

M-5M
MODEL

INSTRUCTION MANUAL
MONOGRAM II AUDIO CONSOLE

LPB[®]

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PRICE \$15.00

FINAL TEST AND INSPECTION REPORT
MONOGRAM II

Customer Control Technology

Model M- 5M s/n 10969 Date May 23, 1983 By Charles Carter

No. Mic Preamps 1 Mechanical Inspection ok Electrical Inspection ok

Mic Channel (ch 1) (Line Pot at 6, Master at 13)

Audio input for +8dBm output -55dBm at 1kHz

Distortion .085 percent at 1kHz

Response relative to 1kHz: 20Hz -.5dB 500Hz 0dB 5kHz 0dB
10kHz -.5dB 20kHz -1dB

Noise 72 dB below +8dBm output (20Hz to 20kHz)

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

Audio input for +8dBm output -16dBm at 1kHz

Distortion .07 percent at 1kHz

Response relative to 1kHz: 20Hz -.4dB 500Hz 0dB 5kHz 0dB
10kHz -.2dB 20kHz -.4dB

Noise 76 dB below +8dBm output (20Hz to 20kHz)

Functions:

Monitor ok Cue ok Phones ok Muting Relay ok

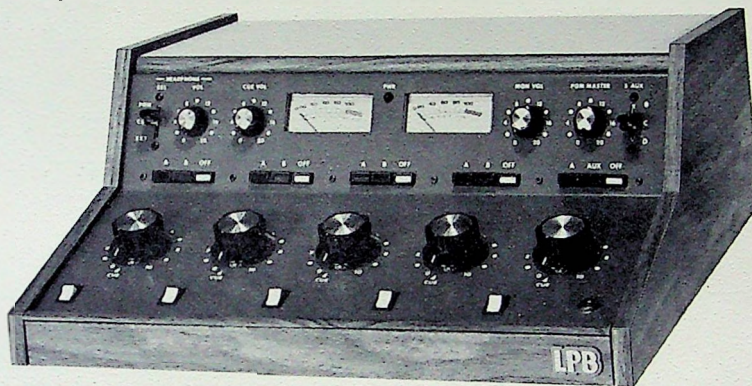
All inputs ok All outputs ok On-Air Contacts ok

LPB[®]

monogram II series

FIVE MIXER CONSOLES

- ALL INPUT CIRCUITRY PLUG-IN
- VISIBLE INDICATOR INPUT SELECTORS
- TORQUE CONTROLLED CERMET ATTENUATORS STANDARD
- ALL ACTIVE COMPONENTS PLUG-IN



Model M-5S
5 Mixer Stereo



Model M-5M
5 Mixer Mono

- BARRIER STRIP INPUT/OUTPUT CONNECTIONS
- ALL OUTPUTS SHORT-CIRCUIT-PROOF
- BI-POLAR REGULATED POWER SUPPLY

The Model M-5S 5-Mixer Stereo Console and the Model M-5M 5-Mixer Mono Console both accept a total of 12 audio inputs, 2 to each of the first four mixers, and 4 inputs to mixer 5. As shipped, mixer 1 is equipped with a mono microphone preamp plug-in, which accepts 2 microphone inputs. A stereo microphone plug-in is optionally available for the Model M-5S. Mixers 2 thru 4, as shipped, will accept 2 high level inputs each, while mixer 5 accepts 4 high level inputs. Additional optional mic preamp plug-ins or optional phono preamplifier plug-ins may be substituted in any or all 5 input plug-in positions.

Monitor Speaker muting and talley (on-air) light relays are provided on all Monogram II Consoles, operated by the first 2 mixer positions. As shipped, mixer 1 will mute the monitor and cue, and enable a talley light relay. Mixer 2 will mute the auxiliary program output and enable a second talley light relay. Monitor muting and cue muting, along with the talley relays may be reconnected by the user to operate on any mixer position desired.

A cue position is provided in each mixer, and all models

include an internal cue system consisting of a cue amplifier, level control and 5" speaker. A front panel mounted phone jack provides headphone monitoring of program, cue or an external source, and includes a level control.

All connections to the Monogram II Consoles are made to labeled barrier strip screw terminals located within the console.

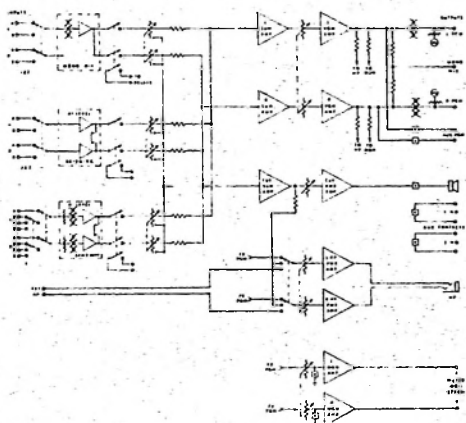
In addition to the input preselector pushbuttons, an auxiliary switch is provided for each mixer position. The auxiliary switch in the first mixer position of all models is factory wired as a 2 position channel on-off switch. The second mixer position auxiliary switch is also an alternate action switch, but left unwired to allow user selection of function. The remainder of the auxiliary switches are momentary, and again are unwired to allow user flexibility. Additional momentary and two position switches are available from LPB and may be user installed to allow for any particular remote control or channel on/off functions.

All Monogram II stereo models are provided with a mono sum output and an unmuted program auxiliary output.

SPECIFICATIONS

Mixers	
Total	.5
With Cue	.5
Type	Cermet (Step Attenuators Optional)
Inputs	
Standard Factory Equipped	
Microphone	2 Mono (M-5M & M-5S)
Hi-Level	10 Stereo (M-5S) Mono (M-5M)
Optional Maximum	
Microphone	12 (Mono or Stereo)
Hi-Level	or 12 (Mono or Stereo)
Total	:12
External Headphone	1
Input Impedance	
Microphone	150 ohms source, transformer balanced
Hi-Level	20,000 ohms balanced bridging (600 ohms with terminating resistor) standard, 600 ohms transformer balanced optional
External Headphone	10,000 ohms unbalanced
Input Levels	
Microphone	-55 dBm nominal, -35 dBm max.
Hi-Level	-10 dBm nominal, +15 dBm max.
External Headphone	200 mv nominal
Outputs	
Program	+8 dBm (0 VU) nominal, +19 dBm clipping level
Monitor	8 watts/channel M-5S, 16 watts M-5M
Aux Program	200 mv nominal
Cue	1 watt with 5" internal speaker
Mono Sum (M-5S)	1 volt (Program @ +8 dBm output)
Output Impedance	
Program	600 ohms load (transformer balanced output)
Monitor	.8 ohms load minimum
Aux Monitor	2,000 ohms load
Headphones	8 ohms load, minimum
Mono Sum	10,000 ohms load
Frequency Response	
Program	+0, -½ dB (REF 1 kHz, 20Hz-20 kHz)
Monitor	±1½ dB 20 Hz-20 kHz
Total Harmonic Distortion	
Program	0.2% typ., 0.5% max. 20 Hz-20 kHz
	@ +18 dBm output, -55 dBm input

Monitor	0.3% max. @ 8 watts (Stereo), 16 watts (Mono)
Headphone	0.5% max. @ ½ watt output, 20 Hz-15 kHz
Cue	0.5% max @ 1 watt output, 20 Hz-15 kHz
Intermodulation Distortion (IM)	
Program	Less than 0.15% @ 18 dBm output
Monitor	Less than 0.2% @ 8 watts (Stereo), 16 watts (Mono)
Headphone	Less than 0.2% @ ½ watt
Cue	Less than 0.2% @ 1 watt
Signal to Noise (S/N) @ 20 Hz-20 kHz measurement bandwidth	
Program	Better than 74 dB below +18 dBm output with -55 dBm input
	Better than 82 dB below +18 dBm output with -10 dBm input
Monitor	Better than 65 dB below 8 watts output (Stereo) 16 watts (Mono)
Headphone	Better than 65 dB below 1 watt output
Cue	Better than 65 dB below 1 watt output
Crosstalk	
Program/Monitor/Cue	Better than 70 dB
Power Requirements	
Voltage	105-130 VAC
Frequency	60 Hz
Power	75 watts max.
Dimensions	
Width	19¼"
Height	8½"
Depth	19½"
Shipping Weight	26 lbs.
Cabinet	
Material	.090" Aluminum
Finish	Textured scratch resistant "Champagne Gray" Armohide with Walnut finish end panels and trim
Panel	
Material	0.125" Aluminum
Finish	charcoal gray baked enamel, white epoxy silk screened nomenclature with clear epoxy overcoat



ORDERING INFORMATION

5 Mixer stereo Console	Model M-5S
(1 mono mic, 4 stereo Hi-Level bridging plug-ins)	
5 Mixer mono Console	Model M-5M
(1 mic, 4 mono Hi-Level bridging plug-ins)	

INSTALLED OPTIONS

Step Attenuators for M-5S (set)	Option -02
Step Attenuators for M-5M (set)	Option -01
Transformer Balanced inputs for M-5S (4 stereo plug-ins)	Option -06
Transformer Balanced inputs for M-5M (4 mono plug-ins)	Option -05
Mono/Stereo Phono Preamps (2 plug-ins)	Option -08

SPARES/OPTIONS

Mono/Stereo Phono Preamp plug-in	Model MPP
Mono Mic preamp plug-in	Model MMM
Stereo mic preamp plug-in	Model MSM
Mono/Stereo Hi-Level bridging input plug-in	Model MIH
Mono transformer balanced input plug-in	Model MMB
Stereo transformer balanced input plug-in	Model MSB
Semiconductor Kit	Model MMS
Momentary Switch (aux.)	Model SWM
Alternate Action Switch (aux.)	Model SWA

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INSTRUCTION MANUAL
LPB MONOGRAM II SERIES, MODEL M-5M
5-MIXER MONO AUDIO CONSOLE

1.0 SUMMARY

The LPB M-5M 5-mixer Mono Studio Console is directed to production and newsroom requirements, or as a master console for an automated broadcaster. It provides a number of flexible features and retains all of the component quality and ruggedness typical of larger LPB consoles.

The model M-5M accepts a total of twelve audio inputs, two to each of the first 4 mixer and four inputs to mixer 5. As shipped, mixer 1 is equipped with a microphone preamp plug-in, which accepts two microphone inputs. Mixers 2 through 4, as shipped will accept two high-level inputs each, while mixer 5 accepts four high-level inputs. Additional optional mic preamp plug-ins may be substituted in any or all five input plug-in positions.

A cue position is provided in each mixer and the console contains an internal cue amplifier with level control and five inch speaker. An internal 16-watt monitor amplifier is also provided.

Monitor speaker muting and ON-AIR light relays are provided, operated by the first two mixer positions. As shipped, mixer 1 will mute the monitor and cue, and will enable an ON-AIR light relay. Mixer 2 will mute the auxiliary program output and enable a second ON-AIR light relay. Monitor and cue muting, along with the ON-AIR light relays, may be reprogrammed by the user to operate on any mixer position desired. (See Fig. G)

All connections to the M-5M are made through barrier strip screw terminals located within the console.

Many other features make this console quite flexible, convenient and reliable. Refer to the enclosed catalog sheet, drawings and texts for detailed descriptive information.

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 shop to correct any failure.

If the need for service arises, contact LPB for permission to return and for shipping instructions before shipping. Note that the 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 mode of shipment or packing method other than that recommended by LPB.

Prompt delivery of replacement parts is always available for out of warranty equipment, as are factory repairs. When ordering replacement parts, please specify unit type, and the description and reference symbol number of each item ordered.

The replacement part which will be supplied may not be an exact duplicate of the original part. It will be, however, an equivalent or superior replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment.

Since LPB has a \$25 minimum billing amount, parts costing less than this amount will require either prepayment or C.O.D. shipping. 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. LPB should also be notified.

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

4.0 INSTALLATION

This section of your M-5M Console Manual describes all aspects of wiring the console into your facilities and preparing for actual use.

Careful planning and attention to a few basic installation rules based on good engineering practice will insure optimum performance and reliability of the console. The M-5M should be connected to the station ground at one point only. That point is the wing nut at the rear of the console near the line cord.

The internal circuitry within the console utilizes a "star" grounding system with all ground currents being separately returned to a single point in the console. This point is electrically the same as the wing nut on the rear panel.

When using the console with single-ended (unbalanced) inputs and outputs, careful attention should be paid to the type of grounding circuits employed in the external sources or loads. Parallel ground paths ("ground loops") may be inadvertently created which can cause portions of the internal ground currents to flow through paths external to the console. This can cause excessive cross-talk, hum, noise, RF pickup and in some cases oscillations.

It is important to note that, like the M-5M console, many electronic devices utilize a 3-wire line cord with a safety grounding pin which connects the chassis of the unit to the building ground. If these devices have an unbalanced output, their signal grounds may also be tied to the chassis. This is a potential cause of a ground loop. Turntables, tone arms, and phono preamps are particularly subject to these multiple parallel ground paths. Equipment with unbalanced high impedance input and output connections such as off-the-air monitors and external monitor power amplifiers are also potential causes of problems.

The shield connection in balanced audio lines should be grounded at only one end. Chassis ground terminals (marked G) are provided within the console near all inputs and outputs for this purpose. Another common technique is to single-end-ground the cables at the studio patch bay. Care should be taken to avoid allowing the shield to contact metal conduit, wire trays and cabinet racks, since these are usually grounded. The best choice for input and output connections to the console is shielded, jacketed, twisted-pair audio cable, such as 2-conductor Belden "Beldfoil" #8451 (AWG 22 stranded of 7 strands AWG 30) or #8450 (AWG 22 solid) and four conductor "Beldfoil" #8723 (stranded); equivalent Columbia stranded numbers are 2576 for 2-conductor and 2523 for 4-conductor.

When balance lines are used, the twisted pair should be used to carry the signal with the shield being grounded at one end only. For unbalanced lines, one wire of the twisted pair is used to carry the signal and the other is used to carry the ground current, again with the shield being grounded at only one end.

A good choice of wire type from the monitor amplifier output to the speaker is conventional AWG18 stranded (zip cord) as used for household lamps, etc. Although the voltage carried by the loudspeaker lines is not significantly higher than the program lines, the higher currents driving the low impedance speakers can cause magnetic coupling into other audio cables. The currents in these lines can be as high as 1 amp peak. All speaker leads should be very tightly twisted right up to the monitor connection terminals since the strength of the field generated by these wires is directly proportional to the area enclosed by any loop in these lines. Extreme care should be used in the routing of these speaker lines. Avoid routing them with low level lines such as microphone cables and tone arm cables. Unbalanced and high impedance lines should also be avoided.

To facilitate connection to the input and output barrier strips in the console, it is recommended that "spade lug" connectors be crimped and soldered to the cable ends. This method minimizes possible intermittent connections and shorts between adjacent barrier terminals.

4.1 MOUNTING

A mounting location for the console should be chosen with attention to providing adequate clearances for the top cover and front panel to swing fully open for ease of installation and servicing. Sufficient spacing should be provided to assure that the console is not excessively heated by external components such as cartridge tape machines, tube-type amplifiers, etc.

Strong external magnetic fields from such sources as motors and power transformers should be kept away from the console to avoid inductively coupling hum fields into the console.

Slots in the console chassis adjacent to the input and output barrier strips allow the passage of the connecting cables out of the unit and through the table on which it is mounted.

4.2 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. Mixer: The circuits in the console that select the input signals and feed them into the buses at a controlled level.

2. Fader: The gain controlling device of a given mixer circuit.

3. Bus: The point in the console where signals from the various mixers are combined.

4. Muted and Unmuted: To prevent feed back, in certain control positions, the monitor speakers, cue speaker, the program auxiliary output, or all, are disabled.

4.3 CONNECTION TO THE AC POWER SOURCE

The power cord exits from the right rear panel of the console. The main power switch and fuse are located on the output base board to the right rear of the console interior. The power cord is of the 3-wire type with an internal safety grounding pin. Do not remove the grounding pin from the power cord. If it is necessary to break the loop created by this ground pin and connection of the station ground strap to the console chassis, a 3:2 adaptor should be used. To prevent a possible shock hazard either a station ground must be connected to the chassis or the line cord plugged into a 3-wire outlet.

The value of the main fuse (F500) can be found in the parts list at the rear of this manual. In order to maintain the protection afforded by this fuse, it must be replaced by only the type specified. *M 7 L 1*

4.4 INPUT CONNECTIONS

All input connections to the console are made to screw terminal barrier strips mounted along the inside bottom of the main frame of the console, with the exception of the external headphone input which is located on the right-hand barrier strip on the output baseboard. The 12-mono inputs, plus a number of common grounding points are clearly marked. The marking of these is interpreted as follows, using input 3B as an example:

3 - references an input to the #3-mixer.

B - references the B input to mixer #3, of the two (a or b) available.

+ and - references phasing of this input.

G - references the chassis ground connection for single ended grounding of the cable shield.

4.5 INPUT LEVELS AND IMPEDANCES

Microphone inputs: The input of the mic preamp is designed for conventional balanced, -55dBm (0.7mv) output level microphones of approximately 150 ohms impedance. Maximum peak input voltage to the preamp should be limited to -35dBm (7mv) to avoid distortion.

When using microphones with an output level higher than -55dBm, such as electret condenser microphones, it is advisable to install a suitable "O pad" or "H pad" between the microphone and the microphone input of the console to reduce the level to -55dBm. This reduces the chances of distortion by maintaining the 20dB of head-room in the mic preamp and reduces the chances of operator error by keeping the fader setting at a standard position.

The manufacturer's data received with the microphone should be consulted in phase and shielding data.

Hi-Level preamplifiers: As normally supplied, the M-5M console has hi-level input preamplifier plug-ins in mixers 2 through 5. These preamps have 20K ohm balanced bridging inputs and require -10dBm (245 millivolts) at their input terminals as a nominal level. The maximum peak level which should be applied to the input of these preamps is +15dBm (4.35 volts) maximum.

These preamps may be used several ways:

1. Balance bridging across an already terminated 600 ohm line. (See Fig. A) For example, it is desired to run the same source simultaneously to more than one mixer. The source would be run to one mixer input and terminated, and the a parallel connection run to another mixer input which remains balanced bridging. The method can be used to expand the input switching capabilities of the console while avoiding the level problems caused by double termination.

2. As a selectively terminated console input. (See Fig. B) For example, it is desired to run the A input of a given mixer as a terminated load across one source while using the B input of the same mixer bridging (or nonterminating) across another source. This could be accomplished by connecting a 620 ohm resistor across the A input of that mixer, while leaving the B input of the same mixer unterminated.

3. As a terminating load to both inputs of the mixer. (See Fig. C) A 620 ohm resistor may be installed in the holes near the bottom of the plug-in to make the preamp input terminating. This will present a 600 ohm load to either the A or B input of that mixer.

4. With an unbalanced high impedance source. (See Fig. D) Since the preamp input is a resistive differential circuit it will present half its normal impedance when driven with an unbalanced source. The source must be capable of supplying 489 millivolts into a 10K ohm load. When using a high impedance source in this manner, the input cable should be kept short to avoid rolling off high frequencies and picking up extraneous fields. Care should also be taken to avoid creating ground loops using this method.

An optional 600 ohm transformer balanced input preamp is also available for the M-5M. This preamp requires a nominal input level of -10dBm and may be fed by a balanced or unbalanced 600 ohm source.

It is important to remember that while the nominal input required by the M-5M is -10dBm, many audio sources have output levels that vary from -10dBm to +8dBm into 600 ohms. To facilitate proper fader setting from mixer to mixer, decrease distortion caused by input overload and minimize cross-talk, all sources should be adjusted for a nominal -10dBm output using the source level controls or by attenuator pads installed between the source and console input. The individual manuals should be reviewed for the best way to accomplish this. Particular attention should be paid to the signal-to-noise ratio at various output level settings of a given source, it is better to reduce the level into the console by the use of a pad.

Another point to be considered is that when a 600 ohm source is connected to an unterminated bridging balanced input on the M-5M its level will effectively be 6dB higher than normal.

External Headphone Input: The external headphone input connection point can be found at one end of the right-hand barrier strip on the output baseboard. (See Fig. L) It is marked + and "G" (ground). The impedance of this input is 10K ohms, unbalanced, and requires 200 millivolts of signal to drive the headphone output at rated level. It is important that the ground associated with this input be used. The proper ground is delineated by the marking in front of the barrier strip. It is also important to avoid creating ground loops when using this input.

The external headphone input is useful for monitoring an off-the-air signal or for reviewing recorded material in production work.

4.6 OUTPUT CONNECTIONS

The barrier strip, located at the left front edge of the output baseboard (see Fig. L), contains the program output, the unmuted program auxiliary output and the muted program auxiliary output.

The barrier strip on the right front edge of the output baseboard (see Fig. L) contains the external headphone input, the muted monitor output, and the mixer 1 and 2 ON-AIR light relay contacts.

The program output is transformer balanced and requires only a single-ended ground connection to the shield. All the other signal outputs from these two barrier strips are unbalanced, so careful attention must be paid to avoiding ground loops.

4.7 OUTPUT LEVELS AND IMPEDANCES

Program output line:

The program output line is transformer balanced 600 ohm to drive a 600 ohm balanced or unbalanced load. Nominal output for zero VU meter indication is +8dBm with 11dB of headroom, so clipping occurs at +19dBm.

The ground for this output is intended only for connecting a single-ended cable shield.

The VU meter is connected directly across the output line, and hence will show when a load mismatch occurs or, when measuring frequency response, the presence of a nonlinear load on the program output line.

When the program output line is connected to telephone lines the user should be aware that the danger exists of a ring voltage being inadvertently impressed on the phone lines, and also that lightning strikes in the phone system can induce high transient voltages and damage the program output circuitry in the console.

This is also true with telephone lines which are connected to console inputs.

The Telephone Company should be made aware of this and take appropriate protective measures.

Muted and unmuted program auxiliary outputs (See Fig. L):

These outputs are high impedance unbalanced signal sources fed directly by the program line amplifier in the console. The recommended minimum load impedance is 2,000 ohms. Two hundred millivolts of signal is present at these terminals at zero VU on the meters. The ground terminal provided between these outputs is to be used as the ground current return connection point for loads tied to these outputs, and not be used as a tie point for any other grounds.

The unmuted program auxiliary output could be used to feed an unbalanced high impedance input of a tape recorder. This would be useful when it is desired to record program material without unbalancing the program line output of the console. Another possible use of this output could be as an unmuted source of program audio which could be used to feed an external monitor power amplifier connected to lobby or office speakers.

The muted program auxiliary output could be used to feed an external monitor power amplifier with greater output capability than the built-in monitor amp in the console. This situation could arise when using a pair of large inefficient speakers, such as the acoustic suspension types.

If the external monitor amplifier employed with this output has a high input impedance (for example, 47K ohm) it is advisable to connect a 2,000 ohm resistor across each of the inputs of the amplifier to prevent hum pickup when the console auxiliary output is muted.

Muted monitor amplifier outputs:

The internal stereo monitor amplifier is rated at 16-watts into an 8 ohm load. It will drive higher impedance loads at somewhat reduced power. Do not operate the monitor amplifier into 4 ohm speakers or parallel combinations of 8 ohm speakers. This can result in amplifier overheating or activation of the short circuit protection within the amplifier on program peaks, thus causing distortion.

This output is muted when the on-off switch of mixer 1 is depressed.

The ground connection designated (See Fig. L) with this output must be used to return speaker currents to the console. Connection of the speaker grounds to other ground points within the console can result in degraded cross-talk characteristics.

Headphone amplifier output:

A stereo headphone jack is provided on the right front panel of the M-5M. This output will deliver a minimum of a 1/2-watt into 8 ohm headphones. Headphones with impedances higher than 8 ohms may also be used for this output. The headphone amplifier is short-circuit protected to prevent inadvertent amplifier damage.

It is important to note that many types of low impedance headphones which require as much as 1/2-watt per channel to achieve high volume levels are also quite sensitive to much lower levels of signal. It has been found that some types of these headphones will reproduce audible levels with as little as 1 to 2 mV impressed upon them. This peculiarity of some types of headphones can cause unnecessary concern in the user about potential cross-talk problems within the console.

Cue amplifier output:

The internal cue amplifier in the console delivers 1-watt of power to the internal 5 inch cue speaker mounted on the left rear panel of the M-5M. This speaker is a high efficiency 8 ohm speaker. The cue amplifier output is muted when the on-off switch of mixer 1 is depressed.

4.8 MUTING, ON-AIR LIGHT CONTROL AND REMOTE CONTROL

In typical operation the console operator's microphone will be on mixer 1. Since feedback can occur from cue and monitor speakers to microphone, provision is made to avoid this. When the on-off switch of mixer 1 is depressed, the cue and monitor speakers are disabled.

Depressing the mixer 1 on-off switch also activates a relay containing a pair of auxiliary contacts (see Fig. L) which close when the cue and monitor speakers are disabled. In typical operation these contacts would be used to activate an ON-AIR light.

When either the A or B input switch of mixer 2 is depressed the auxiliary program output is disabled. With the addition of a microphone preamp plug-in, mixer 2 could be used to receive the feed from a newsroom or another studio. The muted program auxiliary output can then be utilized to feed an external monitor amplifier and speakers in the adjacent studio. This combination will achieve the desired result of disabling the studio speaker when the microphone is live.

Depressing either of the mixer 2 input switches also activates a relay containing a pair of auxiliary contacts which could be used to activate another ON-AIR light or audio sources such as turntables, cart machines, etc.

Auxiliary contact relay characteristics:

The relays activated by mixers 1 and 2 are electrostatically shielded reed relays with contact ratings of 1 amp maximum. Because of the danger of high surge currents and potential shock hazard, AC powered loads should not be run directly through the console auxiliary contacts. An outboard 24 volt DC power supply and secondary control relays are conventional for this purpose. (See Fig. E)

It should be noted that while many audio sources require this type of continuous contact closure for remote control, several other types of remote control requirements will be encountered in other types of studio equipment. Some other common types are: momentary or continuous contact to a DC potential such as 5 volts, etc. Manuals for the various audio sources should be consulted for the proper method of remote control.

Momentary switch wiring:

As shipped, the M-5M comes equipped with momentary rocker switches installed in the front panel and are located directly beside the fader of each mixer, with the exception of mixers one and two, which are alternate action rocker switches. The switch wiring is left to the discretion of the users' requirements. An audio source requiring a momentary contact closure for remote control would be one use of the momentary switch. The contact rating of the switch is 5 amps, 125 VAC, but as noted previously, because of the danger of high surge currents and potential shock hazard, AC powered loads should not be run directly through the console. Following this precaution will also prevent any hum pickup by the input or output lines which may be running close to a line connected to an AC powered load. An outboard 24 volt DC power supply and secondary control relays are conventional for remote control of an AC powered load and is recommended. (See Fig. E).

4.9 CONSOLE OPERATION

Input switching:

The M-5M mono console has two inputs available in mixers 1 and 2. As shipped, mixer 1 is wired with an on-off switch beside the first mixer position. The on-off switch is the white rocker located directly beside the fader. For proper use, the pushbutton input switch, located above the mixer 1 fader, should be used to pre-select either A or B input while the on-off switch is used to activate the mixer. The mixer 1 on-off switch also activates the cue and monitor muting and the auxiliary relay contact functions within the console. Also as shipped, mixer 2 has an on-off switch but is not wired into the console. The on-off switch in mixer 2 can be relocated to any mixer position in the console. (See Figure P for switch wiring). Mixers 3 and 4 has two inputs available and are selectable with the input switch pushbutton. Mixer 5 in the M-5M console has four inputs available, with input A selected by depressing the A pushbutton above the fader and inputs B, C, and D made available by depressing the auxiliary pushbutton above the fader and then moving the auxiliary selector switch to the desired position.

Reference to the circuit diagram (see Fig. N) shows that the input switching is performed ahead of the input preamplifier modules. In the OFF position of the input selector switches the preamplifier outputs are disconnected from the program bus to reduce the possibilities of cross-talk.

Plug-in preamplifier modules:

Three types of input preamplifier plug-in modules may be used with the M-5M console:

- A. Mono microphone preamp plug-in.
- B. Mono high-level bridging plug-in.
- C. Mono transformer balanced high level plug-in.

Select the appropriate plug-in modules for mixers 1 through 5 for your requirements.

Program master and fader settings:

With the level of the audio sources to the console set as previously explained in section 4.5, the program master control setting and fader settings for zero VU on the meter should correspond to the positions noted in the test data sheet at the front of this manual. After initial program master adjustment, this control should never have to be reset. When a source is activated the only level adjustment necessary should be bringing the appropriate fader up to a given position. This will minimize errors and facilitate smooth operation of the studio.

Cue volume control:

The cue volume control will be found just to the left of the VU meter on the front panel of the console. This controls the audio level to the cue speaker and does not affect the cue level in the headphones.

Monitor volume control:

Just to the right of the VU meter will be found the monitor volume control. This controls the audio level to the monitor speaker and does not control the level of the signal at the auxiliary program outputs. The monitor amplifier input receives signal from the program amplifier before the primary of the line output transformer. Hence, a load mismatch in the program line output will not be reflected in the monitor amplifier level.

Headphone controls:

In the upper lefthand corner of the M-5M front panel will be found the headphone selector switch and volume control. In the program position of the selector switch, the headphones receive a signal derived directly from the program amplifier. In the cue position of the selector switch the headphones receive a cue signal taken from the output of the cue driver amp before the cue volume control. Hence, the cue volume control has no affect on the cue level in the headphones. This signal will be present in both sides of a pair of stereo headphones. In the external position of the selector switch the headphone signal is derived from the signal being fed to the external headphone input. Common sources of this signal are off-air monitors, the outputs of tape recorders when doing production work, talk-back circuits from consoles in other studios, etc.

When the level fed to the external headphone input is approximately 200 mV, the relative volume between the program and external headphone selector switch positions will be about the same. The headphone sensitivity in the cue position is greater, so that accurate cuing can be obtained when an audio source begins with quiet passages. This is also helpful in overcoming the ambient noise generated by an unmuted monitor speaker.

4.9 MAINTENANCE

You have invested a considerable sum of money in your LPB M-5M mono console. It is a high quality handcrafted electronic unit of which you can expect to be proud for many years. To expect this equipment to maintain original appearance and perform reliably, certain minimums of care in the routine handling of the equipment, and a bit of occasional maintenance are necessary.

The panel of the M-5M console has a clear baked epoxy overspray for protection of the markings. Use no solvents on the panel. Mild cleaners such as Windex, can be used to remove any stains from the panel.

Care should be taken that a minimum of dirt collects inside the console. An occasional dusting with a soft brush and vacuuming is recommended. If the console has the optional step attenuators, we recommend that quarterly the rear dust covers be removed, the contacts cleaned and lubricated. Aerosol cleaners should not be used on the step attenuators since they can wash dirt into the bearing assemblies of the attenuators. A light coating of Vaseline or Lubriplate makes a good contact lubricant. The contacts of the printed circuit plug-in modules should also be cleaned once or twice each year. Aerosol contact cleaners are fine for this purpose.

Once a year the contacts of the two wafer switches should be given a light spray of cleaner/lubricant. Also, once a year the input push button selector switches could be given the same treatment, but care must be taken to avoid getting the spray inside the plastic assemblies of the push buttons. A type of aerosol cleaner must be chosen that does not harm the plastic, such as a good quality TV tuner cleaner. No other routine maintenance should be needed.

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

A complete circuit diagram which includes the input and output baseboards and all main frame wiring is furnished as a separate sheet with this manual. Refer to it for details of switching functions, etc.

Circuit diagrams of the input preamplifier plug-ins (see Fis. I & J), and a complete parts list tabulation may be found at the back of this manual.

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 cost 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.

5.1 MODIFICATION

Muting and remote control:

The muting and auxiliary contact controls on mixers 1 and 2 may be selectively disabled. Spare contacts are present on the input selector switches for all mixers. Remote control functions may be added to these switches. Refer to Figure G for the location of the spare contacts on the input switches.

If it is desired to modify other functions of the console, contact LPB for advice on how best to accomplish the modifications.

5.2 STANDARD TEST CONDITIONS

1. Input terminating resistors:

Mic; 150 ohm low noise resistor - one percent tolerance metal film resistors are suitable.

High level input; 600 or 620 ohm carbon composition or carbon film resistors are suitable for these inputs.

2. Input levels:

Mic; -55dBm into 150 ohms which corresponds to 0.7mV RMS.

High level input; -10dBm into 600 ohms. This corresponds to 245mV RMS.

Note: when using a high level input preamplifier plug-in with a bridging balanced input, a terminating resistor must be used to make the -10dBm level valid.

3. Control Setting:

Mixer fader: the fader should be set at the position noted on the test data sheet in the console manual.

the position noted in the test data sheet and then turned up until the console output corresponds to +18dBm. This level corresponds to 6.15 volts into 600 ohms. Note: the VU meter will be reading off scale. Note too, while making program channel measurements the headphone volume and monitor volume control should be turned down since the program channels are now being operated 10dB higher than normal.

4. Monitor, headphone and cue amplifier:

Output loads: the monitor output load should be a 8 ohm 10-watt power resistor. The headphone amplifier load should be an 8 ohm resistor soldered to a phone plug. The cue amplifier load is the cue speaker itself. Note 1: when making measurements on these circuits the program master control should be reduced back to the setting noted in the test data sheet so that the console is set for zero VU. This corresponds to +8dBm into a 600 ohm load (1.94 volts). Note 2: the ground lead of the voltmeter and/or the oscilloscope used should be connected to the output ground point of the circuit being measured.

5.2 TEST EQUIPMENT

Audio oscillator:

A low distortion oscillator with a flat frequency response from 20 to 20,000Hz should be used. A type which has a selectable 150 ohm balanced and a 600 ohm balanced output is preferable. When using an oscillator which has a 600 ohm unbalanced output, a high quality 600 to 600 ohm transformer should be used. This is especially true when feeding a bridging balanced input on the M-5M. When feeding a mic input, the transformer should be used followed by a 600 ohm in, 150 ohm out, H or O pad which will deliver .7mV RMS into 150 ohms.

Output measuring device:

Unbalanced input VTVM's, distortion analyzers and oscilloscopes may be connected to the program outputs of the console since these are transformer balanced. The 600 ohm output terminating resistors should be connected to the output barrier strip of the console and not across the test equipment inputs.

To accurately measure the signal to noise ratio of any electronic device, it is important that the measurement bandwidth be specified. The noise figures specified in the product specification sheets for LPB consoles are measured using the full audio bandwidth of 20 to 20,000 Hz. Since the console bandwidth is considerably greater, a bandwidth limiting filter must be used for meaningful measurements. Figure H shows a circuit for a bandwidth filter which rolls off rapidly after 20,000Hz. This filter should only be used when making noise measurements and removed for frequency response and distortion test.

After setting up the console for the desired output level, the input signal should be removed and input terminated with the appropriate source impedance. Below are listed several residual noise values in mV listed in dB below operating level.

74dB below +18dBm output + 1.2mV RMS

82dB below +18dBm output + 0.5mV RMS

65dB below 8 watts (8 ohm load) + 4.5mV RMS

65dB below 1 watt (8 ohm load) + 1.6mV RMS

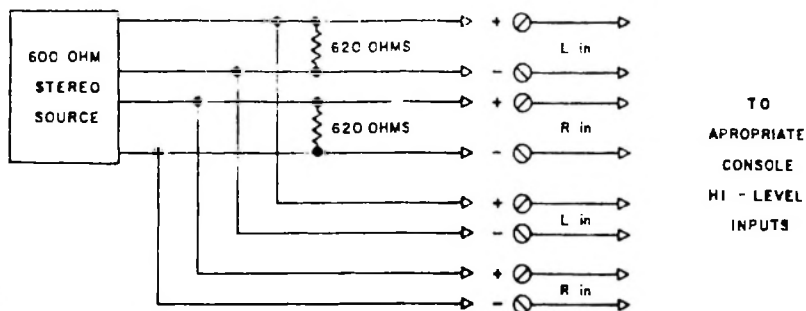


Figure A Balanced bridging across an already terminated line

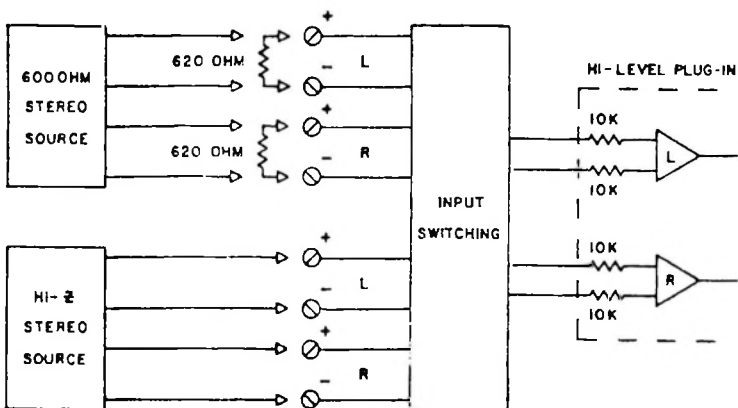


Figure B Selectively terminated inputs to the same mixer

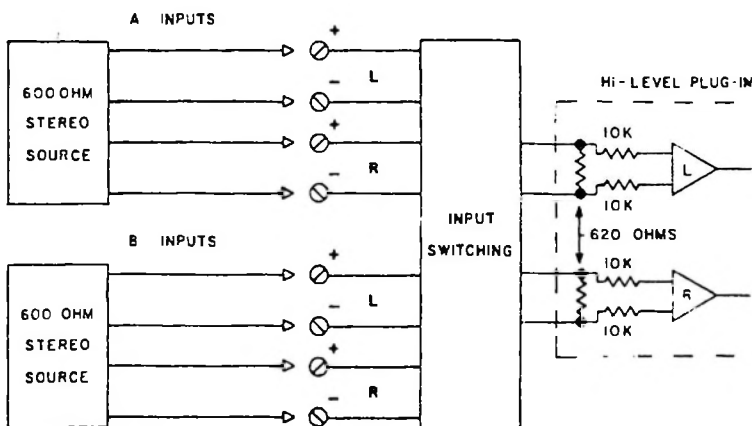


Figure C Both inputs to the same mixer terminated

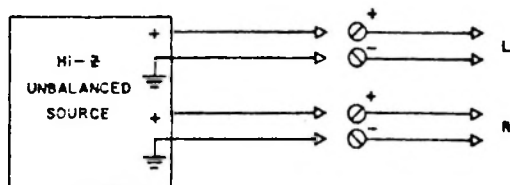


Figure D Use with an unbalanced high impedance source

NOTE: Hi-level plug-in cannot have 620 ohms terminating resistors installed.

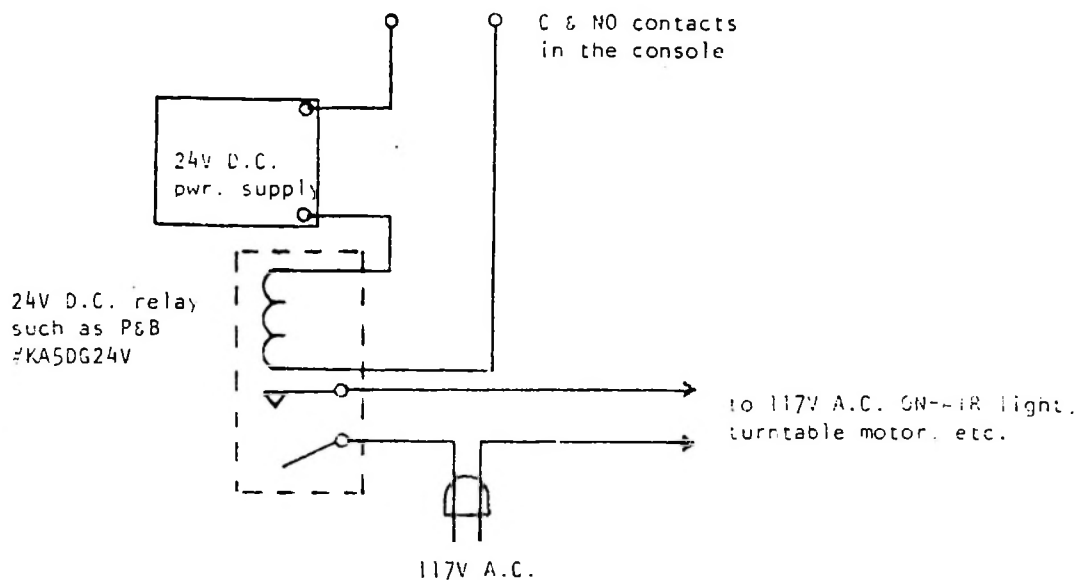


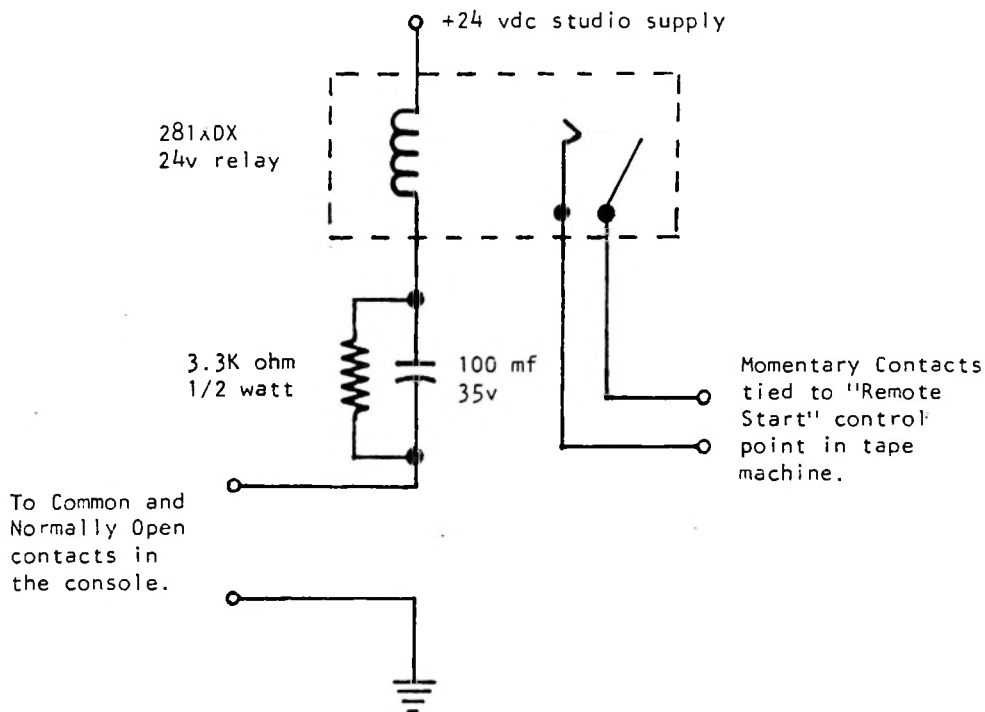
Figure E

REMOTE START & ON-AIR LIGHT SWITCHING

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.

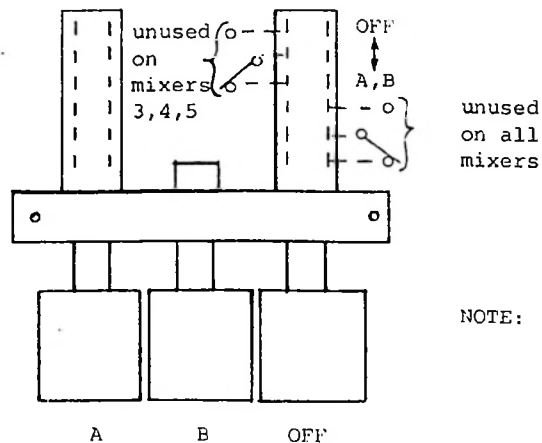
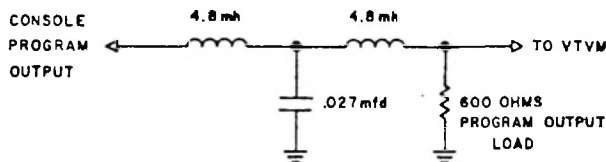


Figure G Monogram muting and remote control connections



1 dB loss @ 1 kHz (NOTE: loss is a function of the dc resistance of inductors)

Frequency Response

0 - 8 kHz	flat
15 kHz	-1dB
20 kHz	-3dB
30 kHz	-10dB
40 kHz	-17dB
50 kHz	-22dB

Figure H Bandwidth limiting filter (used for noise measurements only)

COMPONENTS WITH "O" OUTLINES ARE FOR "F" OPTIONS ON "F"

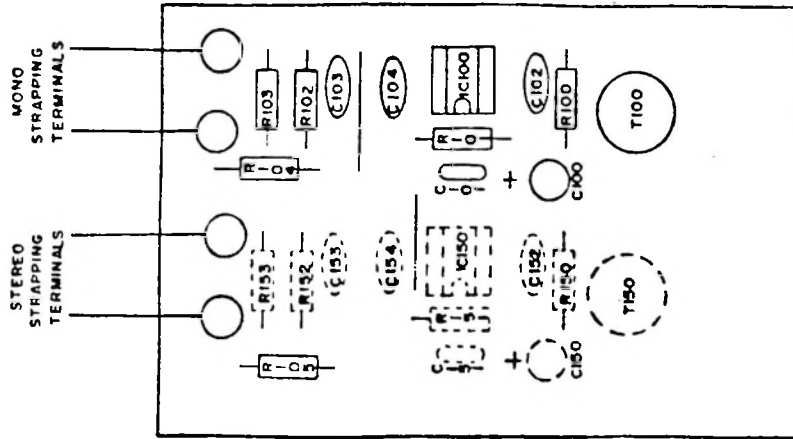
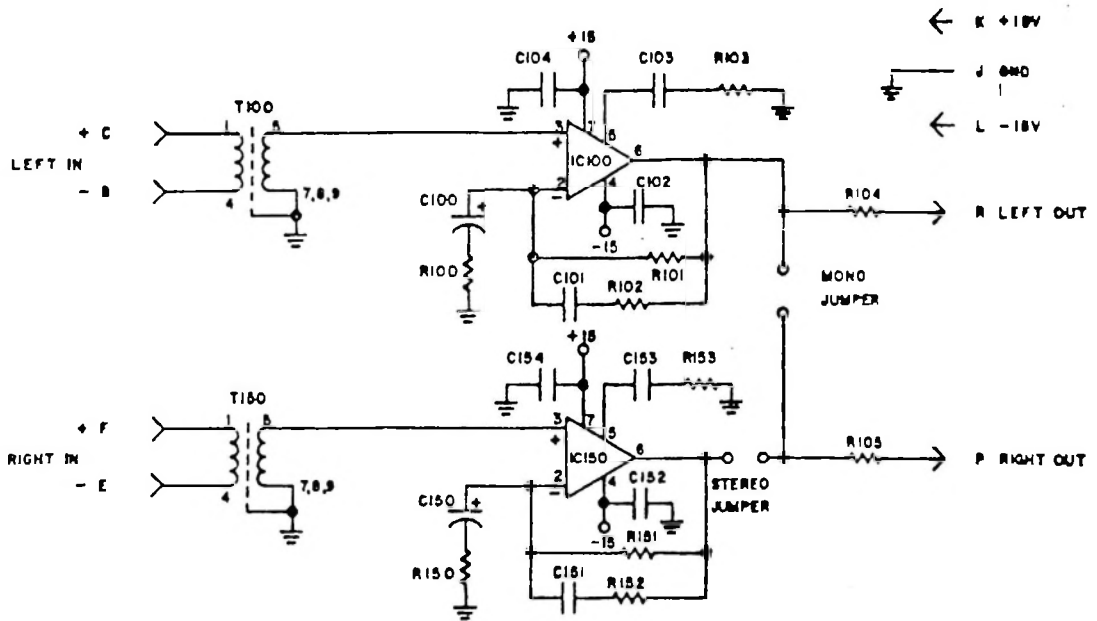


FIG. 1
MFC PREAMP PLUG-IN
TOP VIEW



MONO MICROPHONE PREAMP PLUG-IN,MMN

ASSY NO. 2040-B

PAGE 1

DATE 5/1/81

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R100	1	3.3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2133	
R101	1	39K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2159	
R102	1	68K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2165	
R103	1	47 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2089	
R104	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R105	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
C100	1	33 MFD AL CAP RAD 16V -10/+50 %	172-1076	
C101	1	100 PF DN CAP 500V +/- 5 % DN19	171-1025	
C102	1	.1 MFD CER DISC CAP 50V	174-1254	1
C103	1	.01 MFD CER DISC CAP 100V	174-1217	1
C104	1	.1 MFD CER DISC CAP 50V	174-1254	1
IC100	1	LM725CN LINEAR IC (8 PIN DIP)	361-1009	
T100	1	200:45K MIC XFMR PC MNT BEYER	863-1035	
1	1	MON II MIC PREAMP PLUG-IN PCB, BLK	671-2043-B	
2	1	8 PIN IC SOCKET RECESSED	365-1001	

NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R200	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R201	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R202	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R203	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R204	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R205	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R206	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R207	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R208	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R209	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
C200	1	.1 MFD CER DISC CAP 50V	174-1254	1
C201	1	.1 MFD CER DISC CAP 50V	174-1254	1
IC200	1	UA747 LINEAR IC (14 PIN DIP)	361-1015	
1	1	MONO HI-LEVEL INPUT PL-IN PCB, BLK	671-2033-C	
2	1	14 PIN IC SOCKET RECESSED	365-1003	

NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R200	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R201	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R202	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R203	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R204	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R205	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R206	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R207	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R208	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R209	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R290	1	620 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2116	
C200	1	.1 MFD CER DISC CAP 50V	174-1254	1
C201	1	.1 MFD CER DISC CAP 50V	174-1254	1
IC200	1	UA747 LINEAR IC (14 PIN DIP)	361-1015	
T290	1	200:600 LINE IN XFR BOBBIN LPM-812	863-1075	
1	1	MONO HI LEVEL INPUT PL-IN PCB, BLK	671-2033-C	
2	1	HI-LEVEL PLUG-IN XFMR SHIELD	521-3116-A	
3	1	14 PIN IC SOCKET RECESSED	365-1003	
4	2	4-40 X 1/4" PAN HD SCREW PHILLIPS	301-1104	
5	4	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
6	2	4-40 HEX NUT	302-1005	

NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.

PC BOARD ASSEMBLY

ASSY NO. 2001 18

PAGE 1

DATE 4/15/82

SUPERCEDES 10/9/81

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R300	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2113	
R301	1	18K OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2151	
R302	1	22 OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2081	
R303	1	22 OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2081	
R304	1	10 OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2073	
R305	1	10 OHM, 1/2W, 5% RESISTOR, CARB FILM	742-2073	
C300	1	.1 MFD CER DISC CAP 50V	174-1254	1
C301	1	.1 MFD CER DISC CAP 50V	174-1254	1
C302	1	.1 MFD CER DISC CAP 50V	174-1254	1
C303	1	.1 MFD CER DISC CAP 50V	174-1254	1
C304	1	100 PF DM CAP 500V +/- 5 % DM10	171-1094	
C305	1	.1 MFD CER DISC CAP 50V	174-1254	1
C306	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C307	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C308	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C309	1	.01 MFD CER DISC CAP 100V	174-1217	1
IC300	1	LM318N LINEAR IC (8 PIN DIP)	361-1001	
IC301	1	LM318N LINEAR IC (8 PIN DIP)	361-1001	
S301	1	TRIPLE PUSHBUTTON ARRAY, W/INDICATOR	827-1020	
S302	1	TRIPLE PUSHBUTTON ARRAY, W/INDICATOR	827-1020	
S303	1	TRIPLE PUSHBUTTON ARRAY, W/INDICATOR	827-1020	
S304	1	TRIPLE PUSHBUTTON ARRAY, W/INDICATOR	827-1020	
S305	1	TRIPLE PUSHBUTTON ARRAY, W/INDICATOR	827-1020	
U301	1	15 PIN PC MOUNT CARD-GUIDE CONN	193-1008	
U302	1	15 PIN PC MOUNT CARD-GUIDE CONN	193-1008	
U303	1	15 PIN PC MOUNT CARD-GUIDE CONN	193-1008	
U304	1	15 PIN PC MOUNT CARD-GUIDE CONN	193-1008	
U305	1	15 PIN PC MOUNT CARD-GUIDE CONN	193-1008	
1	2	8 PIN IC SOCKET RECESSED	365-1001	
2	1	NON II 5 CH INPUT MOTHER PCB, BLK	671-2024-E	
3	10	4-40 X 1/2" PAN HD SCREW PHILLIPS	301-1112	
4	10	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
5	10	4-40 HEX NUT	302-1005	

NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.

M-5M FRONT PANEL ASSEMBLY

ASSY NO. 2002-1E

PAGE 1

DATE 7/19/82

SUPERCEDES 5/7/82

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R401	1	10K OHM POT, SING, AUD, CD PL, W/SWITCH	772-1125	1
R402	1	10K OHM POT, SING, AUD, CD PL, W/SWITCH	772-1125	1
R403	1	10K OHM POT, SING, AUD, CD PL, W/SWITCH	772-1125	1
R404	1	10K OHM POT, SING, AUD, CD PL, W/SWITCH	772-1125	1
R405	1	10K OHM POT, SING, AUD, CD PL, W/SWITCH	772-1125	1
R406	1	2.2K OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1129	
R407	1	2.2K OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1129	
R408	1	2.2K OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1129	
R409	1	2.2K OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1129	
R410	1	2.2K OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1129	
R411	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R412	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R413	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R414	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R415	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
S406	1	3PDT ALT ACT ROCKER SWITCH, WHITE	821-1026	
S407	1	3PDT ALT ACT ROCKER SWITCH, WHITE	821-1026	
S408	1	SPDT MOMEN ROCKER SWITCH, RED	821-1009	
S409	1	SPDT MOMEN ROCKER SWITCH, RED	821-1009	
S410	1	SPDT MOMEN ROCKER SWITCH, RED	821-1009	
1	1	M-5M, M-5S FRONT PANEL	521-2005-F	
2	1	M-5M INPUT BOARD ASSEMBLY	2021-1E	
4	5	POT MOUNTING NUT 3/8"	779-1002	
5	5	POT LOCK WASHER 3/8"	779-1011	
6	1	3 COND PHONE JACK INSUL BUSHING	192-1001	2
7	5	2+1 LH MNT TERMINAL STRIP PHENOLIC	197-1011	
8	10	4-40 X 1/4" HEX THREADED SPACER	304-1039	
9	22	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
10	10	4-40 HEX NUT	302-1005	
11	6	2-3/8" PC BOARD SUPPORT BRACKET	305-2005	
12	12	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
13	10	4-40 X 1/2" PAN HD SCREW PHILL BK0X	301-1113	
14	6	6-32 X 1/2" PAN HD SCREW PHILL BK0X	301-1213	
15	86	22 AWG PVC HOOK-UP WIRE, RED	931-1003	3
16	18	22 AWG PVC HOOK-UP WIRE, BLACK	931-1002	3
17	120	22 AWG PVC HOOK-UP WIRE, GREEN	931-1004	3
19	50	22 AWG PVC HOOK-UP WIRE, BLUE	931-1006	3
21	14	14 AWG TINNED COPPER BUS WIRE	935-1019	3
22	8	20 AWG TINNED COPPER BUS WIRE	935-1016	3
23	25	22 AWG 2-COND, SHIELDED AUDIO CABLE	932-1002	3
24	18	20 AWG PVC TUBING, CLEAR	936-1003	3
25	25	4" SELF-LOCKING NYLON TIE-WRAP	937-1004	
26	10	1" ADHES BASE TIE-WRAP HOLD-DOWN, NY	937-1012	

CONTINUED ON PAGE 2

M-5X FRONT PANEL ASSEMBLY

ASSY NO. 2000-10

PAGE 2

DATE 7/19/82

SUPERCEDES 5/7/82

NOTES:

1. SEE ORDER FOR TYPE OF FADER; STANDARD AS SHOWN, OR -01 STEP ATTENUATORS (ASSY #2083).
2. INCLUDES MOUNTING HARDWARE.
3. QUANTITY EQUALS TOTAL LENGTH USED IN ASSEMBLY IN INCHES. SEE ASSY DWG FOR INDIVIDUAL LENGTHS AND LOCATIONS.

M-5M CHASSIS ASSEMBLY

ASSY NO. 2011-1D

PAGE 1

DATE 5/7/82

SUPERCEDES 4/30/81

SYMBOL	QTY	DESCRIPTION	PART	NOTES
T500	1	36V 2.8A PWR XFMR CH MNT 241-8-36	861-1044	
SP500	1	8 OHM PANEL MOUNT SPEAKER,5"	801-1006	
Q500	1	MJE205 NPN SIL PWR TRANSISTOR,PLAS	782-1178	1
Q501	1	MJE205 NPN SIL PWR TRANSISTOR,PLAS	782-1178	1
Q502	1	MJE105 PNP SIL PWR TRANSISTOR,PLAS	782-1175	1
Q503	1	MJE205 NPN SIL PWR TRANSISTOR,PLAS	782-1178	1
Q504	1	MJE105 PNP SIL PWR TRANSISTOR,PLAS	782-1175	1
Q505	1	MJE205 NPN SIL PWR TRANSISTOR,PLAS	782-1178	1
1	1	M-5M,M-5S CHASSIS	521-2015-D	
2	1	MUMETAL TRANSFORMER SHIELD(MONOGR)	521-2009-A	
3	1	M-5M HARNESS ASSEMBLY	2076-A	
4	1	1+1 RH MNT TERMINAL STRIP PHENOLIC	197-1002	
6	1	18 AWG 3-COND POWER CORD,GRAY VINYL	939-1003	
7	1	STRAIN RELIEF BUSHING 18-3,.100 PNL	939-1021	
8	11	1/4" NYLON PC BOARD STANDOFF	304-3005	
9	7	FAST-ON LUG	195-1020	
10	6	MOLEX PLUG 3 HOLE	195-1002	
11	18	MOLEX PIN (FOR 195-1002)	195-1005	
12	6	#6 COMPRESSION WASHER	789-1022	
13	6	MICA INSULATOR,.5" X .85"	789-1016	1
14	0	THERMAL HEAT SINK COMPOUND-CLEAR	789-1010	1
15	8	CABINET FEET,GRAY RUBBER,11/16" DIA	309-8005	
16	9	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
17	10	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
18	10	6-32 X 1/2" PAN HD SCREW PHILLIPS	301-1212	
19	9	6-32 HEX NUT	302-1010	
20	10	6-32 HEX NUT 1/4" DIA	302-1011	
21	1	6-32 SOLID WING NUT	302-5010	
22	4	#6 SOLDER LUG	306-1010	
23	2	#6 FLAT WASHER	303-4010	
24	2	8-32 X 1/2" PAN HD SCREW PHILLIPS	301-1312	
25	2	#8 EXTERNAL TOOTH LOCKWASHER	303-1015	
26	2	8-32 HEX NUT	302-1015	
27	12	22 AWG PVC HOOK-UP WIRE,BLACK	931-1002	2
28	10	22 AWG PVC HOOK-UP WIRE,RED	931-1003	2
29	15	22 AWG PVC HOOK-UP WIRE,GREEN	931-1004	2
30	50	22 AWG PVC HOOK-UP WIRE,BLUE	931-1006	2
31	36	22 AWG PVC HOOK-UP WIRE,ORANGE	931-1008	2
32	13	22 AWG PVC HOOK-UP WIRE,GRAY	931-1009	2
33	16	14 AWG TINNED COPPER BUS WIRE	935-1019	2
34	10	20 AWG PVC TUBING,CLEAR	936-1003	2
35	45	22 AWG 2-COND,SHIELDED AUDIO CABLE	932-1002	2
36	4	4" SELF-LOCKING NYLON TIE-WRAP	937-1004	
37	4	1" ADHES BASE TIE-WRAP HOLD-DOWN,NY	937-1012	

CONTINUED ON PAGE 2

M-5M CHASSIS ASSEMBLY

ASSY NO. 2011-1D

PAGE 2

DATE 5/7/82

SUPERCEDES 4/30/81

NOTES:

1. INSTALL MICA INSULATOR WITH THERMAL COMPOUND ON BOTH SIDES UNDER TRANSISTOR.
2. QUANTITY EQUALS TOTAL LENGTH USED IN ASSEMBLY IN INCHES. SEE ASSY DWG FOR INDIVIDUAL LENGTHS AND LOCATIONS.

M-5M OUTPUT BOARD ASSEMBLY

ASSY NO. 2026-1A

PAGE 1

DATE 5/7/82

SUPERCEDES 4/15/82

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R500	1	1.5K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2125	
R501	1	.2 OHM, 2W, 5% RESISTOR, WIREWND	765-1016	
R502	1	.2 OHM, 2W, 5% RESISTOR, WIREWND	765-1016	
R503	1	7.5 OHM, 5W, 2% RESISTOR, WIREWND	765-1168	
R504	1	240 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2106	
R505	1	2.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2131	
R506	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R507	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R508	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R509	1	4.7 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2065	
R510	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R511	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R512	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R513	1	4.7 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2065	
R514	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R515	1	130K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2172	
R516	1	6.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2141	
R517	1	180K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2175	
R518	1	1.5K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2125	
R519	1	82K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2167	
R520	1	82K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2167	
R521	1	22 OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1081	
R522	1	22 OHM, 1/4W, 5% RESISTOR, CARB FILM	762-1081	
R523	1	3.3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2133	
R524	1	3.3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2133	
R525	1	12 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2075	
R526	1	12 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2075	
R527	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R528	1	270 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2107	
R529	1	2.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2131	
R530	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R531	1	270 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2107	
R532	1	5.62K OHM, 1/2W, 1% RESISTOR, MET FILM	764-1373	
R533	1	10K OHM, 1/2W, 1% RESISTOR, MET FILM	764-1401	
R536	1	27K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2155	
R537	1	27K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2155	
C500	1	2200 MFD AL CAP AXL 35V -10/+50 %	172-2197	
C501	1	2200 MFD AL CAP AXL 35V -10/+50 %	172-2197	
C502	1	.1 MFD CER DISC CAP 50V	174-1254	1
C503	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C504	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C505	1	15 MFD AL CAP RAD 35V -10/+50 %	172-1056	
C507	1	.001 MFD CER DISC CAP 1000V	174-1155	1
C508	1	47 MFD AL CAP RAD 35V -10/+50 %	172-1087	
C509	1	.1 MFD CER DISC CAP 50V	174-1254	1
C511	1	1.0 MFD AL CAP RAD 50V -10/+75 %	172-1007	

CONTINUED ON PAGE 2

M-5M OUTPUT BOARD ASSEMBLY

ASSY NO. 2026-1A

PAGE 2

DATE 5/7/82

SUPERCEDES 4/15/82

SYMBOL	QTY	DESCRIPTION	PART	NOTES
C512	1	.001 MFD CER DISC CAP 1000V	174-1155	1
C513	1	47 MFD AL CAP RAD 35V -10/+50 %	172-1087	
C514	1	15 MFD AL CAP RAD 35V -10/+50 %	172-1056	
C515	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C516	1	.1 MFD CER DISC CAP 50V	174-1254	1
C517	1	1500 MFD AL CAP AXL 16V -10/+50 %	172-2186	
C518	1	15 MFD AL CAP RAD 35V -10/+50 %	172-1056	
C519	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C520	1	.1 MFD CER DISC CAP 50V	174-1254	1
C521	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C522	1	1500 MFD AL CAP AXL 16V -10/+50 %	172-2186	
C523	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C524	1	27 PF DM CAP 500V +/- 5 % DM15	171-1050	
C525	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C526	1	.1 MFD CER DISC CAP 50V	174-1254	1
C527	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C528	1	.1 MFD CER DISC CAP 50V	174-1254	1
C529	1	56 PF DM CAP 500V +/- 5 % DM15	171-1077	
C530	1	56 PF DM CAP 500V +/- 5 % DM15	171-1077	
	1	.005 MFD CER DISC CAP 1000V	174-1204	2
IC500	1	LM325N 15 VOLT REG IC (14 PIN DIP)	363-1005	
IC501	1	LM317H ADJ VOLT REG IC (TO-5)	363-1001	3
IC502	1	LM378N LIN POWER IC (14 PIN DIP)	362-1001	
IC503	1	LM378N LIN POWER IC (14 PIN DIP)	362-1001	
IC504	1	LM378N LIN POWER IC (14 PIN DIP)	362-1001	
IC505	1	LM318N LINEAR IC (8 PIN DIP)	361-1001	
D500	1	IN5404-400V, 3A SILICON RECTIFIER	781-1104	
D501	1	IN5404-400V, 3A SILICON RECTIFIER	781-1104	
D502	1	IN5404-400V, 3A SILICON RECTIFIER	781-1104	
D503	1	IN5404-400V, 3A SILICON RECTIFIER	781-1104	
D504	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D505	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D506	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D507	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D508	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D509	1	IN4148 SILICON SIGNAL DIODE	781-1048	
D510	1	IN4148 SILICON SIGNAL DIODE	781-1048	
Q506	1	MPSU52 PNP SIL PWR TRANSISTOR, PLAS	782-1184	
Q507	1	MPSU04 NPN SIL PWR TRANSISTOR, PLAS	782-1181	
T501	1	600:600 LINE OUT XFR (LEADS) LPB-027A	863-1010-A	2
S500	1	SPDT MIN TOGGLE SWITCH, PC MOUNT	821-1005	
F500	1	1 AMP, 250V, SLO-BLO FUSE	691-1014	
K500	1	1FORM A (SPST-NO) REED RELAY, 24V COIL	741-1002	
K501	1	1FORM A (SPST-NO) REED RELAY, 24V COIL	741-1002	
K502	1	1FORM A (SPST-NO) REED RELAY, 24V COIL	741-1002	
K503	1	1FORM A POWER REED RELAY, 24V COIL	741-1003	

CONTINUED ON PAGE 3

L P R PARTS LIST

N-5N OUTPUT BOARD ASSEMBLY

ASSY NO. 2026-1A

PAGE 3

DATE 5/7/82

SUPERCEDES 4/15/82

SYMBOL	QTY	DESCRIPTION	PART	NOTES
K504	1	1FORM A POWER REED RELAY,24V COIL	741-1003	
1	1	MON II OUTPUT MOTHER PCB,BLK	671-2028-A	
2	1	MONOGRAM OUTPUT BOARD SHIELD	521-2017-A	
3	2	12SCR TERM BLK PC MNT 3/8 CTR	191-1031	
4	1	TO-5 BULKHEAD MOUNT HEATSINK-SCREW	332-1016	4
5	1	14 PIN DIP HEATSINK	332-1010	5
6	1	8 PIN IC SOCKET RECESSED	365-1001	
7	3	14 PIN IC SOCKET RECESSED	365-1003	
8	1	14 PIN IC SOCKET FLAT	365-1004	6
9	3	TRANSISTOR SOCKET,3 PIN,TO-5,NYLON	789-1001	7
10	3	20 AWG TINNED COPPER BUS WIRE	935-1016	
11	2	8-32 X 3/8" PAN HD SCREW PHILLIPS	301-1308	
12	2	8-32 HEX NUT	302-1015	
13	2	#8 EXTERNAL TOOTH LOCKWASHER	303-1015	
14	2	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
15	2	4-40 HEX NUT	302-1005	
16	2	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
17	2	PC MOUNT FUSE CLIPS	699-1001	

NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.
2. SEE ECO #2026-824-1.
3. COAT WITH THERMAL COMPOUND BEFORE INSERTING INTO HEATSINK.
4. INCLUDES MOUNTING HARDWARE.
5. SOLDER HEATSINK TO IC502 WITH IC INVERTED.
DO NOT FLOW SOLDER ONTO IC PINS WHERE THEY GO INTO SOCKET.
6. INSTALL IN IC502 POSITION.
7. QUANTITY EQUALS TOTAL LENGTH USED IN ASSEMBLY IN INCHES.
SEE ASSY DWG FOR INDIVIDUAL LENGTHS AND LOCATIONS.

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R416	1	10K OHM POT, SINGLE, AUDIO, COND PLAS	772-1121	
R417	1	10K OHM POT, SINGLE, AUDIO, COND PLAS	772-1121	
R418	1	500 OHM POT, SINGLE, AUDIO, COND PLAS	772-1051	
R419	1	10K OHM POT, SINGLE, LINEAR, COND PLAS	771-1121	
M400	1	2.5"VU METER B SCALE, WITH BEZEL	541-1002	1
D400	1	LED T-1-3/4 -RED	473-1006	
S400	1	2 POLE, 3 POS LEVER SWITCH	825-1013	
S401	1	2 POLE, 3 POS LEVER SWITCH	825-1013	
1	1	M-5M CHASSIS ASSEMBLY	2011-1D	
2	1	M-5M FRONT PANEL ASSEMBLY	2002-1E	
3	1	MONO MICROPHONE PREAMP PLUG-IN, MMM	2040-B	2
4	4	MONO/STER HI-LEV BRIDGING PL-IN, NIH	2030-C	2
5	1	MONOGRAM METAL END PLATE, LEFT HAND	521-2006-1A	
6	1	MONOGRAM METAL END PLATE, RIGHT HAND	521-2006-2A	
7	1	M-5M, M-5S TOP COVER	521-2010-1B	
8	2	MONOGRAM HINGE, FRONT & REAR 5-CHAN	521-2004-1A	
9	1	WOOD END PANEL, LEFT HAND (MONOGRAM)	951-2007-1A	
10	1	WOOD END PANEL, RIGHT HAND (MONOGRAM)	951-2007-2A	
11	1	MONOGRAM WOOD TRIM STRIP, 5-CHAN	952-2016-1B	
12	36	WOOD GRAIN VINYL TRIM, ADHES-BACKED	502-1001	3
13	1	2.5" METER BEZEL (MOD)	547-1001	1
14	1	FILLER BEZEL INSERT-GRAY PLEXI(MON)	547-2003-A	4
15	0	SUPER-GLUE	504-1001	5
16	1	LED CLIP & RING	473-1007	
17	5	2" SKIRTED KNOB W/INLAY BLACK PLAS	414-1007	
18	4	1" SKIRTED KNOB W/INLAY BLACK PLAS	414-1004	
19	2	TOP HAT KNOB BLACK PLASTIC	413-1010	
20	2	STEEL STRIKE-SELF ADHESIVE	309-1012	
21	2	MAGNETIC CATCH-SNAP IN	309-1010	
22	2	MAGNETIC CATCH MOUNTING BRACKET	309-1011	
23	4	3/16" PVC SHRINKABLE TUBING, BLACK	936-1025	3
24	3	1/8", 18AWG TINNED COPPER FLAT BRAID	935-1005	6
25	2	#6 SOLDER LUG	306-1010	
26	10	4-40 X 3/8" FLAT HD SCREW PHILLIPS	301-2108	
27	22	4-40 HEX NUT	302-1005	
28	22	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
29	6	#6 X 1/2" HEX HD SHEET METAL SCREW	301-6212	
30	1	MONOGRAM CHASSIS DECALS	444-2069	
31	8	#8 X 5/8" HEX HD SHEET METAL SCREW	301-6314	
32	8	#8 FLAT WASHER	303-4015	
33	6	4-40 X 3/8" PAN HD SCREW SLOTTED	301-1158	
34	12	.330"L X 1/8" D BLIND RIVET ST AVEX	307-1013	
35	11	#6 BEAD CHAIN, STAINLESS-STEEL	309-6004	6
36	2	#6 BEAD CHAIN COUPLING STNLS-STEEL	309-6012	
37	11	3/16" X 5/16" OD PVC TUBING, CLEAR	936-1019	6
38	4	POT LOCK WASHER 3/8"	779-1011	

CONTINUED ON PAGE 2

M-5M FINAL ASSEMBLY

ASSY NO. 2000-1A

PAGE 2

DATE 7/19/82

SUPERCEDES 5/7/82

SYMBOL	QTY	DESCRIPTION	PART	NOTES
39	8	POT MOUNTING NUT 3/8"	779-1002	
40	4	10-32 HEX NUT	302-1020	
41	2	#10 SOLDER LUG	306-1020	
42	4	6-32 X 1/4" PAN HD SCREW PHILL BKOX	301-1205	
43	6	4-40 X 5/16" FLAT HD SCREW PHILLIPS	301-2106	
R420	1	1 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2049	
R421	1	1 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2049	

NOTES:

1. INCLUDES MOUNTING HARDWARE.
2. INSTALLED BY TEST.
3. QUANTITY EQUALS TOTAL LENGTH USED IN ASSEMBLY IN INCHES.
SEE ASSY DWG FOR INDIVIDUAL LENGTHS AND LOCATIONS.
4. LEAVE PAPER BACKING ON.
5. USE SPARINGLY TO AVOID MARRING PLASTIC.
6. QUANTITY EQUALS LENGTH IN INCHES.

1 1 1 P A R T S L I S T

M-5M -01 STEP ATTENUATOR OPTION

ASSY NO. 2083-

PAGE 1

DATE 4/15/82

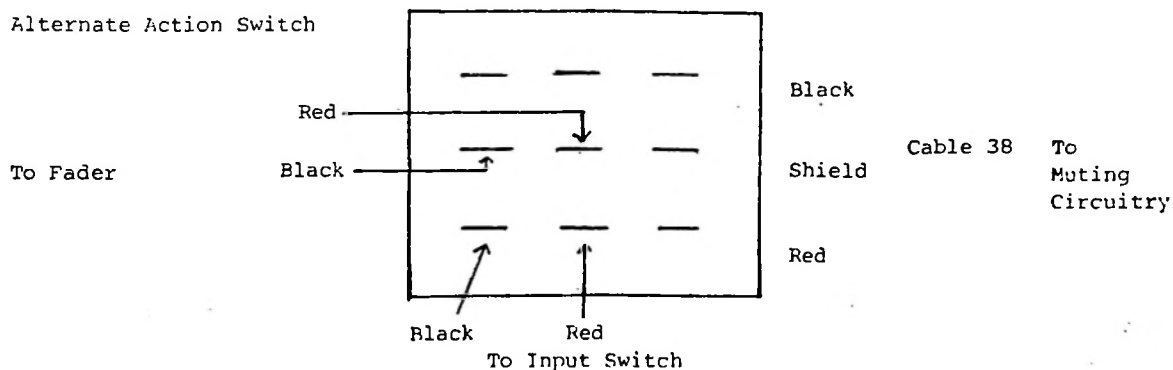
SYMBOL	QTY	DESCRIPTION	PART	NOTES
R401	1	10K OHM STEP ATTEN, SINGLE, WITH CUE	773-1030	1
R402	1	10K OHM STEP ATTEN, SINGLE, WITH CUE	773-1030	1
R403	1	10K OHM STEP ATTEN, SINGLE, WITH CUE	773-1030	1
R404	1	10K OHM STEP ATTEN, SINGLE, WITH CUE	773-1030	1
R405	1	10K OHM STEP ATTEN, SINGLE, WITH CUE	773-1030	1
	10	6-32 X5/16" PAN HD SCREW PHILLIPS	301-1206	1

NOTES:

1. DELETE 5 P/N 772-1125, 5 P/N 779-1002 AND 5 P/N 779-1011.

Bottom View

Alternate Action Switch

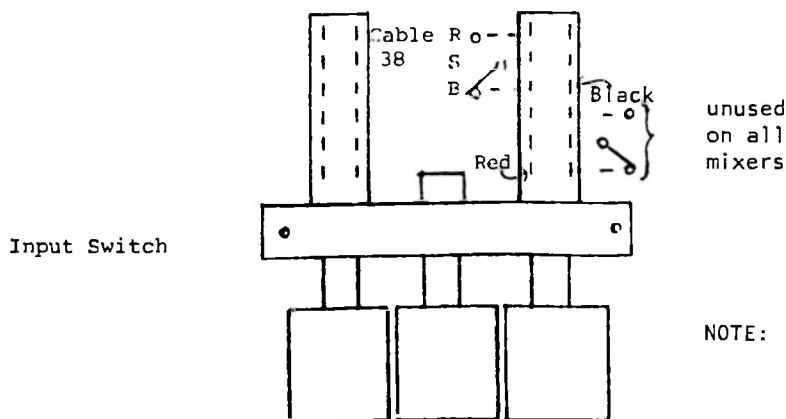


Alternate Action Switch Wiring:

If on-off switch is to be wired into the mixer 2 position, remove cable 38 from the input switch and reconnect to on-off switch as in illustration above. Remove Red and Black twisted pair from input switch and reconnect to on-off switch as in illustration. Using #22 PVC stranded wire connect input switch to the on-off switch as shown in illustrations above and below.

When wiring into another mixer position only the Red and Black twisted pair connections as stated above will be necessary.

The muting and auxiliary contact controls on mixers 1 and 2 may be selectively disabled or moved to another mixer position as desired. Refer to figure G for location of spare contacts on the input switch or to this diagram for wiring to an alternate action switch.



NOTE: Unused contact sets are isolated from console circuitry.

Figure P
Alternate Action
Switch Wiring

OPTIONAL

MODEL MPP MONO/STEREO PHONO PREAMP PLUG-IN

A1.0 INTRODUCTION

The LPB Model MPP Mono/Stereo Phono Preamp Plug-In is designed for use with magnetic phono pickup cartridges such as the Stanton Series. High gain and exceptionally low noise makes the MPP ideally suited for broadcast applications which either do not desire and/or warrant external phono preamplifiers.

A2.0 CIRCUIT DESCRIPTION

The MPP utilizes a low noise IC dual amplifier to provide voltage amplification and RIAA response equalization for the phono cartridge output. The RIAA equalization circuit employs epoxy dipped silver mica capacitors and carbon film resistors for long term stability and high reliability. The outputs of the IC drive the console circuitry directly, without transformers. Power for the MPP is taken from the regulated supply of the console.

The MPP inputs are designed with a capacitance of 100 pf. This capacitance (determined by C1 and C2) may be altered by changing the values of C1 and C2. It is important to take into account the capacitance of the tone arm cable when computing the total capacitance loading the phono cartridge.

A3.0 CONNECTIONS

The inputs to the MPP appear on the appropriately marked barrier strip screw terminals located within the console. The "hot" leads of the tone arm cable should be connected to the "+" terminal(s), while the "low" sides should be connected to the "-" terminal(s). The tone arm ground lead should be connected to an adjacent "G" terminal. Note that for monaural use, the left and right tone arm leads should be paralleled. In all cases, care must be taken to avoid creating ground loops.

A4.0 OPERATION

Once the tone arm cable is connected to the MPP, the audio level controls should be set. The standard recording levels provided by a test record are desirable to set operating levels. With the appropriate fader at normal operating position, the gain controls on the MPP are adjusted for 0 VU indication on the console's VU meters.

A5.0 SPECIFICATIONS

Input Level	Nominal 5 mV rms, 250 mV rms input overload @ 1 kHz
Input Level Range	1 mV rms to 40 mV rms to obtain 0 VU at normal fader and master settings
Input Impedance	47K ohm, unbalanced, 100 pf nominal capacitance
Frequency Response	RIAA +1 dB, 20 Hz - 20 kHz
Distortion	0.2% Max. @ normal output level
Signal-to-Noise Ratio	65 dB minimum, ref. to 5 mV input, normal input, normal output level, 20-20,000 Hz measurement bandwidth
Channel Separation	55 dB minimum below 10 kHz 50 dB minimum at 20 kHz

U P D P A R T S L I S T

MONO/STER RIAA PHONO PREAMP P-1,MPP

ASSY NO. 2055-A

PAGE 1

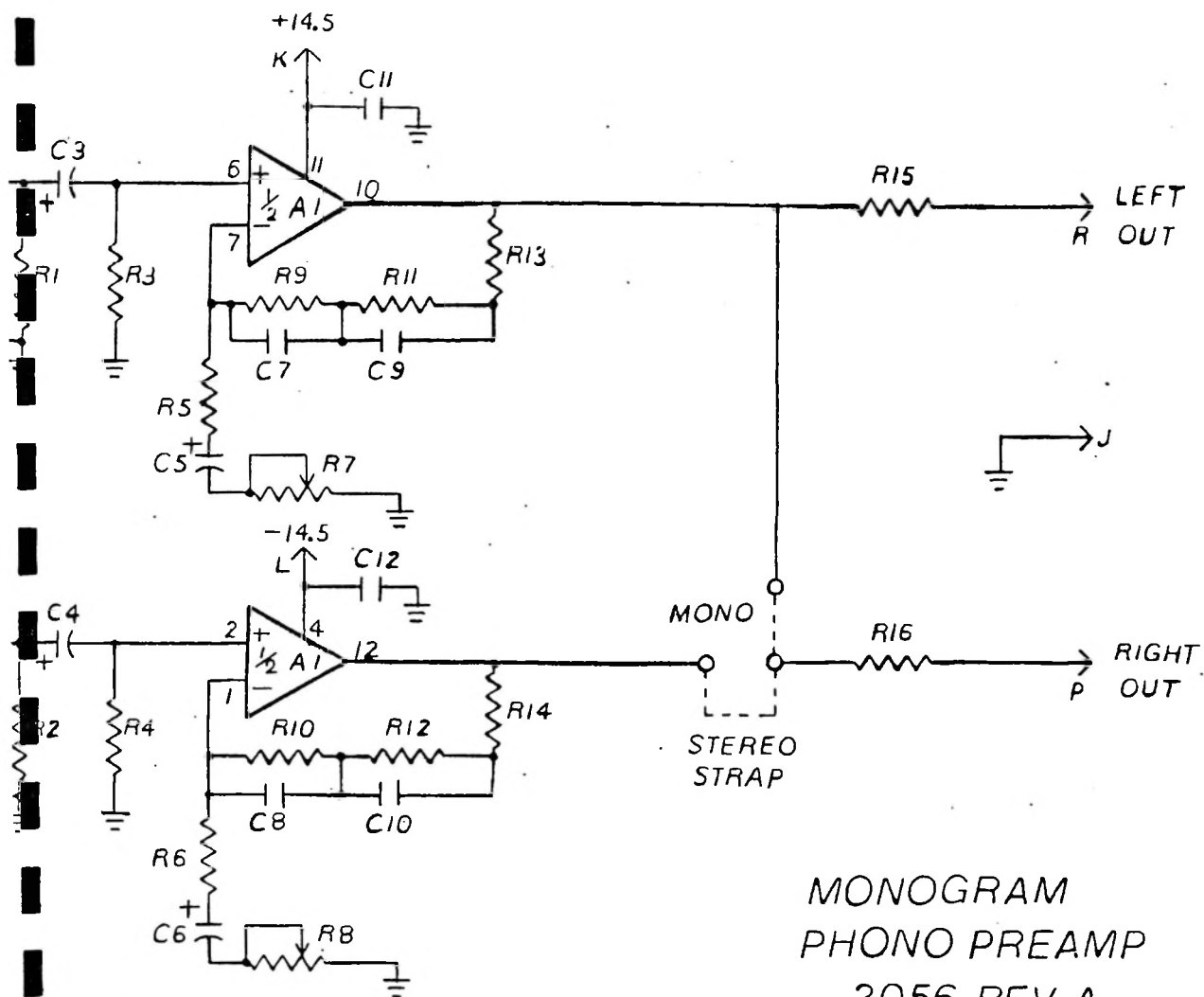
DATE 5/6/81

SYMBOL	QTY	DESCRIPTION	PART	NOTES
R1	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R2	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R3	1	820K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2191	
R4	1	820K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2191	
R5	1	180 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2103	
R6	1	180 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2103	
R7	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	
R8	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	
R9	1	750K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2190	
R10	1	750K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2190	
R11	1	51K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2162	
R12	1	51K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2162	
R13	1	2.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2131	
R14	1	2.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2131	
R15	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
R16	1	470 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2113	
C1	1	100 PF DM CAP 500V +/- 5 % DM10	171-1094	
C2	1	100 PF DM CAP 500V +/- 5 % DM10	171-1094	
C3	1	1.0 MFD AL CAP RAD 50V -10/+75 %	172-1007	
C4	1	1.0 MFD AL CAP RAD 50V -10/+75 %	172-1007	
C5	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C6	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C7	1	.0056MFD NI POLY CAP 100V 5%	175-1028	
C8	1	.0056MFD NI POLY CAP 100V 5%	175-1028	
C9	1	.0015MFD NI POLY CAP 100V 5%	175-1007	
C10	1	.0015MFD NI POLY CAP 100V 5%	175-1007	
C11	1	.1 MFD CER DISC CAP 50V	174-1254	1.
C12	1	.1 MFD CER DISC CAP 50V	174-1254	1
A1	1	NE5533AN LINEAR IC (14 PIN DIP)	361-1031	2
XA1	1	14 PIN IC SOCKET RECESSED	365-1003	
1	1	MON II PHONO PREAMP PL-IN PCB, BLK	671-2058-A	

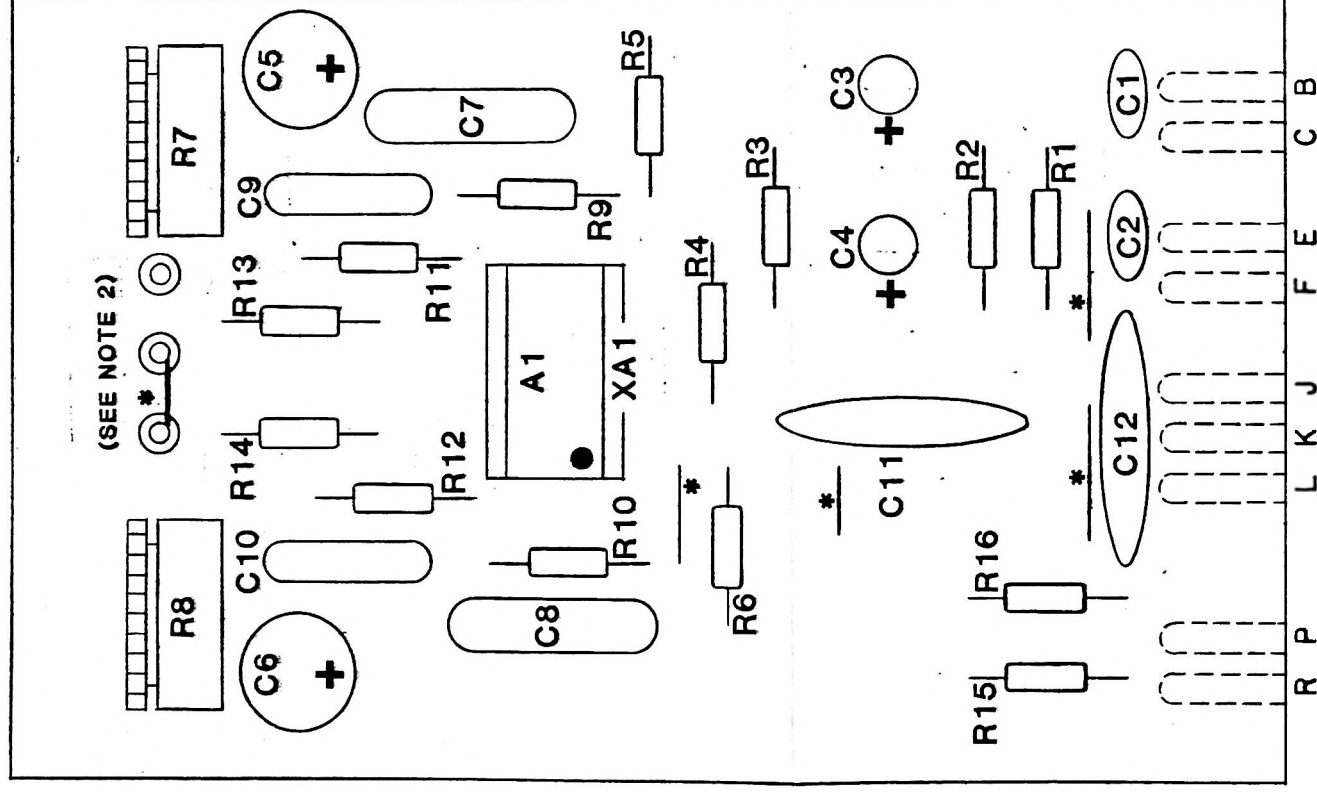
NOTES:

1. BOTTOM OF CAPACITOR SHOULD BE NO MORE THAN 1/8" ABOVE PC BOARD. SCRAPE COATING OFF LEADS IF NECESSARY.

2. MUST BE LOW NOISE TYPE (AN).



MONOGRAM
 PHONO PREAMP
 2056 REV. A



NOTES:

1. * - use #22 bus wire for all jumpers (5 places).
2. For stereo application solder terminal jumper in position shown. For mono application solder jumper from center terminal to right hand terminal.

TEST INFO:

CONTACT

B: - LEFT IN
 C: + LEFT IN
 E: - RIGHT IN
 F: + RIGHT IN
 J: GROUND
 K: + V
 L: RIGHT OUT
 R: LEFT OUT

CONTRACT NO.		LPB Inc. 28 BACTON HILL RD. FRAZER, PA. 19355	
APPROVALS	DATE	MONOGRAM PHONO PREAMP PLUG-IN ASS'Y.	
DRAWN	PTD 7-17-81	SIZE	FSCM NO. 2055
CHECKED		REV.	A
ISSUED		SCALE	2:1
		SHEET	1 of 1