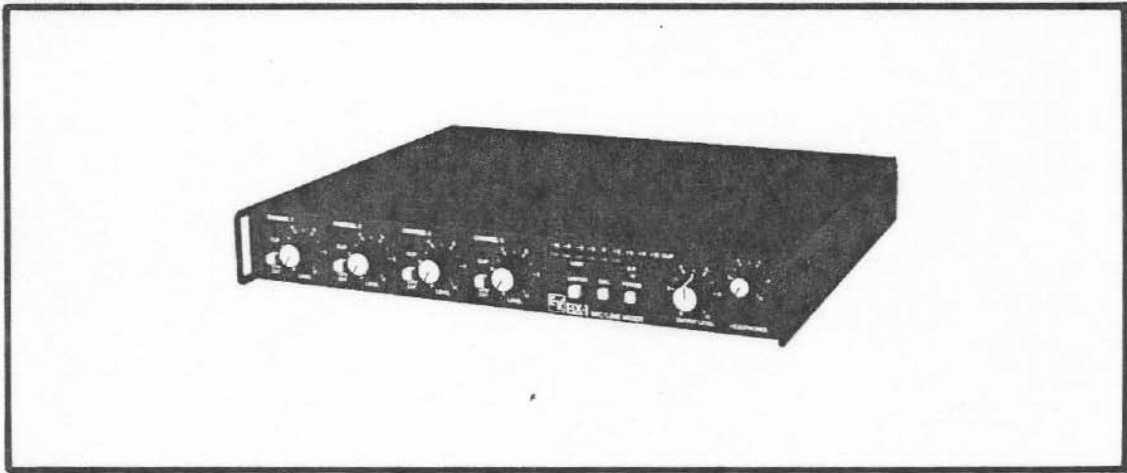


EV [®] SERIES
ELX

OWNER'S MANUAL



ELX-1 Broadcast Mixer

ELX-1 FEATURES

- Compact design uses only one rack space (1-3/4 inch).
- Four balanced transformerless inputs have RF filters and are switchable to mic or line level.
- Input controls set gain of preamps for optimum noise performance with any input signal.
- State-of-the-art circuit technology provides flat frequency response, low distortion, and low noise.
- Phantom power is available at microphone inputs.
- Low-cut filters switchable at each input reduce handling and background noise.
- LED indicator at each input lights if clipping occurs.
- 1/4-inch auxiliary input jack is for fifth input or for stacking additional mixers.
- Two 1/4-inch stacking jacks are for interconnection with additional mixers, and can be modified for insert patching.
- Solid-state three-color bargraph meter shows peak output level and has clip indicators.
- Switchable output limiter prevents clipping. Yellow LED lights when limiting action occurs.
- 1 kHz oscillator facilitates level calibration.
- Transformer-isolated output with binding posts.
- Transformer-isolated output with XLR connector and mic/line level select switch.
- Headphone output, with separate power amp and level control, can drive any headphones or a cue speaker.
- RF shielding and protection circuitry is used throughout.
- Electro-Pulse indicator shows power status and battery condition.
- Powerable from AC line, internal batteries, or external DC source, with automatic switchover.
- Detachable line cord and accessory shoulder strap allow portable operation.

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DESCRIPTION

The ELX-1 is a compact, high-performance audio mixer designed for professional applications where reliable operation and clean sound are important. With its long list of features, it is extremely versatile and suitable for broadcast, P. A., recording, or film productions. The ELX-1 mounts in a single rack space, can be used on any surface, or can be carried with the accessory shoulder strap.

OPERATION**1. INPUT CONNECTIONS**

Three-pin female XLR-type connectors are used for the balanced mic/line inputs. Pin 2 is +, pin 3 is -, and pin 1 is the shield-ground connection. Next to each input connector is a mic/line level select switch, which allows any input level to be accommodated. The line level position should be used when the nominal input level is above -20 dBu.

2. PHANTOM POWER

When the back panel phantom power switch is pressed, phantom power will be applied to the microphone level inputs. Pins 2 and 3 have 30 volts DC with a source resistance of 3.6 K ohms and pin 1 is the ground reference.

3. INPUT CLIP INDICATORS

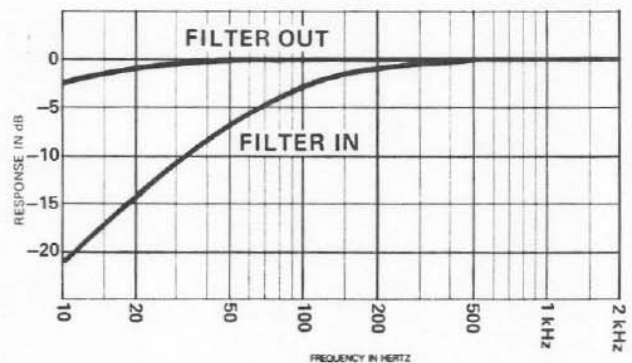
Each input has a red clip indicator near its level control. If it lights, the preamp is clipping, and the level control should be turned down.

4. INPUT LEVEL CONTROLS

Each input level control simultaneously adjusts the preamp gain and mixes its channel to the output. This setting can be optimized by applying the loudest signal to be encountered to the input and setting the knob as high as possible without lighting the clip indicator. Then reduce the level if necessary to create the desired mix.

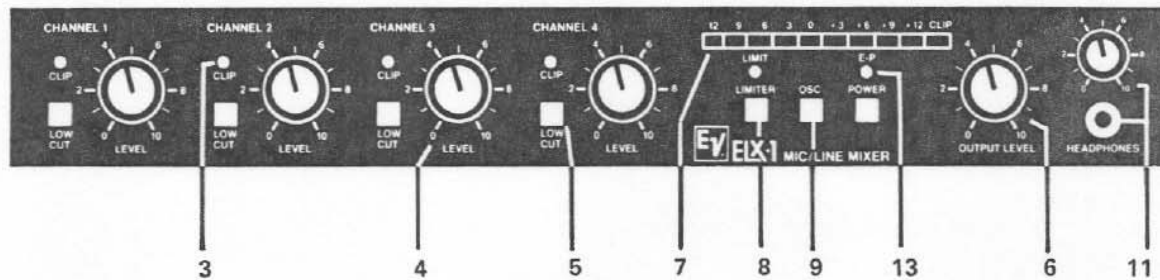
5. LOW CUT FILTERS

Wind, handling, or background noises can be reduced by switching in the low-cut filter at the appropriate input channel. The corner frequency of these filters is 100 Hz and the slope is 6 dB/octave. See Figure 1.

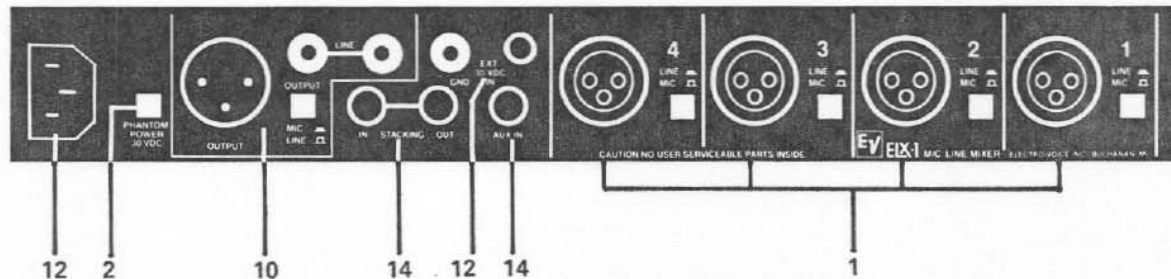
**FIGURE 1 - Low Cut Filter Response****6. MASTER LEVEL CONTROL**

This controls the level of the main output. The main output signal is available from two transformer windings, one connected to the XLR output connector and the other to the binding posts.

EV ELX-1 Broadcast Mixer



Front Panel



Rear Panel

7. DISPLAY

A ten-segment LED bargraph indicator shows the level at the main outputs. The meter responds to peaks; its rise and fall times conform to the widely accepted Peak Program Meter Standard, BS4297. By observing peak signal levels one can make use of the available headroom in the mixer (or following equipment) without the risk of clipping the signal. In normal operation signal peaks should reach into the yellow display range -- +3 to +12 dB. The 0 dB reference level is factory calibrated to read 0 dBu (sine wave). This can be changed; see Service Section.

The last segment of the display is a red clip indicator. It senses clipping at two places: the mix amp output, and the main output. If reducing the master level control does not affect a clip indication, then the mix amp is being overdriven. The actual threshold of the clip indicator will drop if the supply voltage drops (e.g., weak batteries).

The time constants of the display can be changed to match those of a VU meter (the clip indicator will still operate normally). The meter indication will then correlate more with perceived loudness than with the actual signal voltage. This modification is described in the Service Section.

The display will show a bargraph when AC power is used. When batteries or external DC is used, the display will switch to dot mode, lighting just one segment at a time to conserve power.

8. LIMITER

When the limiter switch is pressed, the limiter will protect the output from clipping distortion which might otherwise occur during unexpected increases in program level. The output level is limited to +14 dBu. The yellow limit indicator above the limiter switch will light whenever limiting (gain reduction) occurs (see Figure 2). If large amounts of limiting are anticipated be sure the input controls are low enough so that the input preamps will not clip even with the loudest sound that might occur.

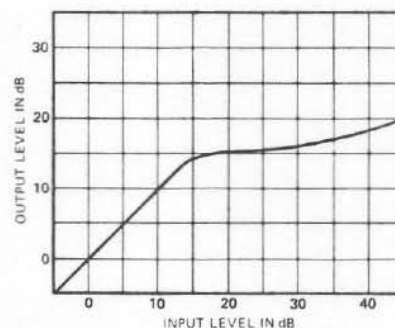


FIGURE 2 - Limiter Response

The limiter threshold (+14 dBu) can be changed to a different level. This modification is described in the Service Section.

9. OSCILLATOR

The built-in oscillator is convenient for level checks or for verifying operation of a system. The output is a 1 kHz sine wave. The master level control will set the level, which is indicated on the display. The oscillator signal is also available at the stack output jack at a fixed level of -10 dBu.

10. MAIN OUTPUTS

The main transformer isolated output has two different connections, each with its own secondary winding. The binding post connection can hold a telephone line. The telephone company may require an interface device between the telephone line and the mixer. The other winding has a 3-pin male XLR-type connector with a level switch for line or microphone level. Like the inputs, pin 2 is +, pin 3 is -, pin 1 is shield ground.

11. HEADPHONE OUTPUT

A three-conductor jack is provided on the front panel to drive stereo headphones of any impedance. The headphone level control adjusts the gain for the headphones independently from the master output control. This allows you to cue an input or adjust a mix with headphones before bringing up the master output control.

The headphone jack can be used as a separate line-level output. Like the main output, the signal will be clean, with very low distortion and low noise. If a two-conductor plug is used with this three-conductor jack, it should be inserted only part way (to the first detent).

12. POWER SOURCE

There are three ways to power the ELX-1: AC, internal batteries, or an external DC supply. A power supply inside the mixer is energized whenever the AC cord is plugged in. If the line voltage drops while the mixer is on, the batteries or external supply (whichever has a higher voltage) will take over. The battery holder is accessed from the bottom of the mixer. It holds three 9-volt transistor radio batteries which will power the mixer to full output. Alkaline batteries are recommended for maximum life, especially if phantom power and headphones are used.

For external DC power operation, use a Switchcraft S-760 or equivalent power plug, and a .25 amp fuse in series with the power source. The external power supply voltage should be between 24 and 45 volts for optimum performance, although the mixer will operate at lower voltages.

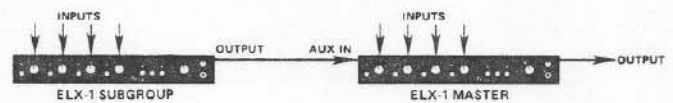
13. ELECTRO-PULSE POWER STATUS INDICATION

The green Electro-Pulse™ LED will light steadily during AC operation. When batteries or external DC power is used, the LED will flash to indicate that the power is on, and the flash rate corresponds to the supply voltage. The indication ranges from one second per flash (fresh batteries) to about five seconds per flash (weak batteries). If the supply voltage drops to 18 volts or less, the Electro-Pulse LED will stop flashing.

14. STACKING

The ELX-1 is designed to allow connection of additional mixers to increase the number of inputs available. Three 1/4-inch jacks on the back panel are intended for this purpose.

The auxiliary input is line level (-10 to $+4$ dBu), buffered, and feeds the mix bus. The output of another mixer or other audio equipment can be connected here to mix with the four input channels (see Figure 3).



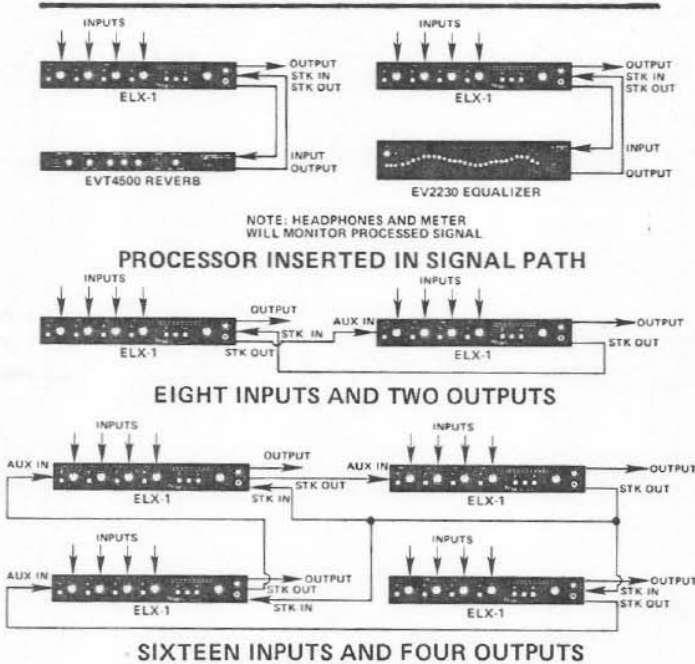
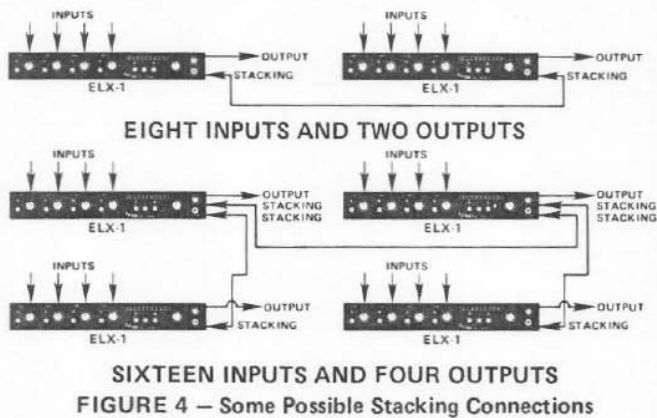
FOUR EXTRA INPUTS WITH SUBGROUP CONTROL

FIGURE 3 — Using the Auxiliary Input

The two stacking jacks are wired at the factory for passive mix bus connections. Two ELX-1's can be interconnected by patching a stacking jack on one mixer to a stacking jack on the other mixer; it makes no difference which jack is used. Additional ELX-1's can be added using one additional patch cord per mixer (see Figure 4). Each master will control only that mixer's output, which consists of the complete mix of all input channels. These jacks can also be used as fixed-level outputs; they are unaffected by the master level control.

The stacking jacks can be converted to a normal pair for inserting auxiliary equipment in the signal path. This modification is described in the Service Section. If this modification is performed, other connection possibilities will exist (see Fig. 5). Standard 1/4-inch two-conductor (or three-conductor) patch cords can be used.

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The connections in Figure 4 (unmodified stacking jacks) result in some drop in signal level, which is partially compensated by the use of more input channels. These connections use simple patch cords. In Figure 5, no level loss occurs; but, if three or more mixers are stacked and all outputs need to have the complete mix, some Y-connectors will be required.

SERVICING/MODIFICATIONS

RACK MOUNTING

Use the Electro-Voice rack mount kit Model RM-1. This optional kit consists of two rack-mount brackets and eight # 6 x 1/2-inch self-tapping screws. On each side of the mixer, remove the four screws holding the side panels, place the rack

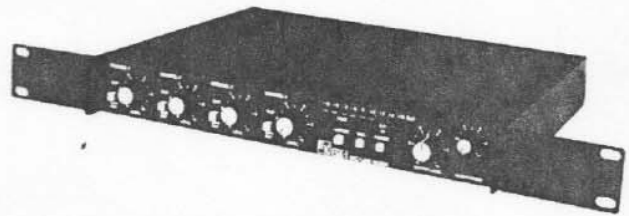


FIGURE 6 – ELX-1 with Rack Mount Brackets

DISASSEMBLY

THE REMAINING MODIFICATIONS REQUIRE OPENING THE CASE AND SHOULD BE DONE ONLY BY A QUALIFIED SERVICE TECHNICIAN.

To open the top cover, remove the bottom two screws from each side, and the screws at the top edge of the back. Then pull the top cover, with sides attached, straight up.

To remove the display board, pull upward at the back of the board until the connector is disengaged, then slide the board out toward the back of the mixer. When reinstalling, be sure the bargraph and individual LED's are properly placed in the front panel. To service the main board, remove the nuts on the pots and the screws holding the printed circuit board. If power is to be applied while servicing, be sure to ground the power supply to the chassis. The rear board is held by three screws and five XLR-type connectors. The XLR-type connectors can be removed by rotating the screw in the small hole at the contact end of each connector. The board can then slide out toward the front.

METER CALIBRATION

See note on Display Section of schematic. R223 can be accessed through a hole in the PC board.

METER TIME CONSTANT

See Note 1 on Output Section schematic.

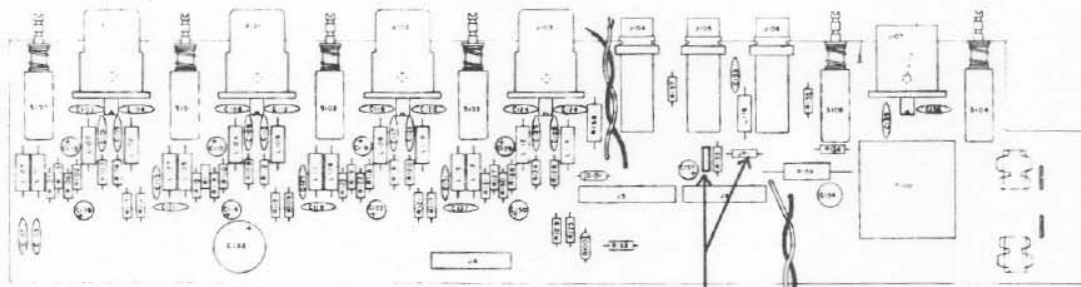
CHANGING THE LIMITER THRESHOLD

The limiter threshold can be set for levels from +4 dBu through +14 dBu. See Note 2 on Output Section schematic. The diode can be soldered on the terminal posts without removing the PC board.

STACKING JACK CONVERSION

See Note 3 on Output Section schematic.

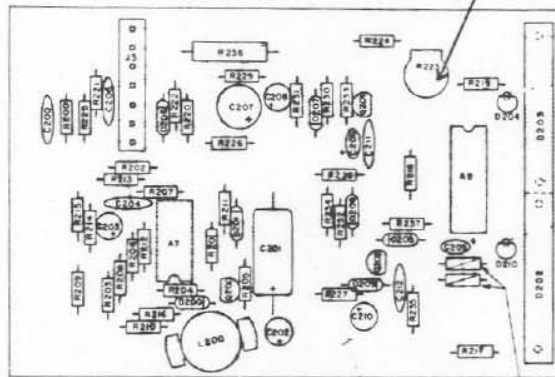
ELX-1 Broadcast Mixer



CONNECTOR BOARD

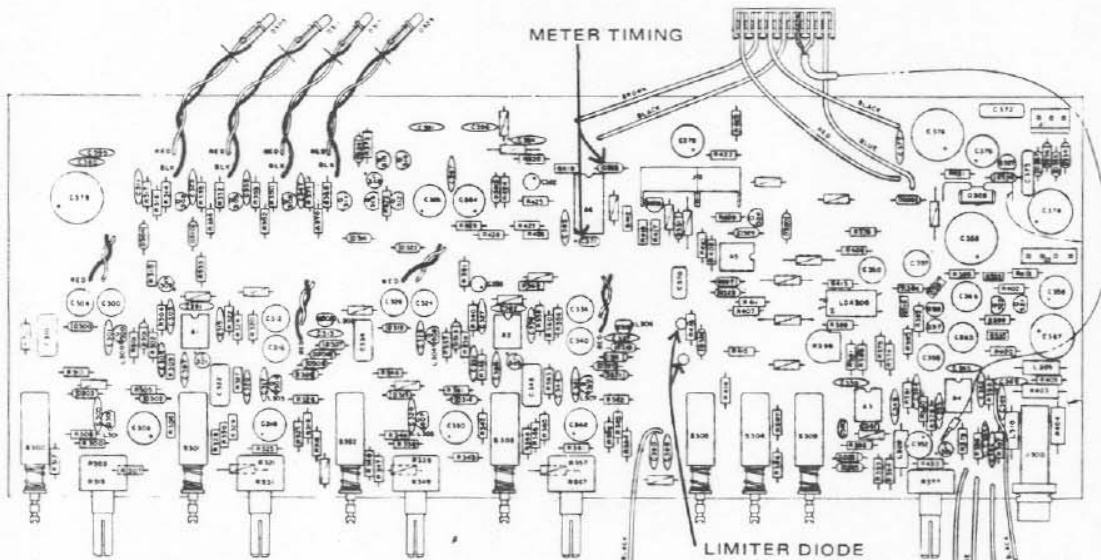
INSERT PATCHING

METER CALIBRATION



DISPLAY BOARD

METER TIMING

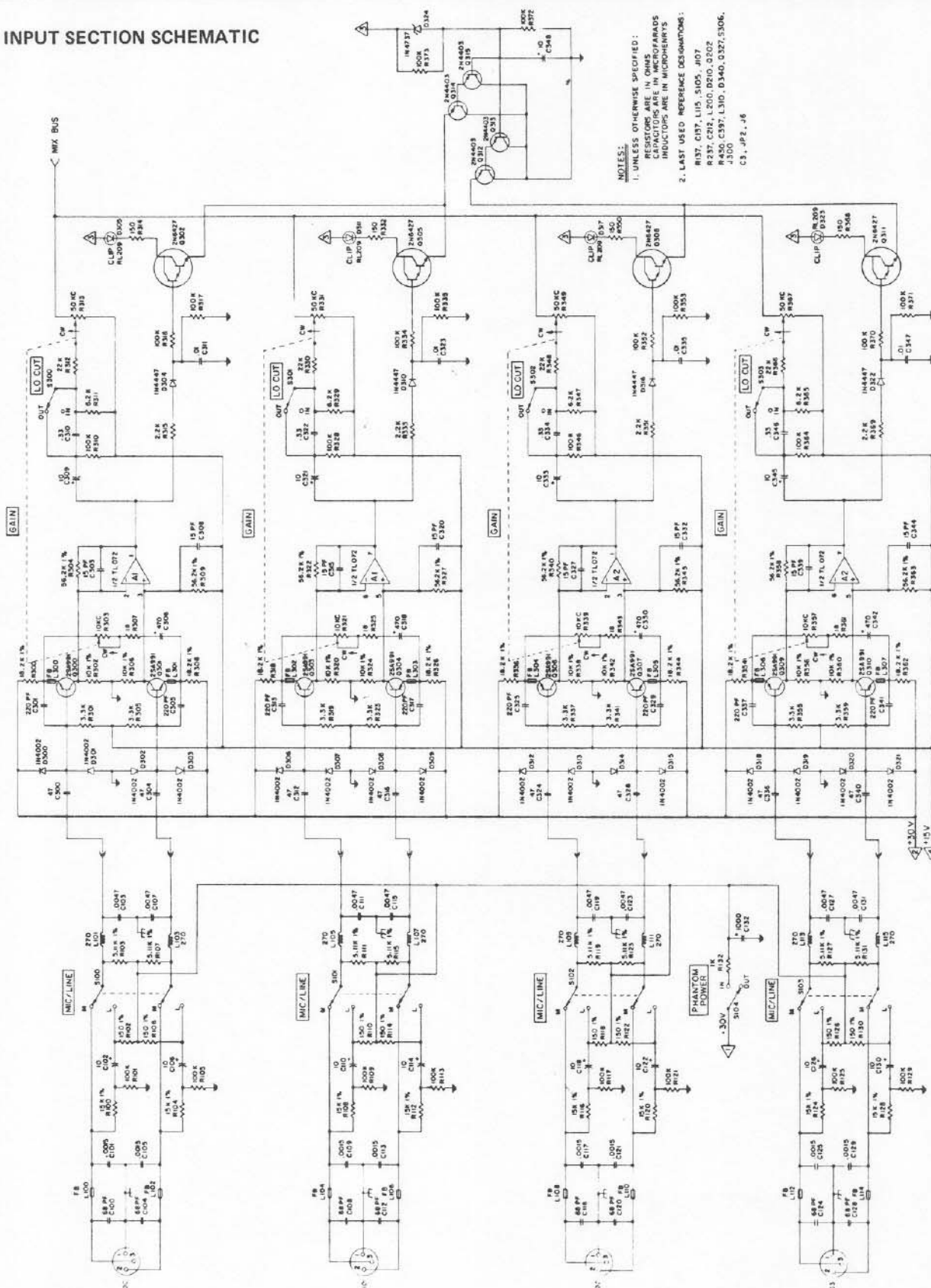


MAIN BOARD

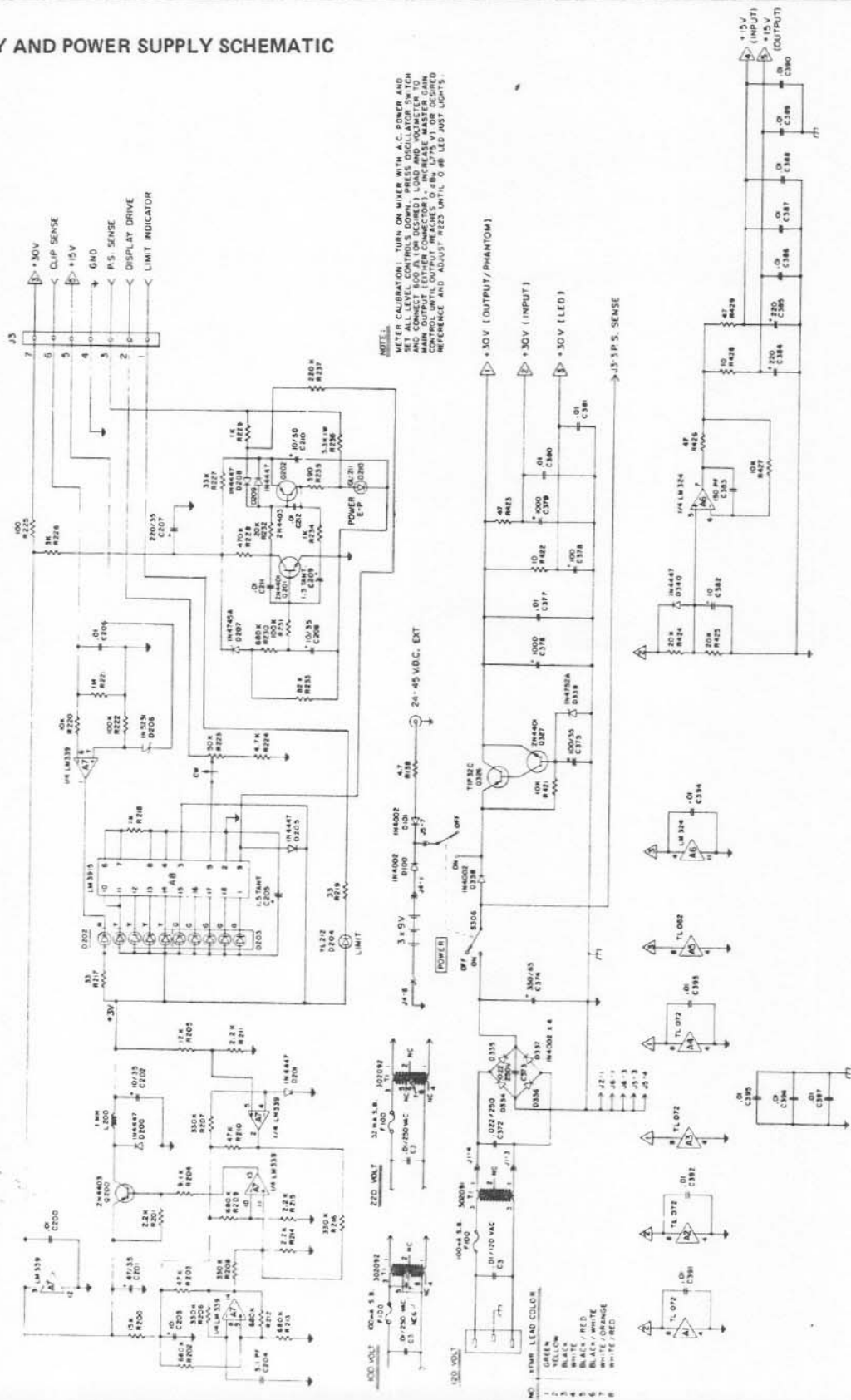
LIMITER DIODE

ELX-1 Broadcast Mixer

INPUT SECTION SCHEMATIC



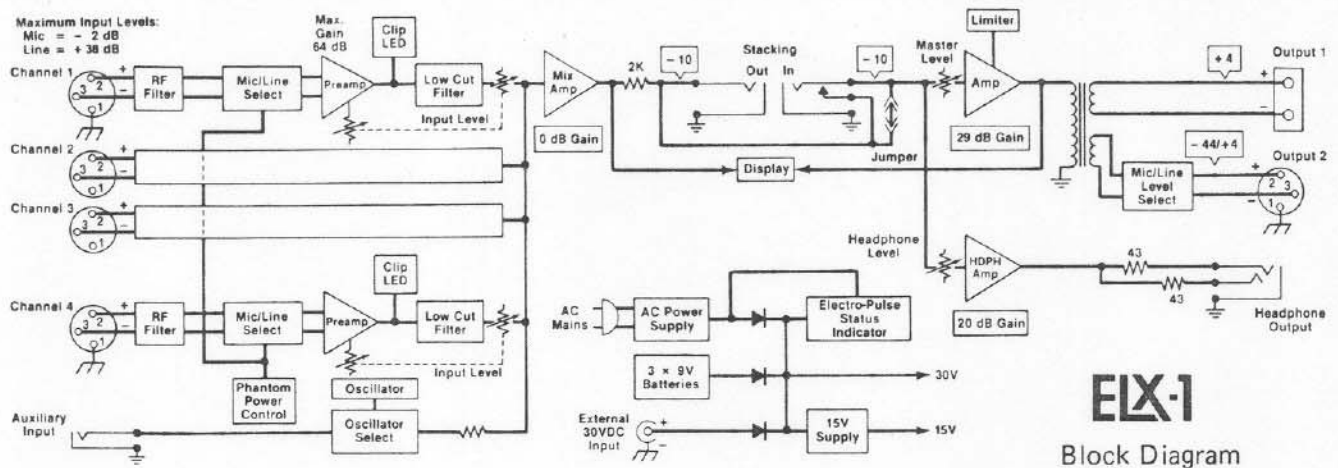
DISPLAY AND POWER SUPPLY SCHEMATIC



NOTE:
AFTER CALIBRATION, TURN ON MIXER WITH A.C. POWER AND SET ALL LEVEL CONTROLS DOWN. PRESS OSCILLATOR SWITCH AND CONNECT 800 Ω OR 600 Ω LOAD AND VOLTMETER TO CONTROL UNTIL OUTPUT REACHES 0.48V U75 V1 OR OSCILLO REFERENCE AND ADJUST R223 UNTIL 0.88 LED JUST LIGHTS.

- NO. JUMP LEAD COLOR
- 1 VIOLET
 - 2 BLACK
 - 3 BLACK/RED
 - 4 BLACK/WHITE
 - 5 WHITE/ORANGE
 - 6 WHITE/RED
 - 7 RED
 - 8 GREEN
 - 9 BLUE
 - 10 BROWN

ELX-1 Broadcast Mixer



ELX-1 SPECIFICATIONS

Frequency Response,

Any input to any output:
30 Hz-20 kHz +0, -1 dB

THD,

Any Output:
20 Hz-20 kHz at +4 dBu <.15%
50 Hz-20 kHz at +18 dBu <.15%

Stack or Headphone Output:
20 Hz-20 kHz at +18 dBu <.1%

Noise,

EIN, MIC Input, MAX Gain,
150-Ohm Source:

-129 dBu (typ)

Output Noise,

Inputs Down, Master Down:

<-80 dBu

Inputs Down, Master at Nominal:

<-78 dBu

Inputs Down, Master Full Up:

<-65 dBu

Maximum Voltage Gain (± 2 dB),

Mic Input to Main Outputs:

91 dB

Mic Input to Headphone Output:

82 dB

Mic Input to Stack Output:

63 dB

Common Mode Rejection:

60 dB, 20 Hz-20 kHz (typ)

Phantom Power:

30 VDC, 3.6 K Equiv. Source Res.,
Mic Input Only

Low Cut Filters,

Slope

6 dB/Octave

Corner Frequency:

100 Hz

Clip LED's:

Light 1 dB below clipping,
follow supply voltage

Limiter Threshold

(Changeable - see text):
+14 dBu

Oscillator,

Frequency:

1 kHz

Sine Wave Distortion:

<1.5%

PPM LED Display (Changeable to Vu - see text),

Range:
-12 dBu to Clipping

Rise Time:

10 ms

Fall Time:

3 s

Shorting Protection:

Any output may be shorted
indefinitely without causing damage

Operating Temperature Range:

-20° C to +60° C

-4° F to 140° F

Power Requirement,

AC:

120 VAC, 60 Hz

also available

220-240 VAC, 50/60 Hz

100 VAC, 50/60 Hz

12 W maximum

Batteries:

Battery Life Approx. 8 hrs.

Uses three 9 V batteries

NEDA 1604A, Mallory MN1604,

Eveready 522,

External DC-

24-45 vDC, 100 ma maximum

Dimensions:

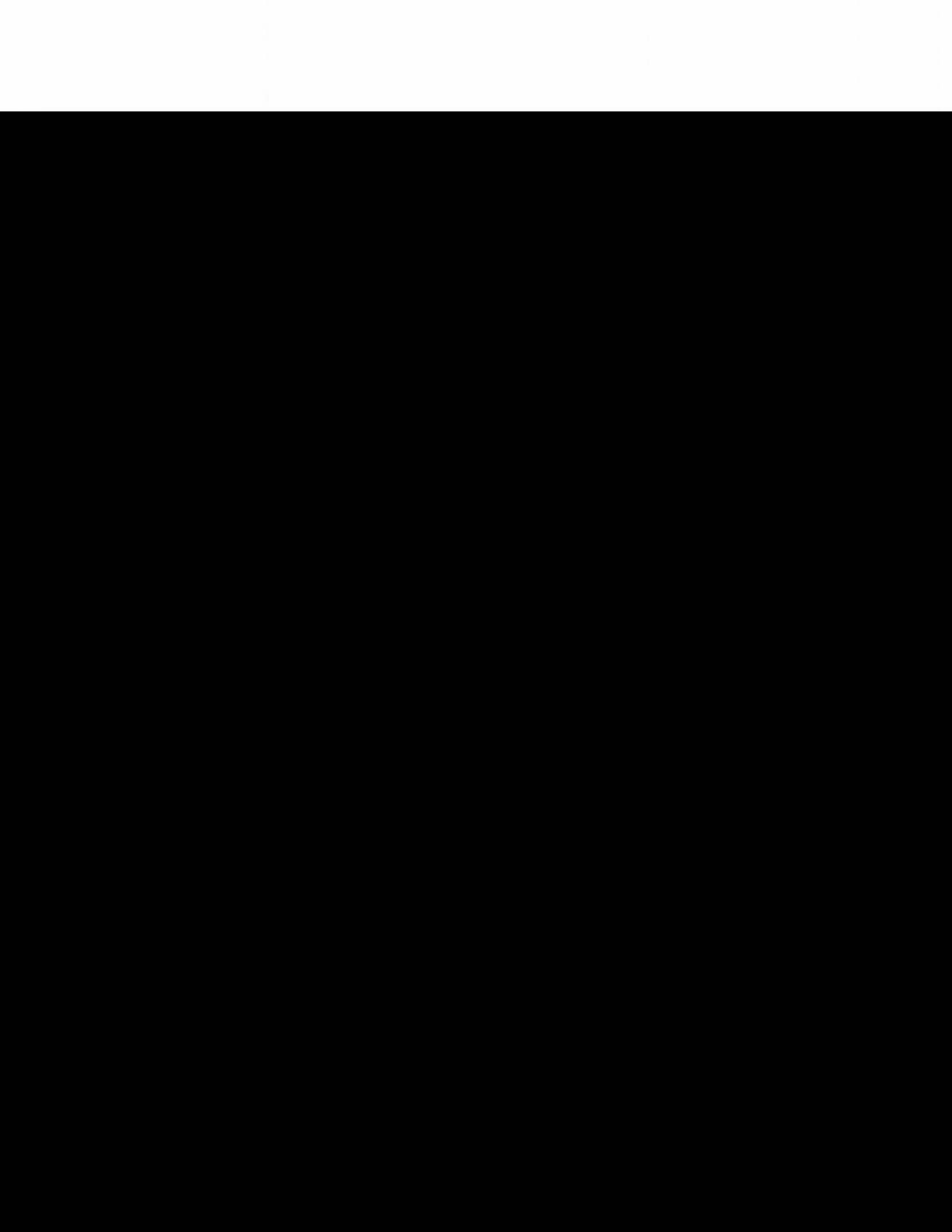
1-3/4 high

12-7/8 wide

11-3/4 deep

Weight:

5.5 lbs w/batteries and cord



EV ELX-1 Broadcast Mixer

| | | | | |
|--------------------------|-----------|----------|---------|---------|
| Aux In | 15 K Ohms | -- | -10 dBu | +18 dBu |
| Stack In | 2 K Ohms | 2 K Ohms | -10 dBu | +18 dBu |
| Stack In Modified (1) | 22 K Ohms | -- | -10 dBu | +30 dBu |

OUTPUT SPECIFICATIONS

| OUTPUT | OUTPUT IMPEDANCE | NOMINAL LOAD IMPEDANCE ^[2] | NOMINAL LEVEL | MAXIMUM LEVEL |
|------------------------------|------------------|---------------------------------------|---------------|---------------|
| Main Output | | | | |
| Binding Posts | 60 Ohms | 600 Ohms | +4 dBu | +18 dBu |
| XLR-Line Level | 60 Ohms | 600 Ohms | +4 dBu | +18 dBu |
| XLR-Mic Level | 10 Ohms | -- | -44 dBu | -30 dBu |
| Headphone Out | 43 Ohms/Ch. | 600 Ohms/Ch. | +4 dBu | +18 dBu |
| | | 8 Ohms/Ch. | -- | -1 dBu |
| Stack Output | 2 K Ohms | 2 K Ohms | -10 dBu | +12 dBu |
| Stack Output Modified (1) | 10 Ohms | >2 K Ohms | -10 dBu | +18 dBu |

(1) Stacking jacks can be modified for insert patching — see text.

(2) Outputs will operate with any load impedance without damage.

WARRANTY (Limited)

Electro-Voice Series ELX Electronic Products are guaranteed for two years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not cover finish or appearance items or malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

Electro-Voice engineering continually improves existing products, as well as creating new ones. Thus specifications given in this brochure are subject to change without notice. For complete specifications consult the appropriate Engineering Data Sheet.

FACTORY SERVICE

If you need service information, replacement parts, or factory service, our address is:

Electro-Voice, Inc.
Service Department
3810 148th Avenue, N.E.
Redmond, Washington 98052
206/881-9555

If you write to the factory, please include a concise description of your problem, any related equipment, your telephone number, and the time of day when you can be reached.



600 Cecil Street, Buchanan, Michigan 49107