model 1620LE
MUSIC MIXER
USER GUIDE

IMPORTANT
Please read this manual carefully before using your mixer for the first time.

CE

This equipment complies with the EMC directive 89/336/EEC Modified by 92/31/EEC 93/68/EEC 91/263/EEC and LVD 73/23/EEC modified by 93/68/EEC

This product is approved to safety standards:

IEC 60065: 2001
EN60065:2002
UL6500 7th Edition: 2003
CAN/CSA-E60065-03

And EMC standards
EN55103-1: 1996 (E2)
EN55103-2: 1996 (E2)

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Part No. ZM0315-01

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For your own safety and to avoid invalidation of the warranty please read this section carefully.

SAFETY SYMBOL GUIDE

For your own safety and to avoid invalidation of the warranty all text marked with these symbols should be read carefully.

WARNINGS

The lightning flash with arrowhead symbol, is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTIONS

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

NOTES

Contain important information and useful tips on the operation of your equipment.

HEADPHONES SAFETY WARNING

Contain important information and useful tips on headphone outputs and monitoring levels.

Recommended Headphone Impedance >= 200 Ohms.

IMPORTANT SAFETY INSTRUCTIONS

Read these instructions.

Keep these instructions.

Heed all warnings.

Follow all instructions.

Do not use this apparatus near water.

Clean only with a dry cloth.

Do not block any ventilation openings. Ventilation should not be impeded by covering the ventilation openings with items such as newspapers, table cloths, curtains etc. Install in accordance with the manufacturer's instructions.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Do not defeat the safety purpose of a polarised or grounding type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

Only use attachments/accessories specified by the manufacturer.

Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Refer all servicing to qualified service personnel. It is recommended that all maintenance and service on the product should be carried out by Soundcraft or its authorised agents. Soundcraft cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects fallen into the apparatus, the apparatus has been exposed to rain or moisture,

does not operate normally, or has been dropped.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose the apparatus to dripping or splashing and do not place objects filled with liquids, such as vases, on the apparatus.

THIS APPARATUS MUST BE EARTHED. Under no circumstances should the safety earth be disconnected from the mains lead.

The mains supply disconnect device is the mains plug. It must remain accessible so as to be readily operable when the apparatus is in use.

If any part of the mains cord set is damaged, the complete cord set should be replaced. The following information is for reference only.

The wires in the mains lead are coloured in accordance with the following code:

Earth (Ground):	Green and Yellow (US - Green/Yellow)
Neutral:	Blue (US - White)
Live (Hot):	Brown (US - Black)

As the colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol. ⏚

The wire which is coloured Blue must be connected to the terminal in the plug which is marked with the letter N

The wire which is coloured Brown must be connected to the terminal in the plug which is marked with the letter L

Ensure that these colour codes are followed carefully in the event of the plug being changed

This unit is capable of operating over a range of mains voltages as marked on the rear panel. It is important to ensure that the correct mains fuse is fitted before switching on the unit.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipmentis operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

INTRODUCTION

Becoming the owner of a new ***Urei by Soundcraft*** 1620LE means you own a piece of DJ history – using the most upto date engineering technology Soundcraft deliver the Classic 1620 with the most awesome audio characteristics for today's demanding DJ.

UREI is a classic pro audio name and has been a member of the Harman group since the early 80's. The UREI 1620 DJ mixer, originally produced in the 1970's, reached cult status and played a major part in shaping today's international club scene. Famed for its unique sound it was regularly selected as the 'mixer of choice' by most of the top clubs and installers including the renowned Richard Long.

Richard Long was famous for designing and installing large nightclub systems in the 70's including Paradise Garage, Xenon, Regines, Hippopotamus, 12 West and Studio 54.

Until today opportunities to buy the UREI 1620 have been rare and when second-hand units do become available they change hands for a premium as DJ aficionados seek to obtain their own piece of history and bathe in the mystique that the unique '1620 sound' is famous for. Such is the popularity of the UREI 1620 it's become the influence for countless products from many manufacturers around the world - **it's been copied but never truly reproduced – until now.**

Soundcraft, the world-leading mixer specialist and part of the Harman Pro Group, has re-launched the UREI series led by the UREI 1620LE, a limited edition version of the classic 1620.

The new unit retains its legendary performance and has been brought bang up to date with modern manufacturing techniques, components and materials.

Soundcraft has caringly followed the ethos of the original electronic design and used its 30 years design and engineering expertise to deliver an even better sounding mixer that has to be heard to be believed. Trials at high-end nightclubs with some of the most renowned masters of club sound have demonstrated that not only the extraordinary sound quality of the original 1620 has been retained – it's been improved.

Now you can enjoy your own piece of DJ history, and help create the future.

DESCRIPTION

The UREI Model 1620LE Music Mixer is a multi-input stereo mixer which has been optimized for the heavy demands of fixed and mobile sound installations. The outstanding features and reliability of the Model 1620LE make it useful where high quality is essential.

The Model 1620LE has six input positions, each with a level control and a balance control. In addition, the input positions labeled AUX 1 – AUX 4 have input source selector switches, allowing any of these four positions to control any of five auxiliary inputs (AUX A – E) or the output of an optional internal preamplifier associated with that input position only. AUX 4 input is supplied with a microphone preamplifier card, Part No. ***1620-MC***, and the selector switch position is labeled MIC. If no preamplifier card is installed in input positions AUX 1, AUX 2 or AUX 3, the preamplifier input may be used with a line level source.

The output circuits of the Model 1620LE are quite versatile. Separate outputs for house and booth amplifiers are provided, each with its own level control; the house output is transformer-isolated, so that remote amplifiers may be fed with minimum likelihood of grounding problems or noise pickup in the interconnecting lines.

A separate headphone circuit has its own selector switch, allowing its source to come from any of the six input controls (pre-fader) or from the program output; its level control feeds an internal headphone amplifier and front panel stereo 6.3mm (1/4 in) phone jack. For convenience in attaching lighting controllers, an isolated mono (L + R) output is provided on a rear panel jack; this output is not affected by any of the output level controls, so that lighting intensity will not be changed by overall level adjustments. Separate bass and treble controls for left and right channels affect the house, booth, headphone and mono outputs. The inflection points of these controls have been carefully selected for minimum midrange coloration and good adjustment range.

Additionally, two separate tape outputs are provided for making recordings, and an effects loop allows connection of equalizers, limiters, expanders or other signal processing equipment.

To further customize the 1620LE Mixer for specific installations, you may select internal options to bypass the tone controls and/or connect the standard mic input so that is does not appear on the tape outputs or effects loop and is not affected by the master gain or tone controls.

The Model 1620LE has been designed for long life and reliability. All input and output level controls are quiet and smooth-acting. Modular construction assures minimum down time for service – all preamplifiers, selector switches, level and balance controls are on modular subassemblies which may be replaced in the field without soldering. Components have been selected to be over-rated to assure reliability in continuous duty service. Additionally gold-plated connectors are used throughout. For audio signal accuracy and good channel matching, tight-tolerance electronic and electro-mechanical parts have been specified.

TYPICAL SPECIFICATIONS

INPUTS **Six stereo inputs with individual balance and level Controls.**

Phono 1 & 2 RIAA-equalized stereo phono, with two Part No. ***1620-PC*** preamplifier cards supplied as standard configuration.

Auxiliary 1-4 Switchable to any one of five line level sources or aPreamplified low level source.

Standard configuration: Aux 4 Input equipped with mono microphone preamplifier card, Part No. ***1620-MC***.

Optional configuration: Preamp source position accepts stereo phono preamplifier card, Part No. ***1620-PC***, or mono microphone preamplifier card, Part No. ***1620-MC***; Phono inputs 1 & 2 alternately will accept mic preamp card in place of standard phono preamp card.

Phono Inputs

Input Impedance	47k Ohms.
Gain	64 dB maximum @ 1 kHz (measured at House XLR).
Connector	RCA-type phono jack.

Microphone Input

Input Impedance	For 150 ohm microphone, electronically balanced.
Gain	60-84 dB, adjustable on card (measured at House XLR).
EIN	< -126 dBu (22-22kHz).
Connector	XLR-type three-pin female.

Auxiliary Inputs

Input Impedance	10k ohm nominal.
Gain	20 dB maximum
Connector	RCA – type phono jack.

OUTPUTS

House Output:

i) Balanced **Transformer isolated, symmetrical, floating balanced**

Output Impedance	< 50 Ohms.
Recommended Load	>= 600 Ohms.
Frequency Response	+ 0/-1 dB, 20 Hz – 20 kHz.
THD +N	< 0.1% 30 Hz – 20 kHz @ +20 dBu, 10k Ohms.
Maximum Output	+25 dBu into 600 Ohms.
Connectors	XLR-type three pin male.

ii) Unbalanced Single-ended, electronic

Output Impedance	75 Ohms.
Recommended Load	>= 600 Ohms.
Frequency Response	+ 0/-1 dB, 20 Hz – 20 kHz.
THD +N	< 0.05% 20 Hz – 20 kHz @ +20 dBu, 10k Ohms.
Maximum Output	+20 dBu into 600 Ohms.
Connectors	RCA-type phono jack.

Booth Output: same signal as House Output, separate front panel level control.

i) Balanced Single-ended, impedance balanced, electronic

Output Impedance	75 Ohms.
Recommended Load	>= 10k Ohms.
Frequency Response	+ 0/-1 dB, 20 Hz – 20 kHz.
THD +N	< 0.05% 20 Hz – 20 kHz @ +20 dBu, 10k Ohms.
Maximum Output	+22 dBu into 10k Ohms.
Connectors	XLR-type three pin male.

ii) Unbalanced Single ended, electronic

Output Impedance	75 Ohms.
Recommended Load	>= 10k Ohms.
Frequency Response	+ 0/-1 dB, 20 Hz – 20 kHz.
THD +N	< 0.05% 20 Hz – 20 kHz @ +20 dBu, 10k Ohms.
Maximum Output	+22 dBu into 10k Ohms.
Connectors	RCA-type phono jack.

Headphone Output:Switchable to any input control (pre-fader) or to Program output.

Output Impedance	< 50 Ohms.
Recommended Load	>= 200 Ohms.
Frequency Response	±1.5 dB, 20 Hz – 20 kHz.
THD +N	< 0.3%, 20 Hz – 20 kHz, +20dBu(into 200 ohm load).
Maximum Output	+20 dBu into 200 Ohms.
Connector	6.3mm (1/4 in) stereo jack on front panel.

Mono Output: Summed left and right program signals, not affected by master gain, intended for lighting controllers or zone control.

Output Impedance	5k Ohms.
Recommended Load	>= 5k Ohms.
Frequency Response	+0/-1 dB, 20 Hz – 20 kHz.
Maximum Output	+14 dBu into 5k Ohms.
Connector	6.3mm (1/4 in.) stereo jack (tip = signal, ring & sleeve=ground).

Tape Outputs x 2

Output Impedance	75 Ohms.
Recommended Load	>= 10k Ohms.
Frequency Response	+0/-1 dB, 20 Hz – 20 khz.
THD +N	<0.05%, 20 Hz – 20 kHz, +20dBu, 10k Ohms.
Maximum Output	+22 dBu into 10k Ohms.
Connector	RCA – type phono jack.

Effects Loop Ouptut: Same specifications as Tape Outputs.

Effects Loop Input

Input Impedance	10k Ohms.
Maximum Input Level	+ 22 dBu.
Connector	RCA – type phono jack.

TONE CONTROLS: Affect program material from House, Booth, Headphone and Mono outputs; Separate controls for left and right channels.

Treble	± 12 dB @ 10 kHz.
Bass	± 10 dB @ 50 Hz.

POWER REQUIREMENTS **100-125/200-250 V AC, 50/60 Hz, Selectable on rear panel.**

Consumption	20 W maximum.
Indicator	LED, front panel via cue switch.
Fuse Type	20mm, Slow Blow, T1AL, 250 V (for either 120 or 240V setting).
Power Connector	IEC with cable retainer

ENVIRONMENT

Operating:	0 C to + 50 C (+32F to +122 F).
Storage:	-20C to +60C (-4F to +140F).

PHYSICAL SPECIFICATIONS

Dimensions

Front Panel	133 x 483mm (5-1/4in x 19 in.) EIA Rack mount.
Depth Behind Panel	203 mm (8 in.)

Finish

Panel is 3.2mm (1/8 in.) black anodized, Chassis is anodized aluminium.

Weights

Net Weight	6.0 kg (13.3 lb).

ACCESSORIES

Part No. 1620-MC	Microphone Preamplifier.
Part No. 1620-PC	Phono Preamplifier.

(Note: 1 each 1620-MC and 2 each 1620-PC are supplied in the 1620LE Mixer; up to 3 additional preamplifiers may be installed).

WARRANTY

1 Soundcraft is a trading division of Harman International Industries Ltd.
End User means the person who first puts the equipment into regular operation.
Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.
Equipment means the equipment supplied with this manual.

2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.

3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.

4 This warranty shall only be available if:
a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.

5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.

6. The benefit of this Warranty may not be assigned by the End User.

7. End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

INSTALLATION

The Model 1620LE is an all solid state unit, ruggedly constructed with the highest quality components. As such, it should provide years of trouble free use with normal care. All parts used are conservatively rated for their application, and workmanship meets UREI by Soundcraft's rigid standard.

NO SPECIAL PREVENTIVE MAINTENANCE IS REQUIRED, AND (WITH THE EXCEPTION OF THE MICROPHONE GAIN TRIM) THERE ARE NO INTERNAL SERVICE ADJUSTMENTS.

GENERAL PRECAUTIONS

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry cloth is ideal.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high-power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis.

Caution! In all cases, refer servicing to qualified personnel.

Handling and Transport

The console is supplied in a strong carton. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved we recommend that it is installed in a foam lined flightcase. At all times avoid applying excessive force to any knobs, switches or connectors.

Power Cable

Always use the power supply cable supplied with the mixer: the use of alternative cables may cause damage and voids the warranty.

Warning ! In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the mixer and unplug from the mains.

Signal Levels

It is important to supply the correct input levels to the console, otherwise signal to noise ratio or distortion performance may be degraded; and in extreme cases, damage to the internal) circuitry may result. Likewise, on all balanced inputs avoid sources with large common mode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that OdBu =0.775V RMS.

Refer to the Specifications section for details of input and output levels.

MAINS INSTALLATION

General Wiring Procedures

To take full advantage of the excellent signal to noise ratio and low distortion of Soundcraft consoles, care must be taken to ensure that incorrect installation and wiring does not degrade the performance of the desk. Hum, buzz, instability and Radio Frequency interference can usually be traced to earth loops and inferior earthing systems. In some areas, especially heavily industrial areas, the incoming mains earth will not be adequate and a separate technical earth for all the audio equipment must be supplied. However, check with your local electricity supply company to ensure that safety regulations are not infringed or negated.

The successful, hum free, installation of a system requires forethought, and the establishment of a set of ground rules, which must be consistently adhered to at all stages of installation.

INITIAL WIRING CONSIDERATIONS

For optimum performance, it is essential for the earthing system to be clean and noise free, as all signals are referenced to this earth. A central point should be decided on for the main earth point system, and all earths should be 'star fed' from this point. It is common electrical practice to `daisy chain' the earths to all electrical outlets but this method is unsuitable for audio installations. The preferred method is to run an individual earth wire from each outlet, back to the system star point to provide a safety earth screen reference for each piece of equipment.A separate earth wire should also be run from each equipment rack and area, to the star point. This may or may not be used depending on circumstances, but it is easier to install in the first place, than later when problems arise.The location of the star point should be a convenient, easily accessible place, preferably at the rear of the console or in the main equipment rack.

Install separate 'clean' and 'dirty' mains outlets, wired individually back to the incoming mains distribution box. Use the 'clean' supply for all audio equipment and the `dirty' supply for all lighting, etc. Never mix the two systems.

If necessary, to provide sufficient isolation from mains borne interference on the booth output, install an isolating transformer. This should be provided with a Faraday Shield which must be connected with earth.

Never locate the incoming mains distribution box near audio equipment, especially tape recorders, which are very sensitive to electro-magnetic fields.

Ensure that all equipment racks are connected to earth, via a separate wire back to the star point.

Equipment which has unbalanced inputs and outputs may need to be isolated from the rack to prevent earth loops.

AUDIO WIRING

Having provided all equipment with power and earthing connections, consideration must be given to the method of providing audio interconnection and adequate screening of those interconnections. This must be done in a logical sequence to avoid problems and assist in the localisation of problem equipment.

Connect the Main or Booth system to the console and check for any hum, buzz, or RFI. Only when you are satisfied with the quietness of the console and the PA system should you proceed with the next step.

Connect decks or CD players, FX and sends one at a time, checking and isolating any connection which degrades performance.

Connect all other peripheral devices.

Connect all microphone lines.

By following this sequence much time and future trouble will be saved, and the result will be a quiet, stable system.

SHIELDING

Audio equipment is supplied with a variety of input and output configurations, which must be taken into consideration when deciding where the screen connections should be made. There are three sources of unwanted signal being impressed on the screen, which are as follows:

Extraneous electrostatic or electromagnetic fields.

Noise and interference on the earth line.

Capacitive coupling between the screen and signal wires.

To minimise the adverse affects of the unwanted coupling to the signal wires, it is important that the screen is connected at one end only, i.e. the screen must not carry any signal) current. Any signal) on the wires within the screen will be capacitively coupled to the screen. This current will ultimately be returned to the source of the signal, either directly, if the screen is connected at the signal source end, or indirectly via the earthing system, if the signal is connected at the signal destination end. The indirect connection will cause an increase in high frequency cross-talk, and should be avoided wherever possible.

Therefore, in general, always connect the shield only at the signal source end. In high RF areas, the screen can also be connected to earth via a 0.01 mF capacitor. This will present a short circuit at RF frequencies, thus lowering the effective shield impedance to ground. However, at low audio frequencies the capacitor will effectively be an open circuit and thus not cause an earth loop problem.

POINTS TO REMEMBER

In all cases, use good quality twin screened audio cable. Check for instability at the output.

Always connect both conductors at both ends, and ensure that the screen is only connected at one end.

Do not disconnect the mains earth from each piece of equipment. This is needed to provide both safety and screen returns to the system star point.

Equipment which has balanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment, to avoid earth loops.

It is important to remember that all equipment which is connected to the mains is a potential source of hum and interference and may radiate both electrostatic or electromagnetic radiation. In addition, the mains will also act as a carrier for many forms of RF interference generated by electric motors, air-conditioning units, thyristor light dimmers etc. Unless the earth system is clean, all attempts to improve hum noise levels will be futile. In extreme cases there will be no alternative but to provide a completely separate and independent `technical earth' to replace the incoming 'noisy earth'. However, always consult your local electricity supply authority to ensure that safety regulations are not being infringed.

WORKING SAFELY WITH SOUND

Although your new console will not make any noise until you feed it signals, it has the capability to produce sounds which when monitored through an amplifier or headphones can damage hearing.

The table below is taken from the Occupational Safety & Health Administration directive on Occupational noise exposure (1926.52):

PERMISSABLE NOISE EXPOSURE

DURATION PER DAY, HOURS	SOUND LEVEL dBA SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
<0.25	115

Conforming to this directive will minimise the risk of hearing damage caused by long listening periods. A simple rule to follow is the longer you listen the lower the average volume should be.

Please take care when working with your audio - if you are manipulating controls which you don't understand (which we all do when we are learning), make sure your monitors are turned down. Remember that your ears are the most important tool of your trade, look after them, and they will look after you.

Most importantly - don't be afraid to experiment to find out how each parameter affects the sound - this will extend your creativity and help you to get the best results.

Recommended Headphone Impedance >= 200 Ohms.

INSPECTION AND INSTALLATION

UNPACKING AND INSPECTION

Your Model 1620LE was carefully packed at the factory, and the container was designed to protect the unit from rough handling. Nevertheless, we recommend careful examination of the shipping carton and its contents for any sign of physical damage which could have occurred in transit.

If damage is evident, do not destroy any of the packing material or the carton, and immediately notify the carrier of a possible claim for damage. Shipping claims must be made by the consignee.

The carton should contain:

Model 1620LE Music Mixer.

Mains Cable

UREI Instruction Manual (this book).

Warranty Card (Model 1620LE – the serial number tag is on the rear panel of the Mixer).

Spare Fuses

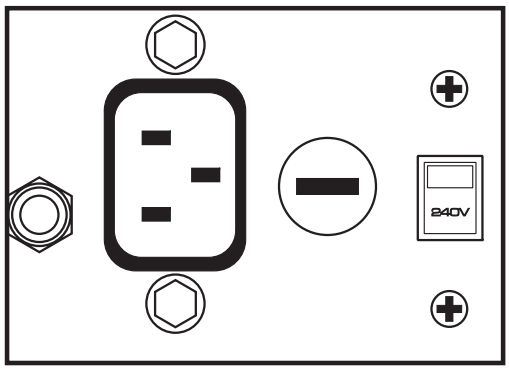
ENVIRONMENTAL CONSIDERATIONS

The 1620LE Mixer will operate satisfactorily over a range of ambient temperatures from 0 C to +50C (+32F to +122F), and up to 80% non-condensing relative humidity.

If the system is installed in an equipment rack, console or desk with high heat producing equipment (such as power amplifiers), adequate ventilation should be provided in order to assure longest component life. Also, while circuitry susceptible to hum pickup is sufficiently shielded from moderate electromagnetic fields, installation should be planned to avoid mounting the system immediately adjacent to large power transformers, motors, etc

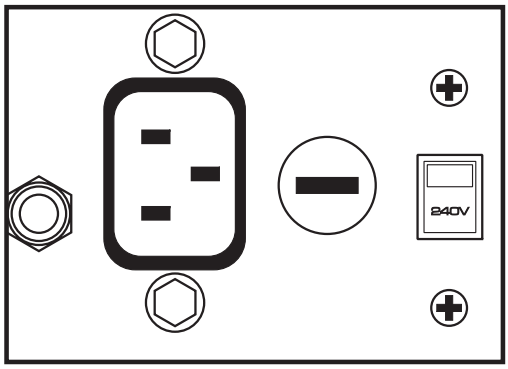
POWERING

The 1620LE may be operated from either 100-125 V AC or 200-250V AC mains (50-60 Hz, single phase). As indicated below, the nominal line voltage may be selected with a rear panel switch. BE SURE TO VERIFY BOTH THE ACTUAL LINE VOLTAGE AND THE SETTING OF THE VOLTAGE SELECTOR SWITCH BEFORE CONNECTING THE 1620LE TO THE MAINS.



LINE VOLTAGE SWITCH

Unless a tag on the line cord specifies otherwise, the Model 1620LE was shipped ready for operation with nominal 240 V AC power mains. To change this for nominal 115 V AC operation, slide the VOLTAGE SELECTOR switch on the rear panel to the 120 position. The voltage is visible in a window next to the switch slot. A small screwdriver should be used to move the recessed switch.



EXTERNAL CONNECTIONS

Note: See also the Block Diagram (page 22) for further details.

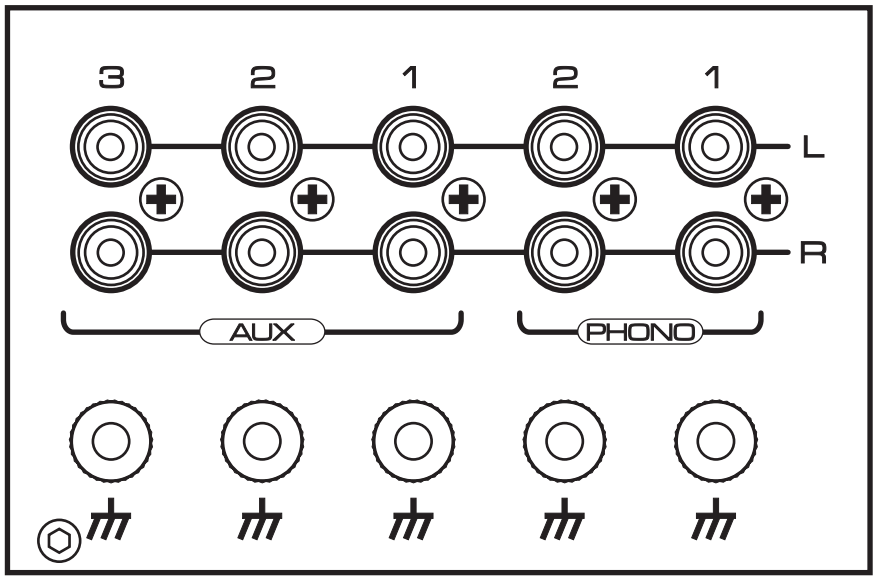
Input and output signal wires should be shielded cable, connected in accordance with standard wiring practice.

INPUT CONNECTIONS

Phono 1 & 2

The first two inputs of the Model 1620LE, as supplied from the factory, are equipped with phono preamplifier cards, Part No. 1620-PC.

Input is through standard RCA-type phono connectors. Most turntables have a separate ground wire. A ground terminal for this connection is located on the rear panel, adjacent to the input jacks for Phono 1 and 2.

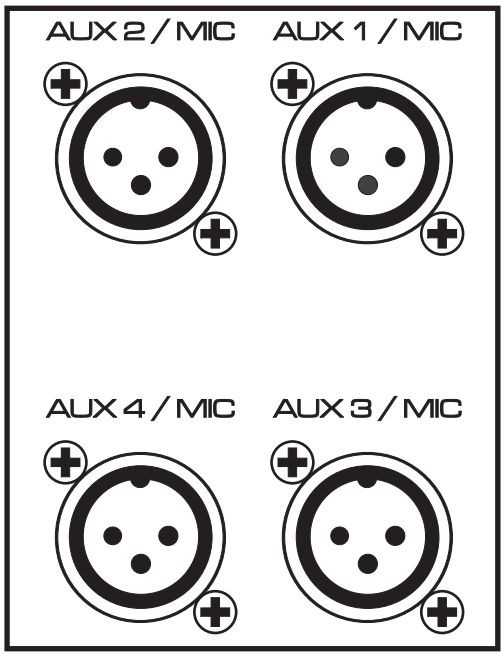


Microphone Input:

The AUX 4 preamplifier position is supplied from the factory with a microphone preamplifier, Part No. 1620-PC, installed. Connection is made via a standard XLR-type socket. The wiring convention is:

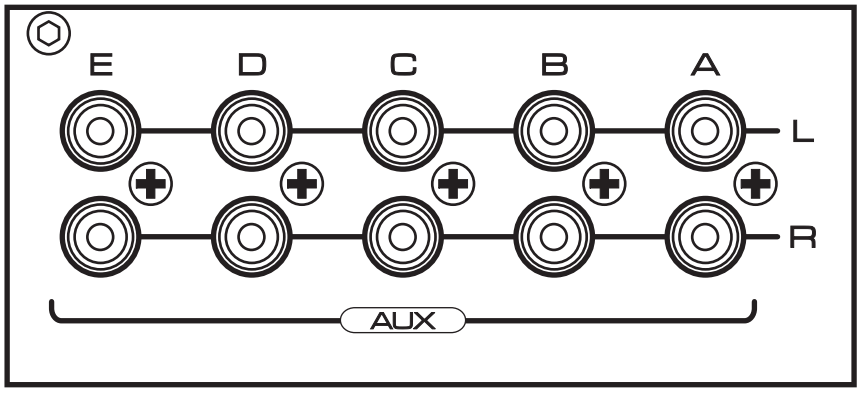
Pin 1 – Screen
Pin 2 – Hot +ve
Pin 3 – Cold -ve

The microphone to be used should be a low impedance type. If the Microphone is unbalanced, the Common and Shield pins in the cable connector should be connected together.

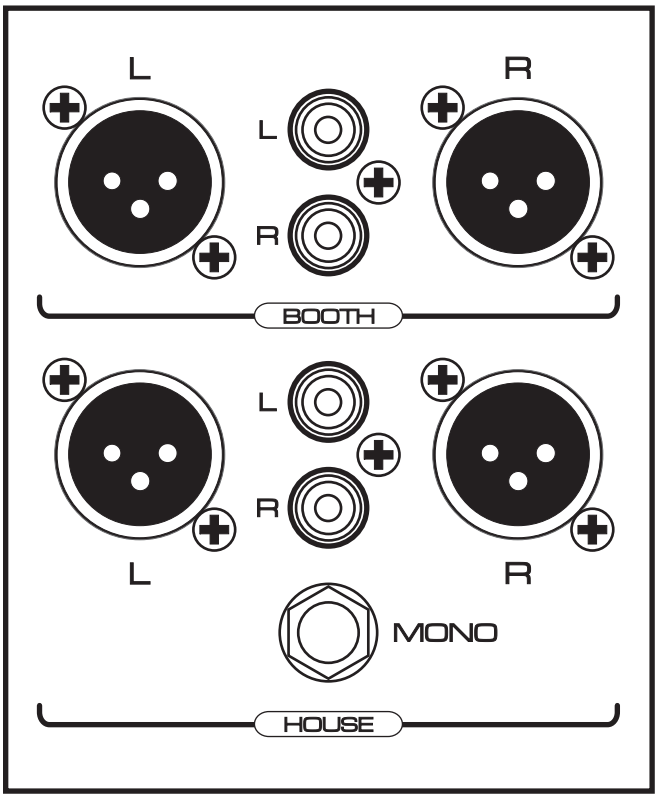


Auxiliary Line Level Inputs:

Five sets of auxiliary line level inputs are available on the Model 1620LE, labelled AUX A, B, C, D and E. Connection on the rear panel is through RCA-type phono jacks. These inputs may be accessed by any of the selector switches associated with the front panel input level controls labelled AUX 1– AUX 4. Additionally, the inputs on the back panel labelled AUX 1 through AUX 3 may be used as line level-inputs as supplied from the factory, with no preamplifier cards installed and the switches on the mother board bypassing the internal preamplifier connectors: refer to switch location diagram on page 26.



OUTPUT CONNECTIONS



House Output:

The main or house output of the Model 1620LE is available on the Rear panel in Balanced and Unbalanced form.

Balanced Output, via XLRs, is transformer isolated and floating. Balanced or symmetrical lines should be connected as follows:

	XLR
Screen	1
Hot +ve	2
Cold -ve	3

Unbalanced Output is via Phono sockets. Unbalanced lines should be connected as follows:

	PHONO
Screen	Case
Hot	Center Pin

If there is a long cable run from the output of the Model 1620LE to the input of the power amplifier, equalizer, crossover network or other connected device, we recommend connecting a 620 ohm 1/2 watt resistor across the line at the end of the cable which is hooked up to the input of that device. This will establish the impedance of the line at approximately 600 Ohms and will make the line less susceptible to induced noise.

Booth Output:

The booth output is the same program signal as the house output, but it is fed by a separate front panel level control for those installations which have monitor speakers in the control booth. Connection is made on the rear panel via Male XLR-type connectors and RCA-type phono jacks. The XLR outputs are balanced , and the phono outputs are unbalanced. The connection details are tha same as for the House outputs.

If the installation is to include booth monitor speakers and a booth microphone, care should be taken to turn down the booth output before turning up the microphone input to prevent acoustic feedback. Similarly, do not turn up the booth output until the booth microphone has been turned down. This will prevent embarrassment as well as possible equipment damage.

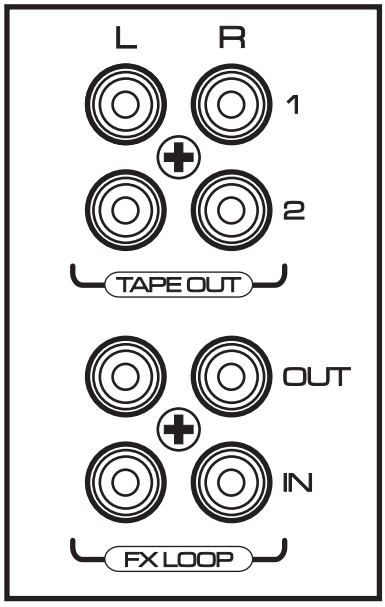
Mono Output:

A mix of the left and right signal busses is taken out to a 6.3mm (1/4 in.) three-conductor jack on the rear panel. This unbalanced output is intended to be a convenient feed for lighting controllers, etc. While it is possible to take program audio for other purposes from this jack (for restroom speakers, dressing rooms, bar areas, etc), it should be remembered that this output is not affected by the house and booth output level controls and, therefore, a separate level control should be provided.

	JACK
Signal	Tip
Gnd	Ring
Gnd	Ring

Tape Outputs:

Two parallel sets of RCA-type phono jacks provide convenient means for connecting to tape recorders. These outputs are not affected by the tone controls, the output level controls, or any device connected to the effects loop (see below).



Effects Loop:

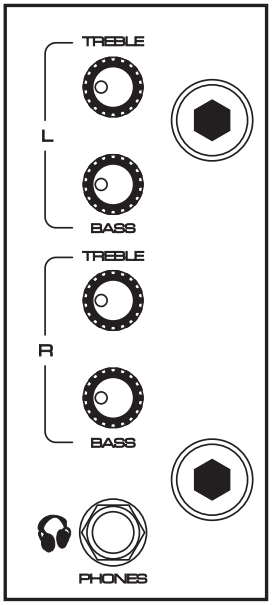
The effects loop is a patch point into the signal path at the same point as the tape outputs. The Loop Out and Loop In connectors are RCA-type phono jacks. External factory installed jumpers connect them together.

To use the effects loop, the jumpers must be removed. Connection is then made from the effects loop output to the input of the external processing device and from the output of that device to the effects loop input. Devices inserted in the effects loop should have unity nominal gain to preserve best possible signal to noise ratio.

If no effects processor is connected to the EFFECTS LOOP then the jumper bars must be inserted. If they are not inserted there will be no audio output.

Headphone Monitor

The headphone monitor output appears on a 6.3 mm (1/4 in.) three-conductor stereo phone jack on the front panel. The minimum recommended impedance of the headphones is 200 Ohms per side.



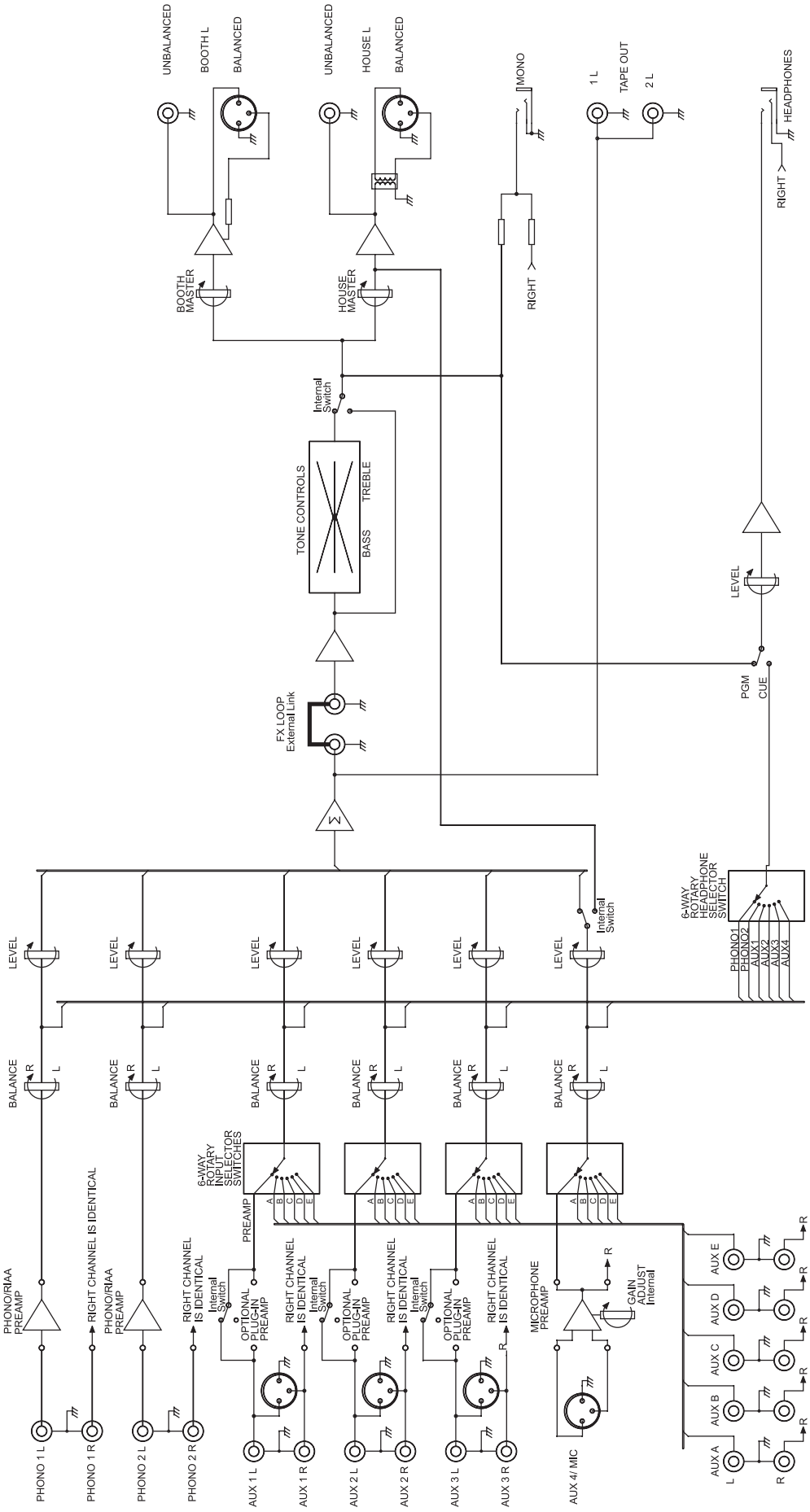
IMPEDANCE AND TERMINATION

Modern audio systems utilise amplifiers and other active devices which have very low output impedances and high (10k to 50k) input impedances. These products may thus be operated in series, or many inputs may be connected to a single output of a preceding device, without regard to impedance "matching". "Floating" (ungrounded) transformer outputs minimize ground loop problems, and differential transformer-less circuitry (or input transformers) minimize common mode noise or interference which may be induced into the interconnecting wires or cables.

Where audio must be transmitted through cables or wire pairs of more than 100 metres or so (several hundred feet) in length, transmission line termination practices should still be observed.

The Model 1620LE's microphone input is electronically balanced and symmetrical. It is designed for use with a 150 Ohm microphone. The line and effects loop inputs are unbalanced (one side grounded) and have a 10 k Ohm impedance. This makes these inputs suitable for use with any nominal source impedance, low or high. A source termination resistor will only be required when the 1620LE line inputs are connected to a source which requires a low impedance termination.

BLOCK DIAGRAM



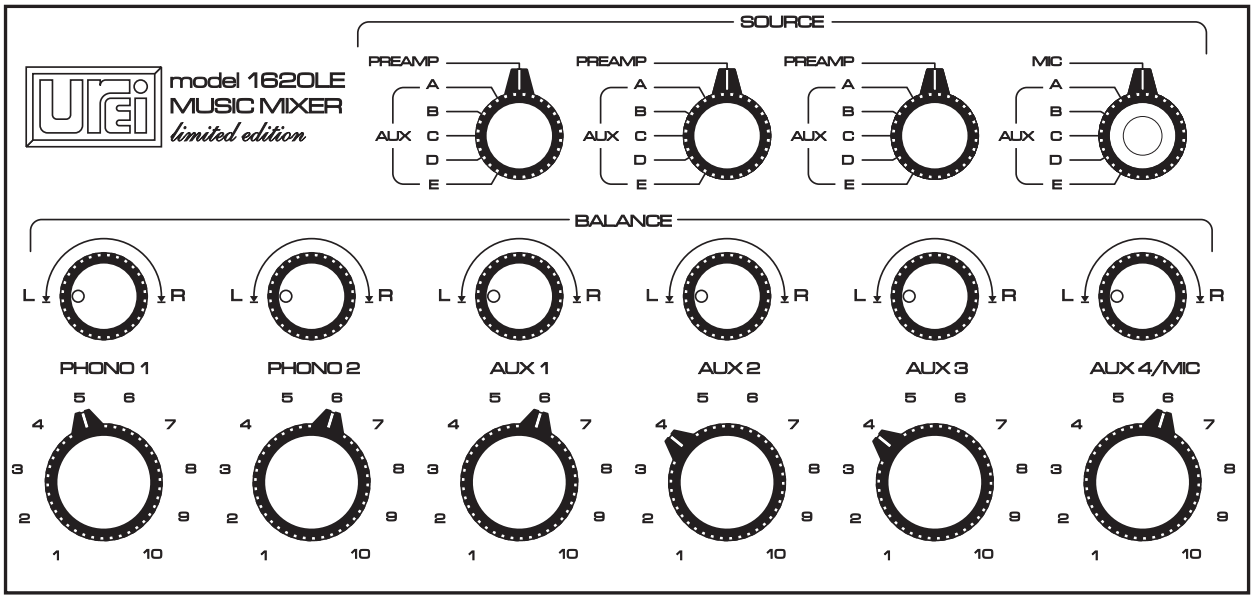
OPERATING CONTROLS

INPUTS

Standard Configuration

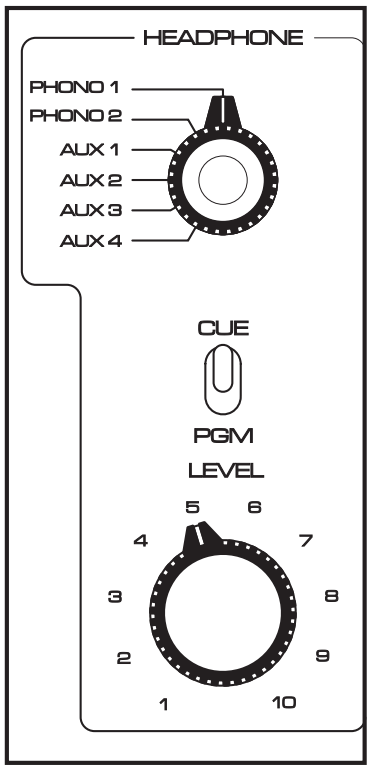
Inputs 1~2: Phono
Inputs 1~3: Aux/Line
Inputs 4: Mic

The Model 1620LE has six input positions, each with a level control and balance control. In addition, the input positions labelled AUX 1 –AUX 4 have input source selector switches, allowing any of these four positions to control any of five auxiliary inputs (AUX A – E) or the output of an optional internal preamplifier associated with that input position only. AUX 4 input is supplied with a microphone preamplifier card, Part No. ***1620-MC***, and the selector switch position is labelled MIC. If no preamplifier card is installed in input positions AUX 1, AUX 2 or AUX 3, the preamplifier input may be used with a line level source.



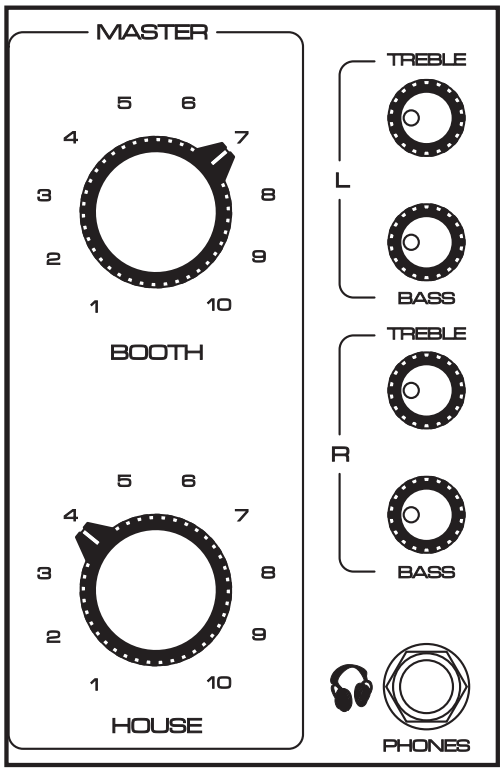
HEADPHONE

The headphone circuit is designed as a cue and monitoring circuit. With the CUE/PGM switch in the PGM position, the program signal is fed to the headphones. With the switch in the CUE position, the signal feed is taken from before the individual input level controls. A six position selector switch determines which input will be heard. When cueing, be certain that the level control for that input is completely off, to avoid cueing through the house system.



HOUSE, BOOTH AND TONE CONTROLS

The house master affects the level of the house output, and the booth master affects the level of the booth output. The tone controls are separate for left and right channels and are shelving types, with a nominal cut or boost of 10 dB maximum at 50 Hz and 10 kHz.



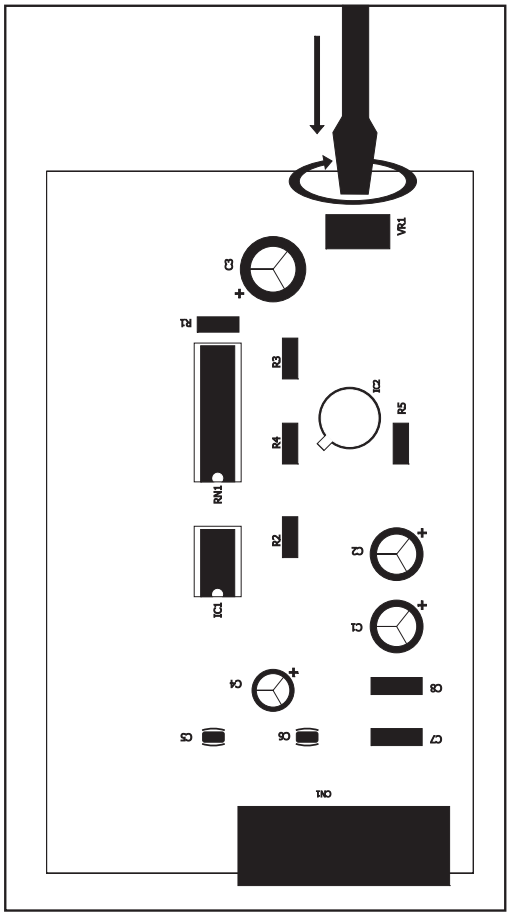
OPTIONAL CONFIGURATIONS

CAUTION: THE FOLLOWING SECTIONS ARE FOR USE BY QUALIFIED SERVICE PERSONNEL ONLY. TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING, OTHER THAT THAT CONTAINED IN PREVIOUS SECTIONS, UNLESS YOU ARE QUALIFIED TO DO SO.

WARNING: BE CERTAIN THAT THE POWER CORD IS DISCONNECTED FROM THE ELECTRICAL MAINS BEFORE ATTEMPTING ANY OF THE FOLLOWING RECONFIGURATIONS.

MICROPHONE GAIN ADJUSTMENT

As supplied, the microphone preamplifier card, Part No. ***1620-MC***, is set for 64 dB of gain, which should be adequate for most installations. If necessary, the gain may be changed with the trim potentiometer on the top edge of the card. The range of adjustment is 20 dB. Set to minimum (CCW position), the gain is 60 dB; set to maximum (CW position), the gain is 84 dB. The potentiometer may be accessed by removing the three screws that secure the top of the 1620LE, then removing the top cover. There is one screw at the centre front of the top panel, and two others on the rear lug of the top panel. Be sure to replace all three screws when reinstalling the cover.

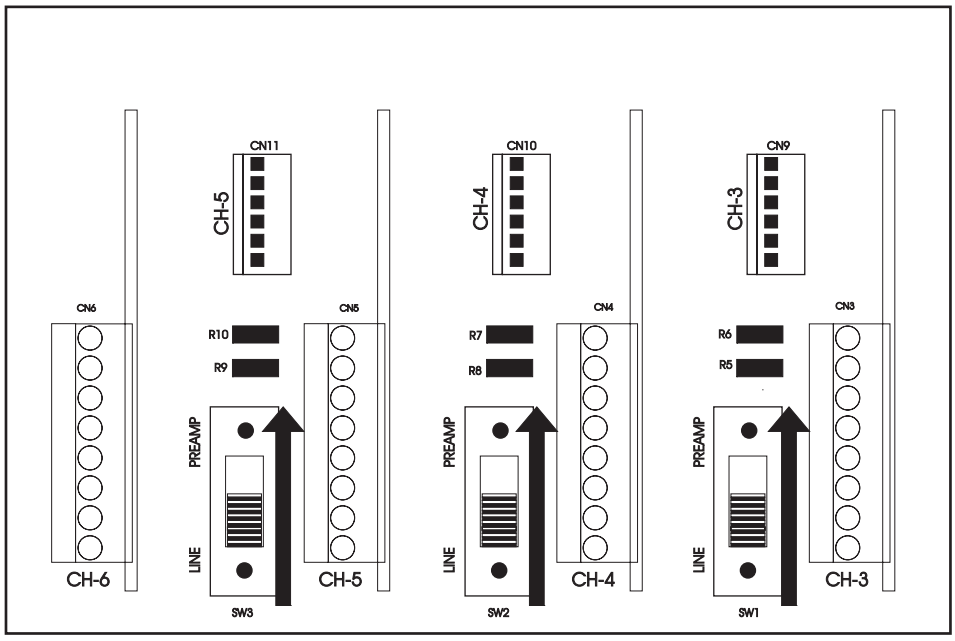


PHONO INPUT ON AUX 1, 2 AND/OR 3

Auxiliary inputs 1, 2 and 3 may be optionally equipped with Part No. **1620-PC** phono preamplifier cards. To install these cards:

1) Remove the three screws fastening the top cover of the 1620LE to the chassis, and remove the cover.

2) Locate the selector switch to the ***left*** of the connector on the motherboard into which the new preamplifier card will be installed. This switch allows its AUX input to be used as a line input when no preamplifier is installed, and must be switched over when the preamplifier card is installed.



3) Install Part No. ***1620-PC*** preamplifier cards in the required locations on the motherboard. Note the orientation of the card and make certain that the card correctly mates with the connector on the motherboard.

4) Reinstall the top cover, using all three screws.

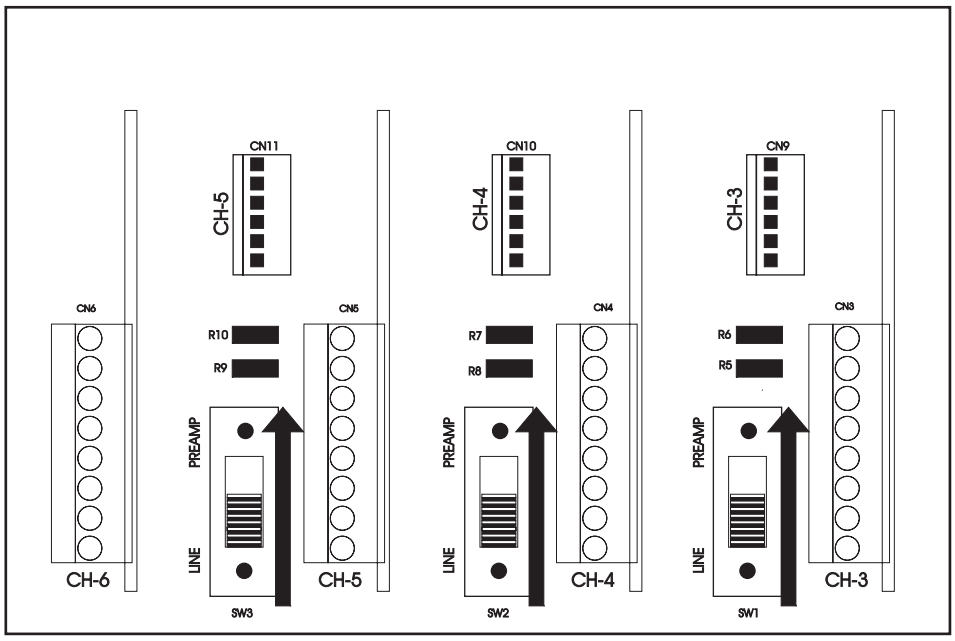
MICROPHONE INPUT ON AUX 1, 2 AND/OR 3

Auxiliary inputs 1, 2, and 3 may be optionally equipped with Part No. ***1620-MC*** microphone preamplifier cards and therefore use the XLR connectors on the rear connector panel.

To install a connector and preamplifier card:

1) Remove the three screws fastening the top cover of the 1620LE to the chassis, and remove the cover.

2) Locate the selector switch to the ***left*** of the connector on the motherboard into which the new preamplifier card will be installed. This switch allows its AUX input to be used as a line input when no preamplifier is installed, and must be switched over when the preamplifier card is installed.



3) Install Part No. ***1620-MC*** preamplifier cards in the required location(s) on the mother board. Note the orientation of the card and make certain that the card correctly mates with the connector on the motherboard.

4) If required, adjust the gain of the preamplifier by rotating the trimmer on the top edge of the card. See the section on Microphone Gain Adjustment.

5) Reinstall the top cover, using all seven screws.

6) Connect a microphone to the XLR connector, following the same wiring convention as for the other microphone(s) used with the 1620LE.

WARNING: When the 1620LE has been modified as above, the RCA-phono sockets are still active. Do not connect a line level input to these sockets, since the preamplifier will be severely overloaded and heavy distortion will result. Additionally, if a microphone is simultaneously connected in parallel with a line input, which could happen if the RCA-phono sockets are accidentally used at the same time as the XLR connector, the microphone could be seriously damaged.

AUX 4 INPUT : BYPASSING MASTER GAIN CONTROLS

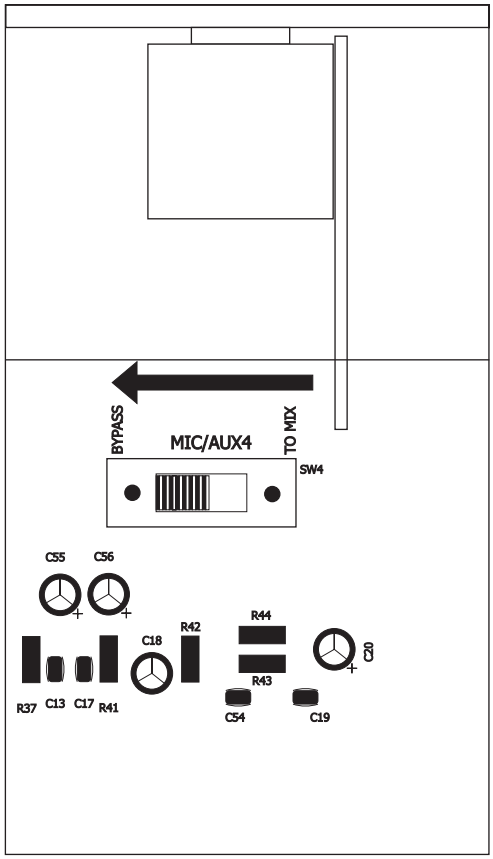
The Model 1620's microphone signals will appear at the tape outputs and effects loop, and will be affected by the house master and tone controls. In some circumstances, it may be desirable to keep the mic signal from appearing at these points so that it does not get processed along with the music and is not recorded on tape.

With this modification, the mic connected to AUX 4 will be unaffected by the master gain control. Its level will be controlled only by the AUX 4 input control. Note, however, that if this modification is done, it is advisable to internally disconnect the line level inputs AUX A – E from the AUX 4 control, since bypassing the extra tone control and master gain amplification stages will cause the AUX 4 control to be out of phase with the other AUX controls. If the same line input signal is inadvertently fed from AUX 4 and another AUX control at the same time, the signal will partially or totally cancel.

To make this modification:

1) Remove the three screws fastening the top cover of the 1620LE to the Chassis, and remove the cover.

2) Move the Mic/Aux4 switch tio the BYPASS position.



3) (Optional but recommend) Locate the front panel circuit board containing the AUX 4/MIC selector switch, and unplug the IDC connector attached to the ribbon cable. This disables all line level inputs feeding the AUX 4 position.

4) Make sure all connections are secure, and reinstall the top using all three screws.

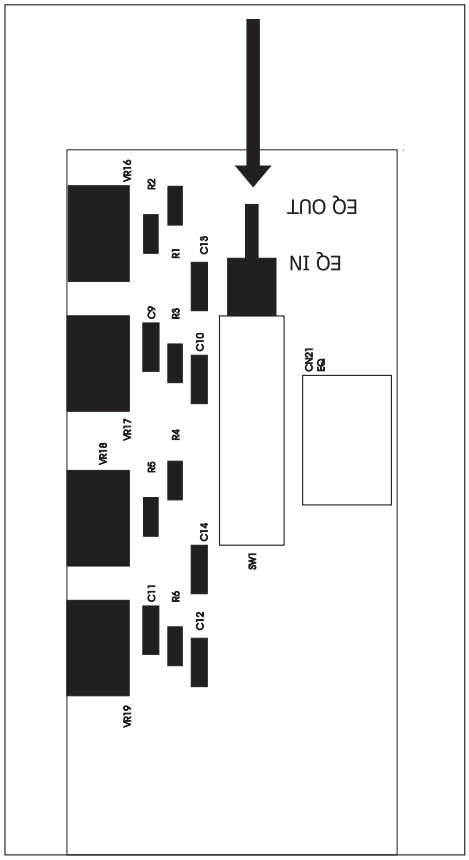
TONE CONTROL BYPASS

In some circumstances, it may be desirable to defeat the tone controls. To disable these controls:

1) Remove the three screws fastening the top cover of the 1620LE to the chassis, and remove the cover.

2) Locate the Tone Control circuit board on the right side of the front panel.

3) Press and release the EQ IN/EQ OUT switch until it is in the EQ OUT position.



4) Replace the top cover, using all three screws.