DISTRIBUTION AMPLIFIERS
AND
VIDEO & AUDIO PRODUCTS

ESE

- *S-VHS*   • *Audio Video*   • *High Resolution*   • *Time Code*   • *Color Bars*   • *Black Burst*

- *Inserters*   • *Faders*   • *VU Indicators*   • *Level Interfaces*   • *Clock & Timers*

In 1982 **ESE** introduced our first Distribution Amplifier (DA), the ES-207. Since then, we have sold nearly 10,000 of those simple 1 x 4 Video DAs and added over 40 other products to the DA line. That same year **ESE** demonstrated our further commitment to the Broadcast Industry when we introduced the ES-206 (Time and Date Video Inserter) and ES-214 (Digital VU Indicator). These two products marked the beginning of our Video Product Line and our Audio Product Line, respectively. Thirty years later, updated versions of these early units continue to be produced - distinguished examples of our products' longevity in keeping with **ESE's** 40+ years of excellence.

Applications

- Schools & Distant Learning Centers
- Recording & Duplication Facilities
- Tele-Conferencing Centers
- Post Production Houses
- Broadcast Facilities
- Recording Studios
- Network TV

Features

- NTSC & PAL
- 5 year Warranty
- Digital & Analog
- Broadcast Quality
- Custom Capabilities
- Many Options Available
- Designed For Convenience & Durability

ESE

TABLE OF CONTENTS

ESE *142 SIERRA ST., EL SEGUNDO, CA 90245 (310)322-2136 FAX (310)322-8127 www.ESE-WEB.com*

3G/HD/SD SDI VIDEO
DISTRIBUTION AMPLIFIERS

The **DV-201**, **DV-207, DV-208**, **DV-212, DV-222** and **DV-228** are 3G/HD/SD SDI Distribution Amplifiers. These units feature high-performance & low-cost and are able to distribute 3Gb/s, 1.5Gb/s & 270Mb/s data rates. They automatically detect the data rate and then re-clock and equalize the signal. These Distribution Amplifiers can equalize 400m @ 270Mb/s, 200m @ 1.5Gb/s and 140m @ 3Gb/s. Each of the units are DVB-ASI compliant at 270Mb/s. When the units are in Reclock mode, they automatically lock to and reclock the DVB-ASI signal. Additionally, the **DV-207, DV-208**, **DV-212**, **DV-222** and **DV-228** provide a non-reclocked loop output.

Features:

- Automatic Input Rate Detection
- Reclocking & Equalization
- Rate Indicators

- 270Mb/s, 1.5Gb/s, 3Gb/s
- Reclocking Bypass Switch
- DVB/ASI Compliant @ 270Mb/s

DV-207
(1 x 4)

DV-201
(1 x 4)

(optional rackmount available)

DV-208
(1 x 12)

DV-222
(Dual 1 x 4)

DV-212
(1 x 12)

DV-228
(1 x 8)

SPECIFICATIONS

POWER: 110 – 120 VAC, 50 – 60 Hz, 5 Watts maximum
85 – 264 VAC, 47 – 63 Hz, 15 W maximum (DV-212, DV-222, DV-228)

MECHANICAL: Desktop Enclosure 1.6" H x 7" W x 5" D (DV-201)
Die Cast Box 4.7" H x 3.7" W x 2.2" D (DV-207, DV-228)
Die Cast Box 7.4" H x 4.7" W x 2.2" D (DV-208, DV-222)
Rackmount Enclosure 1.75" H x 19" W x 4.8" D (DV-212)

VIDEO STANDARDS: SMPTE 259M-C, SMPTE 292M and SMPTE 424M compliant

VIDEO INPUT: 1 BNC
1 BNC per channel (DV-222)

LOOP THROUGH: 1 BNC (DV-207, DV-208, DV-212, DV-228)
1 BNC per channel (DV-222)

CABLE EQUALIZATION: 2.97Gb/s: 140m @ 0.3UI (Belden 1694A cable)
1.485 Gb/s: 200m @ 0.3UI (Belden 1694A cable)
270 Mb/s: 400m (Belden 1694A cable)

VIDEO OUTPUTS: 4 BNCs (DV-201, DV-207)
4 BNCs per channel (DV-222)
8 BNCs (DV-228)
12 BNCs (DV-208, DV-212)

OPTIONS: DC, J, P, P2, UL (DV-201)
DC, J, UL (DV-207, DV-208)
DC, UL (DV-212, DV-222, DV-228)

1 X 12 & 1 X 24
VIDEO/STEREO
DISTRIBUTION AMPLIFIERS

The **ES-209A** is a 1 x 12 Video Distribution Amplifier combined with a 1 x 12 Dual Audio Distribution Amplifier. The **ES-224** is very similar except that it is a 1 x 24 version. They are primarily designed to meet the needs of tape duplication systems as well as installations that require Audio and/or Video Distribution. Front panel-mounted controls are provided to adjust Video (EQ & Gain) and Audio (Left & Right Gain) output signals.

Features:

- Left & Right Channel Audio Gain Controls
- Professional Audio & Video Quality
- Transformerless Audio DA
- 1 x 12/24 Video DA
- 1 x 12/24 Stereo DA
- Video EQ & Gain Controls

- Loop-thru Audio & Video Inputs
- Accepts Balanced or Un-Balanced Audio

- Internal Linearity Control
- Rack Mount Enclosure

The video section of the **ES-209A** and **ES-224** may be used for signal distribution and for signal conditioning. They are capable of delivering the very highest professional video quality. The Equalization Control (EQ) may be used to boost chroma in recording if desired. The Gain Control provides an output from .5 Vpp to 1.5 Vpp (with 1 Vpp input).

The audio portion of the unit is designed to create 12/24 identical copies of the stereo input drive signals. Response, distortion and noise specifications make the stereo performance of the DA ideal for tape duplication or signal distribution, The audio DA input is balanced or un-balanced (hi-impedance), while the outputs are medium, and will drive either 600Ω or hi-impedance inputs.
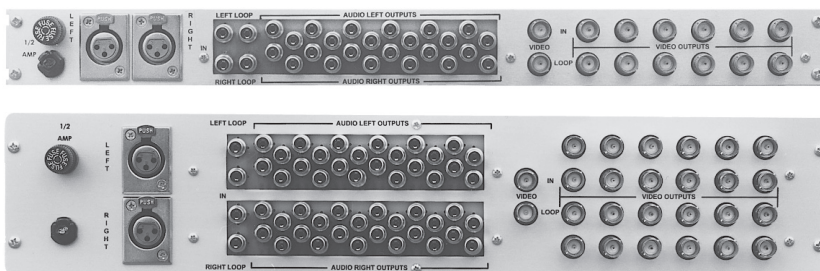
Specifications

VIDEO

Input:	75Ω loop-thru, 1.0 Vpp nominal video, 15pf parallel
Response:	10 Hz - 10 MHz, +/-.5dB
Propagation Delay:	3ηs
Differential Gain:	< .2%
Differential Phase:	< .2⁰ (internal null pot)
S/N Ratio:	< 62dB below 1 Vpp output
Gain:	-2dB to +3dB
Equalization:	Will roll down 1dB or up 7dB at 3.58 MHz; EQ control compensates up to 1000' of RG-59
Output Isolation:	45dB between outputs
Output:	1.0 Vpp video, blanking at 0V DC. 12/24 identical outputs
Source:	75Ω
Connectors:	BNC, 14/26

AUDIO
(Dual Channel)

Input:	Balanced or Unbalanced, 2KΩ - 25KΩ
Gain:	+18dB maximum
Output Level:	+21dB Maximum
Output:	600Ω Unbalanced
Hum and Noise:	-112dB typical under +8dBm output -84dB min. under -20dBm output
Response:	Within 0.2dB, 20-20,000 Hz Within .5dB 2-35,000 Hz
Distortion:	Less than 0.1% at 0dBm output
Connectors:	28/52 RCA, 2 XLR

GENERAL

Dimensions:	19" Rack x 1.75" High x 5" Deep (**ES-209A**) 19" Rack x 3.5" High x 5" Deep (**ES-224**)
Power:	117 VAC 50/60 Hz, 5 W
Options:	J, UL

DUAL 1 X 4 AUDIO/VIDEO DA
WITH 5 BLACK BURST SYNC OUTPUTS

The **ES-2940** is a single rack mounted unit which contains two Audio Distribution Amplifiers, two Video Distribution Amplifiers and a five output RS-170A Black Burst Sync Generator (BBSG). The unit is designed to meet the requirements of systems which must interface with, distribute and synchronize video and audio signals.

Features:

- Video Gain & EQ Controls
- Audio Gain Controls
- Five RS-170A Black Burst/Sync Outputs
- Rack Mount Enclosure
- Two 1 X 4 Video DA's
- Two 1 X 4 Audio DA's
- Accepts Balanced or Unbalanced Audio
- Broadcast Quality Audio & Video

Each of the two 1 x 4 Video DA's provide a loop-thru input and four isolated outputs. Screwdriver adjustable Gain and EQ controls are accessible on the front panel, all inputs and outputs are provided on rear mounted BNC connectors.

Both 1 x 4 Audio DA's accept one balanced (or unbalanced) audio signal and produce four identical copies. Each of the totally isolated outputs has its own front panel-mounted Gain control (an adjustable, internally mounted input attenuator is also provided). The audio inputs and outputs are accessible on rear mounted terminal blocks. If unbalanced outputs are desired, then each of the 1 x 4 Audio Distribution Amplifiers can provide up to eight separate and isolated feeds.

The BBSG provides a convenient source of composite black burst for pre-blacking video tape or for general synchronization purposes. The output signal consists of sync, blanking, reference black setup level and colorburst which is SCH phased. The five RS-170A outputs are provided on rear mounted BNC connectors.

Specifications

GENERAL

Power: 117 VAC, 50/60 Hz
Mechanical: 1.75" x 19" Black Anodized Panel and Chassis 5" Deep
Options: J, UL

1 x 4 AUDIO DA

Gain: +18dB maximum
Input: Balanced or unbalanced; 2KΩ (input attenuator at maximum) 25KΩ (input attenuator at minimum)
Output: 600Ω balanced or unbalanced
Output Level: +21dBm maximum
Response: 20-20,000 Hz, +/- 0.2dB
Hum and Noise: -90dB typical under +18dBm output
Distortion: Less than 0.2% at +18dBm output

1 x 4 VIDEO DA

Input: BNC Loop-thru, 1 Vpp nominal
Output: 4 BNC output, 1 Vpp nominal 75Ω source
Gain Range: -2dB to +3dB adjustable
EQ Range: up to 1000' of RG-59
Frequency Response: 10 Hz - 10 MHz +/- .5dB
Slew Rate: 750v/μS
Differential Gain: <0.2% @ 3.58 MHz
Differential Phase: < .2⁰ @ 3.58 MHz
S/N Ratio: 62dB
Propagation Delay: 3ηs
Output Isolation: 45dB
Maximum Output: 2.7 Vpp into 75Ω, outputs loaded

BBSG

Output: 5 BNC, 75Ω, RS-170A composite video Sync & Burst 40 IRE, Setup 7.5 IRE

AUDIO DISTRIBUTION AMPLIFIERS

The **ES-217** & **ES-218** (1x4) and the **ES-245** & **ES-246** (Quad 1x6) are Audio Distribution Amplifiers that accept a balanced or unbalanced audio signal and produce exact copies of that signal. The outputs are isolated and have recessed Gain controls. These units are the "Audio Counterparts" of the Video DA's (ES-207A and ES-247E respectively) shown on page 6.

All inputs and outputs are accessible on terminal blocks for simple "permanent" installations. Or, if option "XLR" is specified, all inputs and outputs are available on XLR connectors for easy disconnect/reconnect.

Features:

- Terminal Block Inputs/Outputs (Optional XLR Connectors)
- Accepts Balanced or Unbalanced Audio
- Professional Audio Quality
- Ruggedized Enclosure
- Transformerless Audio

ES-217XLR
ES-217
ES-246
ES-246/XLR & ES-245/XLR
Rear View
ES-246 & ES-245
Rear View
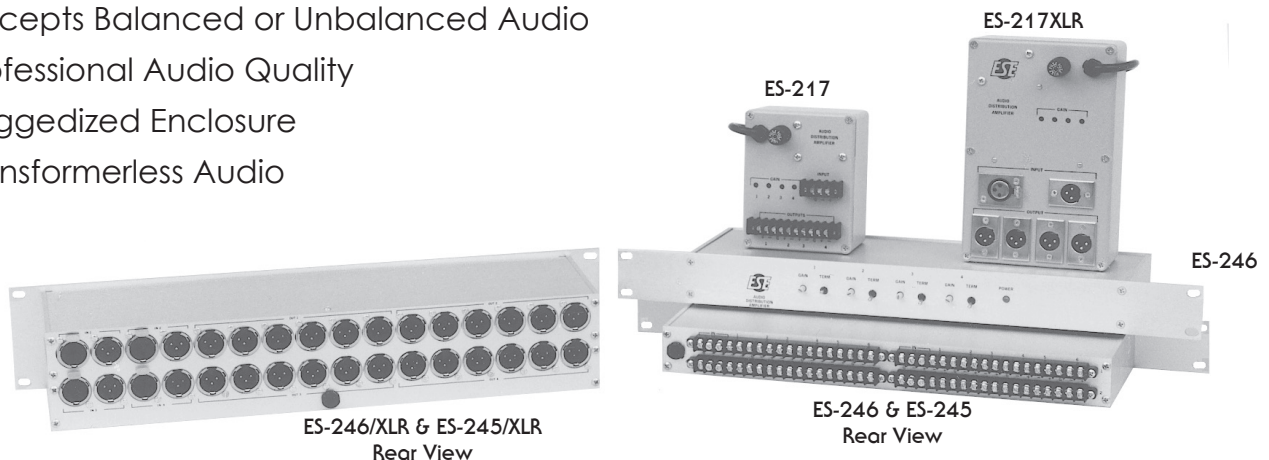
The **ES-217** is an Audio DA with four independently adjustable (via the top-mounted Gain controls) outputs, while the **ES-218*** has a single Gain control that adjusts all four outputs simultaneously. The transformerless design accepts balanced or unbalanced audio and provides four exact copies. If unbalanced outputs are desired, up to eight separate and isolated feeds can be made. An input attenuator is also provided which is internally adjustable and may be used when using lower input levels. These rugged units are housed in orange-painted, die-cast aluminum boxes.

The **ES-245*** is a quad 6-output Audio DA with 24 independently adjustable (via front-mounted Gain controls) outputs, while the **ES-246** has four Gain controls (one per input channel). The unit is a transformerless design and each of the four channels accepts a balanced or unbalanced audio signal that provides six exact copies. If unbalanced outputs are desired, up to twelve separate and isolated feeds can be made per channel. An input termination switch (between 600Ω and 100KΩ) is also provided on the **ES-246**.

*(Not Shown)

Specifications

	ES-217	ES-218	ES-245	ES-246
Input:	Balanced or Un-balanced 2KΩ - 25KΩ	Balanced or Un-balanced 100KΩ	Balanced or Un-balanced 2KΩ - 25KΩ	Balanced or Un-balanced 600Ω or 100KΩ, switchable
Response:	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB
Gain:	+18dB maximum	+18dB maximum	+20dB maximum	+20dB maximum
Gain Controls:	Four	One	24 (one per output)	Four (one per input)
Output:	600Ω	600Ω	600Ω	600Ω
Output Level:	+21dB maximum	+26dB maximum	+26dB maximum	+23dB maximum
Connectors:	Terminal Block	Terminal Block	Terminal Block	Terminal Block
Enclosure:	Die-cast Orange Box	Die-cast Orange Box	Rack Mount	Rack Mount
Dimensions:	4.7" x 3.7" x 2.2"	4.7" x 3.7" x 2.2"	1.75" x 19" x 5"	1.75" x 19" x 5"
Electrical:	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
Power Required:	3 Watts	3 Watts	5 Watts	5 Watts
Options:	J, UL, XLR	J, UL, XLR	J, MT, UL, XLR	J, UL, XLR

VIDEO DISTRIBUTION AMPLIFIERS

ESE offers several DAs that operate with standard NTSC or PAL video signals. Described below are the **ES-207A** (1x4), **ES-208** (1x12) and **ES-247E** (Quad 1x6). The "Audio Counterparts" to the **ES-207A** and the **ES-247E** are described on page 5.

The **ES-247E** is a quad 6 output Video Distribution Amplifier housed in a traditional rack mount enclosure. Meanwhile, the **ES-207A** and **ES-208** Video Distribution Amplifiers answer the "one more unit" question with a versatile little package that can be stashed most anywhere, either temporarily or permanently. Controls are accessible with a miniature screwdriver through the front panel/top plate for Video Gain, HF Equalization and, in the case of the **ES-208**, DC Level. A single pair of BNC connectors are wired for a loop through input.

Features:

- Ruggedized Enclosure
- Video Gain & EQ Controls
- Loop-thru Input
- Equalization For Up To 1000' of RG-59 Cable
- Broadcast Quality Distribution
- DC Coupling Available
- Recessed Controls

ES-208

ES-207A

ES-247E (Rear View)

ES-247E

These amplifiers can be used for distribution and for signal conditioning, with the EQ control equalizing up to 1000 feet of RG-59 coaxial cable. A very wide range of chroma level adjustment can be obtained with the Gain control. The **ES-208**'s output video should be set for 0 VDC (using the DC control) on the blanking or porch level, with video extending positive and sync negative.

Specifications

	ES-207A	ES-208	ES-247E
Input:	1 Vpp	1 Vpp	1 Vpp
Source:	75Ω	75Ω	75Ω
Response:	10 Hz - 10 MHz, +/-1dB	10 Hz - 10 MHz, +/-1dB	10 Hz - 10 MHz, +/-1dB
Equalization:	1000' of RG-59	1000' of RG-59	1000' of RG-59
Gain:	-2dB to +3dB	-2dB to +3dB	-2dB to +3dB
S/N Ratio:	62dB	62dB	62dB
Output Isolation:	45dB	45dB	45dB
Differential Gain:	<.2%	<.2%	<.2%
Differential Phase:	$< .2^0$	$< .2^0$	$< .2^0$
Propagation Delay:	5ηs	100ηs	5ηs
Gain Controls:	One	One	Four (one per input)
Output Level:	1 Vpp	1 Vpp	1 Vpp
Connectors:	BNC	BNC	BNC
Enclosure:	Die-cast Orange Box	Die-cast Orange Box	Rack Mount
Dimensions:	4.7" x 3.7" x 2.2"	7.3" x 4.7" x 2.2"	1.75" x 19" x 5"
Electrical:	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
Power Required:	3 Watts	3 Watts	10 Watts
Options:	J, UL	J, UL	J, UL

1X4 VIDEO DISTRIBUTION AMPLIFIER
(INDEPENDENTLY ADJUSTABLE CHANNELS)

ESE's introduction of the **ES-201** presents the first affordable high performance Video DA with "separate" Gain and Equalization controls. Each of the four video outputs are independently adjustable via separate (recessed) front panel mounted controls. A video loop-thru input and four isolated outputs are accessible via rear panel mounted BNC connectors.

Features:

- Cascadable

- Loop-Thru Input

- Recessed Controls

- DC Coupling Available

- Four Separate Pairs Of Gain & EQ Controls

- Rack Mount Option Available (one per panel or two per panel)

- Each Output Can Compensate For Up To 1000 Feet Of RG-59 Cable
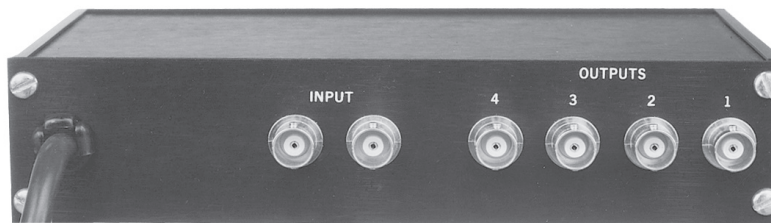
Specifications

Input:	BNC loop-thru, 1 Vpp nominal
Source:	75Ω
Response:	10 Hz - 10 MHz, +/-1dB
Equalization:	up to 1000' of RG-59
Gain:	-2dB to +3dB adjustable
S/N Ratio:	62dB
Output Isolation:	45dB
Differential Gain:	< 0.2% @ 3.58 MHz
Differential Phase:	< 0.2^0 @ 3.58 MHz
Propagation Delay:	3ηs
Slew Rate:	750 V/µS
Output Level:	1 Vpp nominal
Maximum Output:	2.7 Vpp into 75Ω (all outputs loaded)
Connectors:	BNC
Enclosure:	Desk-Top, Black Anodized Aluminum
Dimensions:	1.6" H x 7" W x 5" D
Electrical:	117 VAC, 50/60 Hz
Power Required:	3 Watts
Options:	J, P, P2, UL

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Y/C VIDEO (S-VHS)
&
HIGH RESOLUTION VIDEO (120 MHz)
DISTRIBUTION AMPLIFIERS

The **ES-227** and **ES-237** are 1 x 4 Video Distribution Amplifiers designed to meet the needs of those using Y-C component video (S-VHS) or High-Resolution Video (120 MHz),respectively. Each unit has a loop-thru input and four isolated outputs. Applications include graphics, medical imaging, HDTV and composite video.

Features:

- Loop-thru Video Inputs
- Ruggedized Enclosure
- Broadcast Quality
- Video Gain Control
- Recessed Controls
- EQ Control (optional on ES-237)

Specifications

|	**ES-227 Y-C (S-Video)**	**ES-237 High Resolution**
Input:	1 Vpp	1 Vpp
Response:	30 Hz to 10 MHz, +/-1dB (Y-Bandwidth),	10 Hz - 100 MHz, +/-1dB,
Response:	0.5 MHz to 10 MHz, +/-1dB (C-Bandwidth)	100 MHz - 120 MHz, +/-3dB
Equalization:	up to 1000' of RG-59	100-400' of RG-59 (EQ Option only)
Gain:	+9dB Maximum @ 3.58 MHz (Y-EQ)	-2.5dB to +4dB Adjustable
Gain:	-3.5 to +10.5dB (C)	-
S/N Ratio:	>45db	>74dB
Output Isolation:	40db to 10 MHz	40dB to 120 MHz
Differential Gain:	<0.2% @ 3.58 MHz	<0.1% @ 3.58 MHz
Differential Phase:	<0.2^0 @ 3.58 MHz	<0.15^0 @ 3.58 MHz
Propagation Delay:	10ηS	2ηS
Slew Rate:	>60v/μS	>2000 V/μS
Output Levels:	0.6 to 1.5 Vpp @ 1 Vpp Input (Y)	2.8 Vpp @ 1 KHz, 1.2 Vpp @ 120 MHz
Connectors:	S-VHS	BNC
Enclosure:	Die-cast Orange Box	Die-cast Orange Box
Dimensions:	7.3" x 4.7" x 2.2"	4.7" x 3.7" x 2.2"
Electrical:	117 VAC, 50/60 Hz:	117 VAC, 50/60 Hz
Power Required:	5 Watts	5 Watts
Options:	J, UL	EQ, J, UL

"PC" CARD
DISTRIBUTION AMPLIFIERS

ESE's family of Distribution Amplifiers includes three 1 x 4 "PC" Card DA's. These products are designed to plug into any computer with PC/compatible expansion slots (ISA). The boards are half card size and require no additional power (other than that provided by the computer).

If space and convenience are considerations, these "PC" cards provide exactly that, another practical solution from *ESE*.

Features:

- Gain & EQ Controls
- Desk Top Editing Systems
- Computer Based Systems
- Audio And/Or Video Distribution
- RCA Input And Output Connectors (**PC-217ISA**)
- BNC Input And Output Connectors (**PC-207ISA** & **PC-237ISA**)
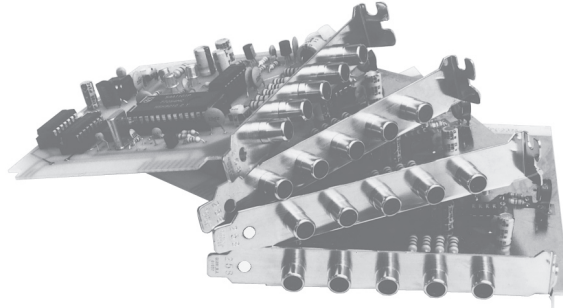
PC-207ISA
Video DA

The **PC-207A** is a 1 x 4 Video Distribution Amplifier designed for use in most video systems. This "PC Product" is the ideal choice when distributing a video signal to more than one monitor or VCR. Also, the **PC-207ISA** provides a perfect method to compensate for lengthy cable runs.

The **PC-207ISA** provides a single input and four isolated outputs via the BNC connectors on the rear card guide bracket & offers a power bandwidth of 10MHz; +/-1dB. Gain and Equalization controls are also provided. Specifications are equivalent the those of the ES-207A (see page 7).

PC-217ISA
Audio DA

The **PC-217ISA** is a 1 x 4 Audio Distribution Amplifier. The unit receives a single unbalanced audio input and creates four identical copies. Inputs and outputs are accessible via RCA connectors on the rear card guide bracket. The output level (Gain control) of the **PC-217ISA** is adjustable and each output is completely isolated.

This "PC-Card" product is a must when sending an audio signal or time code (such as SMPTE or IRIG) to multiple sources or along lengthy cables. Specifications are equivalent to those described in the Audio section of the ES-2940 (see page 5).

PC-237ISA
High-Resolution Video DA

The **PC-237ISA** is a 1 x 4 Video Distribution Amplifier. The unit offers a wide power bandwidth of 100 MHz; +/-1dB (120MHz; +/-3dB) and provides an excellent, low cost solution to the most demanding video requirements. It is designed for use in high resolution video systems including graphics, HDTV, composite video and medical imaging.

The **PC-237ISA** provides a single input and four outputs via the BNC connectors on the rear card guide bracket. The Gain control and an optional Equalization control are board mounted. Specifications are equivalent to those of the ES-237 (see page 9).

TIME CODE
ISOLATION & DISTRIBUTION AMPLIFIERS

Since the early '80s, **ESE**'s Audio and Video Distribution Amplifiers have been recognized for their quality and durability. Using very similar technology, **ESE** presents a line of Distribution Amplifiers (DAs) capable of isolating and distributing most any type of Time Code. The basic idea for each model is the same... provide the ability to distribute time code and compensate for lengthy cable runs while isolating each unit in the Master Clock System.

Described below are units capable of handling any of the IRIG time codes, **ESE** Time Code or ASCII time code. If you're in need of a DA not mentioned here refer to our *DISTRIBUTION AMPLIFIERS* Brochure available on our website or contact the **ESE** Factory.

ES-210
Quad 1x6 1/5/10 MHz DA

The **ES-210** provides four independent 1x6 Frequency DAs in a single rack-mount enclosure. Each DA has loop-thru inputs and six isolated outputs, all accessible via BNC connectors. Screwdriver-adjustable Gain controls are provided on the front of the case. The Gain control provides an overall signal level adjustment of -1.6 to +3.4 db. Unused outputs need not be terminated.

ES-242
Quad 1x6 IRIG(AM) DA

The **ES-242** is a quad, 6-output IRIG Time Code DA. Each amplifier provides a loop-thru input & six 600 ohm outputs. The inputs/outputs are connected via rear mounted BNC connectors. The unit distributes IRIG A, B, E, NASA36, XR3, 2137 & CS3 time codes it has a transformerless design that takes a single unbalanced input and provides six unbalanced single ended outputs.

ES-243
Quad 1x6 ESE DA (or IRIG-'TTL')

The **ES-243** is designed to accept any **ESE** time code signal or any IRIG time code in its "TTL" form and output up to 24 identical copies. The unit has four separate and isolated channels, each with six available outputs. Inputs and outputs are via rear mounted BNC connectors and each output is capable of driving up to 4000' of cable.

ES-249
1x8 RS-232C/ASCII DA

The **ES-249** is designed to accept RS-232C/ASCII and output up to eight identical copies. The unit has a single input and eight outputs that are accessible on rear mounted 9-pin D-sub connectors. Due to the nature of RS-232C, if long cable runs are required, it may be necessary to utilize other time code that is later translated into RS-232C. The unit is rack mounted.

ES-250
1 x 24 RS-232/ASCII DA

The **ES-250** is an RS-232C Isolation and Distribution Amplifier. Three 1 x 8 amplifier circuits allow the incoming signal to be distributed via the 24 outputs. The unit receives RS-232C and buffers the signal so that each of the 24 outputs can drive a single "user" at a distance of up to 50 feet (per output). All inputs and outputs are via rear mounted terminal block connectors.

ES-251
1 x 24 RS-232/ASCII DA

The **ES-251** is an RS-232C Isolation and Distribution Amplifier. Three 1 x 8 amplifier circuits allow the incoming signal to be distributed via the 24 outputs. The unit receives RS-232C and buffers the signal so that each of the 24 outputs can drive a single "user" at a distance of up to 50 feet (per output). All inputs and outputs are via rear mounted terminal DB-9 connectors.

Specifications

	ES-210	ES-242	ES-243	ES-249	ES-250	ES-251
Electrical:	110-120 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz
Power:	5 Watts Maximum	5 Watts Maximum	2 Watts Maximum	2 Watts Maximum	2 Watts Maximum	2 Watts Maximum
Mechanical:	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	3.25" x 19"; 5" Deep
Time Code-	10 KHz-15mHz +/- .5db,	IRIG (A, B or E) NASA 36,	**ESE** (TC76, TC89 or TC90)	ASCII (RS-232C)	ASCII (RS-232C)	ASCII (RS-232C)
Input/Output:	1 Vpp nominal, 50 ohm	XR3, 2137 & CS3	or IRIG(A, B or E)AM Form	-	-	-
Connectors:	BNC	BNC	BNC	9-Pin D-Sub	Terminal Block	9-Pin D-Sub
Configuration:	Quad 1 x 6 (1 x 24)	Quad 1 x 6 (1 x 24)	Quad 1 x 6 (1 x 24)	Single 1 x 8	1 x 24	1 x 24
Options:	J,UL	J, UL	J, UL	J, UL	J, UL	J, UL

HD & SD SDI
PATTERN GENERATORS

The **DV-229** and **DV-230** are Standard Definition (SD) and High Definition (HD) Serial Digital Interface (SDI) Signal Generators. These units are capable of generating a variety of different patterns. Conveniently located on the front panel are five pushbuttons allowing the user to easily set up the **DV-229** and **DV-230** using the menus on the LCD. Alternatively, the user can connect the units to a computer using a USB cable and can then use the DV-229/230 Control Panel software to set up the units. The **DV-229** provides Two identical SDI outputs while the **DV-230** supplies Four identical SDI outputs and a Genlock Input (bi-level or tri-level) all of which are accessible on BNCs located on the rear panel.

These generators produce 4:2:2 (525 and 625 line) digital video signals and are SMPTE 424M, SMPTE 292M and SMPTE 259M compliant.

Features

- 2 SDI Outputs (DV-229)
- 4 SDI Outputs (DV-230)
- Genlock Input (DV-230)
- Twenty Test Patterns
- Universal Power Supply (85-264 VAC)
- Moving Patterns
- Embedded Audio Tone
- RP-188 Time Code Insertion
- Optional Rack Mount
- Closed Caption Insertion
- Onscreen Time Code & User Text Insertion

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The main menu consists of ten items, described separately below.

Video Format: Sets the Video Format.
Available choices are 1080i60, 1080i59.94, 1080i50, 1080p30, 1080p29.97, 1080p25, 1080p24, 1080p23.98, 1080psf24, 1080psf23.98, 720p60, 720p59.94, 720p50, 525i, 625i.

Video Pattern: Sets the visual pattern to display.
Available choices are: Color Bars, Full Color Bars, S198M Check Field, Border Lines, Noise, Gradient, Gray Levels, Red Levels, Green Levels, Blue Levels, White, Red, Green, Blue, 15% Gray, 25% Gray, Black, Target, V Lines, H Lines.

Audio: Sets the mode for the embedded audio test tones.
There are 3 sub menus:
Audio Embed: Enable or Disable the embedding of the audio tone.
Group 1 Freq: Selects 500Hz or 1000 Hz as the test tone for Audio Group 1.
Group 2 Freq: Selects 500Hz or 1000 Hz as the test tone for Audio Group 2.

Motion: Sets the onscreen motion options:
None (pattern is stationary), Square (moving square box, "pong" style, over the currently selected pattern), Square Inv(screen is black, with a square transparent box which reveals the currently selected pattern, moving in a "pong" fashion), Full Motion (the Color Bars pattern moves continuously in a down/right diagonal direction).

Time Code: Sets options for embedding time code or burning in the onscreen time code window.
There are several sub-menu options.

Text Burn: Sets parameters for the text window burn.
Burn Mode: Sets the window appearance - White with Black Background, Black with White Background, White with No Background, Black with No Background, or Disabled (no insert).
Clear Text: Resets the Text to blank.
Set Text: Allows setting of each text character. Navigate left/right in the text line using the LEFT and RIGHT pushbuttons, scroll through the available characters using the UP and DOWN pushbuttons. Select the currently displayed character using the MENU/SET pushbutton.
Text Burn VPOS: Sets the Vertical position of the text window.
Text Burn HPOS: Sets the Horizontal position of the text window.

SMPTE 352M: Enables or Disables insertion of SMPTE 352M Payload Identification data.

Closed Caption: Enables or Disables insertion of the Closed Caption test text string ("ESE DV-229/230"). It is fixed and cannot be changed. Customized Captions are available on a custom basis. Consult Factory.

Color IRE: Sets the Color IRE level from 0% to 100%.
Default is 100%.

Save Settings: Commits the current settings to the non-volatile FLASH memory.

EXAMPLES:

Color Bars   Grey Levels

Gradient   Target

DV-229/DV-230 Control Panel Software
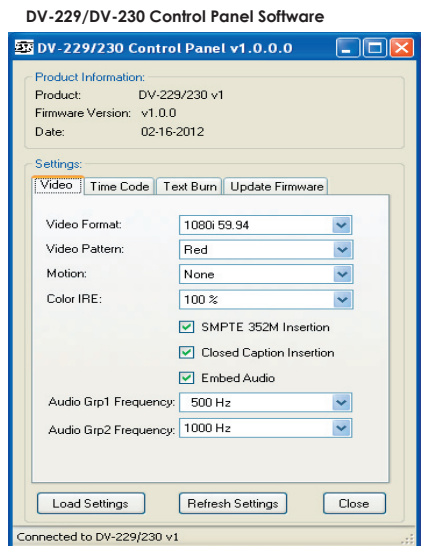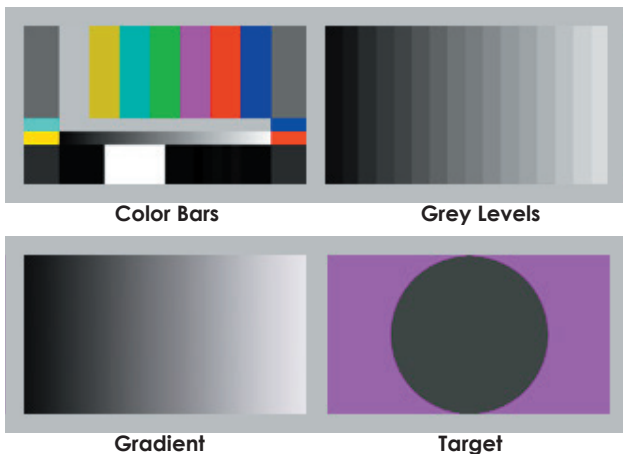
SPECIFICATIONS

POWER:	85 – 264 VAC, 47 – 63 Hz, 20 Watts maximum
MECHANICAL:	Black anodized aluminum enclosure 1.6" H x 8" W x 7.3" D
TIME & SETUP/STATUS DISPLAY:	16 x 2 character LCD
SD SDI OUTPUT:	SMPTE 259M-C (270Mb/s)
SD SDI OUTPUT SWING:	800 mV typical
SD SDI OUTPUT RISE/FALL TIME:	660 ps typical
GENLOCK INPUT (DV-230):	Bi-level or Tri-level, 75 Ohm
OPTIONS:	DC, P, P2, UL

ES-229 & ES-230
NTSC / PAL COLOR BAR GENERATORS

The **ES-229** and **ES-230** are Color Bar Generators that can be used for aligning monitors or for checking the signal fidelity of a video system. Both units generate RS-170A full-field bars or black-burst. The **ES-229** provides one composite output and one S-Video output while the **ES-230** provides eight composite outputs. Front-panel DIP switches allow selection of Auto-Black, Bars / Black, Interlace / Progressive, NTSC pedestal On / Off, Chroma On / Off and PAL mode.

If the "Tone" option is ordered on the **ES-229**, a 1 KHz tone is output from the rear-mounted RCA connector and on the **ES-230**, the frequency can be set to 400 Hz or 1 KHz.
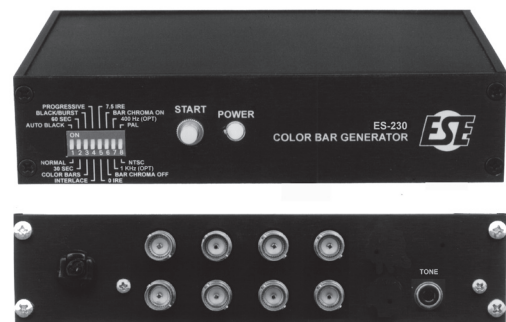
Features

- Auto-black Mode (30 Or 60 Second Delay)
- Optional 1 KHz (400 Hz) Tone
- Switchable NTSC Pedestal
- Color Bars Or Black-Burst
- Interlace Or Progressive
- PAL And NTSC Modes
- Chroma On/Off

Applications

- Pre-Blacking Video Tape
- Video System Synchronization
- Alignment Of Video Monitors
- Pre-Blacking Video Tape
- Checking Signal Fidelity Of Video Systems
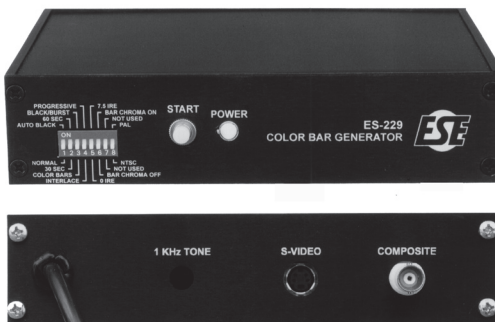
ES-229

ES-230

Operation Notes:

The "Auto-Black" mode generates Color Bars (& Tone if ordered) for 30 or 60 seconds after the START button is pressed, then switches to silent Black-Burst. In "Bars" mode, only color bars are output and in "Black" mode, only Black-Burst is output. The "Interlace/Progressive" switch allows for either 524/624 Line Progressive or 525/625 Line Interlace operation and the "Pedestal" switch allows selection between 7.5 IRE Setup or 0 IRE when in NTSC mode (In PAL mode, 0 IRE is output regardless of setting.). Burst is always present whether the "Bar Chroma" switch is on or off.

Specifications

	ES-229	ES-230
Outputs:	1 Composite, BNC	8 Composite, BNC
	1 S-Video, Mini-DIN	-
Video Level:	75% amplitude, 75% saturation (NTSC)	75% amplitude, 75% saturation (NTSC)
	75% amplitude, 100% saturation (PAL)	75% amplitude, 100% saturation (PAL)
Output Impedance:	75Ω	75Ω
Differential Gain:	0.8%	0.8%
Differential Phase:	0.8°	0.8°
SNR:	60db	60db
Hue Accuracy:	1.0°	1.0°
Saturation Accuracy:	1.0%	1.0%
Enclosure:	Desk-Top, Black Anodized Aluminum	Desk-Top, Black Anodized Aluminum
Dimensions:	1.6" H x 7" W x 5" D	1.6" H x 7" W x 5" D
Tone (optional):	1 KHz Sine Wave, 0 dbm, RCA	400 Hz / 1 KHz Sine Wave, 0 dbm, RCA
Electrical:	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
Power:	5W maximum	5W maximum
Options:	J, P, P2, Tone, UL	J, P, P2, Tone, UL

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ES-219A
## RS-170A BLACK BURST GENERATORS / SYNCHRONIZERS

The **ES-219A** is a Black-Burst / Sync Generator with four isolated outputs. The unit provides a dependable and stable composite black-burst signal for pre-blacking tapes and/or for general synchronization purposes. The output signal of the **ES-219A** consists of sync, blanking, reference black setup level and color burst which is SCH phased. Subcarrier frequency and SCH phase may be adjusted if desired.

Applications:
- Multi-Camera Video Signal Synchronization
- Broadcast Systems   • Pre-Blacking Tapes
- Desk Top Video Editing Systems

ES-219A

ES-219AP

Features:
- Optional Rack Mount Enclosure
- Four Isolated RS-170A Black Outputs
- Optional Audio Reference Tone (1 KHz Output) via RCA Connector
- All Outputs Via BNC Connectors   • Optional Combo Rack Mount (ES-219 with ES-233 Video Fader)
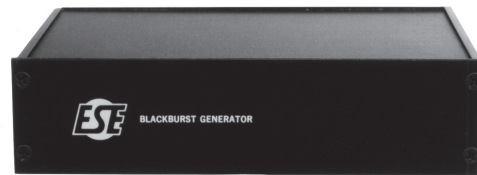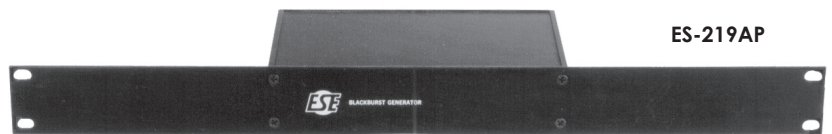
Specifications

Output: 4 BNC, 75 ohm, RS-170A composite video Sync & Burst 40 IRE, Setup 7.5 IRE

Mechanical: 7" W x 1.6" H x 5" D; Black Anodized

Power: 117 VAC, 50/60 Hz; 2 W Max.

Options: J, P, P2, Tone, UL

PC-219ISA

The **PC-219ISA** is designed to plug into any computer with PC/compatible expansion slots (ISA). The unit provides a stable composite black-burst signal identical to that of the **ES-219A**. Subcarrier frequency and SCH phase may be adjusted if desired. The board is half card size and requires no additional power (other than that provided by the computer). Five isolated outputs (BNC Connectors) are located on the rear card guide bracket. Optionally, one output of the **PC-219ISA** may be specified for either sync or an audio reference tone (1 KHz) instead of the composite black.

Features:
- Invisible (mounted inside the computer)
- No External Power Requirements
- Easy Installation

Applications:
- Computer Based Systems
- Desk Top Video Editing Systems
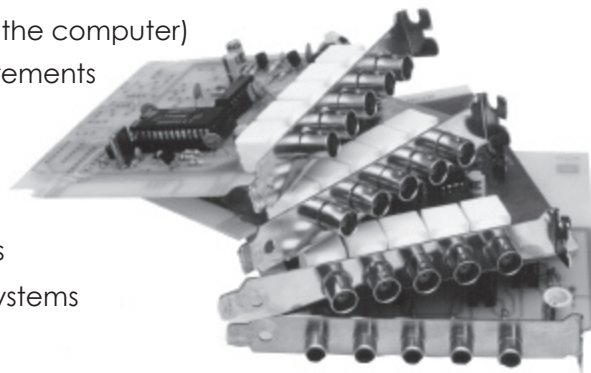
Output Specifications

Video: Five BNC, 75 ohm, RS-170A composite video

Sync & Burst: 40 IRE

Setup: 7.5 IRE

Optional sync output: 2 Vpp into 75 Ω

Optional audio tone: 983 Hz, 0 dbv, adjustable

Other ESE Computer Card Products (The "PC" Family)

- **PC-207ISA** (1 x 4 - Video Distribution Amplifier)
- **PC-217ISA** (1 x 4 - Audio Distribution Amplifier)
- **PC-237ISA** (1 x 4 - 120 MHz High Resolution Video DA)

- **PC-273ISA** (IRIG-B Reader Cord)
- **PC-770ISA** (5000 event Real Time / SMPTE Comparator)
- **PC-771ISA** (16 Channel Expander Card for the **PC-770**)

DV-319 & DV-321
HD/SD SYNC GENERATOR &
GENLOCKABLE HD/SD SYNC GENERATOR

The **DV-319** and **DV-321** are HD/SD Sync Generators. Two SD sync outputs, four HD sync outputs, an AES11 output and a Word Clock output are provided. The four HD tri-level sync outputs may be set to one of eighteen different formats. The AES-11 output may be switched between silent and tone modes. All outputs are in sync and accessible on rear panel BNC connectors. Front panel dip switches allow the user to configure the various outputs. Additionally, the **DV-321** provides a genlock input that accepts tri-level or bi-level signals.

Each unit is housed in a black-anodized desk-top enclosure, optional single and dual 19" rack mount are available.

Features:

- 4 HD Sync Outputs
- AES-11 Output

- 2 SD Color Black/Color Bar Outputs
- Wordclock Output (48KHz)

- 18 HD Formats
- SD/HD Genlock Input (DV-321)

DV-321 Rear

Specifications

POWER: 110 – 120 VAC, 50 – 60 Hz, 5 Watts maximum
MECHANICAL: Desktop Enclosure 1.6" H x 7" W x 5" D
SD SYNC OUTPUTS: Color black or color bars; 2 BNCs
HD SYNC OUTPUTS: Tri-level; 4 BNCs
AES11 OUTPUT: Silence or tone (1kHz)
Impedance: 75Ω
Single ended, 1 Vpp into 75Ω, 1 BNC
WORD CLOCK OUTPUT: 48 kHz, 0 – 5 V, 1 BNC
DV-319 FORMATS: 525i60, 625i50, 720p23.98, 720p24, 720p25, 720p29.97, 720p30, 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080psf23.98, 1080psf24
DV-321 GENLOCK INPUT: Autodetects 15 different reference input signals, see Formats, 1 BNC
DV-321 FORMATS: 525i60, 625i50, 720p23.98*, 720p24*, 720p25*, 720p29.97*, 720p30*, 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080psf23.98, 1080psf24
* indicates unsupported input genlock reference format
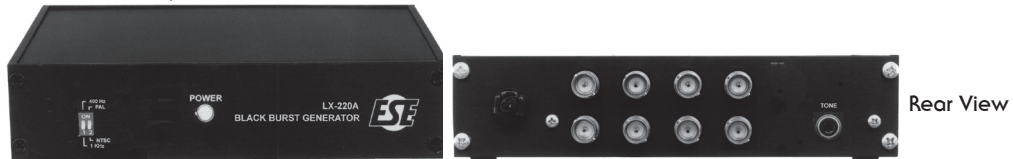**OPTIONS:** DC, J, P, P2, UL, XLR

LX-220A
NTSC / PAL BLACK-BURST GENERATOR

The **LX-220A** provides a convenient source of composite black-burst for preblacking tapes or for synchronization purposes. Eight isolated outputs are provided on rear mounted BNC connectors. The output signal consists of sync, blanking, reference black setup level and color burst which is SCH phased. The **LX-220A** employs a temperature-compensated crystal oscillator for high stability. A sinewave tone, at 0 dbm (2.2 vpp), is accessible on the rear-mounted RCA connector. The frequency of the tone is selectable (400 Hz or 1 KHz) with a front panel DIP switch. The other front panel DIP switch allows the unit to be switched between NTSC (RS-170A) and PAL composite video.

Features

- Eight Isolated Composite Black Outputs
- Enhanced Noise Suppression Circuitry
- Excellent Temperature Stability
- PAL And NTSC Modes
- 400 Hz or 1 KHz Tone

Rear View

Specifications

|			
Outputs:	8 Composite, BNC, 75Ω, RS-170A or PAL Sync and burst 40 IRE, Setup 7.5 IRE 1-Tone (400Hz or 1 KHz), RCA	**Hue Accuracy**:	1.0°
		Saturation Accuracy:	1.0%
		Enclosure:	Desk-Top, Black Anodized Aluminum
Video Level:	75% amplitude, 75% saturation (NTSC)	**Dimensions**:	1.6" H x 7" W x 5" D
	75% amplitude, 100% saturation (PAL)	**Tone**:	400 Hz or 1 KHz Sine Wave
Output Impedance:	75Ω		(selectable), 0 dbm, RCA
Differential Gain:	0.8%	**Electrical**:	117 VAC, 50/60 Hz
Differential Phase:	0.8°	**Power**:	5W maximum
		Options:	J, P, P2, Sync, UL

LX-221

"GENLOCKABLE" BLACK-BURST / SYNC GENERATOR

The **LX-221** is a six output Black-Burst / Sync Generator. The unit features enhanced black-burst circuitry and extremely precise stability. **LX-221** provides a convenient source of RS-170A composite black-burst for pre-blacking tapes or for synchronization purposes. The unit may be genlocked to an external source of video or operate in stand-alone mode. In stand-alone mode the unit references an internal voltage-controlled, temperature compensated crystal oscillator. If the signal is lost when operating in genlock mode, the unit automatically references the internal crystal.

Features

- Enhanced Noise Suppression Circuitry
- Six Isolated Composite Black Outputs
- Excellent Temperature Stability
- Genlockable

Rear View
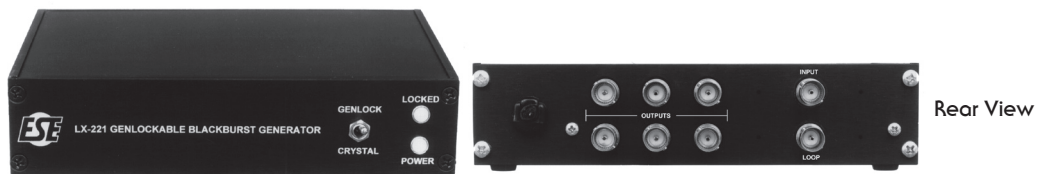
Six isolated outputs are provided on rear mounted BNC connectors. Each output signal consists of sync, blanking, reference black setup level and color burst which is SCH phased. The subcarrier frequency may be adjusted internally if desired (internal reference only). An LED indicator and toggle switch are located on the front panel. The LED is lit when the unit is operating in genlock mode.

Specifications

Input:	75Ω, RS-170A composite video or black-burst	**Dimensions**:	1.6" H x 7" W x 5" D
Outputs:	6 Composite, BNC, 75Ω, RS-170A	**Electrical**:	117 VAC, 50/60 Hz
	Sync and burst 40 IRE, Setup 7.5 IRE	**Power**:	5W maximum
Enclosure:	Desk-Top, Black Anodized Aluminum	**Options**:	J, P, P2, Sync, Tone, UL

HD-455/SD/1

TIME CODE READER / VIDEO INSERTER

The **HD-455/SD/1** is an HD & SD Timecode Reader/Video Inserter. The unit reads SMPTE/EBU LTC, D-VITC or RP-188 and inserts that timecode onto an SDI video signal. The timecode can also be embedded into the D-VITC or RP-188. Additionally, up to 30 characters of user defined text may be inserted into the video. Two independent character windows are available and can be used to insert Time, User Bits, Time & User Bits or User Defined Text. Ten different font sizes are available and the characters may be located anywhere on the video using the horizontal & vertical controls. Included font colors are Grayscale along with six solid colors (Red, Orange, Yellow, Green, Blue & Violet).

The unit is easily configured using the front panel controls or the front panel mounted USB port with the supplied PC software. The front panel controls consist of four push buttons used to navigate the various setup menus that are displayed on a 16 x 2 character LCD display. The USB port and the PC software provide a user-friendly GUI (Graphical User Interface) used to configure the unit.

The **HD-455/SD/1** may be ordered with up to six independent video channels. Additionally available is the **HD-266/SD/1** that reads ESE Time Code, ESE Timer Code, DVITC, RP-188 Time Code and SMPTE/EBU LTC at play speed and the **HD-488/SD** which is a Time Code Reader, Generator and Inserter for HD (High Definition) and SD (Standard Definition) Serial Digital Interface (SDI) video. (Please refer to *ESE*'s SMPTE/EBU Time Code Products & Accessories brochure for further information on the **HD-488/SD**)

Features

- Reads LTC Bi-Directionally at Multi-Speed (1/30th to 20x)
- Two Independent Character Windows
- 1 to 6 Independent Video Channels Available
- Embeds Timecode into D-VITC or RP-188
- Compatible with ES-466 (Up/Down Presettable Timer)
- Several Options and Custom Features Available

- Automatically detects SD or HD Format
- Accepts Common HD & SD SDI Signals
- Inserts Timecode onto SDI Video Signal
- Reads SMPTE/EBU, D-VITC & RP-188
- LCD Status & Setup Display
- Universal Power Supply (86-264 VAC)

SPECIFICATIONS

Power: 85 – 264 VAC, 47 – 63 Hz, 15 Watts max
Mechanical: Black anodized aluminum enclosure 1.6" H x 8" W x 7.3" D
Time & Setup/Status Display: 16 x 2 character LCD
Time Code Input: SMPTE (100 mVpp-10 Vpp; 10kΩ input impedance)
SD SDI Input: SMPTE 259M-C (270Mb/s), 525 line and 625 line 4:2:2
HD SDI Input/Output: 1080i/60, 1080i/59.94, 1080i/50, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/59.94
Options: DC, P, P2, UL, /2, /3, /4, /5, /6

HD-491/SD
RP-188 & DVITC DECODER / GENERATOR

The **HD-491/SD** is an HD & SD SDI Timecode Decoder/Generator. The unit accepts an SDI signal, decodes the RP-188 or D-VITC and produces either a SMPTE or EBU LTC output. Simultaneously, the unit produces an **ESE** timecode output which can be used to drive new or existing clock systems. A selectable (reclocked or non-reclocked) SDI video loop output is also provided.

The unit can be used as a Translator (for shuttle speed applications) or it can be jammed and used as a Generator (real-time applications). When decoding D-VITC, the appropriate line number must be selected and when decoding RP-188, the last valid RP-188 packet is output. The **HD-491/SD** is also capable of transposing RP-188 or D-VITC User Bits into one of multiple different Date formats.

The **HD-491/SD** is configured using the front panel controls or the front panel mounted USB port with the supplied PC software. The front panel controls consist of four push buttons used to navigate the various setup menus that are displayed on a 16 x 2 character LCD display. The USB port and the PC software provide a user-friendly GUI (Graphical User Interface) used to configure the unit.
The unit is available with several options including a 6-digit or 8-digit .55" LED display.

Features
- Decodes RP-188 or D-VITC
- Automatically detects SD or HD Format
- SDI Video Loop Output
- Outputs SMPTE or EBU LTC & ESE Timecode
- Universal Power Supply (86-264 VAC)
- LCD Status & Setup Display
- Accepts All Common HD & SD SDI Signals
- USB Setup Interface

SPECIFICATIONS

|	
Power:	85 – 264 VAC, 47 – 63 Hz, 15 Watts max
Mechanical:	Black anodized aluminum enclosure 1.6" H x 8" W x 7.3" D
Time & Setup/Status Display:	16 x 2 character LCD
SD SDI Input:	SMPTE 259M-C (270Mb/s), 525 line and 625 line 4:2:2
HD SDI Input:	1080i/60, 1080i/59.94, 1080i/50, 1080p/30sF, 1080p/29.97sF, 1080p/25sF, 1080p/24sF, 1080p/23.98sF, 720p/60, 720p/59.94
SMPTE/EBU Output:	0 db into 600Ω, balanced
Options:	DC, P, P2, UL, 6-digit, 8-digit

ES-233
VIDEO FADER

The **ES-233** is an automatic video fade-to-black system. The unit uses a digital attenuator which provides an extremely linear, repeatable fade rate. Fade rates are adjustable between 1 frame and 150 frames via a front panel mounted, ten position selector switch or with Option "D" . The video-fade operation is controlled by either the front panel "UP/DOWN" switch or via the remote control inputs of the rear mounted connector.

Applications
- "Live" Video Fades
- Video Editing Systems
- "Cuts-only" Systems
- Duplication Systems

Features
- Remote Control
- Cascadable Control Inputs
- "Broadcast Quality" Fades
- Optional Rack Mount Enclosure
- Optional Combo Rack Mount (**ES-219A** Black Generator with **ES-233**)
- Video Loop For Simple Installation
- Repeatable And Adjustable "Fade Rate"
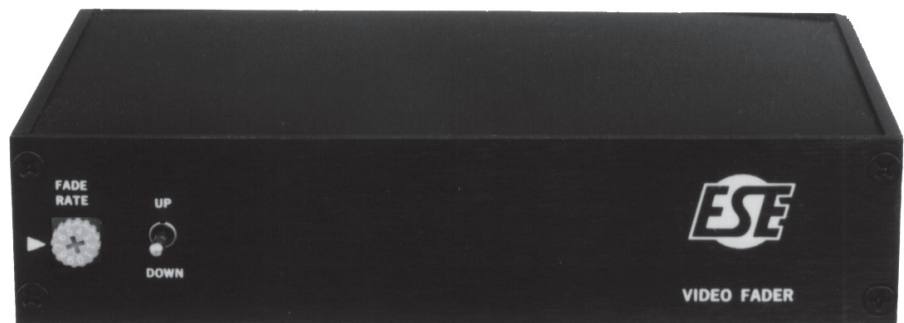
Specifications

Input/Output:	1 Vpp, 75 Ω	**Electrical :**	117 VAC, 50/60 Hz	**Options:**	D, J, P, P2, UL
Fade Rate:	1 Frame - 5 seconds	**Mechanical:**	7" W x 1.6" H x 5" D		
	(adjustable)		Black Anodized aluminum		

ES-206U / ES-266U / ES-306U
VIDEO TIME, TIMER & DATE INSERTERS

The **ES-206U** is a "stand-alone" Video Time/Date Generator & Inserter which superimposes Time and Date information onto a looped-thru video signal. The unit generates six digits of date (Month, Day & Year) and six digits of time (Hour, Minute & Second). With the ease of on-screen programming setting the **ES-206U** is a snap. Controls include Time & Date set and Size, Position & Brightness set. The unit also has several styles of background masks which include, solid characters on video, translucent characters on video or translucent characters on a translucent grey mask. A display setting mode allows the user to view the time and date side by side, stacked, time blanked or date blanked. An optional RS-232 Interface Windows® Control Panel Software may be ordered, which allows remote control of the display modes. Other features include 12 or 24 hour selection and daylight savings time mode.

Applications

- Security Systems
- "Video" Court Rooms
- "In-house" Video Time & Date
- Sporting Events

Features

- Daylight Savings Time Correction
- Operates With NTSC Or PAL
- Vertical and Horizontal Size
- **ESE** Serial Time Code™ Output
- Brightness Control
- Multiple Mask Selection
- On-Screen Programming
- Leap Second Correction
- 12 Hour Format (with AM/PM Indicator) Or Optional 24 Format
- "Blankable" Time or Date
- Vertical and Horizontal Position Control
- Side-By-Side Display Can Be Stacked

The **ES-266U** is a Video Time and Date Slave which decodes either **ESE** Serial Time Code™ or SMPTE/EBU Time Code. The unit superimposes six digits of date (Month, Day & Year) and six digits of time (Hour, Minute & Second) onto a looped-thru video signal. The **ES-266U** also has the ability to superimpose timer information if connected to an **ESE** timer (ES-362U, ES-520U, etc.). On-screen programming features include setting of date, position, size, brightness, mask selection, daylight savings time, and 12/24 hour mode selection. As with the **ES-206U** an optional RS-232 interface and software can be specified.

The **ES-306U** is a Video Up/Down Timer "Inserter". Up to seven digits (Hr, Min, Sec, Tenths) are superimposed onto a video signal looped-thru the unit. Hours and Tenths may be blanked if desired. On-screen menus allow timer presetting, adjustment of the display Size and Position, Mask Selection, Tenths On/Off, Hours On/Off, and Zero Mode (Normal Underflow, Stop, Reverse, or Auto Preset at Zero). The brightness of the Characters and Background may be individually set via front-panel controls. The display may be turned on/off via a front-panel control. Optional RS-232 interface and software is available.

Specifications

Video In/Out:	1 Vpp, 75 Ω
Electrical:	117 VAC, 50/60 Hz, 4 W Max
Mechanical:	1.75" x 19" Rack Mount, 10" deep
Options:	Black, C (ES-206U Only), D, DC, I/O, J, P2, R, UL

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AUDIO LEVEL INDICATORS

ESE offers two basic versions of the "Digital" Audio Level (VU) Indicator. Each version has a reference level ("0 dB") adjustment and is optionally available in a rack mount configuration with as many as six units mounted on a single 1 3/4" x 19" panel.
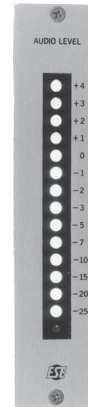
Features:

- Accurate
- Easy To Read
- Peak or VU Mode
- Simple Installation
- Attractive & Low Cost
- Low Power Consumption

ES-215
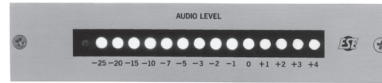
ES-216

ES-214

The **ES-214** (vertical mount) and **ES-215** (horizontal & rack mount) are "in-line" VU Indicators which provide a purely digital representation of an audio signal's loudness. Each has identical circuitry with fourteen LED's (nine green, one yellow and four red) that display loudness at -25, -20, -15, -10, -7, -5, -3, -2, -1, 0, +1, +2, +3 and +4dB. Units are shipped in the Peak mode unless otherwise specified, however, Fast Averaging or Slow Averaging (VU) can be optionally requested. The **ES-215** can be ordered on a rack mount panel with one, two,three, four or six units mounted on the same panel.
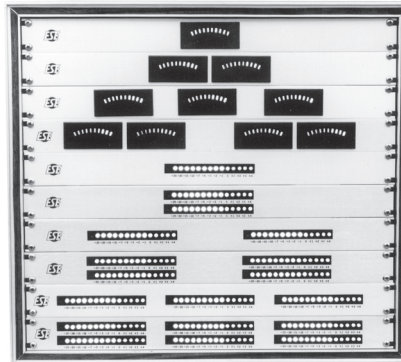
The **ES-216** is a small meter-sized unit which simulates the "flying wand" effect of its "analog" counterparts. The unit displays audio levels in ten discrete steps (-20, -10, -7, -5, -3, -1, 0, +1, +2 and +3 dB) using three red, one yellow and six green LED's. It can be console or panel mounted and is designed to fit into the same opening as many of the commonly used mechanical meters. The rack mount options allow the unit(s) to be mounted one, two, three or four per panel. Either **Peak** or **VU** operation can be specified, (the unit is shipped in the Peak mode unless otherwise specified).

Specifications

	ES-214 / ES-215	ES-216
Indicators:	14	10
Scale:	+4 dB thru -25 dB	+3 dB thru -20 dB
Reference Level "0" Adjustment:	-16 dB to +30 dB	-14 dB to +30 dB
Input Impedance:	2200 ohms @ max. sensitivity	6000 ohms, balanced (any sensitivity)
	6800 ohms @ +8 dBm "House Level"	
	10,000 ohms @ min. sensitivity	
Input Circuit:	Transformer isolated, balanced bridging	Transformerless
Frequency Response:	20 - 20 Khz +/- 1 dB (all modes)	20 - 20 Khz +/- 1 dB (all modes)
Rise Times:	Peak Mode - < 250 uSec	Peak Mode - 1 mSec
	Fast Averaging Mode - < 25 mSec	VU Mode - 300 mSec
	VU Mode - ~ 300 mSec	
Fall Time:	300 mSec from full scale (all modes)	300 mSec
Power Requirement:	Unregulated +15 to +35 VDC	+10 to +24 VDC @ 24 mA
	or regulated +12 VDC (220 mA max.)	(regulated or unregulated)
Modes of Operation:	Peak (unless otherwise specified),	Peak (unless otherwise specified),
	Fast Averaging (Apparent Loudness)	VU (Slow Averaging)
	VU (Slow Averaging)	
Mode Selection:	PCB jumper/component value change	PCB Jumper
Mechanical:	7" x 1 1/2" x 3 1/2" Deep	3" x 1.4" x 1.5" Deep
Options:	P, P2, HP2, P3, P4, P6 (ES-215 only)	P, P2 , P3, P4

AUDIO LEVEL INTERFACE

(X L R   T O / F R O M   R C A)

The **ESE** Audio Level Interface is a stereo, bi-directional coupling unit that either meets or beats the specs of the other "Audio Level & Impedance Interface" type products. The **ES-244** provides a simple/cost-effective means of connecting equipment with unbalanced -10 dBv inputs/outputs to equipment with balanced +4 or +8 dBm inputs/outputs. "Consumer" CD players, etc. are now easily interfaced with "Professional" recorders and mixing consoles.

Features

- Bi-Directional Interface
- Rugged, All Metal Enclosure
- Front Panel Gain Adjustment
- Single or Dual Rack Mount (Optional)

Applications

- Unbalanced Computer Sound Cards to Pro Audio
- Convert Unbalanced to Balanced and Vice-Versa
- Perfect for DAT, CD Recorders, and Tape Decks

ES-244P

ES-244

ES-244/ES-244/P2

REAR VIEW

Specifications

ATTENUATOR

Input Level:	+4 dBm nominal, +26 dBm max.
Input Impedance:	100K Ohms, balanced
Input Connectors:	Female XLR
Output Level:	-10 dBv nominal
Output Impedance:	70 Ohms, unbalanced
Output Connectors:	RCA
Loss:	14 dB, fixed
Response:	DC - 20,000 Hz, +/- .25 dB

AMPLIFIER

Input Level:	-10 dBv nominal, +26 dBv maximum
Input Impedance:	100K Ohms, unbalanced
Input Connectors:	RCA Jack
Output Level:	+4 dBm nominal, +26 dB maximum
Output Connectors:	Male XLR
Gain:	+6 to +20 dB, adjustable recessed controls
Freq. Response:	DC - 20,000 Hz, +/- .25 dB

GENERAL

|	
Electrical:	117 VAC, 50/60 Hz, 2 Watts Maximum
Mechanical:	1.6" High x 7" Wide x 5" Deep
Options:	J, P, P2, UL

DIGITAL CLOCKS & TIMERS

Since introducing digital clocks and timers to the Broadcast Industry more than thirty years ago, **ESE's** product line has grown considerably, as have our customers' applications. With more than 40 products in the "Clock and Timer" Family, **ESE's** products have found homes at sporting events, broadcast and recording studios and hundreds of other commercial/industrial settings.

Recently, **ESE** introduced a new series of enclosures (the **"LX-"** Series) which is described within this brochure. The products in the **"LX-"** Series feature a new streamlined enclosure that is solid as a rock and fits quite nicely into environments looking to maintain a "high-tech/contemporary" appearance. For a more complete listing of **ESE's** Digital Clocks and Timers, refer to the "Digital Clocks & Timers" brochure or call the **ESE** Factory or an **ESE** Dealer for more information.

Features:

- Bright Yellow LED Displays
- Black Texture Painted Enclosure
- Optional & Custom Features Available •
- Master/Slave Compatibility •

LX-520U
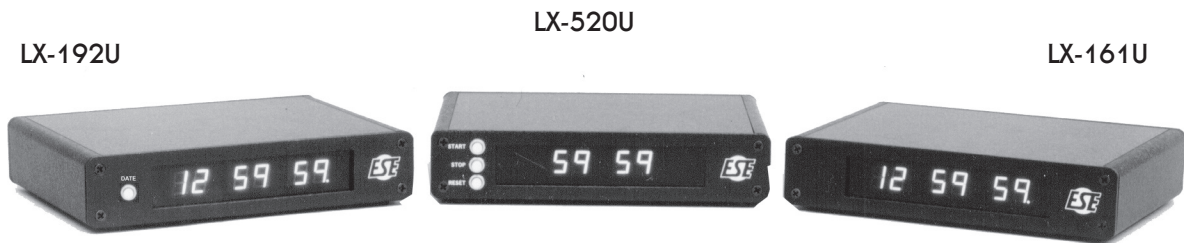
LX-192U

LX-161U

MASTER CLOCK & ESE TIME CODE SLAVE

The **LX-192U (12 hour)/LX-194U (24 Hour)** is a six-digit "Master" Clock that can drive up to 100 **ESE** Serial Time Code™ Slave Clocks (including the **LX-161U**, described below, as well as the **ES-166U**, **ES-171U**, **ES-943U ES-993U**, etc.) at a distance of up to 4000 feet. The bright yellow LED displays are easily viewable from 20 feet and the **"LX-"** enclosure is certain to fit perfectly anywhere form as well as function is a concern. Other features included on the unit include a sync input (allowing the unit to be synchronized with an external sync pulse), a 1 PPS output (capable of driving an Impulse Clock Driver) and remote access to the three setting controls and a date switch.

The **LX-161U** is a six-digit **ESE** Serial Time Code™ Slave. The unit is designed to read the serial time code output by any **ESE** Master Clock including the **LX-192U/LX-194U**. Displays and enclosure are identical to **LX-192U/LX-194U.**

MASTER TIMER & ESE TIMER CODE SLAVE

The **LX-520U** is a four-digit "Master" Elapsed Time Display (Up Timer). The unit can drive **ESE** Serial Time Code "Timer" Slaves including the **LX-361U**, **ES-991U**, **ES-366U**, **ES-372U** and **ES-941U** (*ESE* timer code is accessible via a rear-mounted BNC connector). Displays are bright yellow LED's and can be read from a distance of 20 feet. Three front-mounted controls (Start, Stop and Reset) allow easy operation of the unit. As well, all three controls and four isolated "Reset" inputs are accessible via a rear-mounted D-sub connector. The unit can also be ordered with Option "T", tenths of seconds if necessary.

The **LX-361U** is designed to read the **ESE** "Timer" Code output by an **LX-520U**, **ES-520U** or **ES-362U**. The unit has four bright yellow LED displays (five if tenths of seconds is specified)and is mounted in the **"LX-"** enclosure.

Specifications

	LX-192U/LX-194U	LX-161U	LX-520U	LX-361U
Electrical:	117 VAC 50/60 Hz	117 VAC 50/60 Hz	117 VAC 50/60 Hz	117 VAC 50/60 Hz
Power:	5 Watts	5 Watts	5 Watts	5 Watts
Enclosure:	"LX-" Series	"LX-" Series	"LX-" Series	"LX-" Series
Dimensions:	1.7" H x 8" W x 6" D	1.7" H x 8" W x 6" D	1.7" H x 8" W x 6" D	1.7" H x 8" W x 6" D
Controls:	Fast, Slow, Hold, and Date	none	Start, Stop & Reset	none
Time Code:	**ESE** "TC-90" Output	Any **ESE** or SMPTE/EBU	**ESE** "TC-89" Output	Any **ESE** or SMPTE/EBU
Display:	6 - .56" Yellow LED	6 - .56" Yellow LED	4 - .56" Yellow LED	4 - .56" Yellow LED
Viewing Distance:	20 Feet	20 Feet	20 Feet	20 Feet
Options:	C, J, HR, UL	J, UL	C, J, T, UL	J, T, UL

OPTIONS

Options listed below are available only on certain products and descriptions are relative to products described in this brochure. Refer to product "Specifications" or the Price List for option availability. Features neither listed as a Standard Feature nor available as an Option may be available on a "Custom" basis. Please consult the **ESE** Factory with your specific need. (Certain combinations of options are not available.)

Black   **Black Panel**: Black Anodized Front Panel.

C   **Crystal Timebase**: A .002% crystal is employed for those applications requiring independence from the line frequency. A trimmer is included for greater accuracy (2-3 seconds/week).

D   **Remote Control**: This option consists of a connector wired to switches on a control plate via a six foot cable. Extra cable available.

DC   **DC Operation**: 12-35 VDC Operation (No AC Power Input is supplied with Option "DC").

EQ   **Equalization Trimmer**: Front panel accessible trimmer when cable exceeds 100' (400' max.).

HR   **Hr. and 1/2 Hr. Relay Closure**: Rear panel accessible relay closure circuit.

I/O   **Additional Input/Output Loop Set**: 2 additional Loop-Thru's per set, maximum of 4 additional Loop-Thru's (2 sets).

J   **220 VAC, 50/60 Hz Operation**: Required on many overseas applications.

MT   **Precision Multi-Turn Potentiometers**: Designed for precision gain control (Standard with ES-246/XLR).

P   **19" Front Panel (Rack Mount)**: Designed for mounting into a standard equipment rack. Panel is 1/8" clear or black anodized Aluminum and chassis is 5" - 10" deep.

P2   **Dual Rack Mount**: Allows specific units to be mounted side-by-side on a single Rack Mount panel.

R   **Remote Input**: Rear Mounted connector for Remote Control Input.

Sync   **Composite Sync Output**: A 2 Vpp output into 75Ω.

T   **Tenths of Seconds**: A tenths of seconds digit is added to display.

Tone   **Continuous Tone**: A continuous tone at 0db for Synchronizing Audio with Video.

UL   **UL Power Supply**: The unit is supplied with a UL/CSA approved wall mount power supply.

XLR   **XLR Connectors**: The terminal blocks are replaced with XLR connectors (the enclosure is doubled in height).

CUSTOM CAPABILITIES

Since 1971, **ESE** has manufactured over 2600 "Specials" (products defined by the customer's specific requirement... designed and built by **ESE**). Many of these "Specials" have evolved into "Standard" Products, some of which are mentioned in this brochure. If you have a custom requirement, give us a call and put our "time" and experience to work for you.

OTHER *ESE* PRODUCTS

Products not found in this brochure may belong to another "Family" of **ESE** Products. For product information on any of the below mentioned "Families", please contact the **ESE** Factory.

- ♦ **SMPTE/EBU TIME CODE PRODUCTS**
- ♦ **MASTER CLOCK SYSTEMS**
- ♦ **CLOCKS & TIMERS**
- ♦ **"TIME SYNCHRONIZATION" (9-1-1) PRODUCTS**
- ♦ **TIME CODE CONVERTERS**
- ♦ **TIME CONTROL SYSTEMS**
- ♦ **"IRIG" PRODUCTS (including Airborne)**
- ♦ **"CUSTOM" PRODUCTS**

F I V E   Y E A R   W A R R A N T Y

All products described in this brochure are warranted free of mechanical and electrical defects, and will be replaced or repaired without charge if found defective under normal operating conditions when used as intended. Assembled products must be returned for adjustment within five years of purchase. Before returning goods, please write or call for shipping instructions.