6-13C
MODEL

# INSTRUCTION MANUAL

## Signature II AUDIO CONSOLE

LPB®

LPB Inc.
520 Lincoln Highway
Frazer, Pa. 19355
(215) 644-1123

PRICE $10.00

FINAL TEST & INSPECTION REPORT

SIGNATURE CONSOLE

Customer WCRQ - FM

Model S- 13C s/n 7869 Date 3-22-79 By [signature]

No. Mic Preamps 2 Mechanical Inspection X Electrical Inspection X

Mic Channel (ch 1) (Line Pot at 6, Master at 14) (PGM LEFT)

Audio input for +8 dBm output — 55.0 at 1kHz

Distortion .13 percent at 1kHz

Response relative to 1kHz: 20Hz -.1 500Hz 0 5kHz -.1

10kHz -.2 20kHz -1.0

Noise 65 dB below +3dBm output

Hi Level Channel (ch 4) (Line Pot at 7, Master at 14) (PGM LEFT)

Audio input for +8 dBm output -10.0 at 1kHz

Distortion .12 percent at 1kHz

Response relative to 1kHz: 20Hz -.3 500Hz 0 5kHz 0

10 kHz 0 20kHz -.9

Noise 69 dB below +8dBm output

Functions:

Monitor X Cue X Phones X Muting Relay X

All Inputs X All outputs X On-Air Contacts X

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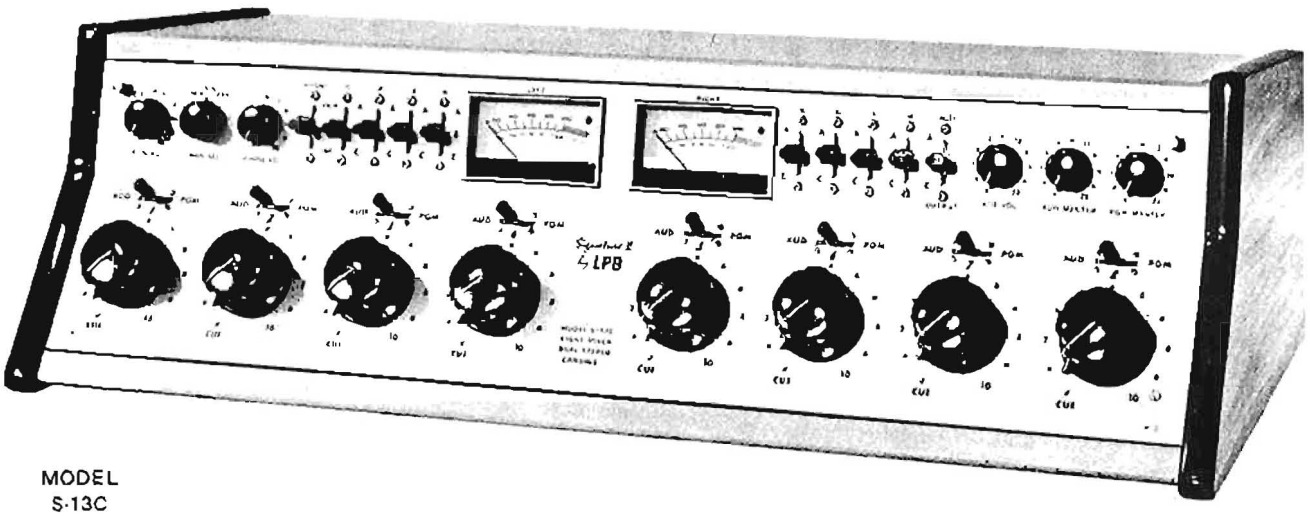
## *Signature II*

## 8 MIXER STEREO/MONO CONSOLE



MODEL
S-13C

• 24 Inputs • Step Attenuators • Plug-In Modules • Led Peak Indicators • Switch Selectable Mic Gain •
• All Transformer Inputs and Outputs • 12 Watt Monitor • Demonstrated RF Immunity •

The LPB Model S-13C 8 Mixer Stereo/Mono Console accepts a total of 24 transformer coupled audio inputs, 3 to each of the 8 mixers. As shipped, mixer 1 accepts 3 switched stereo microphone inputs and mixers 2 through 8 accept 3 switched stereo high level inputs each. Mixers 2 through 4, however, can each accept 3 switched microphone inputs by substituting the standard plug-in high level input boards with available microphone preamp plug-ins. Monitor speaker muting and tally relays are provided for mixers 1 through 3, and mixers 4 through 8 incorporate remote switch contacts. Mixers 1 through 4 are internally switch selectable to mono or stereo, as well as mixer 8 which includes a talkback line.

A cue position is provided on every mixer and the S-13C includes an internal cue system consisting of a cue amplifier, level control and 5 inch speaker. A phone jack mounted on the rear panel provides headphone monitoring of program, audition and cue with its own level control. The internal stereo monitor amplifier is switch selectable to monitor program, audition or an external line. The illuminated VU meters are switched simultaneously with the monitor selector in the program and audition positions, and return to read the program line in the external position of the monitor selector.

The program and audition performance specifications are identical, with the audition channel providing a mono output of all selected inputs. Each output has master level controls on the front panel, with the audition output being fed to a 3-position output director switch. Program, audition, headphone and cue buss auxiliary outputs are also provided. Light emitting diode peak level indicators are standard, located in the VU meters, and may be adjusted to fire at various level thresholds. All connections to the S-13C are made through barrier strip screw connections located within the console.

## SPECIFICATIONS

**Mixers**
- Total . . . . . 8 Stereo
- With Cue . . . . . 8
- Type . . . . . Step Attenuator

**Inputs**
- Standard Factory Equipped
  - Mic (Stereo) . . . . . 3
  - Hi-Level . . . . . 21
- Optional Maximum
  - Mic (Stereo) . . . . . 12
  - Hi-Level . . . . . 24
- Total . . . . . 24

**Input Impedance**
- Mic . . . . . 150 ohms source, Trans. Bal.
- Hi-Level . . . . . 600 ohms, Trans. Bal.

**Input Levels**
- Mic . . . . . selectable: -45 dBm, -55 dBm, -65 dBm
- Hi-Level . . . . . -10 dBm
- Remote/Net . . . . . -10 dBm

**Outputs**
- Program (Stereo) . . . . . (+8 dBm = 0 VU) clipping level above +22 dBm
- Audition (Mono) . . . . . (+8 dBm = 0 VU) clipping level above +22 dBm
- Monitor . . . . . 4 @ 12 watts total
- Cue . . . . . 1 @ 1 watt with 5" internal speaker
- Headphones . . 1, switchable between Program, Audition or Cue

**Output Impedance**
- Program . . . . . 600 ohms, Trans. Bal.
- Audition . . . . . 600 ohms, Trans. Bal.
- Monitor . . . . . 2 to 8 ohms
- Headphones . . . . . 200 ohms and up

**Frequency Response**
- Program . . . . . ±1.0 dB 20 Hz – 20 kHz
- Audition . . . . . ±1.0 dB 20 Hz – 20 kHz
- Monitor . . . . . ±1.5 dB 20 Hz – 15 kHz

**Total Harmonic Distortion**
- Program and Audition . . . . . Typ. 0.2%, 0.5% max., 20 Hz – 20 kHz @ 18 dBm Output, -55 dBm Input
- Monitor . . . . . Typ. 1.5%, 20 Hz to 15 kHz

**I. M. Distortion**
- Program and Audition . . . . Less than 0.15% @ +22 dBm Output Level
- Monitor . . . . . Less than 0.2% @ 12 watts

**Signal to Noise**
- Program and Audition . . . . . Better than 74 dB below +18 dBm Output with -50 dBm Input, 20 Hz – 20 kHz

**Crosstalk**
- Program to Audition and Monitor . . . . . Below noise level

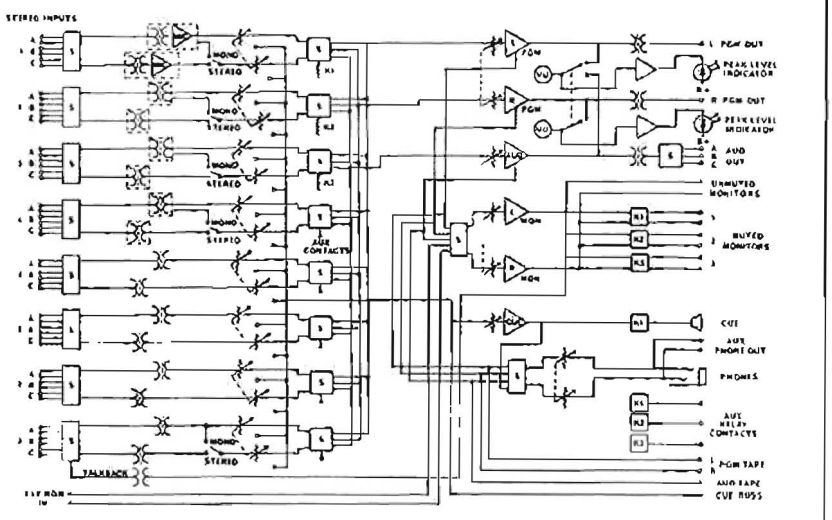
**Power Requirements**
- Voltage . . . . . 117 Vac (234 Vac available)
- Frequency . . . . . 50/60 Hz
- Power . . . . . 60 watts

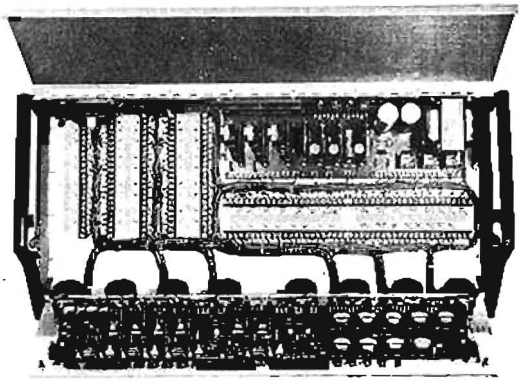
**Dimensions**
- Width . . . . . 32"
- Height . . . . . 9"
- Depth . . . . . 15"
- Weight . . . . . 42 lbs.

**Plug-In Modules**
- Types . . . . . Mic Preamp, Hi-Level Input, Line Amp, Power Amp, Voltage Regulator
- Total Number . . . . . 15

**Cabinet**
- Material . . . . . 0.125" Aluminum
- Finish . . . Textured scratch resistant "champagne gray" Armorhide® exterior, gold anodized interior

**Panel**
- Material . . . . . 0.125" Aluminum
- Finish . . . . Horizontally ground and brushed aluminum, black epoxy silk screening with protective clear epoxy overcoat.





Model S-13C Console Interior

The S-13C Console top cover and front panel hinge open to allow immediate access to all circuit components and the labeled input/output screw terminals.

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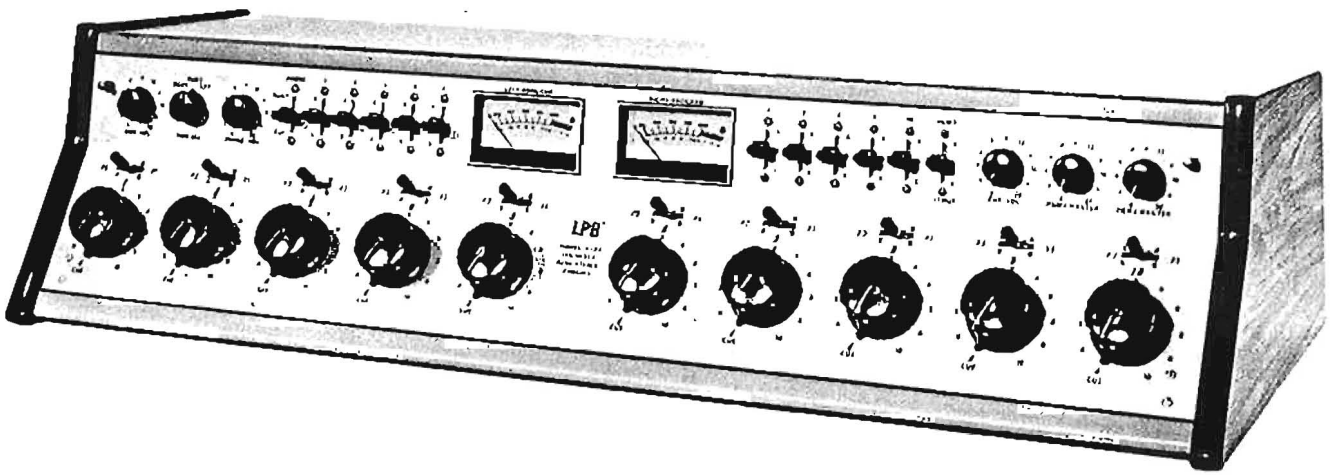
# Signature II

## AUDIO CONSOLE FEATURES




## LPB® Signature II Audio Consoles...

*Designed and manufactured to a high level of operational capability and electronic/mechanical reliability for the master control requirements of broadcasting and production.*

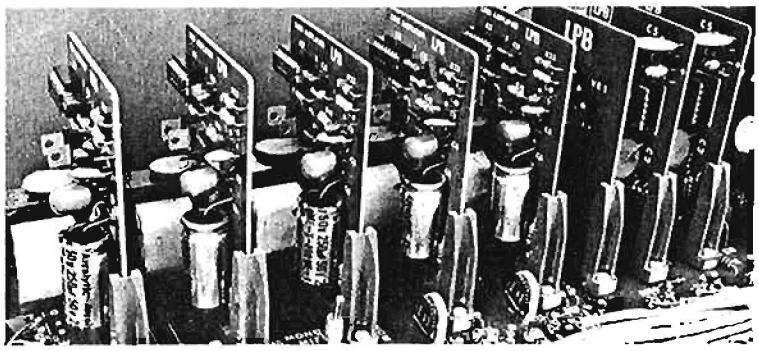
*Extensive human engineering and years of experience in console design have been combined to provide the operator with a console which is both visually appealing and easy to operate.*

*Internally, the approach is similar with immediate visual identification and ease of access to every component and connection in the console.*

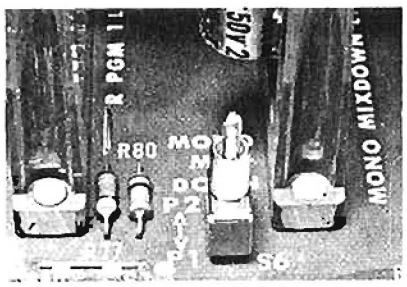
**LPB**®

*Serving the Broadcast Industry since 1960*

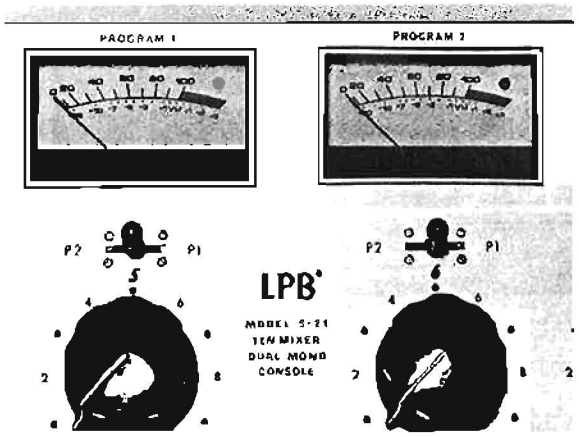
The printed circuit boards are 2 ounce copperclad G-10 fiber glass laminate, tin lead electroplated. Internal wire connections are soldered to silver plated miniature turret terminals, and all internal wiring is multiple-strand, 100% foil shielded. The monitor power output transistors are heat-sunk to the chassis rear panel for maximum heat dissipation. (S-20 output circuit assembly shown)



A feature of the Model S-20 10 mixer dual stereo console is the ability to add an optional output line amplifier which will provide a mono mixdown, switch selectable, of either the stereo program (P1) or audition (P2) busses.




High brightness LED peak audio level indicators are located in each illuminated VU meter and may be set by the user to flash at any desired level.




*other*

## Signature II

*console features*

**OUTPUT DIRECTOR SWITCH**: Dual Consoles have a three position output director switch on the audition output line, other consoles have this switch on the program output line.

**INTERNAL CUE SYSTEM**: A 5" speaker and 1 watt power amplifier are located within the console to provide high quality audio performance.

**MUTING AND TALLY RELAYS**: Rugged telephone-type relays are utilized and are socket mounted for ease of maintenance.

**POWER TRANSFORMER**: The power supply and transformer is completely internal to the console, and the transformer is specifically designed for low field operation and has mylar interwinding insulation for protection against transient damage

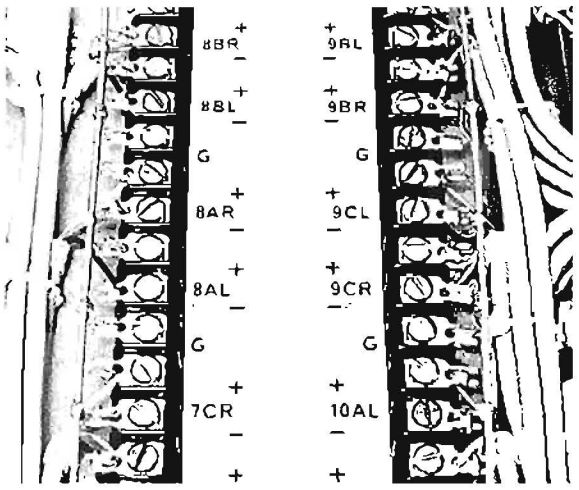
**CHASSIS CONSTRUCTION**: Consoles are constructed completely of aluminum alloy, with wood grain formica and vinyl covered warp free end panels attached to the metal end plates.

**MODULAR ELECTRONICS**: All active signal processing circuitry is "plug-in," and located on 2 "mother board" main frame assemblies. 5 types of plug-in modules are utilized for microphone preamps, balanced high level inputs, line outputs, voltage regulator, monitor output drivers and cue amplifier functions.

**DUAL LINE LEVEL OUTPUTS**: All audition (P2) outputs of Signature II Series consoles are balanced line level and metered, identical in performance to the main program (P1) output.

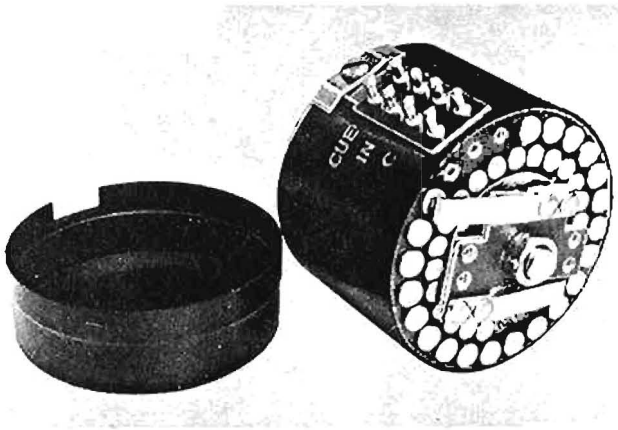
**WARRANTEE**: LPB guarantees your complete satisfaction upon receipt and will provide any necessary repairs at our factory, without charge for one year.

All input-output connections are made to screw terminal barrier strips clearly identified to aid in wiring without reference to the manual. The console harness cables are also identified and correspond to the internal circuit board wiring point markings and the wiring diagram.



**LPB** *Manufacturers and Distributors of Broadcast Equipment*

Signature II Consoles utilize these classic human engineered control knobs which readily conform to the grasp. Position markings allow immediate recognition of level settings at a glance from any direction. Panel markings are black epoxy silk screened over the .125 inch thick deep grained and brushed aluminum front panel, and overcoated with clear epoxy for additional permanence of markings.

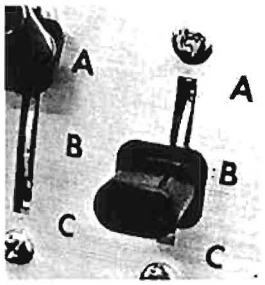


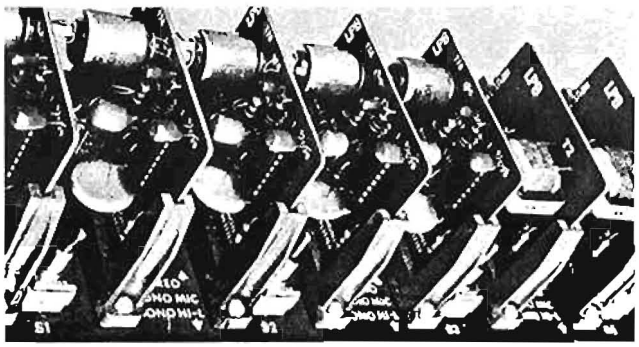
All program buss switches are rugged telephone-type roller cam design with gold alloy contacts. Additional closure contacts are provided for internal relay muting or are wired to terminal strips for external control of cartridge machines, turntables, etc.

The rotary step attenuators are 2dB per step, 20 steps, with appropriate tapers at either end of the control range. The contacts are solid silver alloy and a laminated rotor is used to produce an exceptionally low noise figure of −125 dBm. A stainless steel shaft with free-turning sleeve-type bearings provides constant knob tension.

A unique feature of the Signature II Stereo Consoles is the mono/stereo input switch located behind the front panel, which enables a mono source to be split to the left and right program busses. These selectors are provided for each microphone-capable channel and one high level channel.

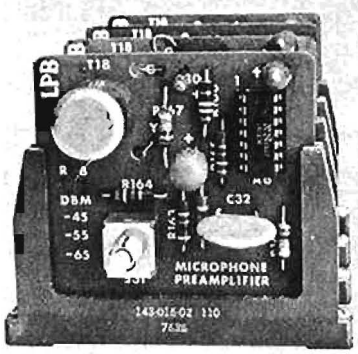
Signature II 8 and 10 mixer consoles feature 3 position input selector switches giving 24 and 30 input source capability. An exclusive manufacturing technique called "wedgelock" contact fastening secures the stationary contact to prevent loosening and rotation of contacts. Spring tempered silver alloy contacts and coin silver rotor blades have a minimum lifetime of 250,000 cycles of operation.



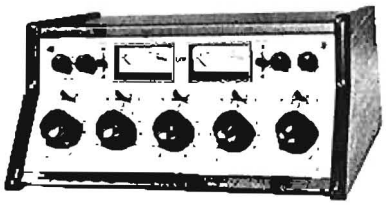



The Card Edge Connectors are molded of high stability diallyl phthalate and the contacts are phosphor bronze, with gold over copper plating. The contacts are of the "tuning-fork" variety with controlled lateral float, maintaining positive continuity of contacts and provides sufficient elastic reserve to prevent the contacts from becoming "set." All I.C. sockets feature gas-tight connection contact geometry with tin-alloy plated copper contacts. The miniature toggle switches used for microphone input gain selection, stereo/mono input switching and mono mixdown are Mil-Spec types with solid coin silver contacts and terminals which feature a minimum of 200,000 cycles of operation. (S-20 input circuit assembly shown)

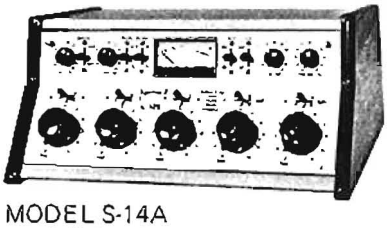
The plug-in microphone preamp incorporates switch selectable preamp gain to allow instant level matching to −45, −55 and −65 dB microphone sensitivity levels. All microphone inputs are coupled with a dual shielded, high RF suppression transformer. All active circuitry is located on plug-in modules for flexibility and ease of maintenance.



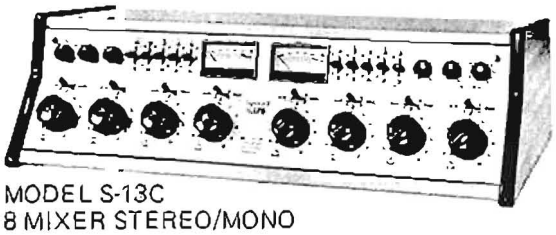
# Signature II Series Audio Consoles...



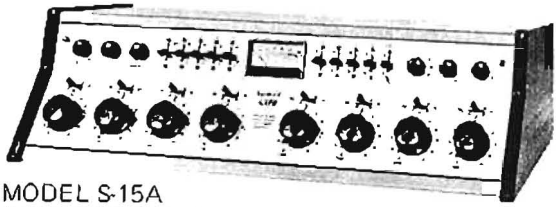
MODEL S-12
5 MIXER STEREO



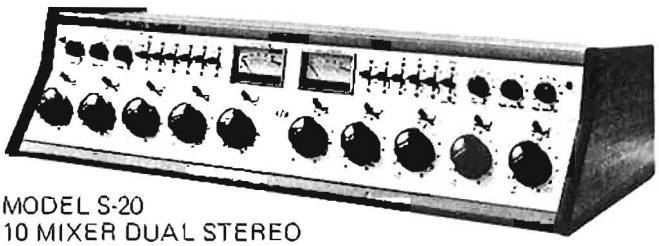
MODEL S-14A
5 MIXER MONO



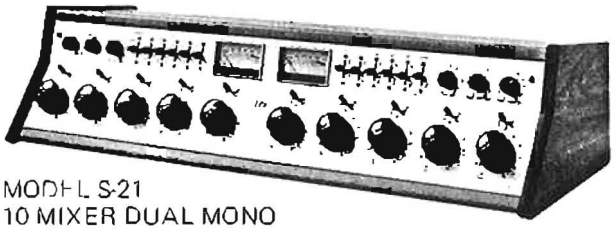
MODEL S-13C
8 MIXER STEREO/MONO



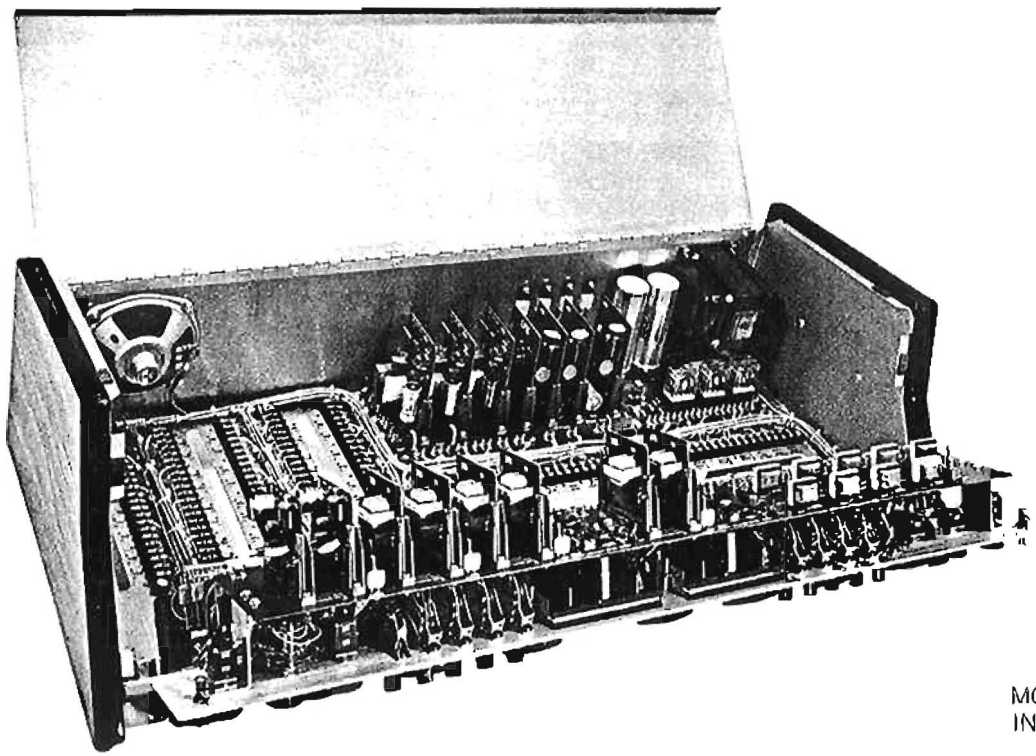
MODEL S-15A
8 MIXER DUAL MONO



MODEL S-20
10 MIXER DUAL STEREO



MODEL S-21
10 MIXER DUAL MONO



MODEL S-13C
INTERIOR

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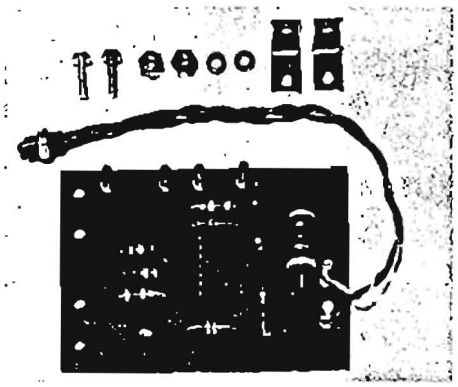
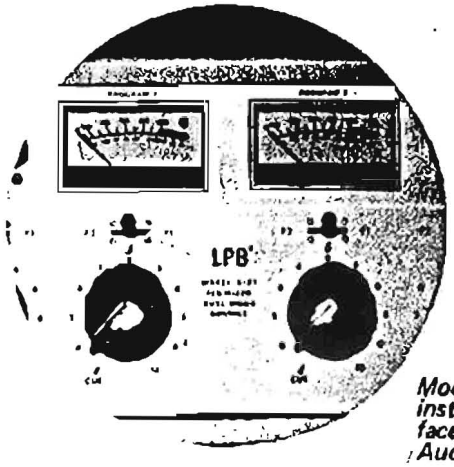
# LED PEAK LEVEL INDICATOR
# MODEL SA-1



*Model SA-1 Kit*




*Model SA-1 as installed in meter faces of LPB Audio Consoles*

## FEATURES

*Available installed in LPB consoles or in kit form*
*Utilizes ultra-high luminance light emitting diode*
*Adjustable peak level trigger*
*Pulse stretcher enhances display of rapid transients*

The LPB Model SA-1 LED Peak Level Indicator is designed to allow the operator of Audio Control equipment to be aware of actual peak levels at and beyond a pre-set reference level. This indication, especially when used in conjunction with an audio console will show how "hard" a peak signal limiter is being driven.

Although designed primarily to be connected across a VU meter, the SA-1 may be connected across virtually any audio source providing a signal of 0.4 to 6 VRMS without unbalancing or loading that source. +24 VDC is required for powering the SA-1, which draws nominally 15 ma. The LED display may be panel or meter mounted through a .189 diameter hole (#12 drill). When installed in LPB consoles, the LED display is mounted in the VU meter.

SPECIFICATIONS:

INPUT IMPEDANCE: 500,000 ohms bridging, balanced or unbalanced
INPUT SIGNAL REQUIRED: 0.4 to 6 VRMS
TRIGGER LEVEL RANGE: Adjustable +3dBm to +28dBm
POWER SUPPLY REQUIREMENTS: Nom. 24 VDC at 15 ma. avg. (5 ma to 30 ma peak)
SIZE AND MOUNTING: Circuit board 2-1/8" x 3" with 90° MTG BKTS on 1-5/8 centers, .187 red LED, mounts in panel thickness 1/16 to 3/16

SET-UP (Audio Console or similar 600 ohm referenced audio equipment)

Connect a sine wave generator set at 1 kHz to the console input. Set the generator or console gain level to provide the peak output level you wish to monitor. Adjust the potentiometers so that the LED just lights (do not turn beyond this point). Example: On a typical console (0 VU = +8dBm), the generator level should be set for a console output of +16dBm. With this setting, the LED will illuminate whenever a peak reaches or exceeds 8 VU. NOTE: The VU meter will be reading off scale at this level.

Other methods to adjust for peak signal detection would be to set the trigger level to coincide with 100% transmitter modulation or 3% THD level for recording.

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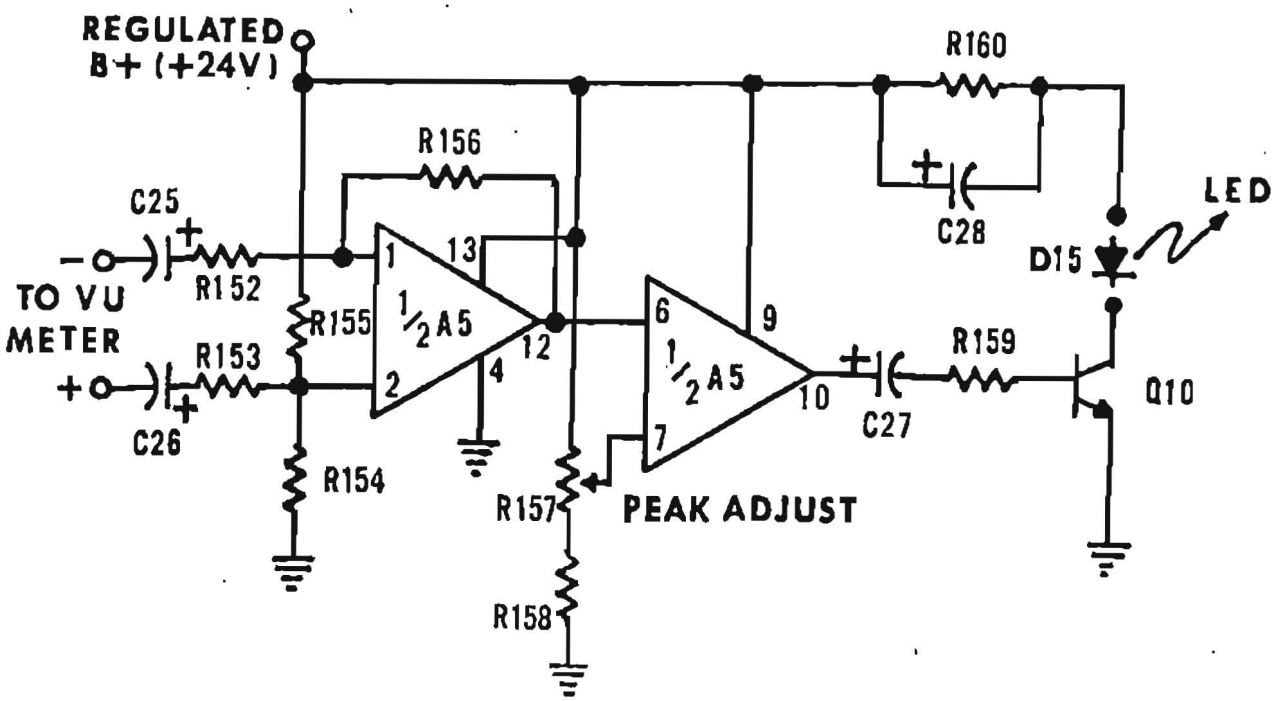
# LED PEAK LEVEL INDICATOR MODEL SA-1




PARTS LIST

| | |
|---|---|
| R152, 153 | Resistor, 100K ohm, 1/2w, 5% |
| R154, 155 | " , 300K ohm, 1/2w, 5% |
| R156 | " , 150K ohm, 1/2w, 5% |
| R157 | Potentiometer, 10K ohm, linear taper |
| R158 | Resistor, 12K ohm, 1/2w, 5% |
| R159 | " , 10K ohm, 1/2w, 5% |
| R160 | " , 470 ohm, 2w, 5% |
| C25, 26 | Capacitor, 1.0 mfd, 20 vdc, electrolytic |
| C27 | " , 100 mfd, 20 vdc, electrolytic |
| C28 | " , 47 mfd, 35 vdc, electrolytic |
| A5 | Dual Op Amp, uA747PC (or equivalent) |
| Q10 | Transistor, 2N3904 |
| D15 | LED, high intensity, red, 2 vdc |

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INSTRUCTION MANUAL

LPB MODEL S-13C, SIGNATURE II

8 MIXER MONO/STEREO CONSOLE

## 1.0 SUMMARY

The LPB Model S-13C 8-mixer Mono/Stereo Audio Console is directed to master control and sophisticated production requirements of stereo broadcasters, especially those who operate a portion of their format in mono. The S-13C has the uniquely helpful advantage of a mono audition channel and a full stereo program channel, the electrical specifications of which are otherwise identical. In addition, four of the input mixer channels may be immediately converted from mono to stereo at the operator's will. Many broadcasters find this basically stereo console offers a substantial advantage in the mono audition channel for they are able to produce in mono, especially cart recordings, many of which are not required in stereo.

The flexibility of plug-in circuits and the twenty-four switched audio inputs together with the unique LED Peak Audio Level Indicators combine to make the S-13C an extremely versatile console.

## 2.0 GUARANTEE

Upon receipt of this equipment we guarantee that you will find the appearance, workmanship and standards of materials and construction in keeping with the application and with good standards of commercial practice.

For a period of one year from date of delivery, we guarantee this equipment against any form of failure, provided that, in the opinion of the manufacturer, no improper use of or modification to the equipment is at fault. During this period, we will furnish the materials and labor in our shops to correct any failure.

If need for service arises, CONTACT LPB for permission to return and for shipping instructions BEFORE shipping. Note that shipping charges are not covered by our guarantee and that we assume no responsibility for correction of shipping damages, especially those which may result from the user's choice of a mode of shipment other than that recommended by LPB.

Prompt delivery of replacement parts is always available for out-of-warranty equipment, as are factory repairs. Contact LPB for current prices.

## 3.0 UPON RECEIPT

Upon receipt, immediately unpack and inspect the console to be certain that:

a. Everything is complete, as ordered, and as itemized on the Packing List.

b. No damage has occurred in transit to you. If there is any damage, retain all packing materials and immediately notify the carrier in writing and by telephone, with a copy to LPB.

c. You are satisfied with the overall quality and appearance of the console.

## 4.0 INSTALLATION

This section of your S-13C console manual describes all aspects of wiring the console into your facilities and preparing for actual use.

## 4.1 DEFINITIONS

To better understand the instructions and illustrations, a list of definitions of some commonly confused terms is included. These are referenced to this console and may not apply to other equipment.

1. Channel - Each of the two signals that comprise a stereo program, Left and Right, or in the case of the mono audition channel, a single mono program.

2. Mixer - The circuits in the console that take the input signals and feed them into the busses at a controlled level.

3. Fader - The gain controlling device of a given mixer circuit. In this case, two channel step attenuators.

4. Buss - The point in the console where signals from the mixers are combined.

5. Muted and Un-Muted - To prevent feedback, in certain control positions, either monitor or cue speakers or both are disabled. Output connections are available for both monitor conditions, depending on studio layout.

6. Program - Historically defined as the signal fed to the transmitter.

## 4.2 CONNECTION TO THE AC POWER SOURCE

The MAIN POWER SWITCH, FUSE and POWER CORD are to the right rear of the console. The power cord is of the three-wire type with an internal safety grounding pin. DO NOT REMOVE THE GROUND PIN from the power cord, as a safety hazard is presented and the equipment warranty is void.

The main Fuse, F1, is a type AGC 1 AMP, Slow-Blo. Another fuse will be found on the output baseboard inside the console. It is a 1/4 AMP fuse and is in series with the lamp bulbs in the VU meters only.

## 4.3 INPUT IMPEDANCES AND INPUT LEVELS

All inputs and outputs of the LPB S-13C Console are transformer balanced. The microphone inputs are 150 ohms; all other inputs and the program outputs are 600 ohm.

The S-13C console is designed for -45/55/65dBm input level microphones (see Section 4.5) and -10dBm input level "high level" sources. Some audio sources may not provide outputs at these levels. Consult the manual on each of your audio source devices. Headroom of 20dB is provided on all console inputs, and it is also desirable that all mixer step attenuators operate at about the same position, usually about "1:30 o'clock".

An example is an Ampex AG-600B open-reel tape recorder whose input is 600 ohms balanced at +4dBm. An attenuator pad of 14 dB attentuation is desired between the AG-600B output and the high level input of the S-13C, Figure B1 shows such balanced "H pads" and tabulates resistor values for several.

Another example, in the case of microphone inputs, might be the use of a Sennheiser MKE 402 Electret Condenser Cardioid Mirophone whose output is rated at -49dBm. This calls for a 6dB "H pad" attenuator between the microphone and the input of the console. This example is shown in Figure B2.

Unbalanced high impedance audio sources, such as TEAC and other tape recorders, may be connected to a high level input of the S-13C console only through an impedance matching transformer. See Figure A for an example of this type of connection.

## 4.4 INPUT/OUTPUT CONNECTIONS

All input and output connections to the console are made to screw terminal barrier strips along the inside bottom of the main frame of the console. Slots adjacent to these barrier strips allow the passage of audio wire from under the console to the strips.

Shielded twisted-pair audio wire, such as 2-conductor Belden "Beldfoil" #8451 (AWG 22 stranded of 7 strands AWG 30) or #8450 (AWG 22 solid) or 4-conductor "Beldfoil" #8723 (stranded) should be used for all audio input and output connections. The solid wire will be somewhat easier to handle and will more readily retain the shape to which it may be bent around corners. Equivalent Columbia stranded numbers are 2576 for 2-conductor and 2523 for 4-conductor.

An excellent choice of wire type from the monitor amplifier output to

speakers is conventional AWG 18 stranded "Zip cord" as used for household lamps, etc.

Figure C shows the locations of input/output connections.

The stereo input pairs, plus a number of common grounding points, are found on the barrier strips to the left of the main frame. The marking of these is interpreted as follows, using input 8BL as an example:

| | |
|---|---|
| 8 | references an input to the #8 mixer. |
| B | references the "B" input to mixer #8, out of the three (A, B, & C) available |
| L | references the Left channel input pair of wires. |
| +,- | references phasing of this input pair. |
| G | references ground connections. |

Note that it is recommended that the shield of all audio interconnection cables be grounded only at the console end to avoid ground loops with attendant noise and hum problems.

Toward the right of the console, on 4 barrier screw terminal strips, are the output and control connections. Several examples follow to clarify the interpretation of the markings:

| | |
|---|---|
| PGM 1 OUT, +,- | Left channel program output of the stereo program channel. |
| AUD 1 OUT, +,- | Mono phased output of the audition channel. |
| MIX 1 C<br>AUX NO | Mixer #1 auxiliary switching contacts, common and normally open, which are closed upon moving the AUD-OFF-PGM switch from the OFF position, used to control ON AIR lights or other outboard equipment starting. (See, for an example, Figure D). |
| MUTED L<br>MON 1 R | Left, right common (ground) connections for a monitor speaker which is muted upon moving the AUD-OFF-PGM switch above mixer 1 from the OFF position. |
| AUX L<br>PHONE R | Alternate or auxiliary connection point for the headphone monitor, L & R stereo pairs (unbalanced). |
| EXT L<br>MON IN R | Input to the console from external off-the-air monitor receiver, L & R stereo pairs (unbalanced). |
| CUE BUSS | Access to the cue buss for use of an outboard cue amplifier, if desired or to put a source, such as an intercom, into the console cue amplifier and speaker. This buss is high impedance. A -22dBm input to it produces approximately 1W to the cue speakers. |

| | | |
|---|---|---|
| PGM TAPE OUT | L<br>R | Unbalanced PGM output, L & R, suitable for tape recording directly from the program buss. |
| MIX 4 AUX | C<br>NO | Mixer #4 auxiliary switching contacts, common and normally open, as MIX 1 AUX described previously, except that the auxiliary contacts for mixer #1 - #3 are via relays while for mixers #4 - #8 are from spare contacts on the AUD-OFF-PGM switches. |

## 4.5 SET-UP FOR OPERATION

Input Switching: To either side of the VU meters along the top of the front panel are located the eight input switches, each numbered 1 thru 8 to correspond with mixers 1 thru 8. Each input switch allows the selection of one of three inputs to that mixer, designated A, B & C. Reference to the circuit diagram shows that the input switching is performed ahead of the input plug-in modules in mixers 1 thru 4 and ahead of the input transformers on 5 thru 8.

Plug-In Modules, Mixers 1 thru 4: Two plug-in module positions are provided for each mixer, 1 thru 4. These are left and right channel plug-ins, allowing choice of microphone level or high level input to each of these mixers. As priced the S-13C Console is supplied with two microphone input plug-in modules for mixer 1, and high level plug-in modules for mixers 2, 3 and 4. All console inputs are transformer-matched. Select the appropriate plug-in modules for mixers 1 thru 4 for your requirements.

Stereo/Mono Mic/Mono Hi-L Switches, Mixers 1 thru 4: These three-position miniature toggle switches will be found adjacent to the plug-in panel. With the appropriate plug-in module in place (microphone or high level, as described above) these switches allow selection of stereo or mono functioning of the individual mixer. Mono operation might be desired for mono mic, mono cart machine, etc.

In mono, the input is connected to the appropriate left input and is split equally to both left and right stereo program channels.

Stereo/Mono Switch, Mixer 8: Similar to the above, this switch, which is found to the right end of the input baseboard, allows stereo or mono operation of mixer 8. Mono operation may be desired for cart machine or remote line inputs.

In mono, the input is connected to input connections labeled 8AL, 8BL or 8CL, and is split equally to both left and right stereo program channels.

AUD OUTPUT Switch: To the right of the mixer 8 input switch will be found a green handled three-position switch marked AUD OUTPUT, A, B, C. This is an output director switch for the mono AUD output to allow direction of the audition output to a choice of three loads, such as an open-reel recorder, cart machine, etc.

Remote/Network Inputs, Mixer 8: Mixer 8 and its associated inputs, 8A, 8B and 8C are normally used for network and remote lines. Inputs 8A and 8B would normally be used for remotes and 8C for a network input. Inputs 8A and 8B have talkback capability.

When the input switch for mixer 8 is in the 8A position, the Left Monitor signal is present on input terminals 8B. When the input switch is in the 8B position, talkback is present on input terminals 8A. The level is dependent on the setting of the Monitor Volume control, with the maximum being +8dBm into 600 ohms.

## 4.6 SPEAKER MUTING, ON AIR LIGHT CONTROL AND REMOTE CONTROL

In typical operation, the console operator's microphone will be on mixer 1, input 1A. Since feedback can occur from cue and monitor speakers to microphone, provision is made to avoid this. When mixer 1 input switch is in the A position, the cue for mixer 1 and the MUTED MONITOR 1 speakers are disabled in either position of the program selector switch. In the center (or off) position of the program selector switch, only the cue is disabled.

In the B and C positions of the mixer 1 input switch, these functions are not disabled. If microphones are fed to these inputs from remote locations, the console operator will be able to utilize the cue and monitor functions of the console without the use of headphones.

Relays are provided within the console to accomplish muting functions, independently, for mixers 1, 2 and 3. Refer to Section 4.4 for description of the terminals, designated MIX 1 AUX, etc.

Operators often want, for example, the turntable motor to be turned on automatically when the switch over mixer 7 (presuming the turntable input to be connected to input 7A, 7B or 7C) is moved from OFF to either AUD or PGM. Auxiliary switch contacts are wired into the console input/output connection strips for this purpose.

See Figure D for outboard control via the auxiliary switching contacts. AC powered loads, such as ON AIR light bulbs or turntable motors should not be run directly through the console. An outboard 24V DC power supply and secondary control relays are conventional for this purpose.

The left and right program line output transformers for PGM and the mono line output transformer for AUD all have center taps which are brought out to the console barrier strip. These center taps can be used for Simplex remote control through a balanced audio line with DC continuity. See Figure E for Simplex hookup method. Note: The relay used should have a sensitive coil with a high DC resistance to limit current flow in the transformers to a safe value of 50 ma maximum.

## 5.0 OPERATION OF THE CONSOLE

This section references the operator's use of front panel controls in the operation of the S-13C Console.

### 5.1 CONTROL SETTINGS

The S-13C Console utilizes stereo step attenuator faders in all eight mixer circuits and stereo potentiometers for AUD and PGM master gain controls. (To accomodate any variations in the gain of the circuits within the console used for the left and right channels, the user will find internal trimmer potentiometers on the main base board adjacent to each left and right line output plug-in module.) Typical operation will find these faders and masters set at about 1:30 o'clock for program material peaking "0 VU" on the meters. Settings experienced in final test of your console will be found on the Final Test Report, included with this manual.

A CUE VOLume control is adjacent to the program masters on the upper right of the panel.

The MONitor SELector rotary switch with positions labeled PGM, AUD and EXT is to the upper left of the front panel. This switch simultaneously controls the inputs to the VU meters and monitor amplifiers. In the PGM position, both the monitor amplifiers and the meters are looking at the stereo PGM output of the console. In the AUD position, the left VU meter reads the mono output from audition, and the two stereo channels of the monitor amplifier are both paralleled on the mono audition output. The right VU meter will be inoperative. With the monitor selector in the EXT position, the VU meters return to read PGM while the left and right stereo channels of the monitor amplifier pick up the EXT MON L, R inputs on the screw terminal barrier strips which would normally be fed from an off-air monitor receiver.

MONitor VOLume, PHONE VOLume and the PHONE selector (PGM - AUD - CUE) switch are also found to the upper left of the panel.

The cue speaker is to the left rear of the console. A nearby headphone jack is provided for headphones of 200 ohms or greater impedance. Do not use low impedance headphones. Damage to the circuits can result. If low impedance headphone capability is required, use an external headphone amp. The headphone jack wiring will accomodate either mono or stereo headphones.

### 5.2 PROGRAM OUTPUT CHARACTERISTICS

A reading of 0 on the VU meters corresponds to +8dBm at the program outputs of the console.

The AUD OUTPUT switch (A - B - C) (See Section 4.4) allows direction of the

audition output to a choice of three loads.

The PGM OUTPUT is not switch directable. This output is normally the transmitter audio feed.

## 5.3 MONITOR OUTPUT CHARACTERISTICS

The internal stereo monitor amplifier is rated at 12 watts per channel into 4 ohm loads. Although separately muted for mixers 1, 2 and 3, all monitor speakers operate in parallel on the output of the amplifier. The equivalent parallel impendance of the various speakers that the user may elect to utilize on the console should be held to not less than 2 ohms per channel.

Note that UNMUTED MONitor output terminals are also provided within the console to drive a lobby speaker, etc.

Speaker leads carry high currents because of the low impedance levels of the speakers. These leads should be routed away from program output wires, and especially from inputs.

# 6.0 MAINTENANCE

You have invested a considerable sum of money in your LPB S-13C Stereo/Mono Console. It is a high-quality hand-crafted electronic unit of which you can expect to be proud for many years. To expect this equipment to maintain original appearance and perform reliably requires certain minimums of care in the routine handling of the equipment and a bit of occasional maintenance.

The panel of the S-13C console is silkscreen marked in baked epoxy with a clear baked epoxy overspray for additional protection. Use no solvents on the panel. Detergent cleaners such as "409" are quite safe and satisfactory, as is "Windex" for removal of any stains from the panel.

Care should be taken that a minimum of dirt collects inside the console. An occasional vacuuming is recommended. Quarterly, we recommend that the step attenuator rear dust covers be removed and the contacts cleaned. The contacts of the several printed circuit plug-in modules should also be cleaned once or twice each year. Many excellent areosol contact cleaners are available for this purpose. No other routine maintenance is needed.

When removing or replacing plug-in circuit modules, turn the console power OFF to avoid any possible circuit damage from transients.

## 6.1 CIRCUIT DIAGRAM AND PARTS LIST

A complete circuit diagram is furnished with this manual. Refer to it for

details of switching functions, etc.

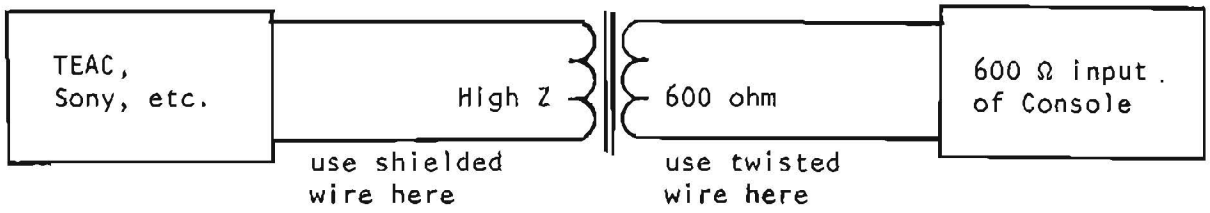
A complete parts list tabulation also follows. A price list for replacement parts is impossible to publish because of rapid changes in our costs from suppliers. LPB will be pleased to quote current parts costs in response to your inquiry.

Your console has been tested in detail at the factory prior to shipment, as the enclosed Final Test Report indicates. If any problems are experienced or suspected, please call LPB immediately.

## Figure A

CONNECTING AN UNBALANCED HIGH IMPEDANCE AUDIO SOURCE

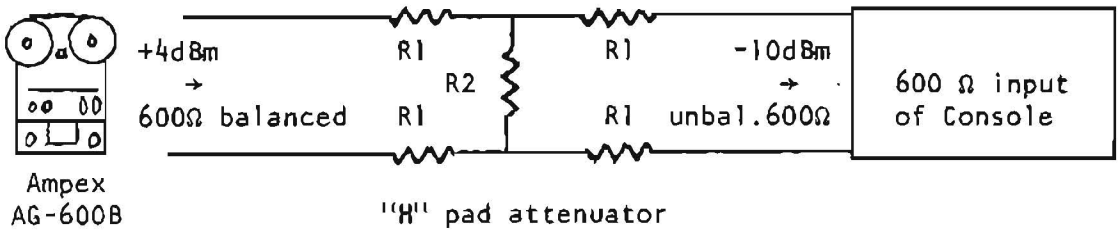
(see 4.3)




High Impedance to
600 ohm transformer,
such as UTC O-1

## Figure B-1

ACCOMODATING HIGH-OUTPUT HIGH-LEVEL AUDIO SOURCES

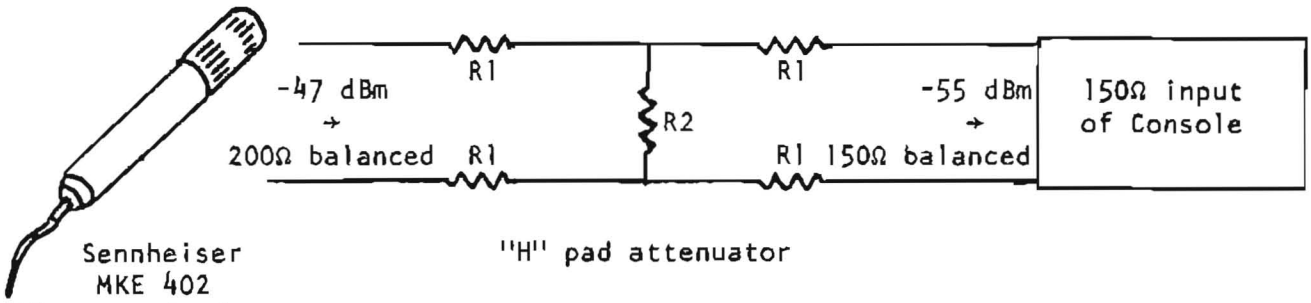



| source level, dBm | dB loss | R1, ohms | R2, ohms |
|---|---|---|---|
| -7 | 3 | 51 | 1600 |
| -4 | 6 | 100 | 820 |
| -1 | 9 | 150 | 470 |
| +2 | 12 | 180 | 330 |
| +5 | 15 | 200 | 220 |
| +8 | 18 | 220 | 150 |

→ use this pad for the Ampex AG-600B example above

**Figure B-2**

ACCOMODATING HIGH-OUTPUT LOW-LEVEL AUDIO SOURCES




Sennheiser
MKE 402
Electret Condenser
Microphone

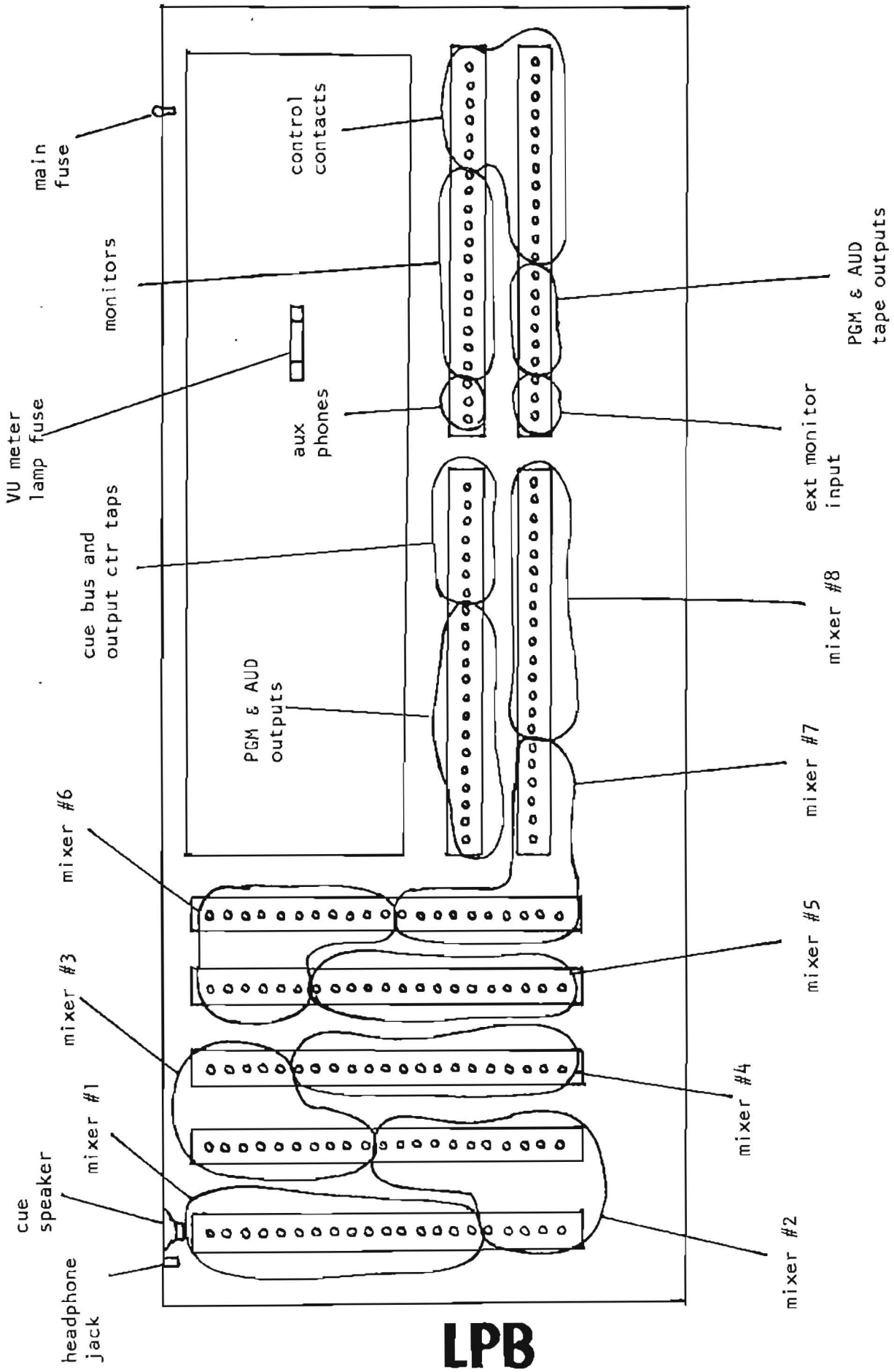
"H" pad attenuator

| source level, dBm | dB loss | R1, ohms | R2, ohms |
|---|---|---|---|
| -52 | 3 | 13 | 430 |
| -49 | 6 | 24 | 200 |
| -46 | 9 | 36 | 120 |
| -43 | 12 | 47 | 82 |
| -40 | 15 | 51 | 56 |
| -37 | 18 | 56 | 36 |
| -34 | 21 | 62 | 27 |

→ use this pad for the Sennheiser electret microphone example above

Figure C

## LOCATIONS OF INPUT/OUTPUT CONNECTIONS, S-13C CONSOLE




LPB

4/77

Figure D

REMOTE START & ON-AIR LIGHT SWITCHING

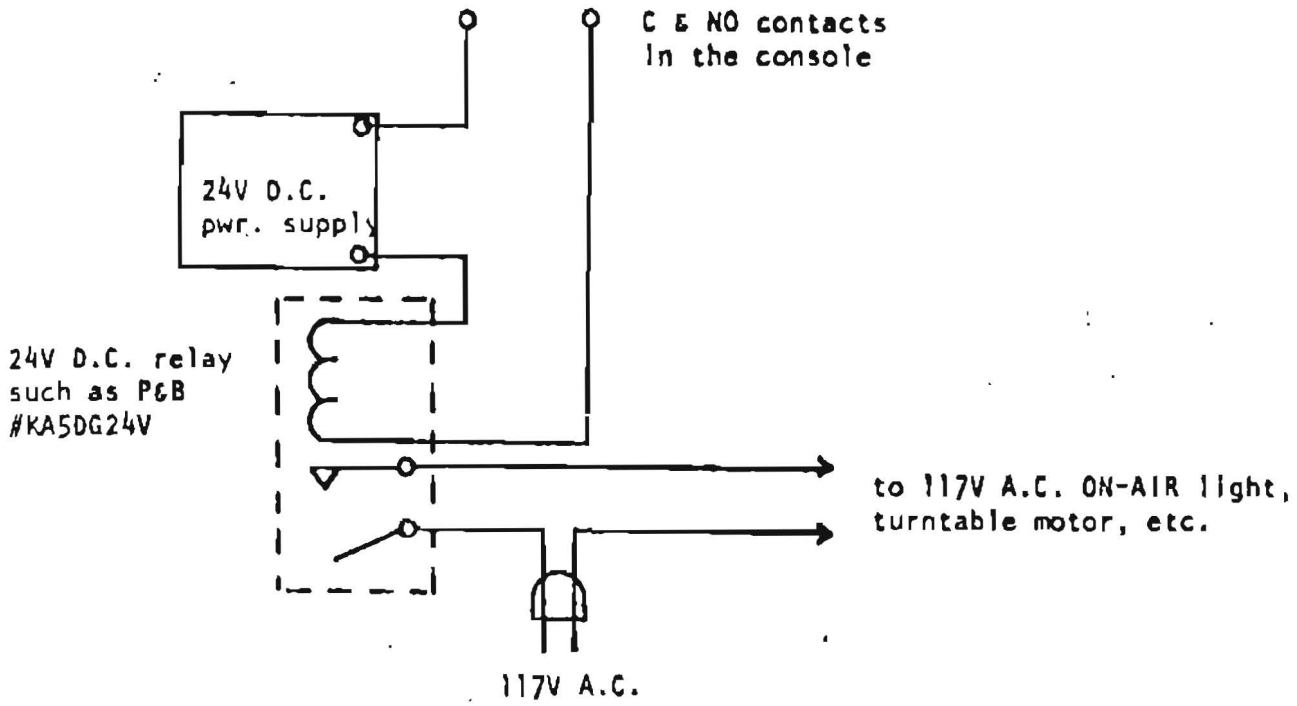



Figure E

SIMPLEX METHOD OF REMOTE CONTROL

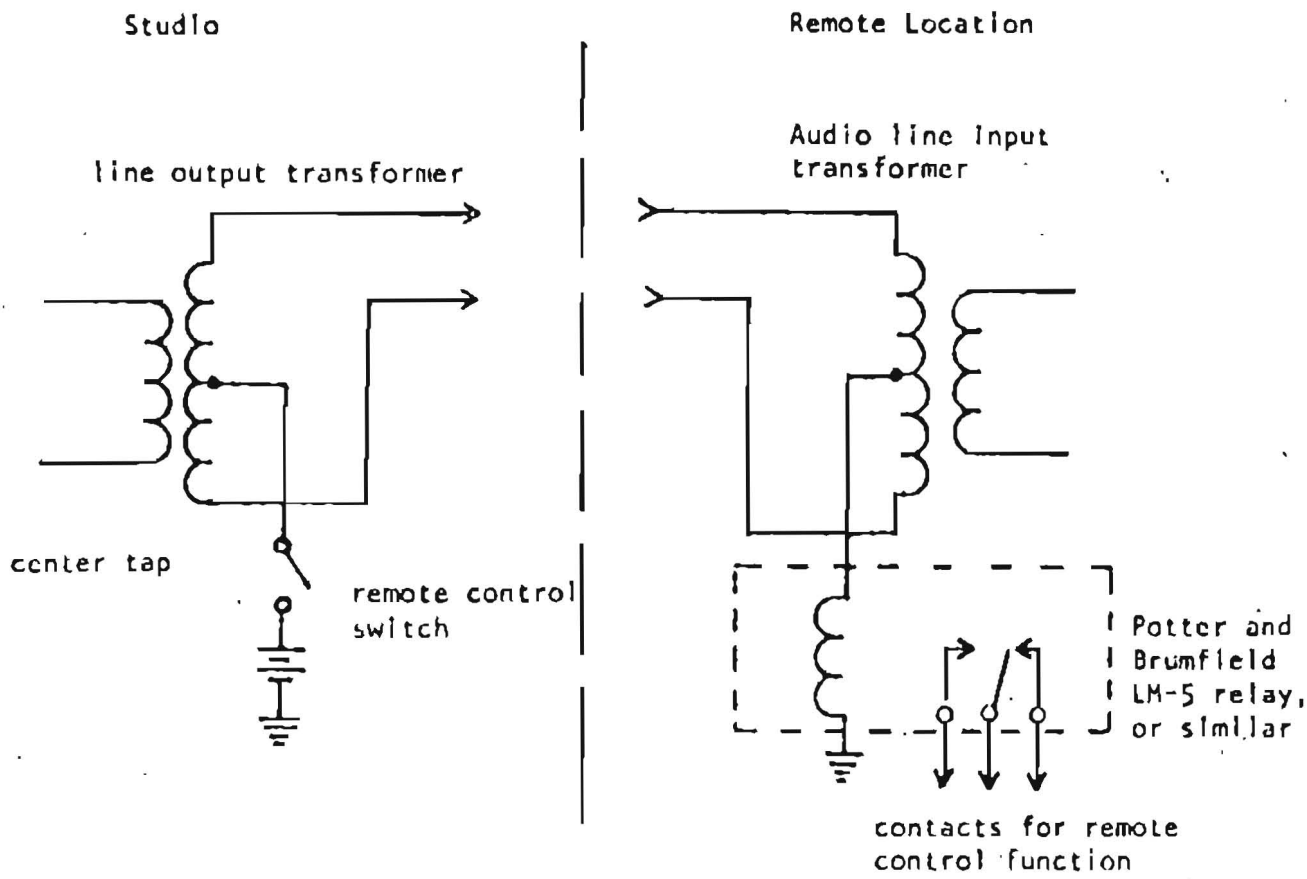
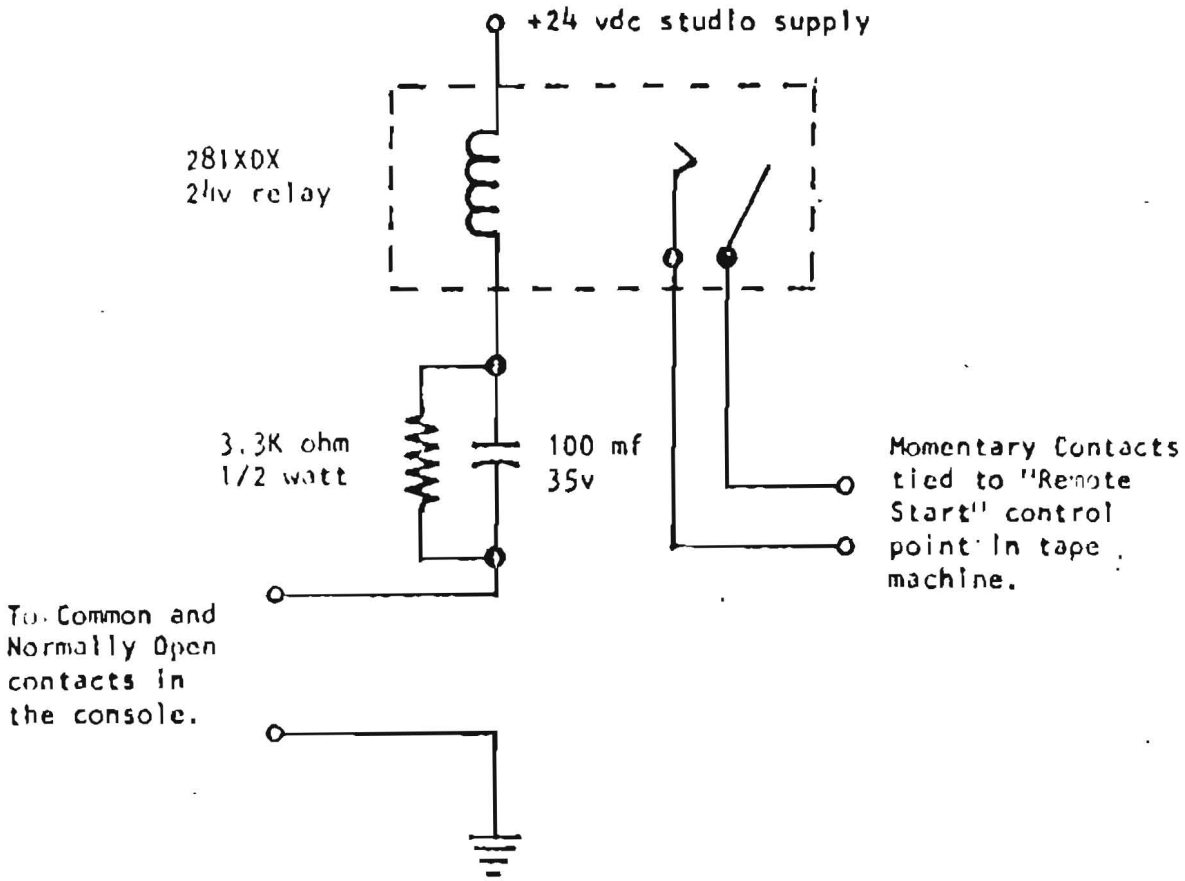


Figure F

## MOMENTARY CONTACT CLOSURE METHOD

## OF REMOTE STARTING

Many devices such as cartridge machines require a momentary contact closure to remotely control their "START" function. This method enables a console user to start a machine in a remote location using a set of standard Normally Open auxiliary contacts in the console.




NOTE: The resistor and capacitor values shown are only for the specific relay mentioned.

PARTS LIST

S-13C

## Input Base Board

| | |
|---|---|
| R37 - 49 | Resistor, 5.6K ohm, 1/2w, 5% |
| R50 | Resistor, 820 ohm, 1/2w, 5% |
| R51 - 53 | Resistor, 10K ohm, 1/2w, 5% |
| R54 - 62 | Resistor, 620 ohm, 1/2w, 5% |
| R75 - 76 | Resistor, 10K ohm, 1/2w, 1% |
| R77 - 78 | Resistor, 5.6K ohm, 1/2w, 1% |
| S1 - 4 | Toggle Switch, Alco MTA-206-PA |
| S5 | Toggle Switch, Cutler Hammer SF1SCY691 |
| T4 - 12 | Transformer, Audio, LPB-812 |

## Output Base and Power Supply Board

| | |
|---|---|
| R63 - 64 | Potentiometer, 1K, Bourns 3353W |
| R65 - 66 | Resistor, 47K ohm, 1/2w, 5% |
| R67 - 68 | Resistor, 15 ohm, 1w, 10% |
| R69 | Resistor, 10 ohm, 1/2w, 5% |
| R70 - 72 | Resistor, 300 ohm, 1/2w, 5% |
| R73 - 74 | Resistor, 100 ohm, 2w, 10% |
| D8 - 10 | Diode, 1N4004 or equivalent |
| D11 - 14 | Diode, 1N4007 or equivalent |
| C18 - 19 | Capacitor, 2000 mfd, 25 vdc, electrolytic |
| C20 - 21 | Capacitor, 1.5 mfd, 35 vdc, electrolytic |
| C22 | Capacitor, 250 mfd, 25 vdc, electrolytic |
| C23 - 24 | Capacitor, 3900 mfd, 50 vdc, electrolytic |
| F2 | Fuse, 3AG, 0.25 amp |
| K1 - 3 | Relay, 4PDT, Struthers-Dunn 281XDX, 24 vdc (or equivalent) |

## Front Panel

| | |
|---|---|
| R79 - 86 | Potentiometer, 10K ohm, audio, Shallco #920Q-2B3-M |
| R87 -102 | Resistor, 9.1K ohm, 1/2w, 5% |
| R103-110 | Resistor, 4.7K ohm, 1/2w, 5% |
| R111 | Potentiometer, 10K ohm, linear, dual |
| R112 | Potentiometer, 10K ohm, linear, single |

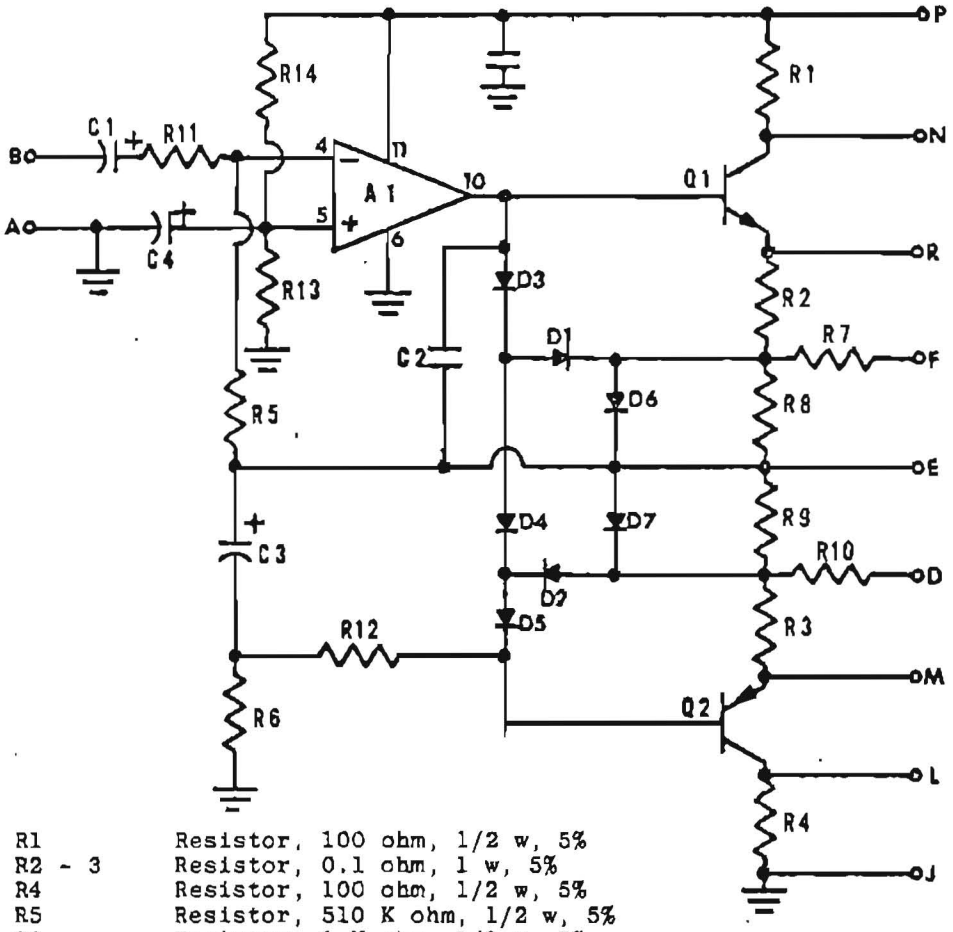
| | |
|---|---|
| R113 | Potentiometer, 10K ohm, audio, dual |
| R114 | Potentiometer, 10K ohm, audio, single |
| R115 | Potentiometer, 500 ohm, audio, dual |
| S7 | Lever Switch, 6 pole, 3 position, Grigsby, No. 45298-6050LR |
| S8 - 13 | Lever Switch, 4 pole, 3 position, Grigsby, No. 42020-6050LR |
| S14 | Lever Switch, 6 pole, 3 position, Grigsby, No. 45298-6050LR |
| S15 - 22 | Lever Switch, telephone type, Capitol Model HLB, No. 2238 |
| S23 A, B | Rotary Switch, 6 pole, 3 position, Centralab type PA-1019 |
| S24 - 25 | Lever Switch, 2 pole, 3 position, Grigsby, No. 41757-6MLR |
| VU1 - 2 | VU Meter, Modutec 3BA-AVU-000-BB-B1-KW |
| PL1 - 4 | Meter Illumination Light, #388 bulb |

Chassis

| | |
|---|---|
| SP1 | Speaker, Quam 5A1Z45 |
| R116 | Resistor, 150 ohm, 1/2w, 5% |
| S26 | Toggle Switch, SPDT, 6a, 125 vac |
| F1 | Fuse, 3AG, 2 amp |
| J1 | Phone Jack, 3 circuit |
| T13 | Transformer, Power, LPB-124 |
| Q6 - 8 | Transistor, MJE 205 |
| Q7 - 9 | Transistor, MJE 105 |

PPA

## POWER AMPLIFIER




| | |
|---|---|
| R1 | Resistor, 100 ohm, 1/2 w, 5% |
| R2 - 3 | Resistor, 0.1 ohm, 1 w, 5% |
| R4 | Resistor, 100 ohm, 1/2 w, 5% |
| R5 | Resistor, 510 K ohm, 1/2 w, 5% |
| R6 | Resistor, 1 K ohm, 1/2 w, 5% |
| R7 | Resistor, 2.2 ohm, 1/2 w, 5% |
| R8 - 9 | Resistor, 22 ohm, 1/2 w, 5% |
| R10 | Resistor, 2.2 ohm, 1/2 w, 5% |
| R11 | Resistor, 5.1 K ohm, 1/2 w, 5% |
| R12 | Resistor, 1 K ohm, 1/2 w, 5% |
| R13 - 14 | Resistor, 1 M ohm, 1/2 w, 5% |
| D1 - 7 | Diode, 1N4002 (or equivalent) |
| Q1 | Transistor, MPS U04 |
| Q2 | Transistor, MPS U52 |
| Q6 | Transistor, MJE-205 (mounted on rear console case) |
| Q7 | Transistor, MJE-105 (mounted on rear console case) |
| C1 | Capacitor, 2.2 mfd, 25 v dc tantalum |
| C2 | Capacitor, 0.1 mfd, 50 v dc disc ceramic |
| C3 | Capacitor, 47 mfd, 35 v dc tantalum |
| C4 | Capacitor, 15 mfd, 35 v dc tantalum |
| C5 | Capacitor, 0.1 mfd, 50 v dc disc ceramic |
| A1 | Op amp, RM741DC (or equivalent) |

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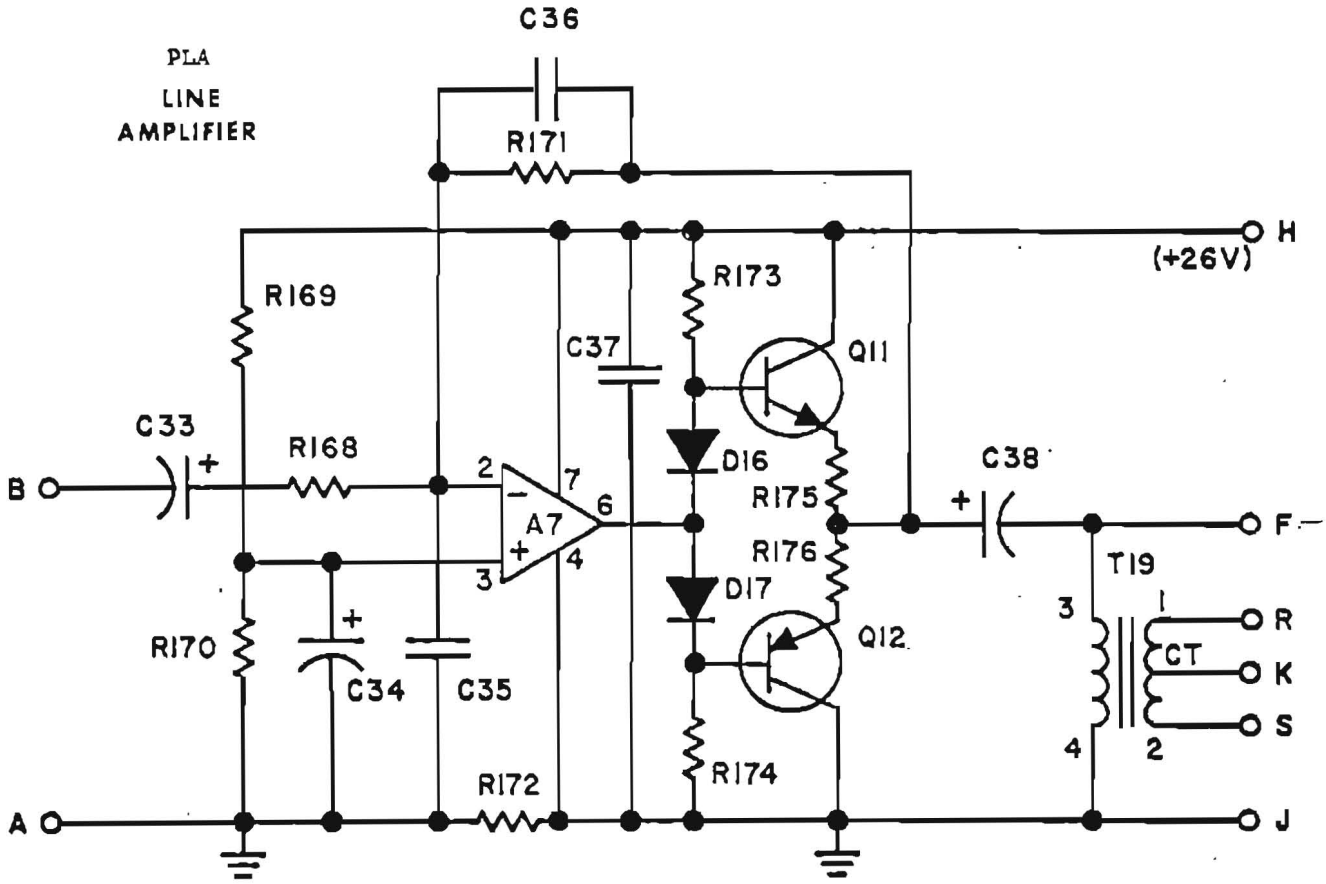
# Signature II SERIES PLUG-IN CIRCUITS




| | | |
|---|---|---|
| R168 | Resistor, | 100 ohm, 1/2 watt, 5% |
| R169 | | 680K ohm |
| R170 | | 680K ohm |
| R171 | | 680K ohm |
| R172 | | 10 ohm |
| R173 | | 1.3K ohm |
| R174 | | 1.3K ohm |
| R175 | | 6.8 ohm |
| R176 | | 6.8 ohm |
| C33 | Capacitor, | 100 mf, 20 vdc, Tantalum |
| C34 | | 2.2 mf, 20 vdc, " |
| C35 | | .001 mf, 50 vdc, Disc |
| C36 | | 2 pf, 50 vdc, Mica |
| C37 | | .1 mf, 50 vdc, Disc |
| C38 | | 1000 mf, 25 vdc, Electrolytic |
| A7 | Op Amp, | LM318N |
| D16 | Diode, | IN4148 |
| D17 | | " " |
| Q11 | Transistor, | MPS-U04 |
| Q12 | " | MPS-U52 |
| T19 | Transformer, | LPB-026 |

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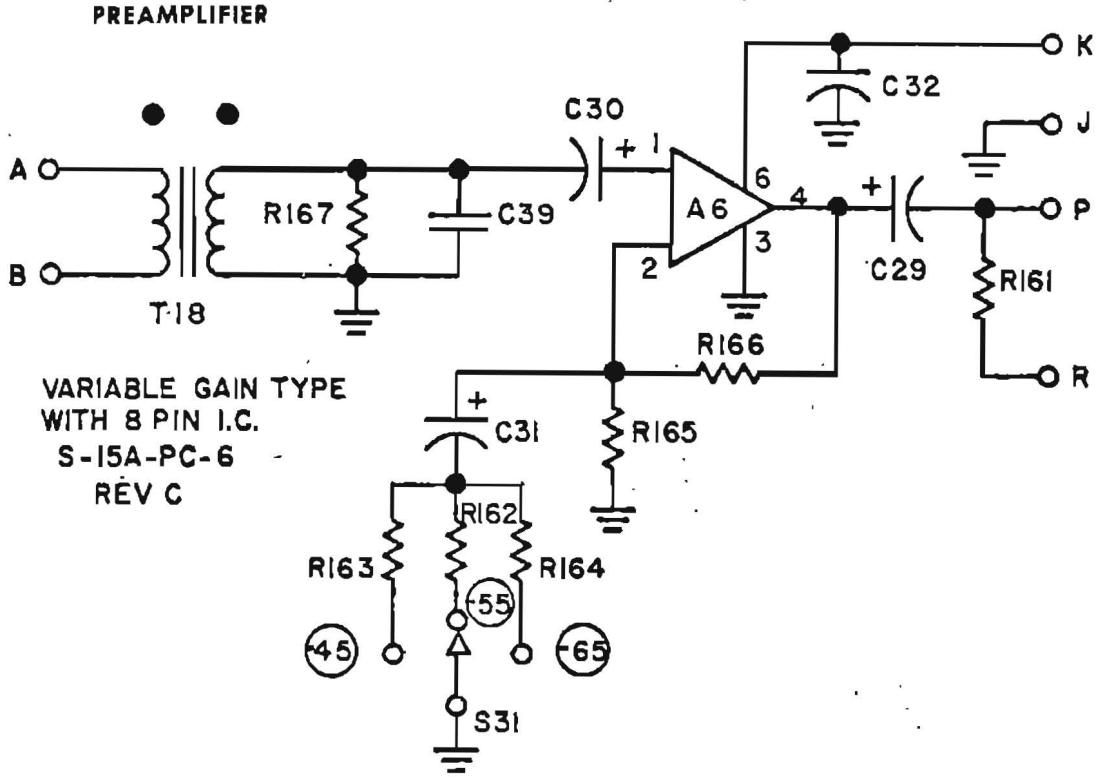
PMP

**MICROPHONE PREAMPLIFIER**




VARIABLE GAIN TYPE
WITH 8 PIN I.C.
S-15A-PC-6
REV C

| | |
|---|---|
| R161 | Resistor, 10K ohm, 1/2 watt, ±5% |
| R162 | Resistor, 620 ohm, 1/2 watt, ±5% |
| R163 | Resistor, 3K ohm, 1/2 watt, ±5% |
| R164 | Resistor, 180 ohm, 1/2 watt, ±5% |
| R165 | Resistor, 6.8K ohm, 1/2 watt, ±5% |
| R166 | Resistor, 68K ohm, 1/2 watt, ±5% |
| R167 | Resistor, 10K ohm, 1/2 watt, ±1% |
| C29 | Capacitor, 15uf, 35 v dc tantalum |
| C30 | Capacitor, 2.2uf, 50 v dc tantalum |
| C31 | Capacitor, 100uf, 20 v dc tantalum |
| C32 | Capacitor, 0.1uf, 50 v dc disc |
| A6 | Op amp, LM381IC |
| T18 | Transformer, Beyer TR/BV 351007004 |
| S31 | Toggle Switch, Alco MTA 206PA |

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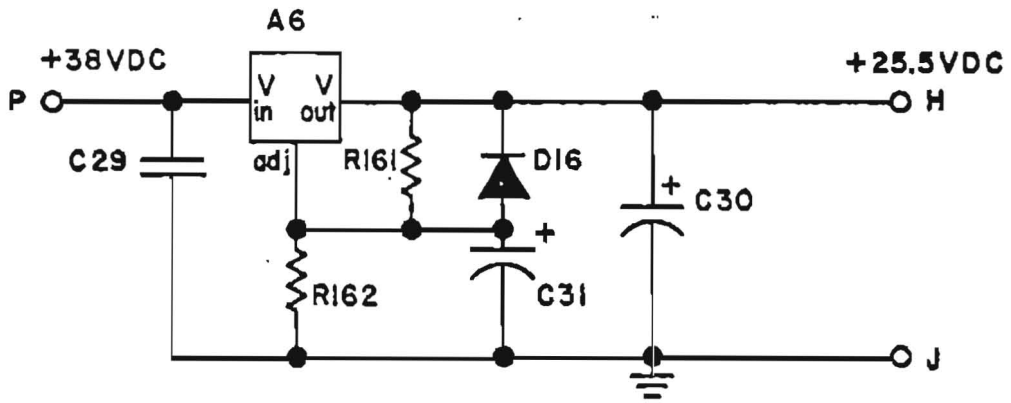
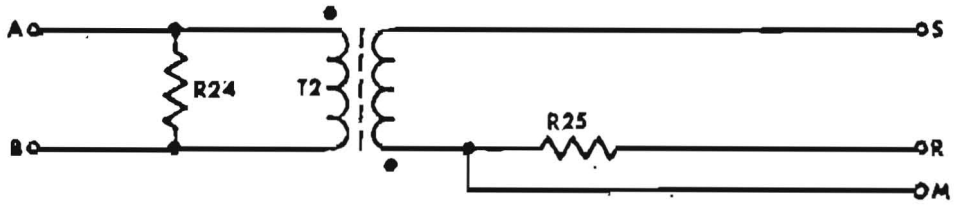
PVA

## VOLTAGE REGULATOR



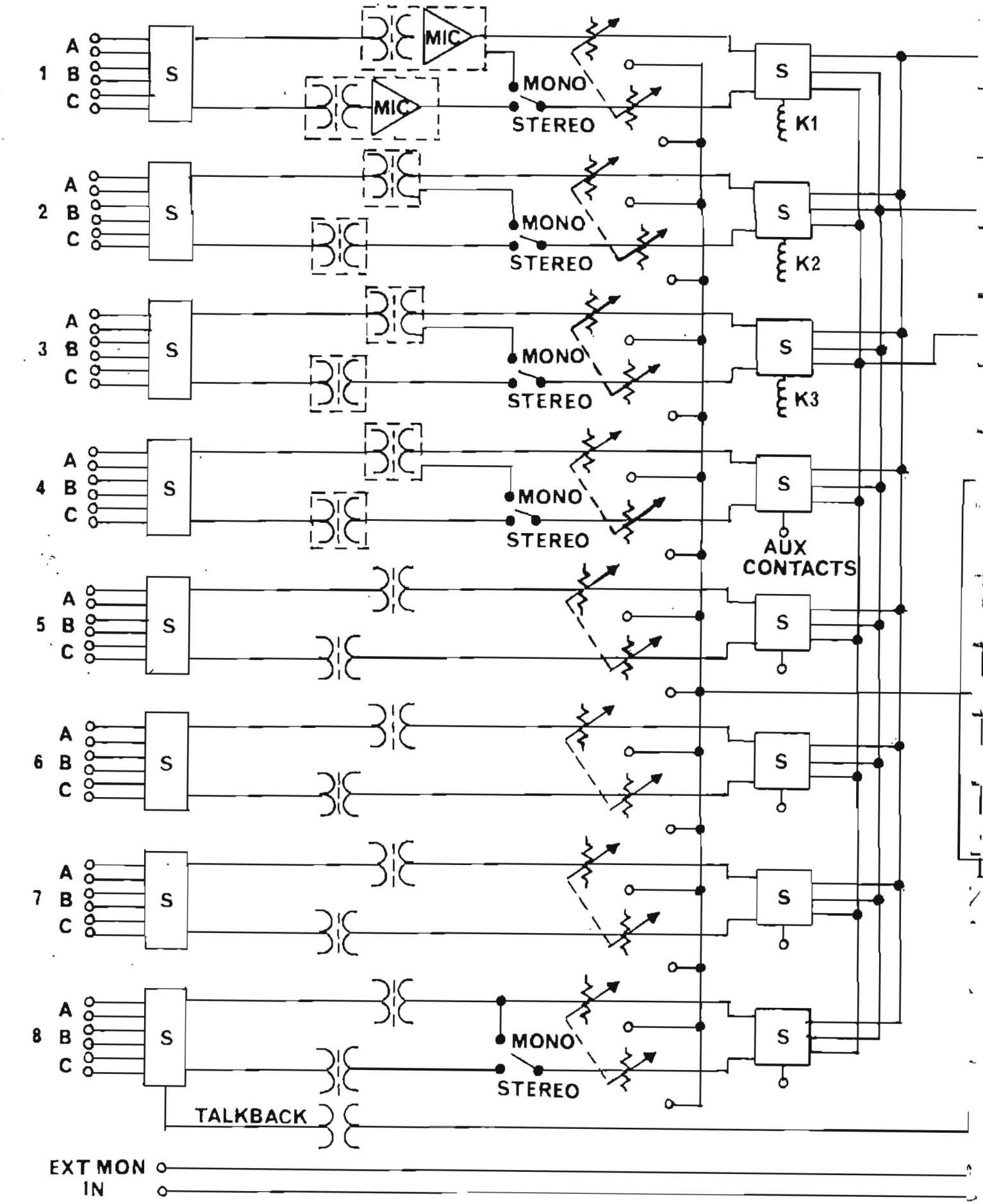

| | |
|---|---|
| R161 | Resistor, 4640 ohm, 1/2 watt, 1% |
| R162 | Resistor, 237 ohm, 1/2 watt, 1% |
| C29 | Capacitor, 0.1 uf, 50 v dc disc |
| C30 | Capacitor, 1 uf, 35 v dc tantalum |
| C31 | Capacitor, 10 mf, 35 vddc tantalum |
| D16 | Diode, IN4002 (or equivalent) |
| A6 | 3 Terminal Regulator, LM 317K |

## INPUT TRANSFORMER

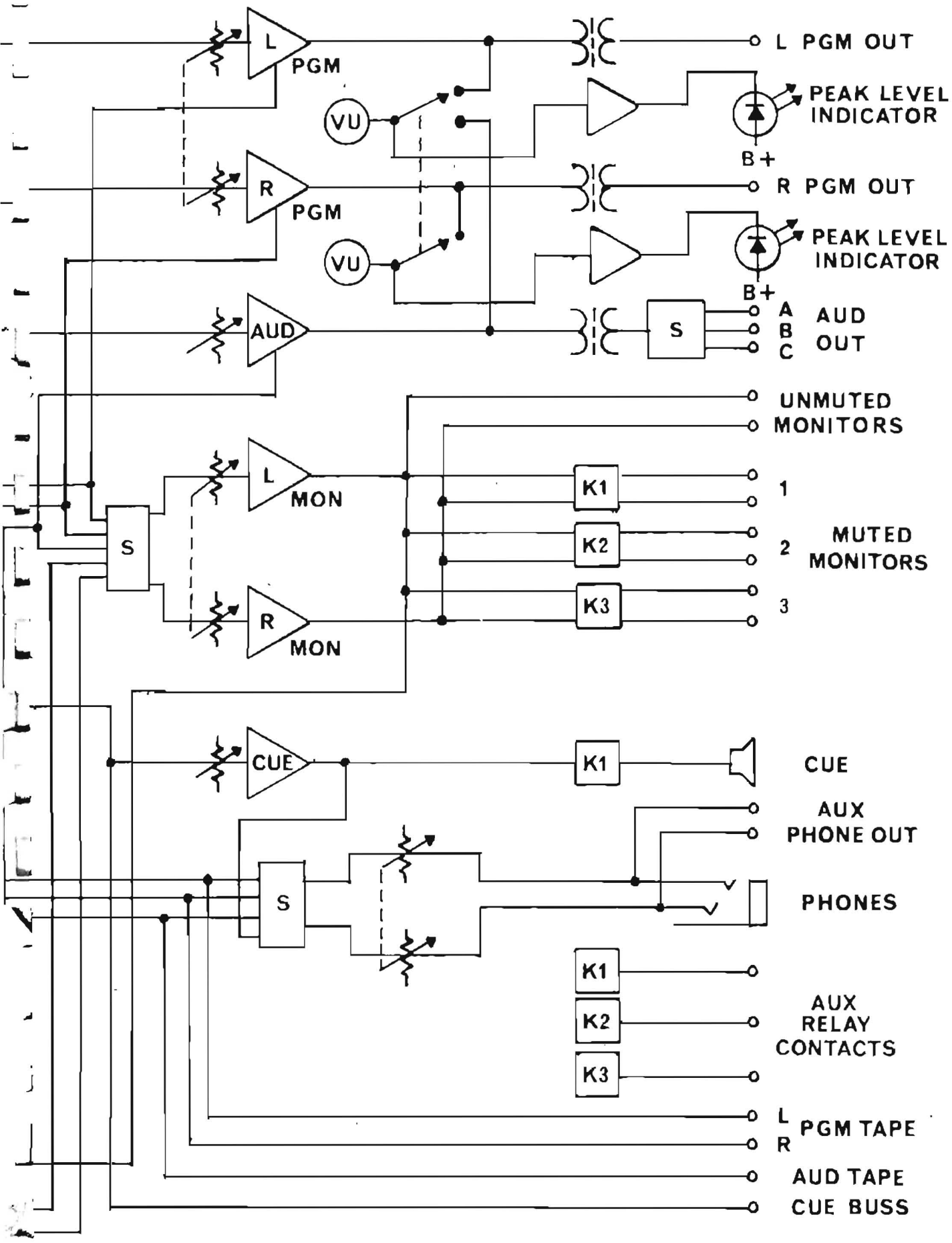



| | |
|---|---|
| R24 | Resistor, 620 ohm, 1/2 w, 5% |
| R25 | Resistor, 5.6 K ohm, 1/2 w, 5% |
| T2 | Transformer, LPB-812 |

LPB®
LPB Inc.
520 Lincoln Highway
Frazer, Pa. 19355
(215) 644-1123




LPB S-13C 8 MIX




# STEREO/MONO CONSOLE

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