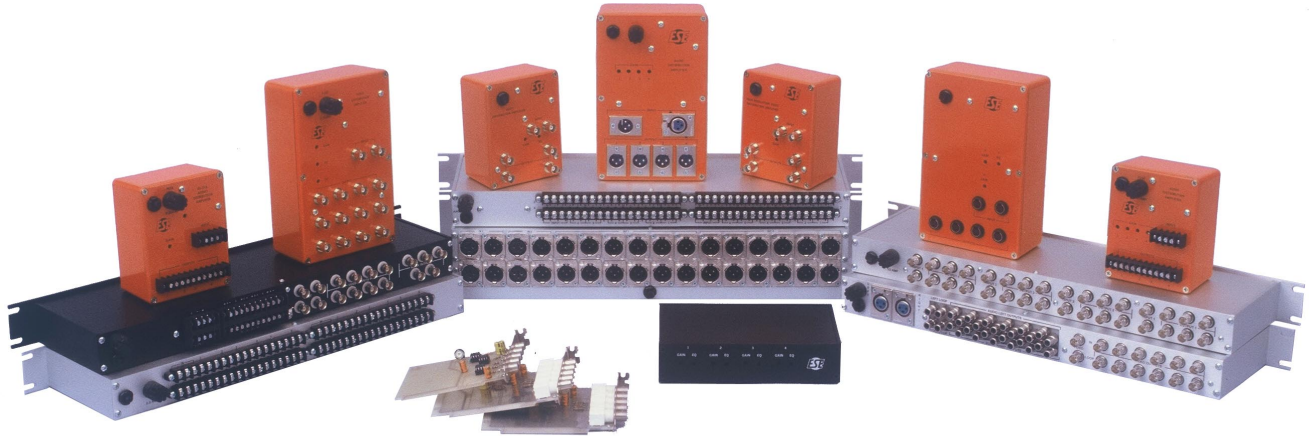




# DISTRIBUTION AMPLIFIERS AND VIDEO & AUDIO PRODUCTS



- 
- *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 8,000 of those simple 1 x 4 Video DAs and added 20 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. Twenty years later, updated versions of these early units continue to be produced - distinguished examples of our products' longevity in keeping with **ESE's** 30+ 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
- 3 year Warranty
- Broadcast Quality
- Custom Capabilities
- User Friendly Controls
- Many Options Available
- Designed For Convenience & Durability



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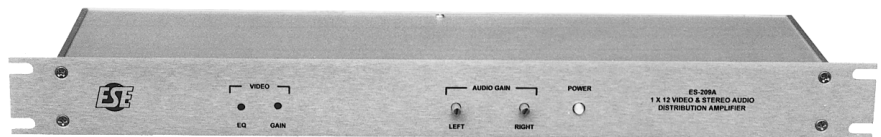


# 1 X 12 & 1 X 24 VIDEO/STEREO DISTRIBUTION AMPLIFIERS

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.

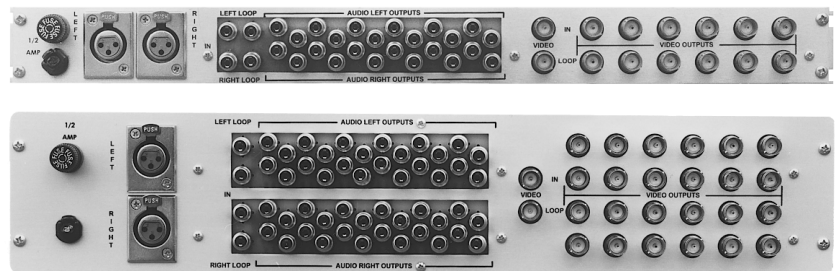
## Features:

- 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:** 3ns
- Differential Gain:** < .2%
- Differential Phase:** < .2° (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-blackening 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; 2K $\Omega$  (input attenuator at maximum) 25K $\Omega$  (input attenuator at minimum)  
**Output:** 600 $\Omega$  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 75 $\Omega$  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/ $\mu$ S  
**Differential Gain:** <0.2% @ 3.58 MHz  
**Differential Phase:** < .2 $^\circ$  @ 3.58 MHz  
**S/N Ratio:** 62dB  
**Propagation Delay:** 3 $\eta$ s  
**Output Isolation:** 45dB  
**Maximum Output:** 2.7 Vpp into 75 $\Omega$ , outputs loaded

### BBSG

**Output:** 5 BNC, 75 $\Omega$ , 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



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 the 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

	<b>ES-217</b>	<b>ES-218</b>	<b>ES-245</b>	<b>ES-246</b>
<b>Input:</b>	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
<b>Response:</b>	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB	20 - 20,000 Hz, +/- 0.2dB
<b>Gain:</b>	+18dB maximum	+18dB maximum	+20dB maximum	+20dB maximum
<b>Gain Controls:</b>	Four	One	24 (one per output)	Four (one per input)
<b>Output:</b>	600Ω	600Ω	600Ω	600Ω
<b>Output Level:</b>	+21dB maximum	+26dB maximum	+26dB maximum	+23dB maximum
<b>Connectors:</b>	Terminal Block	Terminal Block	Terminal Block	Terminal Block
<b>Enclosure:</b>	Die-cast Orange Box	Die-cast Orange Box	Rack Mount	Rack Mount
<b>Dimensions:</b>	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"
<b>Electrical:</b>	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
<b>Power Required:</b>	3 Watts	3 Watts	5 Watts	5 Watts
<b>Options:</b>	J, UL, XLR	J, UL, XLR	J, MT, UL, XLR	J, UL, XLR



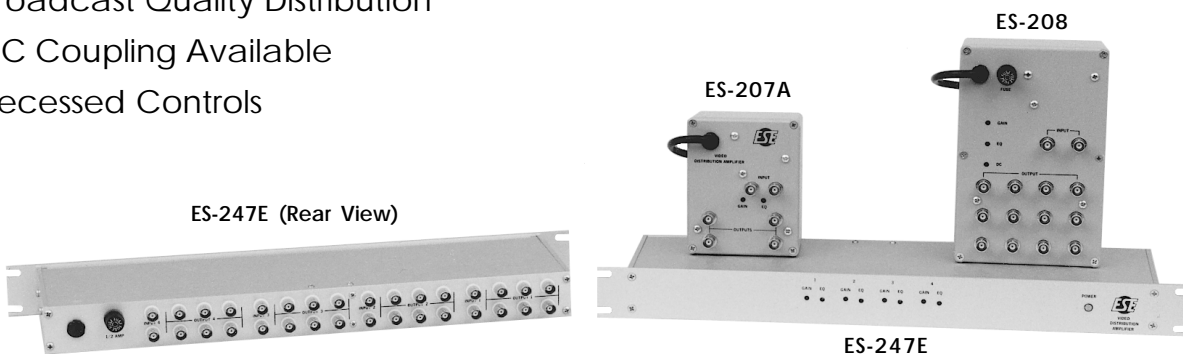
# VIDEO DISTRIBUTION AMPLIFIERS

**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



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°	< .2°	< .2°
Propagation Delay:	5ns	100ns	5ns
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

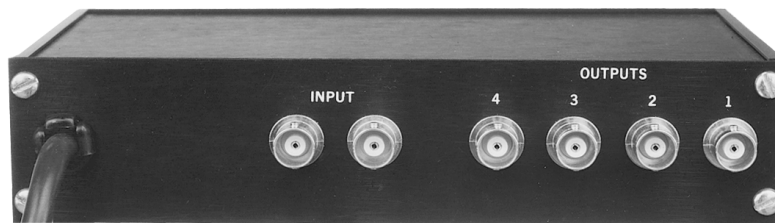


# 1X4 VIDEO DISTRIBUTION AMPLIFIER (INDEPENDENTLY ADJUSTABLE CHANNELS)

*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:** 75 $\Omega$   
**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 $^\circ$  @ 3.58 MHz  
**Propagation Delay:** 3ns  
**Slew Rate:** 750 V/ $\mu$ S  
**Output Level:** 1 Vpp nominal  
**Maximum Output:** 2.7 Vpp into 75 $\Omega$  (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



# 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)



ES-227 Y-C (S-Video)

- Input:** 1 Vpp  
**Response:** 30 Hz to 10 MHz, +/-1dB (Y-Bandwidth),  
**Response:** 0.5 MHz to 10 MHz, +/-1dB (C-Bandwidth)  
**Equalization:** up to 1000' of RG-59  
**Gain:** +9dB Maximum @ 3.58 MHz (Y-EQ)  
**Gain:** -3.5 to +10.5dB (C)  
**S/N Ratio:** >45db  
**Output Isolation:** 40db to 10 MHz  
**Differential Gain:** <0.2% @ 3.58 MHz  
**Differential Phase:** <0.2° @ 3.58 MHz  
**Propagation Delay:** 10ns  
**Slew Rate:** >60v/μS  
**Output Levels:** 0.6 to 1.5 Vpp @ 1 Vpp Input (Y)  
**Connectors:** S-VHS  
**Enclosure:** Die-cast Orange Box  
**Dimensions:** 7.3" x 4.7" x 2.2"  
**Electrical:** 117 VAC, 50/60 Hz  
**Power Required:** 5 Watts  
**Options:** J, UL



ES-237 High Resolution

- Input:** 1 Vpp  
**Response:** 10 Hz - 100 MHz, +/-1dB,  
 100 MHz - 120 MHz, +/-3dB  
 100-400' of RG-59 (EQ Option only)  
**Gain:** -2.5dB to +4dB Adjustable  
**S/N Ratio:** >74dB  
**Output Isolation:** 40dB to 120 MHz  
**Differential Gain:** <0.1% @ 3.58 MHz  
**Differential Phase:** <0.15° @ 3.58 MHz  
**Propagation Delay:** 2ns  
**Slew Rate:** >2000 V/μS  
**Output Levels:** 2.8 Vpp @ 1 KHz, 1.2 Vpp @ 120 MHz  
**Connectors:** BNC  
**Enclosure:** Die-cast Orange Box  
**Dimensions:** 4.7" x 3.7" x 2.2"  
**Electrical:** 117 VAC, 50/60 Hz  
**Power Required:** 5 Watts  
**Options:** EQ, J, UL

## Specifications



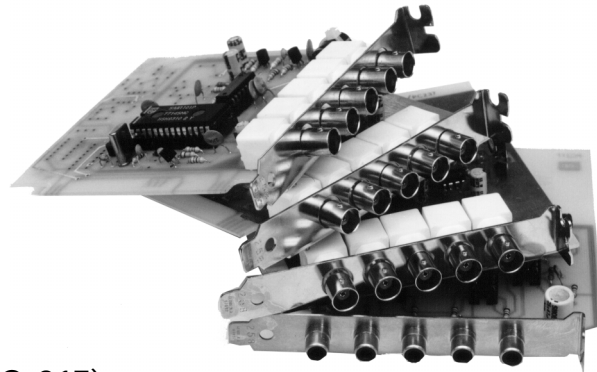
# "PC" CARD DISTRIBUTION AMPLIFIERS

*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-217)
- BNC Input And Output Connectors (PC-207A & PC-237)



### PC-207A 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-207A** provides a perfect method to compensate for lengthy cable runs.

The **PC-207A** provides a single input and four isolated outputs via the BNC connectors on the rear card guide bracket and offers a power bandwidth of 10MHz; +/-1dB. Gain and Equalization controls are also provided. Specifications are equivalent to those of the ES-207A (see page 6).

### PC-217 Audio DA

The **PC-217** 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-217** 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 4).

### PC-237 High-Resolution Video DA

The **PC-237** 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.

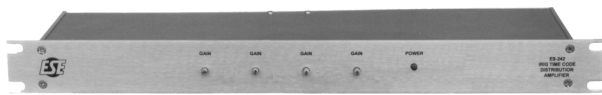
The **PC-237** provides a single input and four outputs via the BNC connectors on the rear card guide bracket. The Gain control and an optional Equalization control are board mounted. Specifications are equivalent to those of the ES-237 (see page 8).



# TIME CODE ISOLATION & DISTRIBUTION AMPLIFIERS

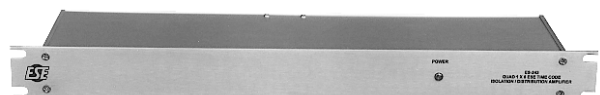
Since their introduction in the early '80s, *ESE's* Audio and Video Distribution Amplifiers have been recognized for their broadcast quality and durability. Using very similar technology, *ESE* presents a line of Distribution Amplifiers (DA) capable of isolating and distributing most any type of Time 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 and every unit in the Master Clock System.

Described below are units capable of handling any of the IRIG time codes, *ESE* Time Code™, SMPTE/EBU time code or ASCII time code.



**ES-242**  
*Quad 1x6 IRIG DA*

The **ES-242** has four separate and isolated channels, each with six available outputs. The unit is designed to accept most IRIG time code signals in their carrier modulated forms, and output up to 24 identical copies. All inputs and outputs are via BNC connectors. Each channel has its own Gain control. The unit is rack mounted.



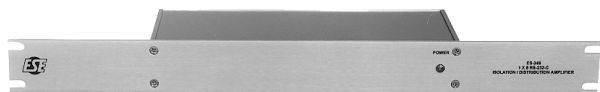
**ES-243**  
*Quad 1x6 ESE DA (or IRIG-'TTL')*

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. The unit is rack mounted.



**ES-245**  
*Quad 1x6 SMPTE/EBU DA*

The **ES-245** is a Distribution Amplifier designed to distribute and isolate most any audio signal including SMPTE and EBU time code. Four channels, each with six outputs, provide up to 24 identical copies. Inputs and outputs are available on the rear mounted terminal blocks (optional XLR connectors are available). The unit is rack mounted.



**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 a different time code that is later translated into RS-232C. The unit is rack mounted.

## Specifications

	<b>ES-242</b>	<b>ES-243</b>	<b>ES-245</b>	<b>ES-249</b>
<b>Electrical:</b>	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
<b>Power:</b>	5 Watts Maximum	5 Watts Maximum	5 Watts Maximum	5 Watts Maximum
<b>Mechanical:</b>	1.75" x 19"; 10" Deep	1.75" x 19"; 10" Deep	1.75" x 19"; 10" Deep	1.75" x 19"; 10" Deep
<b>Time Code Input/Output:</b>	IRIG (A, B or E) In AM Form	<i>ESE</i> (TC76, TC89 or TC90) or IRIG (A, B or E) In AM Form	SMPTE/EBU (balanced or un-balanced)	ASCII (RS-232C)
<b>Connectors:</b>	BNC	BNC	Terminal Block	9-Pin D-sub
<b>Configuration:</b>	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
<b>Options:</b>	J, UL	J, UL	J, UL, XLR	J, 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
<b>Outputs:</b> 1 Composite, BNC 1 S-Video, Mini-DIN	8 Composite, BNC
<b>Video Level:</b> 75% amplitude, 75% saturation (NTSC) 75% amplitude, 100% saturation (PAL)	75% amplitude, 75% saturation (NTSC) 75% amplitude, 100% saturation (PAL)
<b>Output Impedance:</b> 75W	75W
<b>Differential Gain:</b> 0.8%	0.8%
<b>Differential Phase:</b> 0.8°	0.8°
<b>SNR:</b> 60db	60db
<b>Hue Accuracy:</b> 1.0°	1.0°
<b>Saturation Accuracy:</b> 1.0%	1.0%
<b>Enclosure:</b> Desk-Top, Black Anodized Aluminum	Desk-Top, Black Anodized Aluminum
<b>Dimensions:</b> 1.6" H x 7" W x 5" D	1.6" H x 7" W x 5" D
<b>Tone (optional):</b> 1 KHz Sine Wave, 0 dbm, RCA	400 Hz / 1 KHz Sine Wave, 0 dbm, RCA
<b>Electrical:</b> 117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
<b>Power:</b> 5W maximum	5W maximum
<b>Options:</b> J, P, P2, Tone, UL	J, P, P2, Tone, UL



# 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.

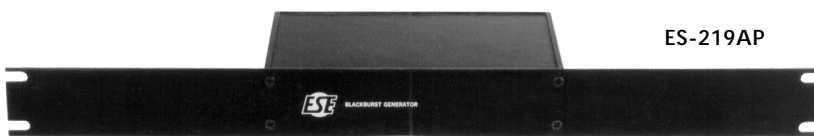
### Applications:

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



### 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

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

**Options:** J, P, P2, Tone, UL

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

## PC-219

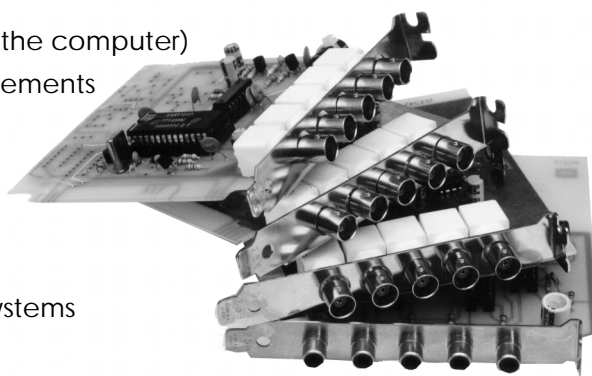
The **PC-219** is designed to plug into any computer with PC/compatible expansion slots (ISA). The unit provides a stable composite black-burst signal identical to that of the **ES-219A**. Subcarrier frequency and SCH phase may be adjusted if desired. The board is half card size and requires no additional 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-219** 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  $\Omega$

**Optional audio tone:** 983 Hz, 0 dbv, adjustable

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

- **PC-207A** (1 x 4 - Video Distribution Amplifier)
- **PC-217** (1 x 4 - Audio Distribution Amplifier)
- **PC-237** (1 x 4 - 120 MHz High Resolution Video DA)
- **PC-273** (IRIG-B Reader Cord)
- **PC-770** (5000 event Real Time / SMPTE Comparator)
- **PC-771** (16 Channel Expander Card for the **PC-770**)



# LX-220A

## NTSC / PAL BLACK-BURST GENERATOR

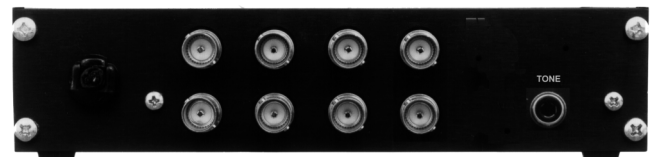
The **LX-220A** provides a convenient source of composite black-burst for preblacking tapes or for synchronization purposes. Eight isolated outputs are provided on rear mounted BNC connectors. The output signal consists of sync, blanking, reference black setup level and color burst which is SCH phased. 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
- Several Options Available
- PAL And NTSC Modes
- 400 Hz or 1 KHz Tone

### Applications

- Broadcast & Desktop Video Synchronization
- Multi-Camera Video Synchronization
- Linear & Non-Linear Editing Systems
- Pre-Blacking Video Tape



Rear View

### Specifications

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



# LX-221

## "GENLOCKABLE"

### BLACK-BURST / SYNC GENERATOR

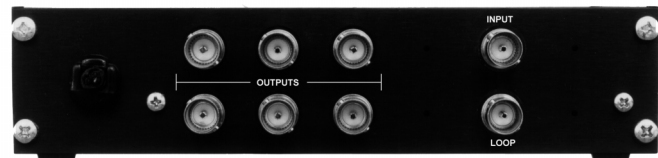
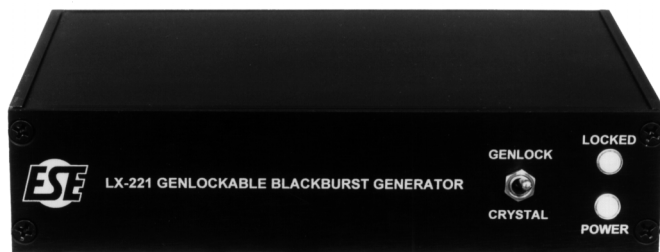
The LX-221 is a six output Black-Burst / Sync Generator. The unit features enhanced black-burst circuitry and extremely precise stability. LX-221 provides a convenient source of RS-170A composite black-burst for pre-blacking tapes or for synchronization purposes. The unit may be genlocked to an external 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
- Several Options Available
- Genlockable

#### Applications

- Broadcast & Desktop Video Synchronization
- Multi-Camera Video Synchronization
- Linear & Non-Linear Editing Systems
- Pre-Blacking Video Tape



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:** 75 $\Omega$ , RS-170A composite video or black-burst
- Outputs:** 8 Composite, BNC, 75 $\Omega$ , RS-170A  
Sync and burst 40 IRE, Setup 7.5 IRE
- Enclosure:** Desk-Top, Black Anodized Aluminum
- Dimensions:** 1.6" H x 7" W x 5" D
- Electrical:** 117 VAC, 50/60 Hz
- Power:** 5W maximum
- Options:** J, P, P2, Sync, Tone, UL



# ES-233

## Video Fader

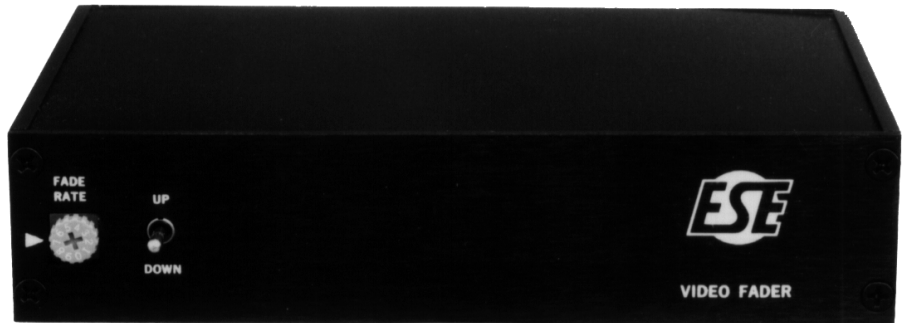
The **ES-233** is an automatic video fade-to-black system. The unit uses a digital attenuator which provides an extremely linear, repeatable fade rate. Fade rates are adjustable between 1 frame and 150 frames via a front panel mounted, ten position selector switch or with Option "D". The video-fade operation 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
- Video Loop For Simple Installation
- Optional Combo Rack Mount (**ES-219A** Black Generator with **ES-233**)
- Repeatable And Adjustable "Fade Rate"



### Specifications

**Input/Output:** 1 Vpp, 75  $\Omega$

**Fade Rate:** 1 Frame - 5 seconds  
(adjustable)

**Electrical :** 117 VAC, 50/60 Hz

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

**Options:** D, J, P, P2, UL

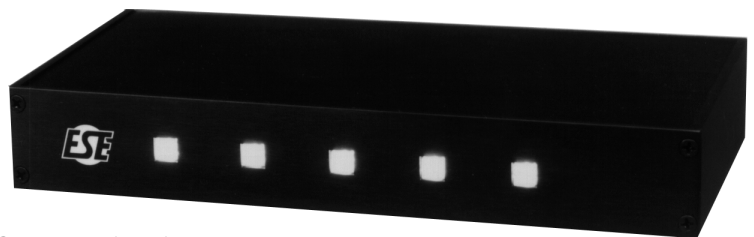
# ES-305

## Electronic Fingers

The **ES-305** is a five second countdown timer designed to signal "News Talent" of an upcoming "On air" situation. The unit can be operated from the control room and allows the director a simple means of communicating with the talent. An external clock or timer can be used to synchronize the countdown with "network" or "in-house" time. Other modes of operation cause the unit to delay five seconds before countdown or to flash all five LED's for five seconds (a "Next Camera" warning).

### Features

- Camera Mountable
- Synchronizable With "Real Time"
- Operates From 120 VAC Or + 12 VDC
- Perfect Timing Between Director and Talent
- Bright LED Displays For Unmistakable (Silent) Communications



### Specifications

**Mechanical:** 10" W x 1.6" H x 5" D (Camera Mountable)

**Electrical:** 110-120 VAC, Max. +12 VDC, 200mA



# 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



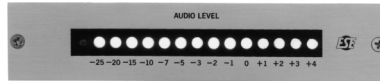
# AUDIO LEVEL INDICATORS

*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.

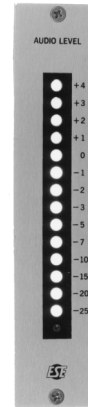
## Features:

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

ES-215

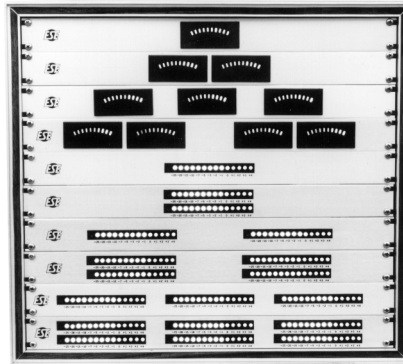


ES-216



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 +4 dB. 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

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

### ES-216

Indicators:	10
Scale:	+3 dB thru -20 dB
Reference Level "0" Adjustment:	-14 dB to +30 dB
Input Impedance:	6000 ohms, balanced (any sensitivity)
Input Circuit:	Transformerless
Frequency Response:	20 - 20 KHz +/- 1 dB (all modes)
Rise Times:	Peak Mode - 1 mSec VU Mode - 300 mSec
Fall Time:	300 mSec
Power Requirement:	+10 to +24 VDC @ 24 mA (regulated or unregulated)
Modes of Operation:	Peak (unless otherwise specified), VU (Slow Averaging)
Mode Selection:	PCB Jumper
Mechanical:	3" x 1.4" x 1.5" Deep
Options:	P, P2, P3, P4



# AUDIO LEVEL INTERFACE

(XLR TO/FROM RCA)

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

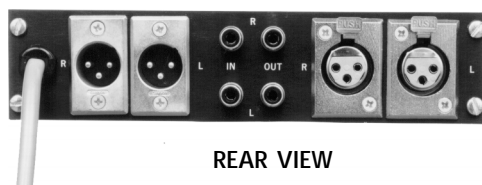
- Unbalanced Computer Sound Cards to Pro Audio
- Convert Unbalanced to Balanced and Vice-Versa
- Perfect for DAT, CD Recorders, and Tape Decks



ES-244P



ES-244



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



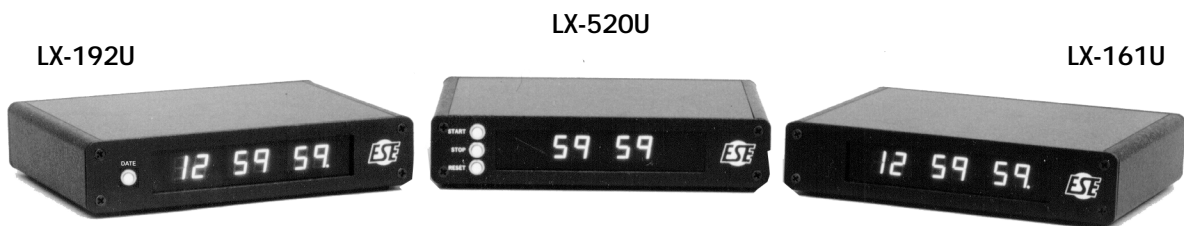
# DIGITAL CLOCKS & TIMERS

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



## 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-364U, ES-366U, ES-372U** and **ES-369U** (**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:	<b>ESE</b> "TC-90" Output	Any <b>ESE</b> or SMPTE/EBU	<b>ESE</b> "TC-89" Output	Any <b>ESE</b> 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 2300 "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

### THREE YEAR WARRANTY

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 three years of purchase. Before returning goods, please write or call for shipping instructions.

