECORDER

1-inch Type B and C.

Manufacturer	Sony		3M Company/NEC	
Model Number	**BVH-1180**	**BVH-2000**	**TT-8000**	**TT-7000**
Video Response (± dB/Hz)	0.5/to 4.2M	0.5/to 4.2M	Flat/to 4.2MHz	Flat/to 4.2M
Signal-to-Noise Ratio	48dB	48dB	– 48dB	48dB
Differential Phase/Gain (±)	4°/4%	4°/4%	4°/4%	4°/4%
K Factors	1% 2T	1% 2T	1% 2T	1% 2T
Chroma Luminance Delay	25nsec	25nsec	20nsec	20nsec
Moire Rating	– 40dB, 75% bars	– 40dB, 75% bars	– 40dB, 75% bars	– 40%dB, 75% Bars
Input Video Reference	Video or sync	Video or sync	Video or sync	Video or Sync
Advanced Sync Input	.....	.....	Yes	.....
DOC Output Signal	Yes	No	Yes	.....
System Time Base Corrector	BVT-2000	Integral	NTC-10	NTC-10
AF Response (± dB/Hz)	1.5, – 3/50-15k	1.5, – 3/50-15k	2/50-15k	2/50-15K
AF Signal-to-Noise Ratio	56dB	56dB	56dB	56dB
Harmonic Distortion	1%	1%	3%	1%
Crosstalk (Worst Case)	– 60dB	– 60dB	– 50dB	– 50dB
Audio Output Load (Ohms)	600	600	600 bal.	600 Bal
Audio Output Level Max	+ 8dBm	+ 8dBm	+ 8dBm nominal	+ 8dBm Nominal
Integral Editing System	Yes	Yes	Yes	Yes
Assemble/Insert Editing	Yes	Yes	Yes	Yes
Edit Controller Interface	Yes	Yes	Yes	Yes
SMPTE Time Code Generator	.....	Yes	.....	Optional
VITC Time Code Generator	.....	Yes	.....	.....
Still Frame/Slow Motion	Yes	Yes	Option	Optional
Maximum Reel Size	14 inch	11.75 inch	10.5 inch	10.5 in
Record Time for Max Reel	188 min	120 min	96 min	96 min.
Standard Packaging	Cabinet	Table-top	Cabinet	Table-top Cabinet
Weight (Portable Models)	.....	.....	.....	.....
Color Standards	NTSC	NTSC	NTSC	NTSC
Reader Service Number	**695**	**696**	**697**	**820**

VTRs

VIDEOTAPE RECORDER, ½-inch VRC Compatible

Insufficient information to provide meaningful spec comparisons is available from manufacturers at this time. Questions regarding the studio VRC units for use with VRC/combo ENG systems may be directed to the companies at the following addresses:

Ampex Corporation
401 Broadway
Redwood City, CA 94063

Fernseh
P.O. Box 15068
Salt Lake City, UT 84115

Hitachi Denshi America Ltd.
175 Crossways Park West
Woodbury, NY 11797

Ikegami Electronics (USA)
37 Brook Ave.
Maywood, NJ 07607

Nippon TV Network Corporation
14 Niban-cho, Chiyoda-ku
Tokyo 102, Japan

Panasonic Company/Video
One Panasonic Way
Secaucus, NY 07094

RCA Broadcast Systems
Front & Cooper Sts., Bldg. 2-2
Camden, NJ 08102

Sony Corporation/Broadcast
9 West 57 St.
New York, NY 10019

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the **BE** *Buyers' Guide* (annual September issue).

TRANSMITTING

Aural STL systems
Broadcast antennas
ENG microwave systems
Transmitters
- AM
- FM low power
- FM high power
- TV UHF
- TV VHF

Test/monitor
- Modulation Monitor
- Vectorscope

Performance specifications are measured by the manufacturers using certain references for frequencies, impedances, levels, etc. Unfortunately the reference values are not the same from one manufacturer to another, nor are the procedures alike. Also, those references are not always provided even in the printed materials offered by the manufacturers. As a result, an exact comparison of equipment performance should not be made based only on published numbers. The manufacturers' representatives should be contacted to discuss performance tests and measurements before final purchasing decisions are made.

AURAL STL SYSTEM

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

Manufacturer	**Marti Electronics**	**McMartin Industries**	**Micro Control Associates**	**Moseley Associates**
System Designator	**STL-8F;R-200/950F**	**9500 Series**	**PTS-10/PRS-10**	**PCL-505/C & PCL-505**
Composite/Dual	Dual	Composite or dual	Composite or dual	Composite or dual
AF Response (±dB/Hz)				
Composite	.....	0.1/50-60k	0.25/30-60k	0.3/30-60k
Monaural	0.5/30-15k	0.1/80-15k	0.25/40-15k	0.4/30-15k
Distortion				
Composite	.....	<0.35%, 30Hz-50kHz	<0.4%	<0.4%
Monaural	<0.5%, 40Hz-15kHz	<0.3%, 30Hz-15kHz	<0.4%, 40Hz-15kHz	<0.4%
Signal/Noise Ratio	>66dB	>70dB	>65dB	>68dB
Crosstalk Sub/Main	.....	<−50dB	<−43dB	<−43dB
Stereo Separation	.....	>45dB, 1kHz	>40dB typically	>35dB
Modulation Capacity				
Baseband	±52.5kHz	±48kHz	.....	±60kHz/±40kHz
Multiplex	.....	±12kHz	.....	±15kHz/±10kHz
Total (100%)	.....	±60kHz	±75kHz/±50kHz	±75kHz/±50kHz
Transmitter Model	**STL-8F**	**9500**	**PTS-10**	**PCL-505/C; PCL-505**
RF Output	8W max	3.5-12W adjustable	10W max	5-10W adjustable
Frequency Stability	0.0005%	±1ppm/year	0.0005%	0.0005%
AM Noise	<−55dB	−70dB	<−65dB	<−70dB
Input Level/Impedance				
Monaural	+10dBm, 600Ω balanced	1.24Vrms, 10kΩ	+10(±2)dBm, 600Ω bal.	+10dBm, 600Ω
Composite	.....	1.24Vrms, 10kΩ	1Vrms, unbalanced	3.5p-p, 10kΩ
Multiplex	0.5Vrms, 50-600Ω unbal	0.53Vrms, 10kΩ	.....	1.5Vp-p, 2kΩ
Powering Requirement	110/220Vac, 110W	110/220Vac, 70W	110/220Vac, 125W	110/220Vac, 80W
Receiver Model	**R-200/950F**	**9503**	**PRS-10**	**PCL-505/C; PCL-505**
Design	Double conversion	Multiple conversion	Double conversion	Double conversion
Sensitivity				
Monaural	<32μV for 60dB SNR	<20μV for 60dB SNR	>10μV, 50dB SNR	<2μV, 20dB SNR
Composite	.....	<30μV for 60dB SNR	>50μV, 60dB SNR	<2μV, 20dB SNR
Useable Bandwidth				
Monaural Baseband	.....	30Hz-15kHz	.....	30Hz-15kHz
Composite Baseband	.....	30Hz-75kHz	.....	1Hz-80kHz
Monaural Multiplex	.....	18kHz-32kHz	.....	22kHz-85kHz
Composite Multiplex	.....	110kHz-240kHz	.....	100kHz-240kHz
Powering Requirement	110/220Vac, 30W	110/220Vac, 25W	110/220Vac, 10W	110/220Vac, 12W
Reader Service Number	**698**	**699**	**700**	**701**

		TFT	
Manufacturer	**Moseley Associates**		
System Designator	**PCL-606/C & PCL-606**	**7700 Series**	**8300 Series**
Composite/Dual	Composite and dual	Composite and dual	Composite
AF Response (±dB/Hz)			
Composite	0.1/30-53k	0.2/50-65k	0.1/50-65k
Monaural	0.25/30-15k	0.2/30-15k	.....
Distortion			
Composite	<0.2%	<0.25%	<0.25%
Monaural	<0.25%	<0.25%	.....
Signal/Noise Ratio	>72dB	.....	.....
Crosstalk Sub/Main	<−54dB	<−70dB	<−74dB
Stereo Separation	>48dB	>45dB	>50dB
Modulation Capacity			
Baseband	±50kHz/±40kHz	±48kHz	±48kHz
Multiplex	±12.5kHz/±10kHz	±12kHz	±12kHz
Total (100%)	±62.5kHz/±50kHz	±60kHz	±60kHz
Transmitter Model	**PCL-606/C; PCL-606**	**7700**	**8300**
RF Output	5-10W adjustable	4-14W	4-14W
Frequency Stability	0.00025%	0.0001%	0.0001%
AM Noise	.....	<−55dB	<−55dB
Input Level/Impedance			
Monaural	+10dBm, 600Ω	1.24Vrms, 10kΩ	.....
Composite	3.5Vp-p, 6kΩ	1.24Vrms, 10kΩ	1.24Vrms, 10kΩ
Multiplex	1.5Vp-p, 6kΩ	0.53Vrms, 10kΩ	0.53Vrms, 10kΩ
Powering Requirement	110/220Vac, 70W	110/220Vac, 75W	110/220Vac, 75W
Receiver Model	**PCL-606/C; PCL-606**	**7703/7707**	**8301**
Design	Triple conversion	Multiple conversion	Multiple conversion
Sensitivity			
Monaural	<15μV, 60dB SNR	<20μV, 60dB SNR	.....
Composite	<30μV, 60dB SNR	<30μV, 60dB SNR	<9μV, wideband
Useable Bandwidth			
Monaural Baseband	30Hz-15kHz	15kHz	.....
Composite Baseband	1Hz-80kHz	63kHz	63kHz
Monaural Multiplex	22kHz-85kHz	39kHz-67kHz	.....
Composite Multiplex	110kHz-185kHz	120kHz-200kHz	120kHz-200kHz
Powering Requirement	110/220Vac, 30W	110/220Vac, 8W	110/220Vac, 8W
Reader Service Number	**702**	**703**	**704**

Spec Note:

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

ENG MICROWAVE SYSTEM

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-1K**	**TBT 50A**	**TBT 202**	**FV2/2.5G Global IX**	**FV2/2.5MP**
Frequency Range	2, 7, 13GHz	2, 2.5GHz	2, 7, 13GHz	1.9-2.7GHz	2, 2.5GHz(1)
Frequency Agile	Yes	Yes	No	55 channels	.....
Crystal Control	.....	.....	Yes	.....	12 channels
Aural Subcarriers	3 standard	2 standard	3	2	2
IF Input	.....	.....	.....	Yes	Yes
Audio Input(s)	600	+9dBm	600	2 mic or line	2 line
RF Output Power	2, 1, 0.2W	2 to 12W	2, 1, 0.2W	3W	1W
Powering by ac	115Vac	110/220Vac	115Vac	115/220Vac	115/220Vac
Powering by dc	.....	12, 28(±4)Vdc	.....	.....	−24Vdc
Dimensions (inches)	5.25x19x17	4x5.5x1.8	5.25x19x17	.....	14.75x7.25x8.5
Weight (pounds)	31 w/o power amp	2	31 w/o power amp	15	14
Receiver Model	**TBR 1K**	**TBR 50A**	**TBR 202**	**FV2CR (2.5CR) Receiver**	**FV2/2.5MP Receiver**
	.....	.....	.....	.....	.....
Frequency Range	2, 7, 13GHz	2, 2.5GHz	2, 7, 13GHz	1.99-2.11(2.45-2.69)	2, 2.5GHz
Frequency Agile	Yes	Yes	No	21(60) channels	12 channels
IF Output	.....	.....	.....	Yes	Yes
System Noise Figure	3, 4.5, 6.5dB	7dB	3, 4.5, 6.5dB	3dB	.....
Video Response (±dB/Hz)	0.5/to 4.5M	1/to 10M	0.5/to 4.5M	0.6/to 4.2M	0.4/to 4.2M
Signal/Noise Ratio	.....	65dB	65dB	70dB	70dB
Differential Phase/Gain	.....	0.5°/1%	0.5°/1%	3°/1%	0.5°/1%
K Factors	.....	1% 2T	1% 2Y	7IRE T	4IRE T
Field Time Distortion	1% max	1% max	1% max	2IRE	2IRE
Audio Response (±dB/Hz)	+9dBm	+9dBm	+9dBm	1/40-15k	1/40-15k
Signal/Noise Ratio	60dB	60dB	60dB	66dB	70dB
Harmonic Distortion	1%, 9dBm	1%, 9dBm	1%, 9dBm	1%	1%
Powering by ac	115Vac	.....	115Vac	115/220Vac	115/220Vac
Powering by dc	24Vdc option	12-32Vdc	24Vdc option	−24, +28Vdc	−24Vdc
Dimensions (inches)	5.25x19x17	5.5x4x2	5.25x19x17	5.25x19x15	14.75x7.25x8.5
Weight (pounds)	30	30 oz	30	35	17
Reader Service Number	**705**	**706**	**707**	**708**	**709**

(1) 1.915 to 1.99GHz not available.

*See Anixter Mark advertisement on page 21.

ENG MICROWAVE SYSTEM

Manufacturer	Harris Broadcast Microwave		HDS, Inc.	Ikegami Electronics	M/A-COM Video Systems
Transmitter Model	**FV 7MP**	**FV 11/13MP**	**FXT7 (FXT13)**	**ML-83 System**	**MA-Super 2MX(MA-2MX)**
Frequency Range	6.875-7.125GHz	10.55-13.35GHz	7(13)GHz	1.99-2.11GHz	1.99-2.11GHz(2)
Frequency Agile	.....	.....	No	7 channel	21 channels
Crystal Control	12 channels	12 channels	Dielectric resonator	No	No
Aural Subcarriers	2	2	Option	2	2
IF Input	Yes	Yes	.....	.....	.....
Audio Input(s)	2 line	2 line	Option	2(−50, −20dBs)	2 mic or line
RF Output Power	250mW, 1W	0.63W	10mW	0.2W	12W typical
Powering by ac	115/230Vac	115/220Vac	.....	.....	115/230Vac
Powering by dc	−24Vdc	−24Vdc	8-20Vdc, 25ma	12Vdc	11.5-28Vdc
Dimensions (inches)	14.75x7.25x8.5	14.75x7.25x8.5	0.25x1.25x3	Camera mountable	4x5.5x7
Weight (pounds)	14	14	3 oz	.....	5
Receiver Model	**FV7/8MP(FV7CR)**	**FV11/13MP**	**.....**	**TA-83/RX**	**MA-2MR(MA-2GUX)**
Frequency Range	6.875-8.5GHz	10.55-13.35GHz	.....	1.99-21.11GHz	1.99-2.11GHz
Frequency Agile	60 channels(FV7CR)	Xtal only	.....	7 channel	21 channels
IF Output	Yes	Yes	.....	.....	.....
System Noise Figure	6dB	.....	.....	.....	3dB
Video Response (±dB/Hz)	0.4/to 4.2M(0.6)	0.4/to 4.2M	.....	1/40-4.5M	0.25/10k-5.5M
Signal/Noise Ratio	70dB(68dB)	70dB	.....	55dB	65dB(−35dBm RCL)
Differential Phase/Gain	0.5°/1%(3°/5%)	0.5°/1%	.....	<1°/1.5%	0.5-1°/1-2%
K Factors	4IRE T (7IRE T)	4 IRE T	.....	.....	.....
Field Time Distortion	2IRE	2IRE	.....	<2%	3IRE
Audio Response (±dB/Hz)	1/40-15k	1/40-15k	.....	1/50-12k	0.25-1
Signal/Noise Ratio	70dB(66dB)	70dB	.....	60dB	66dB(−35dBm RCL)
Harmonic Distortion	1%	1%	.....	1%	1%
Powering by ac	115/220Vac	115/220Vac	.....	115Vac	115/230Vac
Powering by dc	−24Vdc(−24, +28Vdc)	−24Vdc	.....	.....	11.5-28Vdc
		.....	.....	.....	.....
Dimensions (inches)	14.75x7.25x8.5 (rack)	14.75x7.25x8.5	.....	Rack-mount	4x5.5x7
Weight (pounds)	17(35)	17	.....	.....	5
Reader Service Number	**710**	**711**	**712**	**713**	**714**

(2) Super 2MX also covers 2.45-2.5 and 2.3-2.7GHz with MA-2MR. MA-2MX/MA-2GUX covers only 1.99-2.11GHz.

The News & Sports Microwave People

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Circle (29) on Reply Card

ENG MICROWAVE SYSTEM

Manufacturer	M/A-COM Video Systems			RF Technology Inc.	
Transmitter Model	**MA-2CP(MA-2.5CP)**	**MA-7CP(MA-7EP)**	**MA-13CP(MA-13FA)**	**RF-203/Wireless camera**	**RF-202(251)**
Frequency Range	1.99-2.11(2.3-2.7)	6.875-7.125GHz(3)	10.55-13.25GHz(4)	1.99-2.11GHz	1.99-2.11GHz(5)
Frequency Agile	(Yes)	30 channels	(MA-13FA only)	13 channels	13(9) channels
Crystal Control	Yes	.....	1 channel	No	No
Aural Subcarriers	2	2	1	2	2
IF Input	.....	.....	.....	No	No
Audio Input(s)	2 line	2 line	1 line	1 mic, 1 line	2 line (& 1 mic)
RF Output Power	2W, PA option	0.5W	+17dBm(50mW)	0.2W)	2"(1W)
Powering by ac	115/230Vac	115/230Vac	115/230Vac	.....	120/240Vac
Powering by dc	12Vdc	12Vdc	11.5-15Vdc	10.5-17Vdc	10.5-17Vdc
Dimensions (inches)	5.5x7x13.5(16.5)	5.5x7x16.5	4.5x4.5x8	6x4.25x2	7x7.5x3
Weight (pounds)	18(23)	23	7(18)	2	7
Receiver Model	**MA-2P(MA-2.5CP)**	**MA-7CP(MA-7EP)**	**MA-13CP(MA-13FA)**	**RF-200 Compact**	**RF-204C(254C)**
Frequency Range	1.99-2.11(2.3-2.7)	6.875-7.125GHz(3)	10.55-13.25GHz(4)	1.99-2.11GHz	1.99-2.11GHz
Frequency Agile	Yes	Yes	(MA-13FA only)	Yes	Yes
IF Output	.....	.....	.....	.....	.....
System Noise Figure	4.0dB(3.5dB)	4dB	9.5(8)dB	5dB	2.5dB
Video Response (±dB/Hz)	0.25/10k-8M	0.5/to 5.5M	0.5/300-5M(10k-8M)	0.5/to 4.5M	0.5/to 4.5M
Signal/Noise Ratio	65(67dB), −35dBm RCL	67dB	65dB	65dB	60dB .....
Differential Phase/Gain	0.5°/3%(0.3°/0.3dB)	0.5°/3%	0.5°/0.3dB	0.5°/1%	0.5°/1%
K Factors	.....	.....	.....	1IRE 2T	1IRE 2T
Field Time Distortion	3IRE	3IRE	1% (3IRE)	2%	2%
Audio Response (±dB/Hz)	−1.5/50-15k	1/50-15k	−1.5/50-15k	1/50-15k	1/50-15k
Signal/Noise Ratio	60(65)dB, −35dBm RCL	65dB	60dB	60dB	....
Harmonic Distortion	1%	1%	1.5%(1%)	1%	1%
Powering by ac	115/230Vac	115/230Vac	115/230Vac	120/240Vac	110/220Vac
Powering by dc	11-16(12)Vdc	12Vdc	.....(11.5-15Vdc)	10.5-20Vdc	.....
Dimensions (inches)	5.5x7x16.5	5.25x7x16.5	5.25x5.8x10.5	8.75x6.75x5	5.25x19x8
Weight (pounds)	23	23	12.5(18)	11	23
Reader Service Number	**715**	**716**	**717**	**718**	**719**

(3) The MA-7EP system covers 6.4-7.4GHz with a 1W output. (4) The MA-13FA system covers 12.95-13.2GHz. Also available is MA-13EP, 13GHz; MA-15CP, 15GHz; and MA-23VFM 22/23GHz. (5) RF-251/254C system covers 2.45-2.5GHz.

ENG MICROWAVE EQUIPMENT

Manufacturer	RF Technology	TerraCom (Loral Corporation)	
Transmitter Model	**RF-701**	**TCM-6 Series**	**TCM-7 Series**
Frequency Range	6.875-7.125GHz	1.7-15.35GHz	1.7-15.35GHz
Frequency Agile	30 channels	Plug-in synthesizers	Yes
Crystal Control	No	.....	Plug-in oscillators
Aural Subcarriers	2	2	1 and digital
IF Input	No	Yes	.....
Audio Input(s)	2 line	2 line	1 line
RF Output Power	1W	5 to 0.15W per band	0.5 to .04W per band
Powering by ac	120/240Vac	110/220Vac	115/230Vac
Powering by dc	12-17Vdc	±24 or ±48Vdc	−22 to −28Vdc
Dimensions (inches)	8x8x4	16.25x9.5x12	7.5x5.5x10
Weight (pounds)	8	45	10.5
Receiver Model	**RF-700(−704C)(6)**	.....	.....
Frequency Range	6.875-7.125GHz	Per transmitter	Per transmitter
Frequency Agile	Yes	Per transmitter	Per transmitter
IF Output	.....	Yes	.....
System Noise Figure	3dB	8 to 12dB per band	7.5 to 11 per band
Video Response (±dB/Hz)	0.5/to 4.2M	0.5/20-10M	0.25/20-6M
Signal/Noise Ratio	70(60)dB	76 to 67dB per band	72 to 67dB per band
Differential Phase/Gain	0.5°/1%	0.2°/1%	0.5°/1%
K Factors	1IRE 2T	1% 1T, 1.5% 2T	1.5% 2T
Field Time Distortion	2%	0.7%	0.7%
Audio Response (±dB/Hz)	1/50-15k	1/to 15K	1/20-15K
Signal/Noise Ratio	65dB	.....	70dB
Harmonic Distortion	1%	1%	1%
Powering by ac	120/240Vac	110/220Vac	With transmitter
Powering by dc	12/17Vdc (701)	±24 or ±48Vdc	.....
Dimensions (inches)	6.75x5x10 (rack)	16.25x9.5x12	With transmitter
Weight (pounds)	12(23)	45	12.5
Reader Service Number	**720**	**721**	**722**

(6) RF-704C central receiver.

Spec Note:

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

Power on Pigeon Mountain

By Carl Bentz, technical editor

Some experiences from translator and repeater operations are applicable to low power television. Among those are available sources of reliable power, which are of major importance, particularly to relatively inaccessible transmitter sites chosen for widest coverage. An experiment recently concluded in Canada offers wind energy as a viable alternative LPTV power source.

Pigeon Mountain is an 11,000-foot peak on the eastern slope of the Canadian Rockies. A spur at the 9000-foot level overlooks the town of Exshaw, Alberta, Canada, and the Trans-Canadian Highway. On that spur, the Canadian Broadcasting Corporation operates a 50W UHF repeater/translator system. Powering for the electronics package has been from a thermoelectric generation unit capable of providing 120W.

When the CBC began its plans early in 1981 for improvements and changes desired for the 1984 Winter Olympics (in Banff, Alberta, Canada), the Exshaw site was one project to be upgraded. The CBC wanted to improve overall reliability of the installation, at a reasonable expense. Environmental conditions of the site had always presented logistical difficulties. Besides the fuel supply requirements, temperature extremes presented problems in battery bank life and electronics longevity. Getting to the site even for routine maintenance was not always possible. There are 2000-foot vertical cliffs on three sides. A helicopter provides the only practical access, that is, when turbulence and high winds do not prevent it.

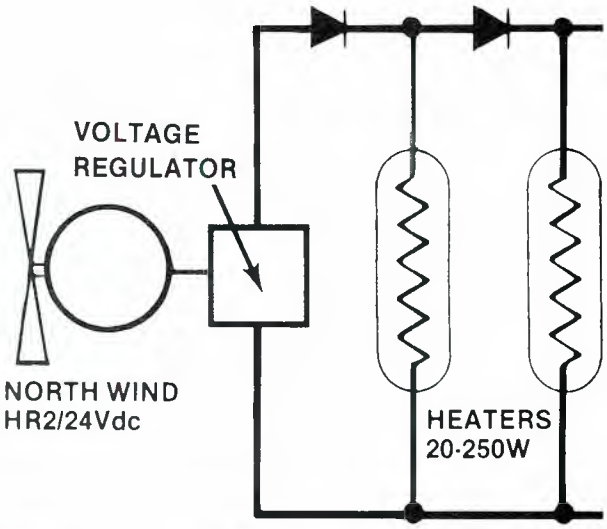
When the CBC indicated an interest in wind energy for the site, LeBlanc & Royle Communications Towers Ltd., the Canadian representative of North Wind Power Company, Waitsfield, VT, offered to take part in a trial demonstration. The company would provide a system to convert wind energy as the primary power source. The existing thermoelectric system would remain in place to be available as a backup in the rare instances in which the wind should die down for more than 48 hours. Also the realistic point of view was that the wind energy conversion system *could* fail.

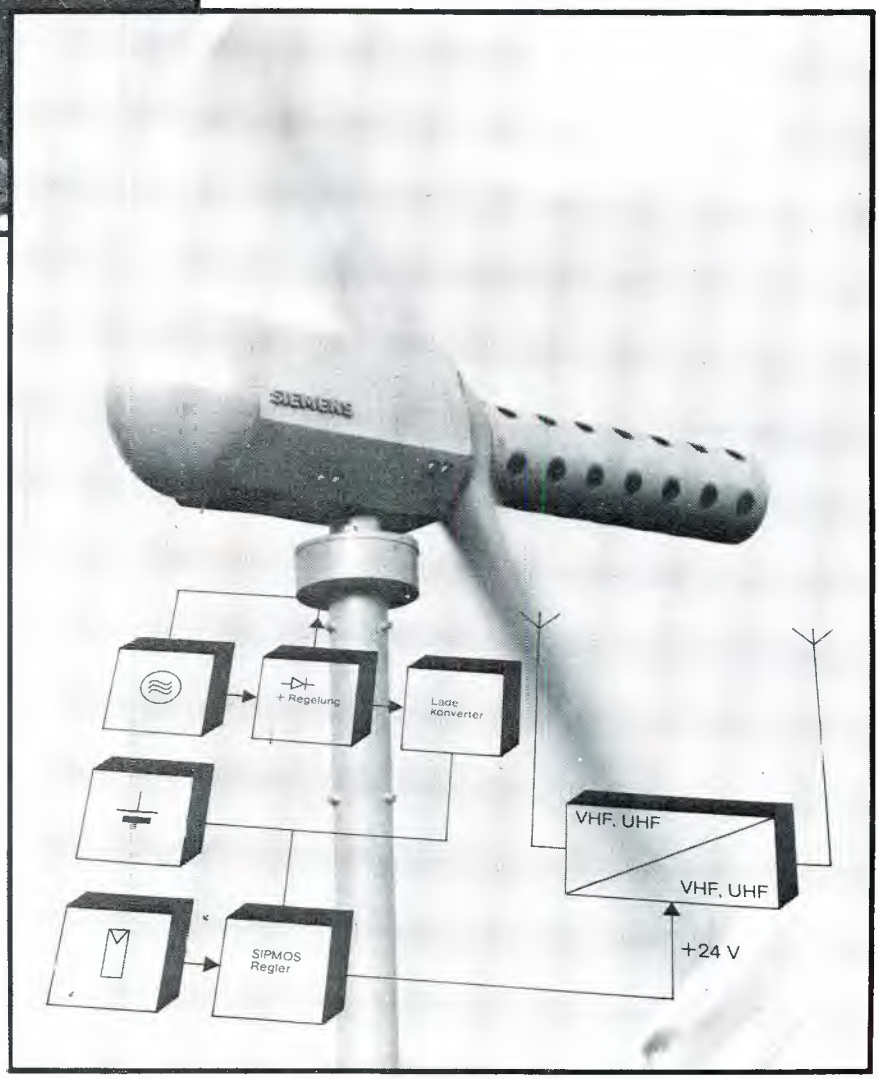
The system suggested for Pigeon Mountain was the North Wind HR2. The 3-blade turbine, approximately 16 feet in diameter, consists of rigid blades of a wood composite material. The wheel is mounted on a rotor assembly that is designed to tilt up out of direct wind as the wind speed becomes more than about 21 mph, thus providing overspeed protection. At wind speeds of more than 105 mph, the rotor tilts 90° to face straight up in a shutdown mode and to cause the least windloading to the tower structure. Under more reasonable winds of 20 mph, the generator output should produce 2200W. Generated power is interfaced to the receiver/transmitter equipment through a 630aH battery bank. (See Figure 1.) Generated voltage levels are 24Vdc, 32Vdc, 48Vdc and 110Vdc.

North Wind's HR2 is designed structurally to withstand winds to 165 mph over a temperature range from −70°F to +140°F. The calculated mean time between failure rate of 105,000h and an estimated maintenance time requirement of less than one man-hour per year promised to meet the rigid requirements of the CBS agreement. Three helicopter trips to the site for maintenance and repairs during the test period would be provided, if needed. On the event of a fourth required repair trip, the equipment would be dismantled and removed from the site. The test would be concluded, per CBC—system unacceptable!

In late September 1981, with all in readiness, the installation began. Rock anchors would be needed for the 40-foot L&R tower and its three guy anchors. An air compressor was transported to the site by helicopter for placing the anchors. Also transported were Larry Barber, North Wind's engineer; Tet Yoshino, CBC

The 50W UHF installation on Pigeon Mountain, powered by the HR2, presents difficult access, even by helicopter.





Siemens AG (Austria) has developed a 1W translator system that derives its power from a combined wind and solar energy system.

engineer; and two L&R technicians, as well as all the equipment needed for the installation. The four would require a total of 10 days work to complete the job. Winds of more than 80 mph during the construction period provided early test conditions for survivability.

By mid-October 1981 the installation was completed. All operations seemed quite good, except for an excessive interference that distorted picture quality. A study proved that the problem was produced by a switching regulator. To alleviate the interference, a low-pass filter was installed between the battery bank and the electronics equipment. (Filter placement is shown in Figure 1.) From that time, the HR2 began to perform beyond the CBC's expectations.

Energy contribution data, recorded between Dec. 17, 1981,, and June 2, 1982, showed an average load of 323W with the HR2 system providing 88% of the total requirement; the thermoelectric unit assisting with the additional 12%. Those figures include operation of a 250W space heater for the electronics and a 20W heater blanket on the battery bank. Based on a ratio of the predicted mean power output of approximately 730W in an annual average wind speed of 12 mph, the actual site load of 335W and losses associated with the 48-hour battery storage system, the contribution of the wind system was predicted to be approximately 95%.

The load requirements at Pigeon Mountain have been found to be well within the specifications of the HR2 system. Fuel-related costs for the previous system, estimated at more than $18,000 per year, should provide equipment pay-off capability within three years. Reliability and survivability surprised the CBC. Of the three offered helicopter rides to the site for maintenance or repairs, only one was used,

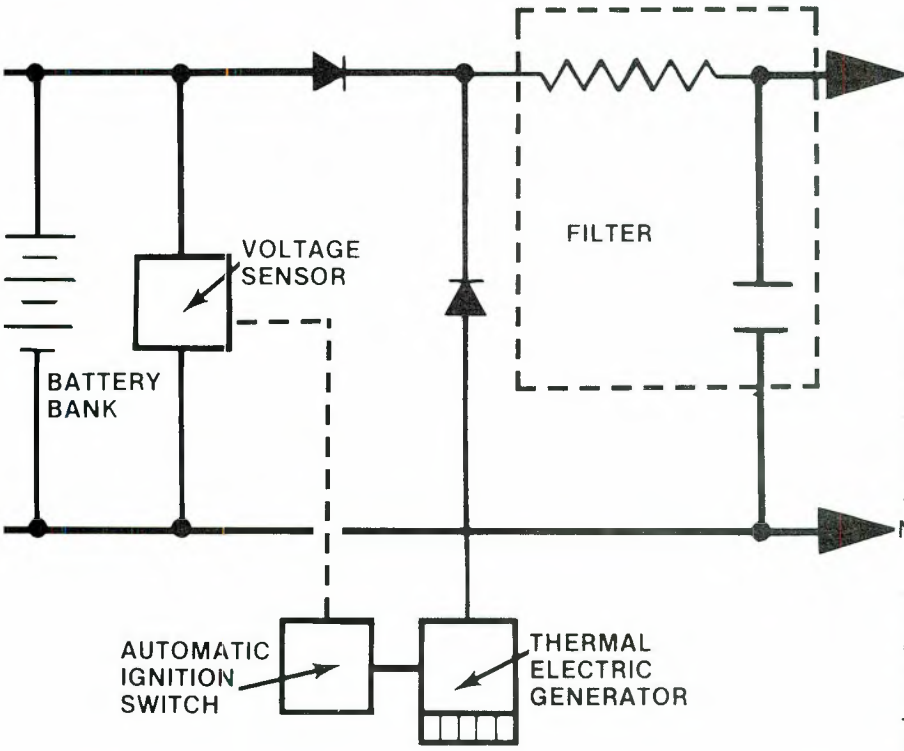


Figure 1. General connection diagram of the Pigeon Mountain project components.

and that was for *routine* maintenance. Equally promising is the fact that no refueling of the thermoelectric generator was needed between the October start up and the June 1982 date. Also, the increased capability provided, which allows the use of heaters for the equipment, has reduced maintenance and replacement needs for the electronics and batteries.

The North Wind equipment and similar wind energy conversion systems, including the Siemens AG (Austria) system available in Europe, provide increased possibilities to the LPTV service, as well as to repeater and translator systems for radio and television. The Canadian experiment, others in the United States and several European years of experience in mountain terrain situations have shown that wind energy can hold its own, or at least contribute a major share toward improving our communications.

Editor's note: BE wishes to thank Donald Mayer of North Wind Power Company for information regarding this CBC experiment. More material on wind energy conversion systems may be obtained by contacting Mayer at Box 556, Moretown, VT 05660, or by circling (811) on the Reader Service Card.

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the **BE** *Buyers' Guide* (annual September issue).

TRANSMITTER, AMPLITUDE MODULATION

Standard Broadcast 535 to 1635kHz.

Radio transmitting equipment for generation, modulation and amplification of amplitude-modulated signals from audio signals. The RF output impedance is 50Ω. Audio signals applied to the transmitter are approximately +10dBm for 100% modulation, 600Ω balanced. Additional model numbers and their associated power levels of transmitters with similar performance specifications are given.

Manufacturer	CCA (Singer)		Continental Electronics		
Model Number	**AM-2500D**	**AM50000D**	**316F**	**315R-1**	**317C-2**
Power Output Level	3Kw	55kW	10.6kW	5.5kW	60kW
Frequency Stability (±)	5Hz	5Hz	5Hz	5Hz	5Hz
Carrier Shift	3%, at 100%	3%, at 100%	<3%, at 100%	<2%	1% at 100%
Modulation Capability	125%	125%	125%	125%	125%
AF Response (± dB/Hz)	1.5/50-10k	1.5/50-10k	1.5/20-10k	1/20-10k	0.3, –.8/10-15k
Harmonic Distortion	2.5%	3%, 90% modulated	<3%	<2%, at 5kW	<2.5%, 95% modulated
AM Noise Figure	–45dB	–55dB	–60dB	–63dB	–60dB
Power Consumption	10kW	140kW	28.4kW	13kVA	60% efficient
Final Amplifier	(2)4-1000A	4CX35000C	(2)4CX10000	3CX3000F7	(2)4CX35000C
Modulator Final	(2)4-1000A	(2)4CX15000A	Solid-state	3CX3000F7	(2)3CX3000A1
Drivers	Tube type	Tube type	Solid-state	Solid-state	Tube type
Other Models	AM-1000D 1.2kW	.....	315F 5.5kW	314R-1 1.1kW	.....
Reader Service Number	**723**	**724**	**725**	**726**	**727**

TRANSMITTER, AMPLITUDE MODULATION

Standard Broadcast 535 to 1635kHz

Manufacturer	CSI Electronics Inc.		Elcom-Bauer		Harris Broadcast
Model Number	**T-1-A**	**T-10-A**	**701B**	**710**	**SX-1**
Power Output Level	1.1kW	12kW	1.1kW	12kW	1.1kW
Frequency Stability (±)	10Hz	10Hz	5Hz	5Hz	10Hz synthesizer
Carrier Shift	.....	.....	3% at 100%	2% at 100%	2% at 100%
Modulation Capability	100%	100%	125%	125%	125%
AF Response (± dB/Hz)	1.5/50-10k	1.5/50-10k	1.5/50-10k	1/50-10k	1/20-12.5k
Harmonic Distortion	2.5%	2.5%	2.5%	2%	<1.5%
AM Noise Figure	−55dB	−55dB	−55dB	−60dB	−60dB
Power Consumption	3.75kW	27kW	4.15kW	27kW	1.8kW typical
Final Amplifier	(2)7527A	3CX10000A3	(2)4-500A	4CX15000Z	High power
Modulator Final	(2)7527A	(2)4CX3000A	(2)4-500A	(2)4CX5000A	MOS FET
Drivers	Tube type	Tube type	Solid-state	Solid-state	Devices
Other Models	T-3-A 3.3kW	T-25-A 30kW	705C 6kW	715C 15kW	SX-2.5 2.5kW
	T-5-A 6kW	T-50-A 55kW	.....	.....	.....
Reader Service Number	**728**	**729**	**730**	**731**	**732**

Manufacturer	Harris Broadcast			LPB Inc.	
Model Number	**MW-10B**	**MW-50B**	**VP-100A**	**TX2-20**	**AM-250**
Power Output Level	10kW	50kW	100kW	2-20W	25-27W
Frequency Stability (±)	<20Hz	20Hz	5Hz	0.0003%	10Hz
Carrier Shift	<2% at 95%	<2% at 100%	<5% at 100%	<2% at 100%	<2% at 100%
Modulation Capability	125%	125%	100% continuous	125%	125%
AF Response (± dB/Hz)	1/20-10k	1.5/20-12.5k	1/40-10k	1.5/20-15k	1.5/20-15k
Harmonic Distortion	2% at 95%	<3% at 95%	<3% at 95%	1.5% max at 85%	2% max, 95%
AM Noise Figure	−60dB	−60dB	−55dB	−55dB max	−55dB max
Power Consumption	28kW	110kW	215kW	90W	2.4kW
Final Amplifier	3CX15000H3	4CX35000C	4CX100,000C	Solid-state	Solid-state
Modulator Final	4CX15000A	4CX35000C	4CX100,000C	Solid-state	Solid-state
Drivers	Solid-state	Tube type	Tube type	Solid-state	Solid-state
Other Models	MW-5B 5kW	.....	.....	TX2-30-TIS	AM-50 55W
	.....	.....	.....	.....	AM-100 110W
	.....	.....	.....	.....	AM-150 165W
Reader Service Number	**733**	**734**	**735**	**736**	**737**

Manufacturer	Marconi Communications		McMartin Industries		RCA Broadcast
Model Number	**B6034**	**B6026**	**BA-5K**	**BA-50K**	**BTA-5SS**
Power Output Level	50kW	750kW	6kW	50kW	5kW
Frequency Stability (±)	10Hz	10Hz	5Hz	5Hz	3.5Hz
Carrier Shift	4% at 100%	5% at 100%	3% at 100%	2% at 100%	1.5% at 100%
Modulation Capability	125%	100%	125%	125%	125%
AF Response (± dB/Hz)	1.5/30-10k	1/60-7.5k	1/10-10k	1.5/40-10k	1/20-12k
Harmonic Distortion	3% at 90%	3% at 95%	2.5% at 100%	2% at 95%	3% at 95%
AM Noise Figure	−59dB	−60dB	−60dB	−63dB	−60dB
Power Consumption	117kW	1,170kW	3.5kW	106.99kVA	11.4kW
Final Amplifier	(2)4CX35000C	(3)VCP2002	(4)4-1000A	(2)4CX20000A	Solid-state
Modulator Final	(2)4CX1500B	(2)VCP2002	(4)4-1000A	(2)4CX20000A	Solid-state
Drivers	Solid-state	Tube type	Solid-state	Solid-state	Solid-state
Other Models	.....	B6021 500kW	BA-1K 1kW	BA-5K2 5.5kW	.....
	.....	.....	BA-2.5K 3kW	BA-10K 11kW	.....
Reader Service Number	**738**	**739**	**740**	**741**	**742**

TRANSMITTER, AMPLITUDE MODULATION

Standard Broadcast 535 to 1635kHz

Manufacturer	Sintronic (Singer)		TTC/Wilkinson		
Model Number	S1-A-5	S1-A-10	AM-250SS	AM-1000B	AM-2000C
Power Output Level	5.5kW	12kW	250W	1kW	26.5kW
Frequency Stability (±)	0.0005%	0.0005%	10Hz	.....	.....
Carrier Shift	2% at 100%	2% at 100%	.....	3% at 100%	5%
Modulation Capability	125%	125%	125%	125%	125%
AF Response (± dB/Hz)	1.5/50-10k	1.5/50-10k	1/50-10k	2/40-10k	1.5/50-10k
Harmonic Distortion	2.5%	2.5%	2% at 95%	3%	3.5% at 95%
AM Noise Figure	−55dB	−55dB	−60dB	−55dB	−54dB
Power Consumption	12kVA	22.5kVA	0.5kVA	4kW	65kW
Final Amplifier	4CX5000A	4CX15000A	Solid-state	(2)4-400C	8990
Modulator Final	(2)4CX5000A	(2)4CX5000A	Solid-state	(2)4-400C	(2)4CX10000D
Drivers	Solid-state	Solid-state	Solid-state	Solid-state/tube	Tube type
Other Models	S1-A-1 1.2kW	.....	.....	AM2500B 2.5kW	.....
	.....	.....	.....	AM5000D 5kW	.....
	.....	.....	.....	AM10000D 10kW	.....
Reader Service Number	743	744	745	746	747

TRANSMITTER, FM Broadcast, High Power

Radio transmitting equipment for generation, modulation and amplification of frequency-modulated signals in the 88 to 108MHz spectrum. The RF output impedance is typically 50Ω. Frequency modulation at 100% results in a carrier deviation of ±75kHz. Values given for monophonic.

Manufacturer	Broadcast Electronics	Continental Electronics	CSI Electronics	Harris Broadcast	
Model Number	FM-30	817R-1	T-25-F	FMD-50K	FM-40K
Power Output Level	15-30kW	50kW	27.5kW	20-50kW	20-40kW
Feed Line Size	3⅛" EIA	6⅛" EIA	3⅛" EIA	6⅛" EIA	3⅛" EIA
Carrier Stability	±300Hz	±500Hz	±250Hz	±300Hz	±300Hz
Modulation Capacity (±)	±200kHz	100kHz	±100kHz	±75kHz	±75kHz
Audio Input for 100%	+10dBm nominal	+10dBm nominal	+10(±2)dBm	+10(±1)dBm	+10(±1)dBm
Audio Input Impedance	600Ω bal.	600Ω	600Ω bal.	600Ω bal.	600Ω bal.
AF Response (± dB/Hz)	0.5/30-15k	1/per 7tus curve	0.5/30-15k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	<0.08%	<0.25% THD	0.5% max	<0.2%	<0.2%
Pre-Emphasis	25, 50, 75μs	75μs, other options	75μs	0, 25, 50, 75μs	0, 25, 50, 75μs
AM Noise	<−55dB	<−55dB	−55dB	−50dB	−50dB
FM Noise	<−72dB	<−65dB	−65dB	−68dB	−68dB
RF Harmonic Suppression	Meets FCC/CCIR specs	>−80dB	....	Exceeds FCC specs	Exceeds FCC specs .....
Recommended Exciter*	FX-30	Continental 510R-1	EX-20-F	Harris MS-15	Harris MS-15
Power Consumption	50kW	80kW	36kW	ca. 80kW	ca. 60kW
Input Power Requirements	208-240Vac3ϕ	200-250Vac3ϕ	190-460Vac3ϕ	220 or 360-415Vac	208-240Vac3ϕ
Overall Efficiency	.....	62%	.....	62%	56%
Power Factor	.....	0.9	.....	0.95	0.95
Automatic Recycle	Yes	Yes	Yes	Yes	Yes
Final PA Tube(s)	4CX20000A/8990	(2)4CX15000A	3CX15000A7	(2)8990	(2)4CX15000A
Driver Tube(s)	Solid-state	(4)4CX250B	8874	Solid-state	(4)4CX250B
IPA Tube(s)	Solid-state	Solid-state	3CX3000A7	Solid-state	4X150A
Related Models	.....	816R-2A, 21.5kW	T-20-F, 22kW	.....	FM-25K, 25kW
	.....	816R-3, 25kW	FM1200-E, 13kW	.....	FM-20K, 21.5kW
	.....	817R-2A, 40kW	.....	.....	.....
	.....	816R-1, 11kW	.....	.....	.....
Reader Service Number	748	749	750	751	752

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the **BE** *Buyers' Guide* (annual September issue).

TRANSMITTER, FM Broadcast

High Power

Manufacturer	Larcan Communications	McMartin Industries	NEC America	Singer/CCA	TTC/Wilkinson
Model Number	**FMT 25F**	**BF-55M**	**FBN-7200E**	**FM55000EP/Dual**	**FM30000E**
Power Output Level	25kW	55kW (Dual BF-25M)	20kW	60kW(2xFM27500E)	30kW
Feed Line Size	3⅛"	6⅛" EIA	3⅛"	6⅛" EIA	3⅛" EIA
Carrier Stability	±350Hz	±500Hz	±500Hz	0.0005%	±1kHz
Modulation Capacity (±)	±100kHz	±150kHz	±100kHz	±100kHz	±150kHz
Audio Input for 100%	+1.5, +13.5dBm	−10(±2)dBm	−10, +12dBm	+10(±2)dBm	+10(±2)dBm
Audio Input Impedance	600Ω	600Ω bal.	>2000Ω bal.	600Ω bal.	600Ω
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	0.3/30-53k	1.5/75μs curve	1/50-15k
Harmonic Distortion	0.4%	<0.3% THD	<0.5%(−46dB)	<0.5%	0.5% THD
Pre-Emphasis	0, 75μs	75μs standard	50, 75μs	50, 75μs	75μs standard
AM Noise	−61dB	<−55dB	<−50dB	<−50dB	−55dB
FM Noise	−67dB	<−65dB	<−63dB	<−60dB	−65dB
RF Harmonic Suppression	−80dB	.....	<−70dB(1mW)	<−80dB	.....
Recommended Exciter*	S3161-C	BFM-8000	HPA-4536B	FM-40E	FME-10
Power Consumption	37kVA	98kVA	35kW	87kW	45kW
Input Power Requirements	208-240Vac3ϕ	208-240Vac3ϕ	220, 308-440Vac3ϕ 50Hz	220Vac3ϕ	208-240Vac3ϕ
Overall Efficiency	.....	.....	.....	.....	.....
Power Factor	0.95	.....	>0.9	.....	0.9
Automatic Recycle	Yes	Yes	Yes	Yes	Yes
Final PA Tube(s)	8985	(2)3CX19000A7	4CX15000A	(2)3CX20000A7	8990
Driver Tube(s)	Solid-state	(2)3CX1500A7	Solid-state	Solid-state	Solid-state
IPA Tube(s)	Solid-state	(2)4CX250B	Solid-state	(2)5CX1500A	4CX250B
Related Models	FMT 15F, 15kW	BF-25M, 27.5kW	.....	FM16000EP,18kW	FM25000E, 25kW
	FMT 10F, 10kW	BF-30M, 30kW	.....	FM24000EP, 26kW	FM 20000E, 20kW
	.....	BF-10M, 15kW		FM40000EP, 44kW	
	.....	.....		FM 20000E, 22kW	.....
Reader Service Number	**753**	**754**	**799**	**755**	**756**

*See Larcan advertisement on page 103.

Editor's Note:

The above listings do not include low power FM broadcast systems. For power requirements to 5kW, the following companies and their products may be considered.

AEG Telefunken

S3161-C	100W
S3149	300W
S3175	1kW
S3168	3kW

Broadcast Electronics

FM-1.5	1.5kW
FM-3.5	3.5kW

C. N. Rood BV

SC/204 SFMT	50W

Continental Electronics

814R-2	1.25kW
814R-1	2.5kW

CSI Electronics

T-1-F	1.5kW
FM-3000E	3.5kW
FM-5000E	5.5kW

Elcom-Bauer

SS-250	250W
SS-1000	1kW
601B	1kW

Harris Broadcast

FM-5K	5.1kW

Marconi

6523	1kW

McMartin Industries

B-950	
B9100	120W
BF-1M	1.5kW
BF-3.5M	3.5kW
BF-5M	5.5kW

NEC America

FBN-7001S	150W
FBN-7003S	300W
FBN-7005S	500W
FBN-7010S	1kW
FBN-7010E	1kW
FBN-7030E	3kW
FBN-7050E	5kW

QEI Corporation

695T1KW	1kW

Rohde & Schwarz

NU 251	500W
NU 311	1kW
NU 315	1.5kW
NU 321	2kW
NU 331	3kW
NU 351	5kW

Singer/CCA

FM100E	140W
FM-2500E	3kW
FM-4000E	4.8kW
FM-5000E	5.6kW
FM250R	250W
FM1000R	1kW
FM2500 R	2.5kW

Singer/Sintronic

S1-F-1	1.5kW
S1-F-3	3.5kW
S1-F-5	5.5kW

TTC/Wilkinson

FM-250E	250W
FM1000E	1kW
FM1500E	1.5kW
FM2500E	2.5kW
FM5000E	5kW

TRANSMITTER, UHF Television

Transmitting equipment for generation, modulation and amplification of the visual and aural carrier from baseband video and audio. The RF output impedance is 50Ω. Input video to the exciter is 1V P-P, 75Ω. Input audio to the exciter is typically +10dBm, 600Ω balanced. The aural carrier is 4.5MHz above the visual . Sideband response and envelope delay characteristics shall fall within FCC regulations, per applicable sections of Part 73, Volume III.

Manufacturer	Acrodyne	CCA/Singer Broadcast	Comark Corporation	EMCEE
Model Number	TT-3400U(1)	2TT-3480	CTU-55BT(2)	CCT-U-55(3)	TTU1000DR
Frequency/Channel	.....	.....	.....	.....	.....
Visual:					
Output Power Peak	1kW	10kW	55kW	55kW	1kW
Carrier Regulation	3%	3%	3%	5%	3%
Response vs. Brightness	0.5dB	0.25dB	.....	5%	0.5dB
Modulation Capacity	5%	2%	8%	3%	95%
Incidental Phase Mod	.....	.....	.....	.....	2°
Differential Phase/Gain	±1°/0.5dB	±1°/0.5dB	5°/0.9dB	3°/0.5dB	3°/3%
Linearity (Low Freq.)	5%	5%	0.9dB	0.75dB	5%
Signal/Noise Ratio	54dB	54dB	51dB	55dB	55dB
K Factors 2T, 12.5T	3%, ±0.1dB	3%, ±0.1dB	.....	.....	2%
Harmonic Radiation	−80dB	−60dB	−60dB	−60dB	−60dB
Visual PA Tube/Type	TH 347	2 TH 382	Ext. cavity klystron	EEV klystron	TH 331
IPA Tube/Type	Solid-state	Solid-state	.....	Solid-state	TH 328
IF Level Modulation	Yes	Yes	Yes	Philips PD5580	Yes
SAW Filtering	No	No	.....	Option	Yes
Aural:					
Output Power	100W	1kW	5.5 or 11kW	12kW	100W
Modulation Capability	±50kHz	±50kHz	25kHz	25kHz nominal	40kHz
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/30-15k	Per FCC	1/30-15k
Harmonic Distortion	0.5%	0.5%	1%	.....	1%
FM Noise	−60dB	−60dB	−60dB	Per FCC	60dB
AM Noise	−50dB	−50dB	−52dB	Per VCC	55dB
Aural PA Tube/Type	Combined in visual	Combined in visual	.....	EEV klystron	IF diplexed
IPA Tube/Type	.....	.....	.....	Solid-state	.....
Cooling System	Air	Air	Water	Water	Air
Input Power Requirement	208Vac3φ	208Vac3φ	.....	.....	208/220Vac 1 or 3φ
Power Consumption	8kW	35kW	190kVa	178kW	5.5kW
Power Factor	.....	.....	0.9	.....	.....
Reader Service Number	**757**	**758**	**759**	**760**	**761**

(1) TT-300/3000U series includes models at 10, 30, 200W, 1, 2.5 and 5kW. The TT-200/2000 series includes similar power levels for non-US installations. (2) Singer also offers the CTU-15BT (15kW) and CTU-30BT (30kW). (3) Comark also offers the CCT-U-10 (10kW) and CCT-U-30 (30kW). (4) The EMCEE line includes the TTU 10RM (10W), TTU 100RM & DR (100W), TTU 1000RM (1kW) and TTU 1000B (1kW). RM models are modulated translators; DR denotes transmitters.

UHF Television

Manufacturer	Harris Broadcast	Larcan Communications	Marconi Broadcast	NEC	Pye TVT/Philips
Model Number	TVE-55(5)	TTF 2 F	B7321(6)	PCU-755H(7)	LDM 1208(8)
Frequency/Channel	.....	.....	.....	.....	.....
Visual:					
Output Power Peak	55kW	2kW	55kW	55kW	55kW
Carrier Regulation	3%	.....	.....	2%	2%
Response vs. Brightness	0.75dB	0.75dB	.....	2%	0.75dB
Modulation Capacity	0%	2%	3%	.....	0.5%
Incidental Phase Mod	2°	−40dB	.....	.....	<−40dB
Differential Phase/Gain	3°/0.5dB	3°/0.5dB	3°/0.95dB	3°/5%	1.5°/0.5dB
Linearity (Low Freq.)	1dB	0.75dB	0.9dB	.....	2%
Signal/Noise Ratio	50dB	−55dB	49dB	52dB	55dB
K Factors 2T, 12.5T	2%, 5%	2%, 5%	2%, 1% bar	1.5%	2%, 5%
Harmonic Radiation	−80dB	−75dB	−60dB	−80dB	−60dB
Visual PA Tube/Type	VA-953H	RS 1054L tetrode	VA 935A	VA953/4/5	Ext/Int klystron
IPA Tube/Type	.....	YD 1381 triode	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filtering	Yes	Yes	.....	.....	Yes
Aural:					
Output Power	11kW	0.2kW	5.5kW or 11kW	5.5kW	5.5kW
Modulation Capability	50kHz	50kHz	50kHz	100kHz	100kHz
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/30-15k	0.5/30-15k	0.5/30-15k
Harmonic Distortion	0.5%	−75dB	1%	0.5%	0.5%
FM Noise	−59dB	−60dB	−60dB	−60dB	−60dB
AM Noise	−55dB	−50dB	−50dB	−50dB	−55dB
Aural PA Tube/Type	VA-953H	Internal diplexed	VA 935A	VA 953/4/5	Ext/Int klystron
IPA Tube/Type	.....	.....	.....	.....	Solid-state
Cooling System Type	Water	Air	Vapor-phase	Vapor-phase	Vapor-phase
Input Power Requirement	480Vac3φ	208-240Vac 1 or 3φ	.....	440Vac3φ	.....
Power Consumption	145kW	10kVa	264kW	175kW	130kW w/ABC klystron
Power Factor	>0.9	ca. 0.9	0.9	0.9	0.9
Reader Service Number	**762**	**763**	**764**	**765**	**766**

(5) Also available are the Harris TVE-30 (30kW) and TVE-110 (110kW). (6) The Marconi line includes models from 4, 10, 25 and 40kW. (7) The NEC line includes models for 10, 40, 60, 80 and 110kW. (8) The Philips line includes the LDM 1742 (25kW) and the LDM 1208/1219 (110kW).

TRANSMITTER

UHF Television

Manufacturer	RCA Broadcast	Thomson-CSF/LGT	Townsend Associates		TTC/Wilkinson
Model Number	TTU-60D(9)	EUHF-1000S(10)	TA-1000 ATU(11)	TA-55NV	XL 1000MU(12)
Frequency/Channel	.....	.....	.....	.....	.....
Visual:					
Output Power Peak	60kW	1kW	1kW	55kW	1kW
Carrier Regulation	3%	.....	.....	3%	.....
Response vs. Brightness	−1, +1.5dB	.....	.....	−1.5dB	0.5dB
Modulation Capacity	3%	.....	5%	5%	.....
Incidental Phase Mod	.....	.....	.....	.....	.....
Differential Phase/Gain	3°/0.5dB	1.5°/0.5dB	3°/1dB	3°/1dB	2°/0.25dB
Linearity (Low Freq.)	1dB	.....	1dB	1dB	.....
Signal/Noise Ratio	55dB	.....	60dB	60dB	.....
K Factors 2T, 12.5T	1.5%, <8%	.....	.....	.....	2%
Harmonic Radiation	−60dB	−60dB	−60dB	−60dB	−60dB
Visual PA Tube/Type	4 int cavity	TH 347	RCA 4628	VA 953H Varian	TH 347
IPA Tube/Type	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filtering	Yes	.....	Yes	Yes	.....
Aural:					
Output Power	6 or 12kW	100W	100W	11kW	100W
Modulation Capability	50kHz	50kHz	25kHz	50kHz	25kHz
AF Response (±dB/Hz)	1/30-15k	/30-15k	1/75μsec curve	1/75μsec curve	.....
Harmonic Distortion	1%	.....	1%	1.5%	.....
FM Noise	−60dB	−60dB	−58dB	−58dB	.....
AM Noise	−50dB	.....	−50dB	−50dB	.....
Aural PA Tube/Type	4 int cavity	IF diplexed	Solid-state	VA 953H Varian	IF diplexed
IPA Tube/Type	Solid-state	.....	Solid-state	Solid-state	Solid-state
Cooling System Type	Vapor-phase	Air	Air	Vapor-phase	Air
Input Power Requirement	440/480Vac3φ	208/220Vac 1 or 3φ	.....	.....	208/230Vac 1 or 3φ
Power Consumption	158kW w/pulsar	4.2kW	8.15kW	146.7kW w/phasor	4.8kVa
Power Factor	0.9	.....	.....	.....	.....
Reader Service Number	**767**	**768**	**769**	**770**	**771**

(9) RCA also provides TTU units for 110, 165 and 220kW. (10) The Thomson-CSF/LGT line includes other models of translators and transmitters. (11) The Townsend line includes additional models for 100W, 10, 30, 60, 110, 165 and 220kW. (12) MU denotes audio/video modulation; VU is a translator with VHF input; UU represents UHF input to a translator.

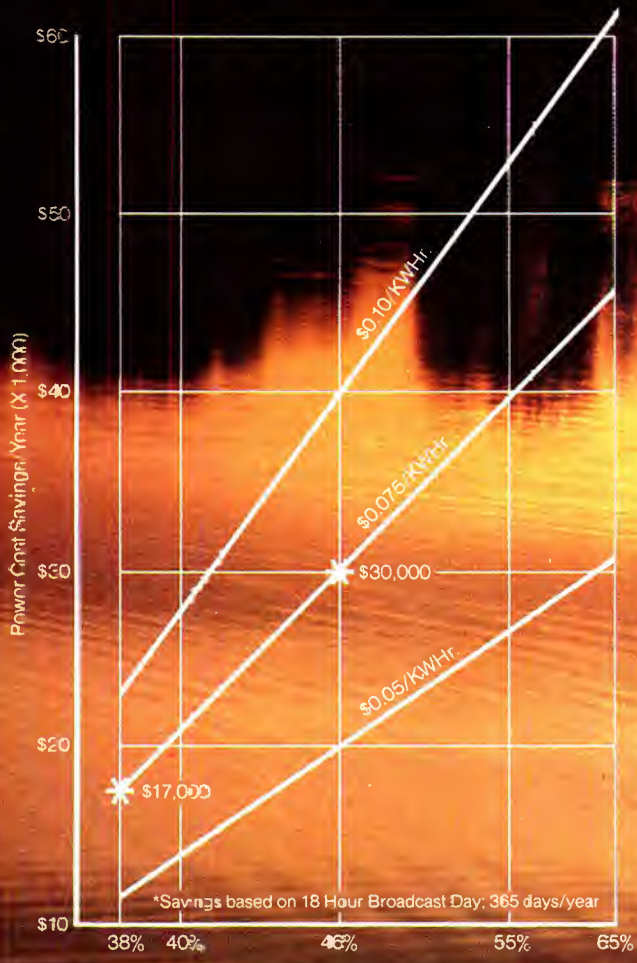
TRANSMITTER, VHF Television

Transmitting equipment for generation, modulation and amplification of the visual and aural carrier from baseband video and audio. The RF output impedance is 50Ω. Input audio to the exciter is typically +10dBm, 600Ω balanced. The aural carrier is 4.5MHz above the visual . Sideband response and envelop delay characteristics shall fall within FCC regulations, per applicable sections of Part 73, Volume III.

Manufacturer	Acrodyne		EMCEE Broadcast		Harris Broadcast
Model Number	TT-330VL(VH)(1)	TT-3500VH	TTV100DR(2)	TTV5000DP	TV-50H(3)
Frequency/Channel	2-6(7-13)	7-13	54-216MHz/2-13	54-216MHz/2-13	174-216MHz/7-13
Visual:					
Output Power Peak	100W	12.5kW	100W	5kW	50kW
Carrier Regulation	±250Hz	±250Hz	2%	3%	250Hz
Response vs. Brightness	0.25dB	0.25dB	±0.5dB	±0.5dB	0.75dB
Modulation Capability	3%	3%	95%	95%	0%
Incidental Phase Mod	.....	.....	2°	3°	1.5°
Differential Phase/Gain	±1°/0.5dB	±1°/0.5dB	5°/5%	3°/5%	1°/3%
Linearity (Low Freq.)	5%	5%	8%	5%	1dB
Signal/Noise Ratio	54dB	54dB	55dB	55dB	55dB
K Factors 2T, 12.5T	<3%, ±0.1dB	<3%, ±0.1dB	3%	2%	2%, 5%
Harmonic Radiation	−80dB	−80dB	60dB	60dB	−80dB
Visual PA Tube/Type	8791	TH561	Solid-state	TH 361	8984/8988
IPA Tube/Type	.....	RCA 8791	.....	TH 338	Solid-state
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filtering	No	No	Yes	Yes	Yes
Aural:					
Output Power	10W	1250W	10W	500W	10kW
Modulation Capability	±50kHz	±50kHz	>40kHz	>40kHz	±50kHz
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/50-15k	1/50-15k	0.5/30-15k
Harmonic Distortion	<0.5% at 25kHz	<0.5% at 25kHz	1%	1%	0.5%
FM Noise	−60dB at 25kHz	−60dB at 25kHz	60dB	60dB	−60dB
AM Noise	−50dB	−50dB	55dB	55dB	−55dB
Aural PA Tube/Type	Combined to visual	Combined to visual	.....	Combined to visual	8807
IPA Tube or Type	.....	.....	.....	Combined to visual	Solid-state
Cooling System Type	Air	Water	Air	Air	Air
Input Power Requirement	208Vac3φ	208Vac3φ	120/240Vac1φ	120/208Vac3φ	480Vac3φ
Power Consumption	1300W	37kVa	1kVa	20kVa	107kW
Power Factor	.....	.....	0.99	0.98	0.97
Reader Service Number	**772**	**773**	**774**	**775**	**776**

(1) Other power levels include 250 and 500W, 1, 2.5, 5 and 10kW. TT-200 Series are applicable for non-US installations. (2) Also available in TTV100RM modulated translator. (3) Other TV series models include the 10H, 18H, 20L, 25H, 30L and 35H.

EEV high efficiency UHF klystrons pay for themselves...in 1 to 3 years!



Annual Power Cost Savings using EEV 55KW high efficiency klystron vs. older generation 30% efficiency klystron

These are the facts.

- Over 70 EEV 55KW high efficiency external cavity klystron installations made during the past three years.
- These klystrons are operating from 38% to 46% efficiency vs. average of 30% efficiency for older generation klystrons.
- Annual power cost savings from $17,000 to $30,000 for single tube installations.*
- Existing transmitters upgraded with new EEV klystrons operating from 38% to 40% Eff.
- New transmitter installations with EEV klystrons operating from 40% to 46% Eff
- Life and reliability proven by 1400 installations worldwide logging over 9,000,000 hours/year.
- EEV 55KW high efficiency klystrons available for UHF channels 14 to 78.
- Development work being completed to attain 55%-65% efficiencies for external cavity klystrons with modulating anode or grid pulsing vs. kystron's intrinsic 46% efficiency.

With these facts you can predict your power cost savings when you install EEV's 55KW high efficiency external cavity klystron.

Start now.

Specify EEV for your existing or new transmitter, *or...*

Convert and upgrade your internal cavity klystron system to EEV's external cavity klystron.

Every week you delay installing an EEV 55KW high efficiency klystron can represent an additional 4400KW to 7500KW on your power bill.

*Based on an 18 Hour Broadcast Day and $0.75/KWHr.

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7 Westchester Plaza, Elmsford, NY 10523, 914-592-6050, Telex 646180
In Canada: EEV CANADA, LTD., 67 Westmore Drive, Rexdale, Ontario, M9V 3Y6, 416-745-9494, Telex 06-989363
In Europe: English Electric Valve Co. Ltd., Chelmsford, England CM1 2QU Tel: 0245 61777, Telex 851-99103

Circle (30) on Reply Card

TRANSMITTER

VHF Television

Manufacturer	Harris Broadcast	Larcan Communications	Marconi Broadcast	NEC	Pye TVT/Philips
Model Number	**TVD-100H(4)**	**TTC30000FL(FH)(5)**	**B7433**	**PCN-1225BH(6)**	**LDM 1211/06**
Frequency/Channel	174-216MHz/7-13	2-6(7-13)	174-230MHz/7-13	7-13	7-13
Visual:					
Output Power Peak	100W	30kW	10kW	25kW	17.5kW
Carrier Regulation	250Hz	±250Hz	2%	2%	2%
Response vs. Brightness	0.75dB	±0.75dB	.....	.....	.....
Modulation Capability	0%	2%	3%	.....	0.5%
Incidental Phase Mod	1.5°	−40dB	−46dB	.....	.....
Differential Phase/Gain	1°/3%	3°/0.5dB	20nsec/5%	1°/3%	3°/0.5dB
Linearity (Low Freq.)	1dB	0.75dB	2%	.....	1dB
Signal/Noise Ratio	55dB	−55dB	54dB	52dB	55dB
K Factors 2T, 12.5T	2%, 5%	2%, 5%	2%, 1% bars	2.5%	2% 2T
Harmonic Radiation	−80dB	−80dB	1mW	−80dB	−40dB
Visual PA Tube/Type	(2)8984/(2)8988	9007 Tetrode	TH361	8F68R	YL1430
IPA Tube/Type	Solid-state	Solid-state	Solid-state	Solid-state	YL1450
IF Level Modulation	Yes	Yes	Yes	Yes	Yes
SAW Filtering	Yes	Yes	Yes	Yes	.....
Aural:					
Output Power	5kW	1.6kW	1kW	2.5 or 5kW	2kW
Modulation Capability	±50kHz	±50kHz	To 50kW	100kHz	To 100kHz
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/30-15k	0.5/30-15k	1/30-15k
Harmonic Distortion	<0.5%	0.75%	1%	0.5%	1%
FM Noise	−60dB	−60dB	−60dB	−60dB	−60dB
AM Noise	−55dB	−50dB	−50dB	−50dB	−50dB
Aural PA Tube/Type	8807	8806	Solid-state	7F71R	YL1450
IPA Tube or Type	Solid-state	Solid-state	.....	Solid-state	Solid-state
Cooling System Type	Air	Air	Air	Air	Air
Input Power Requirement	480Vac3ϕ	208-240Vac3ϕ	.....	.....	.....
Power Consumption	214kW	62kVa	25kW	56kW	40kW
Power Factor	0.97	0.95	0.9	.....	0.9
Reader Service Number	**777**	**778**	**779**	**780**	**781**

(4) Other TVD models include the 36H, 40L, 50H, 60L and 70H. These are dual units of the TV series. (5) Also available are models for 3, 5/6 and 16kW levels. (6) The PCN-1200 series includes models for power levels of 1, 2, 5, 10 and 13kW, including low and high band VHF.

Manufacturer	RCA Broadcast		Townsend Associates		TTC/Wilkinson
Model Number	**TTG-50H(7)**	**TTG-35/35H**	**TA-100ATL(H)**	**TA-1000ATL(H)**	**MA-TVF-10**
Frequency/Channel	174-216MHz/7-13	174-216MHz/7-13	2-6(7-13)	2-6(7-13)	54-216MHz/2-13
Visual:					
Output Power Peak	50kW	70kW	100W	1kW	10W
Carrier Regulation	3%	3%	.....	.....	.....
Response vs. Brightness	±0.75dB	±0.75dB	.....	.....	.....
Modulation Capability	1%	1%	5%	5%	.....
Incidental Phase Mod	±3°	±3°	.....	.....	.....
Differential Phase/Gain	±2°/0.5dB	±2°/0.5dB	3°/1dB	3°/1dB	2°/0.5dB
Linearity (Low Freq.)	0.5dB	0.5dB	1dB	1dB	.....
Signal/Noise Ratio	55dB	55dB	.....	.....	.....
K Factors 2T, 12.5T	2%, 5%	2%, 5%	.....	.....	2%
Harmonic Radiation	−80dB	−80dB	−60dB	−60dB	−70dB
Visual PA Tube/Type	8984 tetrode	(2)8984 tetrodes	Solid-state	Solid-state	Solid-state
IPA Tube/Type	Solid-state	Solid-state	.....	.....	.....
IF Level Modulation	Yes	.....	Yes	Yes	.....
SAW Filtering	Yes	.....	Yes	Yes	.....
Aural:					
Output Power	6.6kW	13.2kW	10W	100W	2W
Modulation Capability	±50kHz	±50kHz	25kHz	25kHz	25kHz
AF Response (±dB/Hz)	0.5/30-15k	0.5/30-15k	1/75usec curve	1/75usec curve	30-15k
Harmonic Distortion	0.5%	0.5%	1%	1%	.....
FM Noise	−60dB	−60dB	−58dB	−58dB	.....
AM Noise	−53dB	−53dB	−50dB	−50dB	.....
Aural PA Tube/Type	8977 tetrode	(2)8977 tetrode	Solid-state	Solid-state	Solid-state
IPA Tube or Type	Solid-state	Solid-state	.....	.....	.....
Cooling System Type	Air	Air	Air	Air	Air
Input Power Requirement	440Vac3ϕ	220-440Vac3ϕ	.....	.....	.....
Power Consumption	85kW 50%APL	133kW 50%APL	620W	6.1kW	75Va
Power Factor	0.94	0.94	.....	.....	.....
Reader Service Number	**782**	**783**	**794**	**785**	**786**

(7) In the TTG series are additional power levels as indicated by the model numbers 16L, 17H, 30L, 30H and 35H. The dual systems TTG-X/X includes 16/16L, 17/17H, 30/30L, 30/30H and 50/50H. Additional models are offered for CCIR-B, D and K1.

MODULATION MONITOR, FM

Manufacturer	Belar Electronics Lab		McMartin Industries	
Model Number	**FMM-1**	**FMM-2**	**TBM-3500B**	**TBM-3700**
Frequency Selector	Crystal control	.....	.....	.....
Signal Level from				
Transmitter direct	0.2-10Vrms	1-10Vrms	0.1-1W	0.1-1W
Off-Air	0.2-10Vrms	1-10Vrms	350μV with LL-35B card	.....
Modulation Range	0-133%	0-133%	to 133%	to 133%
Input Attenuator	Potentiometer	.....	Yes	Yes
Frequency Response	±0.1dB, 50Hz-75kHz	±0.1dB, 50Hz-75kHz	±0.25dB/30Hz-75kHz	±0.5dB/30Hz-75kHz
Accuracy at 5kHz	>5%	>2%	±0.5dB	±0.5dB
Peak Modulation:				
Peak Level Adjust	50-120%	1-199%	50-120%	50-120%
Residual AM	Externally metered	Built-in metering	Built-in metering	Built-in metering
Composite Output	550mVrms, 1kΩ source	Yes	1Vp-p, 300Ω	1Vp-p, 300Ω
Audio Output	+10dBm, 2.5Vrms, 600Ω	+10dBm, balanced	+2dBm, 100%, 400Hz	+2dBm, 600Ω, balanced
Distortion	<0.1%, 50Hz-75kHz	0.02%	<0.5%, 50Hz-15kHz	0.25%, 30Hz-15kHz
Signal/Noise Ratio	75dB, deemphasized	80dB	75dB below 100%	66dB below 100%
Carrier Failure	.....	Yes	Yes	Yes
Modulation Failure	.....	Optional	.....	.....
Stereo Monitor Output	550mVrms, 560Ω source	Yes	Yes	Yes
SCA Monitor Output	3-550mVrms, 2.2kΩ	Yes	Yes	Yes
ATS Capable	.....	Suitable	.....	.....
Reader Service Number	**815**	**816**	**817**	**818**

Manufacturer	**QEI Corporation**	**Rohde & Schwarz**	**TFT**
Model Number	**691 Test Set**	**FKD/FKDL**	**763**
Frequency Selector	Tuneable	Tuneable PLL	Crystal control
Signal Level from			
Transmitter direct	1mW-50W	0.5-2Vrms	1-7Vrms
Off-Air	3.16-80mW	.....	100μV for 56dB S/N(1)
Modulation Range	0-133% (−20, +2dB)	0-77.5kHz	0-133%
Input Attenuator	.....	Yes	50Ω
Frequency Response	0.2dB/30Hz-75kHz	40Hz-60kHz	±0.25dB/100Hz-75kHz
Accuracy at 5kHz	±2% over range	≤±15% error	±0.29% @ 100%
Peak Modulation:			
Peak Level Adjust	0-199%	.....	.....
Residual AM	Built-in metering	.....	0-70dB
Composite Output	Stereo built-in	+6dBm, 600Ω	5Vrms, 5kΩ
Audio Output	+10dBm bal., L/R	+6dBm, L/R/mono	5Vrms, 5kΩ @ 400Hz
Distortion	0.05% THD/0.1% IMD	<0.5%, 30Hz-15kHz	0.1%, max
Signal/Noise Ratio	>75dB	>68dB	75dB, 400Hz,
Carrier Failure	.....	.....	Yes
Modulation Failure	.....	.....	Yes
Stereo Monitor Output	Audio	Yes	1Vrms, 600Ω
SCA Monitor Output	Audio	.....	1Vrms, 600Ω
ATS Capable	.....	.....	.....
Reader Service Number	**819**	**830**	**831**

(1) Using preselector 764A/765A.

Spec Note:

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

MODULATION MONITOR, AM

Manufacturer	Belar Electronics Lab		Harris Broadcast	QEI Corporation	TFT
Model Number	**AMM-2A**	**AMM-3**	**AM-80**	**571**	**753**
Frequency Range	200kHz-160MHz	200kHz-160MHz	540-1600kHz	540-1600kHz	500kHz-4MHz
Frequency Selector	Broadband	Broadband	.....	Broadband	Wideband input
Signal Level from					
Transmitter direct	5-10Vrms	5-10Vrms	6-20V	2-10Vrms	1-10Vrms
Off-Air	5-10Vrms	5-10Vrms	.....	Requires Model 572	100μV for 35dB S/N(1)
Modulation Range	to −100%, +133%	to −100%, +133%	to −100%, +130%	0-133% (−20, +2dB)	to 133%
Input Attenuator	1kΩ potentiometer	1kΩ potentiometer	.....	.....	Yes
AF Response of Meter	0.5dB, 20Hz-25kHz	0.5dB, 20Hz-25kHz	.....	−0.2dB/30Hz-10kHz	±0.5dB/30Hz-25kHz
Peak Modulation:					
−100% Indicator	Fixed, ratio-type	Fixed, ratio-type	50-100% adjustable	Flasher, adjustable	Yes, if −99%
+125% Indicator	Fixed, ratio-type	Fixed, ratio-type	to 130% adjustable	Flasher, adjustable	Yes, if >+125%
Peak Indicator	+ or −, 40-130%	+ or −, 0-99%	Flashers	Flasher	+ or −, 30-150%
Audio System:					
AF Monitor Outputs	+10dBm, 600Ω	+10dBm, 600Ω	Yes	Yes	600Ω
Output Impedance	.....	.....	600 and 4kΩ	600Ω	600Ω
Output Level	5Vrms, test output	5Vrms, test out	0.55V and 4.4V	2.5Vrms, 100%	0dBm
Distortion	0.25%	0.25%	<0.3%	0.25% max	0.15% typical
AF Response	0.5dB, 20Hz-25kHz	0.5dB, 20Hz-25kHz	±0.5dB, 20Hz-20kHz	−0.5dB, 30Hz-16kHz	±0.5dB, 50Hz-15kHz,
Signal/Noise Ratio	75dB	75dB	70dB	75dB below 100%	>75dB below 100%
Carrier Failure	Yes	Yes	.....	Yes	Yes
Modulation Failure	.....	.....	.....	.....	Yes
Calibrator	Yes	Yes	.....	Yes	−100%, +125%
ATS Capable	.....	.....	.....	.....	.....
Frequency Counter	.....	.....	.....	No	With 754 preselector
Reader Service Number	**822**	**823**	**824**	**825**	**826**

(1) With 754/755 preselector.

VECTORSCOPE SIGNAL MONITOR

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/ Broadcast Video Systems		Hitachi Denshi Ltd.	Leader Instruments Corporation	Philips Test & Measurements
Model Number	**EV4020**	**EV4060**	**V-089**	**5850**	**PM5567**
Display Size	8x10cm	8x10cm	3.5-inch	8x10cm	8x10cm
Graticule Type	Internal	External	External	Generated	Internal
Color Standard	NTSC,PAL	NTSC	NTSC	NTSC,PAL	NTSC,PAL,PAL-M
Other Function	.....	Waveform monitor	No	No	No
Video Inputs	A, B	A, B	A, B	A, B looping	A, B looping
Subcarrier Input	1	No	Yes	1	1 looping
Display Reference	A, B, External	A Channel	A or B	A, B, External	A, B, External
Calibrator	Yes	Test circle	Test circle	Test circle	Test circle
Chroma Bandwidth	.....	.....	$F_{sc} \pm 500kHz \pm 100kHz$	$F_{sc} \pm 500kHz$	$F_{sc} \pm 500kHz \pm 100kHz$
Measurement Range					
Diff. Gain	.....	.....	.....	Within 5%	Within 5%
Diff Phase	Within 2°	Within 2°	.....	Within 2°	Within 3°
Dimensions (WxHxD)	8.25"x4.8"x18"	8.5"x5.25"x18"	.....	8.5"x5.25"x18"	8.5"x5.25"x18.4"
Packaging	Bench case or 2-wide rack	Bench case or 2-wide rack	Cabinet or 3-wide rack	Cabinet or 2-wide rack	Cabinet or 2-wide rack
Reader Service Number	**787**	**788**	**789**	**790**	**791**

Manufacturer	Tektronix			Videotek
Model Number	**520A Series**	**1420 Series**	**380 Test Monitor**	**VSM-5A**
Display Size	5-inch circular	8x10cm	.....	5-inch circular
Graticule Type	External	Internal	Internal	Internal
Color Standard	NTSC,PAL,PAL-M	NTSC,PAL,PAL-M	NTSC	NTSC,PAL
Other Function	Line sweep	No	Waveform monitor, oscilloscope	No
Video Inputs	A, B looping	A, B looping	1 looping, 1 probe	A, B looping
Subcarrier Input	1 looping	1 looping	No	1
Display Reference	A, B, external	A, B, external	Input video or internal	A, B, external
Calibrator	Test circle	Test circle	.....	Test circle
Chroma Bandwidth	$F_{sc} \pm 500kHz \pm 100kHz$	$F_{sc} \pm 500kHz \pm 100kHz$	$F_{sc} \pm 500kHz \pm 100kHz$	$F_{sc} \pm 500kHz \pm 150kHz$
Measurement Range				
Diff. Gain	Within 1%	Within 5%	Within 0.5%	Within 1%
Diff Phase	Within 0.2°	Within 2°	Within 0.25°	Within 1°
Dimensions (WxHxD)	19"x7"x19.8"	8.5"x5.25"x18.5"	9.5"x4.5"x14.9"	8.5"x5.25"x18.5"
Packaging	Cabinet or rack	Cabinet or 2-wide rack	Cabinet	Cabinet or 2-wide rack
Reader Service Number	**792**	**793**	**794**	**795**

MANUFACTURERS' ADDRESSES

For addresses of manufacturers whose products are listed in this edition, refer first to the advertisers' index on page 120 and obtain address from the advertisement. For non-advertisers and companies that do not show an address on their advertisement, refer to company name and address listing in the **BE** *Buyers' Guide* (annual September issue).

Service and Parts Centers

The manufacturers advertising in the 1982 **Spec Book** have provided the addresses and telephone numbers of Service Centers and Parts Depots for your convenience.

ADM Technology
1626 E. Big Beaver
Troy, MI 48084
(313) 524-2100

American Video Products
1875 S. Santa Cruz St.
Anaheim, CA 92805
(714) 978-9002
(213) 464-7389

Anixter Mark
2180 S. Wolf Road
Des Plaines, IL 60018
(312) 298-9420
(800) 323-5273 Toll Free

Auditronics
3750 Old Getwell Road
Memphis, TN 38118
(901) 362-1350

Barco Electronics n.v.
Noordlaan 5
8750 Kuurne, Belgium
Phone: 56 35 14 11
Telex: 85 305

Rhode & Schwarz Sales Company
14 Gloria Lane
Fairfield, NJ 07006
(201) 575-0750
(800) 526-2270 Toll Free

Broadcast Microwave Services
7320 Convoy Court
San Diego, CA 92111
(714) 560-8601

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

Video Service Department
800 Tenth Ave.
New York, NY 10019
(212) 757-6977

Dielectric Communications
Route 121
Raymond, ME 04071
(207) 655-4555
(800) 341-9678 Toll Free

EECO
1601 Chestnut Ave.
Santa Ana, CA 92702-0659
(714) 835-6000

EEV Inc.
7 Westchester Plaza
Elmsford, NY 10523
(914) 592-6050

EEV Canada Ltd.
67 W. Moore
Rexdale, Ontario, Canada
(416) 745-9494

Elektroimpex (Budapest)
POB 296, H-1392
Budapest, Hungary
Telex: ELIMP H-22-5771

Enertec/Schlumberger
Departement Audio-Professionnel
1 rue Nieuport - BP 54
78140 Velizy-Villacoublay, France
Phone: (3) 946. 96. 40
Telex: ENERSON 697430 F

Fujinon Optical Inc.
672 White Plains Road
Scarsdale, NY 10583
(914) 472-9800

Fujinon Optical Inc.
118 Savarona Way
Carson, CA 90746
(213) 532-2861

Hitachi Denshi America Ltd.
175 Crossways Park W.
Woodbury, NY 11797
(516) 921-7200

JVC Company
41 Slater Drive
Elmwood Park, NJ 07407
(201) 794-3900

JVC Company
1011 W. Artesia Blvd.
Compton, CA 90220
(213) 537-6020

JVC Company
2250 Lively Blvd.
Elk Grove Village, IL 60007
(312) 364-9300

JVC Company
407 Garden Oaks Blvd.
Houston, TX 77018
(713) 694-0666

Larcan Communications Equipment
396 Attwell Drive
Rexdale, Ontario, Canada M9W 5C3
(416) 675-7517

Lexicon
60 Turner St.
Waltham, MA 02154
(617) 891-6790

Listec Television Equipment Corporation
39 Cain Drive
Plainview, NY 11803
(516) 694-8963

Listec (West) Corporation
1619 Cosmic Way
Glendale, CA 91201
(213) 247-9247

McMichael Limited
Wexham Road, Slough
Berks., England SL2 5EL
Phone: Slough 24541-5/27111-5
Telex: 849212

Midwest Corporation
P.O. Box 271, Union Building
Charleston, WV 25321
(304) 343-8874

Midwest Corporation
One Sperti Drive
Edgewood, KY 41017
(606) 331-8990

Midwest (Charlotte)
2815 Crisman St., Ste E
Charlotte, NC 28208
(704) 399-6336

Midwest (Cleveland)
7500 Wall St.
Cleveland, OH 44125
(216) 447-9745

Midwest (Columbus)
4410 Westerville Road
Columbus, OH 43229
(614) 476-2800

Midwest (Indianapolis)
8455 Keystone Crossing, Ste 101
Indianapolis, IN 46240
(317) 251-5750

Midwest (Louisville)
1804 Cargo Port
Louisville, KY 40299
(502) 291-2888

Midwest (Miami)
3331 NW 82 Ave.
Miami, FL 33122
(305) 592-5355

Midwest (Michigan)
1328 Wheaton Ave.
Troy, MI 48084
(313) 689-9730
(419) 366-6261 (Toledo)
(616) 451-3580 (Grand Rapids)

Midwest (Nitro)
P.O. Box 385
Nitro, WV 25143
(304) 722-2921

Midwest (Virginia)
1395 Airrail Ave.
Virginia Beach, VA 23455
(804) 464-6256

Midwest (Washington DC)
4720 B Boston Way
Lanham, MD 20801
(301) 577-4903

Panasonic Company (Video)
One Panasonic Way
Secaucus, NJ 07094
(201) 348-7000
(800) 447-4700 Continental US
(800) 322-4400 Illinois
(800) 447-0890 Alaska/Hawaii

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

Ramko Research
11355 A Folsom Blvd.
Rancho Cordova, CA 95670
(916) 635-3600

Studer/Revox America
1425 Elm Hill Pike
Nashville, TN 37210
(615) 254-5651

Studer/Revox America Inc.
14046 Burbank Blvd.
Van Nuys, CA 91401
(213) 780-4234

Studer/Revox America Inc.
155 Avenue of the Americas
New York, NY 10013
(212) 255-4462

Studer Revox America
910 South Glasgow
Dallas, TX 75223
(214) 760-8647

Tascam/Teac Corporation of America
7733 Telegraph Road
Montebello, CA 90640
(213) 726-0303

Teac Factory Service
539 West Golf Road
Arlington Heights, IL 60005
(312) 640-6181

Teac Factory Service
63 Bergen Turnpike
Little Ferry, NJ 07643
(201) 641-5600

Teac Factory Service
2706-A Kilihou St.
Honolulu, HI 96819
(808) 836-3623

Teac Factory Service
3731 Northcreast Road, Ste 12
Northcrest 85 Business Parkway
Atlanta, GA 30340
(404) 458-2880

Telesource Communications Services
730 E. Highland, P.O. Box 7132
Phoenix, AZ 85011
(602) 265-1232

Victor Duncan
Four Dallas Communications Complex
6305 N. O'Connor Road #100
Irving, TX 75039
(214) 869-0200

Victor Duncan
661 N. LaSalle St.
Chicago, IL 60611
(312) 943-7300

Victor Duncan
32380 Howard St.
Madison Heights, MI 48071
(313) 589-1900

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

Videotek
9625 North 21st Drive
Phoenix, AZ 85021
(602) 997-7523

For more addresses, see the September Directory issue of *Broadcast Engineering.*

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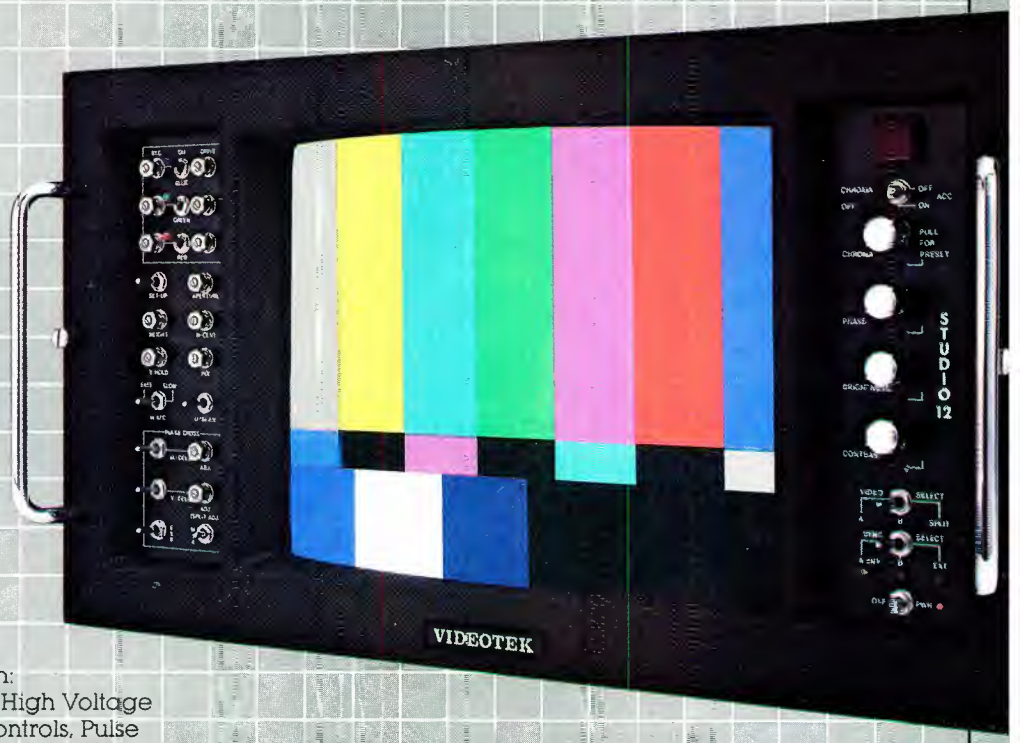
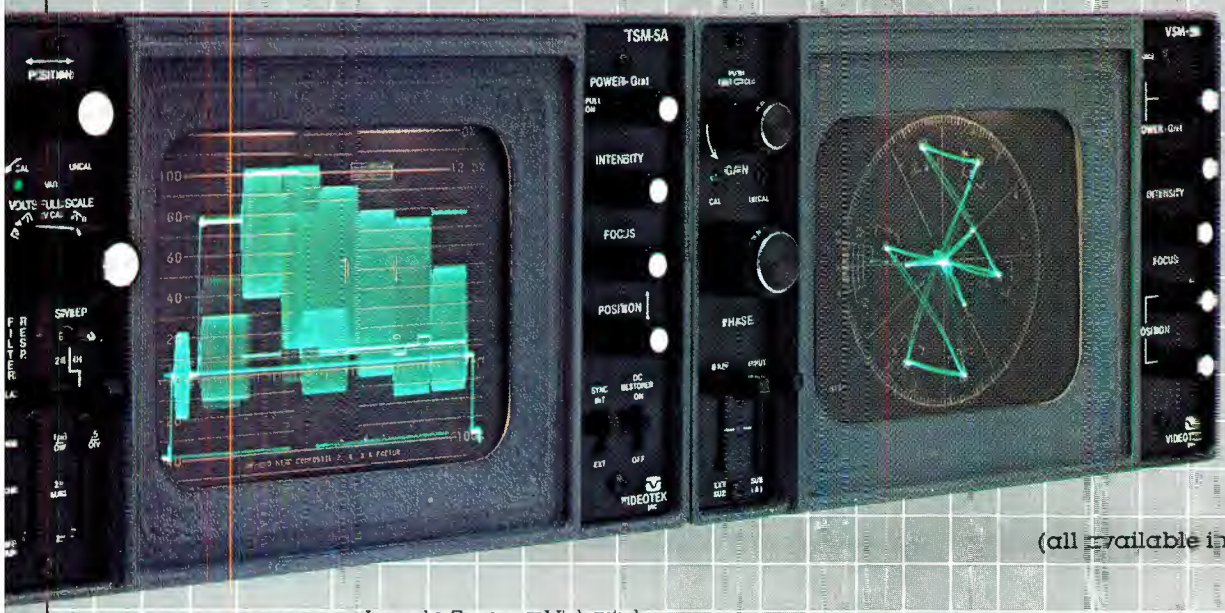
Progress by Design

Videotek's philosophy is to progressively design & refine the quality, function, and reliability of our products, and to provide equally aggressive service-after-the-sale.

Videotek's state-of-the-art TSM-5A Waveform Monitor and VSM-5A Vectorscope reflect this on-going commitment, with such innovative features as Internal Graticule CRT for precise parallax-free signal analysis, and Non-Glare Shields to eliminate distracting ambient light. TSM-5A also includes selectable 1H mode for easy one-line viewing, and 0.5 µs/div scan rate for the most accurate time-base measurements.

Our popular Studio 12 picture monitor includes, as standard equipment, the features found on monitors costing twice as much: A-B Split Screen, Selective H-AFC, High Voltage Regulation, ACC-Defeat, Preset Controls, Pulse Cross, Underscan, External Sync plus more.





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