

XR-700

Operating Guide



WARNING:
TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR
MOISTURE. BEFORE USING THIS APPLIANCE, READ
BACK COVER FOR FURTHER WARNINGS.

GENERAL DESCRIPTION

The XR-700 dual powered mixer is the only mixer/amplifier presently available with built-in mixing, EQ, and power amp facilities **specifically designed** for the monitor function. Our extensive field research indicates that most users of powered "stereo" mixers generally use one of the internal power amps for the monitor function. Most users have found that "full stereo" capability with the resulting pan pots, etc., is not necessary when stereo powered mixers are used to provide monitor power.

Peavey has always endeavored to avoid "gingerbread" features and provide equipment that will "get the job done" as well as provide adequate flexibility, performance, value and, most of all, reliability. The XR-700 is a prime example of this philosophy. In this versatile unit, we have eliminated the often useless stereo functions, but have instead provided **dual** functions for main **and** monitor.

The XR-700's channels have totally independent preamps for both main and monitor, allowing change of either level as required without affecting the other's setting. Each channel has a full three-band active equalization circuit featuring "shelving type" low and high EQ with a "peak/notch type" middle EQ. The effects send provides a mix for the internal reverberation system or an external effects unit. Channel in/out patch points are provided for maximum performance and interface flexibility.

The XR-700 master section provides several unique functions in addition to level controls for the three primary mixing busses, reverb and effects returns. An effects/reverb return to monitor system allows blending reverb and external effects into the monitor mix. A contour control adjusts the timbre of the reverb signal, allowing superb reverb effects for widely varying program sources. Two sevenband graphic equalizers allow precise incremental frequency compensation for both the main and the monitor functions.

The XR-700's dual 100 watt (4 ohm) power amplifiers feature our exclusive DDT compression (patent applied for) which allows absolute maximum performance from the output stage and virtually eliminates output "clipping" and the associated distortion and speaker problems. Each power amp is monitored by a ten-segment LED level display while compression in the two respective power amps is indicated by dual LED's.

The internal headphone system features an independent sublevel control off of each power amp and provides incremental adjustment for both main and monitor headphone jacks.

The master patch bay contains input and output jacks for the various mixing busses, graphic EQ's and power amplifiers to allow interface of the XR-700 to virtually any other professional audio system.

Overall, the XR-700 represents one of the most sophisticated powered mixers available, while providing functional simplicity adequate to allow superlative performance even when used by relatively inexperienced operators. Design, power, versatility, interface capability, and overall performance set the XR-700 apart from all other powered mixers and is unmatched in design and value by any other powered mixer on today's market.

FRONT PANEL

CHANNEL LEVEL CONTROL (A)

The input circuitry of the XR-700 is of the latest variable negative feedback type and the level control setting determines the operating gain of the input preamp. Care should be taken to achieve proper setting so as to allow adequate control range in both the channel level and the master level.

Generally, the channel controls should be operated so as to allow the master level to operate in the center of its range. These settings allow maximum gain to be utilized at the input preamp where it is most efficiently obtained. Lower gain control settings require higher settings of the master, thus yielding a less-than-optimum signal-to-noise ratio; high channel level settings could produce clipping.

It is important to realize that not all "breakup" is caused by the mic signal overloading the input stage of the mixer. If the performer's mic technique includes very close and/or very loud situations, the internal elements of the mic can "bottom out" or distort just as a loudspeaker can when it is overdriven. Quite a few of the mics now used by performers lack the dynamic range required to adequately handle the tremendous sound pressure levels encountered in very loud "rock and roll" situations. It is vital for the professional soundman and the musicians to be aware of the limitations of the various links in the audio system in order to correctly diagnose and solve problems encountered in a sound reinforcement situation.

The channel level is the first control in the circuit and must be set properly in order for the remaining circuits to function properly. "Common sense" and "on the job" experience will allow the operator to achieve superb results in virtually any mixing situation.

MONITOR SEND CONTROLS (B)

The monitor send control settings determine the all-important monitor mix. The signals for the monitor sends are obtained at the channel input. These are referred to as independent "pre" monitor sends; i.e., they are **before** the channel equalization and level controls. With this type of send, any changes made to the EQ or channel level will not affect the monitor system. Having the monitor sends with this capability is absolutely vital to avoid feedback of the monitor system when EQ and normal incremental setting variations are made in the channel levels during the course of the performance.

EQUALIZATION CONTROLS

The three-band equalization circuitry is of the latest active type featuring a "shelving type" filter response for the low and high EQ and a "peak/notch type" response for the middle filter. This EQ circuitry's "hinge points" and filter slopes have been precisely matched to produce optimum combining capabilities and superb interaction characteristics. Because of the pronounced action of these controls, extreme care should be given to the setting of each EQ control and all setup should begin in the vertical (12:00 o'clock) position.

It should be remembered that the active equalization circuits are a form of "electronic crossover" in which the equalization controls are similar to level controls for their respective frequency bands.

Generally, it is poor operating practice to use both high and low equalizer controls in the deep cut (counterclockwise) positions since this results in substantially lower gain from the channel. It should be remembered that the balance of highs and lows is a relative situation; cutting overall gain should be done by the channel level controls.

LOW FREQUENCY CONTROLS (C)

The low frequency control is capable of better than 15 dB boost or cut @ 60 Hz with a sloping characteristic exhibited up to the crossover point. The shelving action of this control has proven to yield a much more satisfying and effective equalization characteristic than some of the "wide open" equalization circuits claiming 20 - 25 dB boost and cut. The action of this equalization control is conventional and should present no problem in operation.

Boost is obtained with a right hand (clockwise) rotation from center position, while cut is obtained with a left hand (counterclockwise) rotation from center position. Flat response is obtained when the equalization control is in the vertical (12:00 o'clock) position.

MID FREQUENCY CONTROLS (D)

The mid frequency control is capable of 15 dB boost or cut @ 600 Hz with a peak/notch type of filter response. This middle EQ circuit enables control over the vital midrange frequencies. The action of this middle filter is somewhat different than the high and low EQ since it is of the peaking and notching type. This type of filter response is necessary to avoid undue interaction with the high and low equalizers.

Caution must be exercised in order to avoid overboosting or overcutting the midrange. Experience has proven that, for most applications, a very slight midrange cut tends to produce a "tight" and well-defined sound. Generally, large amounts of midrange boost are extremely unpleasant and will probably never be used except for special effects or to correct for extremely marginal microphones or unusual voice timbres.

Boost is obtained with a right hand (clockwise) rotation from center position, while cut is obtained with a left hand (counterclockwise) rotation from center position. Flat response is obtained when the equalization control is in the vertical (12:00 o'clock) position.

HIGH FREQUENCY CONTROL (E)

The high frequency control is capable of 15 dB boost or cut @ 8 KHz with a shelving characteristic sloping down to the crossover point. The action of this control is very similar to that of the low equalizer with the exception of its high frequency effect.

Boost is obtained with a right hand (clockwise) rotation from center position, while cut is obtained with a left hand (counterclockwise) rotation from center position. Flat response is obtained when the equalization control is in the vertical (12:00 o'clock) position.

CHANNEL EFFECTS CONTROL (F)

The channel effects send control adjusts the signal level applied to the effects mix buss which feeds the internal reverberation system, as well as the effects output on the patch panel. The overall settings of the channel effects send controls determine the amount of reverb drive as well as the signal output level available from the effects output jack. It is important to note that the effects send control is a "post" type adjustment which is located in the circuit **after** the channel level and equalization controls. The user should be aware that use of the internal reverberation system can only occur when the channel level, the channel effects send, the master effects level, the master reverb return, and the master gain controls are all properly adjusted.

MASTER SECTION

The master section of the XR-700 contains all of the master controls for the respective mixing busses and additional supplementary controls to allow other special functions to be achieved.

The master level controls should be set near the center of their range to take advantage of maximum control action. This setting offers the best compromise between signal-to-noise ratio and headroom limits. Remember that while mixing, it is important to allow yourself adequate "margins" within which to operate. By using any of the controls in their extreme (close-to-stop) positions, you have effectively reduced your operational latitude.

As with any reasonably complex system, experience and operator knowledge of the equipment are essential for satisfactory performance. The mixer, like the musician's instrument, should be practiced on and learned. To properly operate a mixer during a performance requires thorough knowledge and trained reflexes to allow proper responses under the stress of demanding and sometimes sudden situations.

MAIN MASTER LEVEL CONTROL (G)

The main level control adjusts the gain of the main mixing buss and determines the level at the **main** line output jack (10), as well as determining the signal level applied to the input of the graphic equalizer/power amplifier. This control is the master level control and generally should be operated in the center of its range for best performance.

MONITOR MASTER LEVEL CONTROL (H)

The monitor master control adjusts the gain of the monitor mixing buss and determines the level of the signal to the monitor graphic/power amp as well as the signal available from the **monitor** output jack (10). The operation of this control and its independent channel sends is identical to that of the main with the exception that its output is applied to the monitor line output jack and to the monitor EQ/power amp. Like the main, it should be operated in the center of its range.

EFFECTS MASTER LEVEL CONTROL (I)

The effects master control sets the signal level applied to the internal reverberation system and the effects output jack (6). It is important to note that no reverb effect or effects signal will result unless suitable settings of the master effects control are used. The action of this control is similar to both the main and monitor master controls and may be used accordingly to determine the overall output level of the effects mix buss.

REVERB RETURN CONTROL (J)

The reverb return control determines the amount of delayed signal (reverberation) that is mixed back into the main mix buss. The action of this control (J) is defeated by use of a remote switch being plugged into the footswitch jack (4) located on the rear panel. It is important to note that no reverberation will occur unless the internal delay line is being fed signal from the channel effects send and effects master controls. The reverb return control **does not** affect the level available from the effects output jack (6) located on the patch panel.

REVERB CONTOUR (K)

This control is used to vary the "timbre" of the reverb drive circuitry to facilitate precise matching of the reverb circuitry to various program material. Experimentation will illustrate the many advantages of this unique feature.

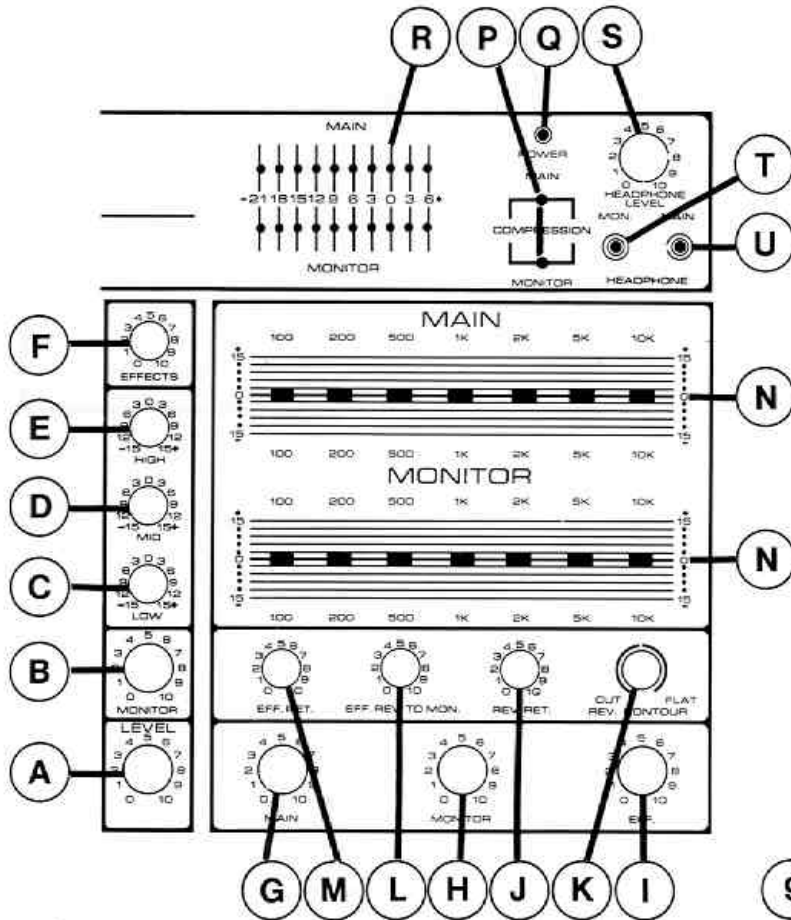
EFFECTS/REVERB TO MONITOR (L)

This control allows blending of the internal reverberation signal and signals from the effects return circuit back into the monitor mixing buss for those who do not prefer a "dry" monitor signal. This unique feature provides greatly enhanced monitoring capability since it allows the performer to hear the same effects in his monitor as being utilized in the main output signal.

EFFECTS RETURN (M)

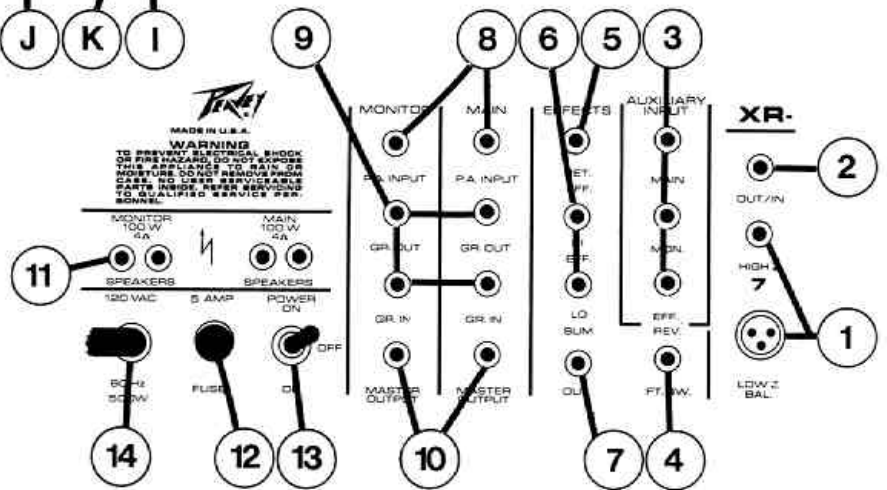
The effects return control determines the gain of the effects return preamplifier. This high impedance auxiliary input preamp feeds the main mixing buss and is applied to the monitor buss through the effects/reverb to monitor control. This unequaled auxiliary input channel is primarily intended for receiving signal from external effects units but also works extremely well with tape recorders, phono preamps, etc., etc. When a tape is used, it is possible to blend the tape signal back into the monitor mix, thus allowing the performer to prerecord various voices or instruments and then utilize this signal in both main and monitor systems during a performance.

CONTROL LOCATION DIAGRAM



front panel

rear panel



Ray
MADE IN U.S.A.
WARNING
TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. DO NOT REMOVE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

GRAPHIC EQUALIZERS (N)

The two seven-band equalizers are of the latest active type and exhibit performance comparable to that found in the finest professional equipment. The graphic equalizers are located in the circuit just before the internal 100 watt RMS (@ 4 ohms) power amplifiers and provide a very versatile and professional equalization of the overall system.

Because of the flexibility built into the XR-700, several different modes of operation are possible.

NORMAL MODE

Under normal operating conditions (no patch connections), the graphic equalizers/power amplifiers are connected through the graphic input switching jacks to the main outputs. These signals are derived from the main mixing busses and are controlled by the master level controls.

MONITOR OPERATION

The graphic equalizers and internal power amps may be used to power external systems. This is done by simply patching from the external device's outputs to the graphic inputs using shielded patch cables. When these patches are accomplished, the signals from the internal mixing busses are available **only** at the output jacks on the patch panel and can then be used in conjunction with external power amps, equalizers, or other accessories.

MASTER EQUALIZATION

The master graphic equalizers are designed to provide room equalization, effective feedback control, and overall system frequency balance. It is important to note that there are no firm operating instructions that will result in the ideal EQ for each and every set of operating conditions. Experimentation with adequate understanding of the graphic equalizer is necessary to achieve optimum results. No amount of equalization will totally correct an acoustically bad room/mic/speaker arrangement or completely correct the response curve of a poor loudspeaker.

Please make sure that the power amplifier has adequate headroom to handle any boost that may be incurred. If you boost 100 Hz by 3 dB, your power requirement will double. As an example: If your normal performing level requires **100 watts**, the power required after only a **3 dB** equalization boost will be **200 watts**.

You should always begin operation with the equalizers in the "0" or center position. It is wise to avoid excessive cutting of large segments of the audio passband since this tends to reduce the dynamic range of the system. Also, it is better to raise the master level control rather than to use the majority of the equalizers in the boost position since better overall signal-to-noise ratio will result. As with any equalizer, careful experimentation and a little common sense will yield the best results.

FEEDBACK CONTROL

Graphic equalizers can be used to great advantage for feedback suppression. The whole point of feedback equalization is to obtain the highest system gain before feedback. In essence, this requires the total system response to be as flat as possible. The following procedure is given as a **guide only!** Use common sense and take your time when attempting the equalization process and your chances of obtaining the desired results will be very good.

Adjust all channel equalization and graphic equalizer controls for an indicated flat response, and slowly bring up the level by use of the channel or master level controls until the system starts to go into feedback. Then very slowly adjust each section of the graphic equalizer until you find the one that has the most effect on the feedback. Return all **other** sections to the flat position and bring up the gain until the system again goes into feedback. Repeat the procedure and equalize out the second and third feedback modes and more if necessary. **WARNING!** You should never have to cut more than 6 to 9 dB under normal conditions. If more cut is necessary, check for proper phasing of the speaker system and microphone positioning. One improperly phased speaker can cause unending feedback problems. Do not expect to obtain a system that is completely free of feedback. Even the finest 1 octave graphic equalizers can only do so much. In short, don't expect miracles.....

"DDT" COMPRESSION (O)

The XR-700 is a compact and powerful system which features 100 watts RMS output per channel power amplifiers (@ 4 ohms) with a new type of dynamic compression. The compression effect enables us to maximize the performance of the amp/speaker combination. We have determined through much research that the compression circuitry should prevent the power amps from running out of headroom (clipping) and should be as simple to operate as possible to avoid undue complication for the user. The compression system is activated by our exclusive "Distortion Detection Technique" (DDT®) circuit (patent applied for) that senses overload conditions and activates compression when clipping is imminent. In other words, compression takes place whenever signal conditions exist which prevent the amplifiers from faithfully reproducing the input signal. The threshold is the clipping level itself and no specific threshold control is provided. This technique effectively utilizes every precious watt available from the power amps. Because of the dynamics of music and vocal program material, it is quite common to activate the compression circuitry virtually constantly during a performance since this is what it is designed to do; i.e., operate to maximize the dynamics available from the amplifiers within their power output capabilities regardless of power supply/line mains voltage variations and load impedance selection.

COMPRESSION LED INDICATORS (P)

The compression LED (light emitting diode) indicators show when compression takes place. As long as gain reduction is occurring, the LED's will continue to illuminate, thereby giving a valuable indication of this unique compression function.

PILOT LED (Q)

The pilot LED indicates when the electrical supply is switched on and is actually delivering power to the amplifier.

LED LEVEL DISPLAYS (R)

The XR-700 features dual ten-segment LED (light emitting diode) level indicators. These all electronic displays have no moving parts with resulting inertia as do conventional VU meters, and provide instantaneous indication of output signal conditions instead of the "delayed" average type response of older VU level indicators.

HEADPHONE LEVEL (S)

This control determines the drive available from either headphone jack. It is important to note that this control sets the level of both main and monitor headphone jacks and operates as a **sublevel** off the two internal power amplifiers.

NOTE: Both headphone jacks are of the stereo (two-circuit) type but have been bridged to provide a mono signal to stereo phones. These jacks will accommodate any known headphones with impedances of 4 ohms or greater. (Mono phones will also work with this system.) Both headphone jacks may be used simultaneously.

MONITOR HEADPHONE JACK (T)

This jack provides headphone level signal from the monitor amplifier whose level may be set with the headphone level control.

MAIN HEADPHONE JACK (U)

This jack provides headphone level signal from the main amplifier whose level may be set with the headphone level control.

REAR PANEL

The rear panel of the XR-700 contains all the interface connections to and from the electronic circuitry. All Peavey consoles feature inputs and outputs on the **rear** of the console chassis. From the manufacturing standpoint, it is far easier and considerably less expensive to position mic inputs on the **front** of the chassis as many of our competitors have chosen to do. By having inputs on the **front** of a console type mixer, the operator (when seated) must contend with a "lap full" of cables and wires, etc., which does not lend itself to professionalism nor operator convenience.

The versatility offered by the XR-700 is unmatched by **any** competing unit and a thorough understanding of the various features is essential in order to fully utilize the performance and versatility of this unit.

INPUT SECTION (1)

Each channel of the XR-700 features both balanced (symmetrical) low impedance (600 ohms) as well as high impedance (50K ohms) unbalanced inputs. Each of these inputs feature extremely wide dynamic range and are fully transient protected to insure durability under road conditions. While these inputs are intended primarily for microphones, they will also work nicely for many other types of program sources.

NOTE

DO NOT ATTEMPT TO CONNECT THE OUTPUT OF MAGNETIC PHONO CARTRIDGES DIRECT TO EITHER INPUT SINCE THESE CARTRIDGES REQUIRE RIAA EQUALIZATION PRIOR TO INSERTION INTO UNITS SUCH AS THIS. THE PREAMP CIRCUITRY OF THIS UNIT FEATURES SUFFICIENT GAIN TO OPERATE WITH MAGNETIC PHONO CARTRIDGES BUT DOES NOT HAVE THE SPECIAL RIAA EQUALIZATION SO NECESSARY TO REALIZE MAXIMUM PERFORMANCE. SMALL "PREAMP/EQUALIZERS" ARE AVAILABLE FROM MOST ELECTRONIC SUPPLY HOUSES THAT PERFORM THIS RIAA EQUALIZATION FUNCTION VERY INEXPENSIVELY.....(SUGGEST SHURE MODEL M-64, RADIO SHACK PHONO PREAMP MODEL NO. 422101, OR EQUIVALENT.)

CHANNEL PATCHING (OUT/IN) JACKS (2)

Each input channel of the XR-700 has been provided with a dual circuit (stereo switching type) jack that provides a channel send and return to allow in line patching of auxiliary effects, equalizers, etc. These jacks accept the standard "ring-tip-sleeve" type stereo plugs. When a stereo plug is inserted into the out/in jack, the "tip" of the plug is connected to the channel send and the "ring" is connected to the channel return, while the "sleeve" is the common ground for both send and return. If a channel output is desired for an additional monitor send or a direct output without breaking the internal link, this can be accomplished by plugging a standard phone plug into the first detent (click) of the jack. This unique send/receive system enables interface of the XR-700 individual channels with a wide variety of auxiliary effects and equipment. The effective output impedance is approximately 600 ohms at a level of 1 volt while the input is approximately 50K ohms with a 1 volt sensitivity.

AUXILIARY INPUTS (3)

The auxiliary inputs are line level access points to the three internal mixing busses. They are the medium impedance type (33K ohms) and are provided to allow paralleling mixers or for any other purpose that requires direct signal injection to the internal mixing busses.

REVERB FOOTSWITCH (4)

To facilitate remote control of the reverberation function, we have included a remote control footswitch jack. Any standard singlepole footswitch may be used to remotely defeat the reverb function. Please note that this switch disables the reverb system **only** and has no effect whatever on the effects system.

EFFECTS RETURN (5)

The effects return on the rear panel is the input to the effects return preamp which has its own level control located on the front panel. This effects return is capable of handling a wide range of input signals and is a very high impedance type (220K ohms). The effects return system connects to the main mixing buss and is intended for use when returning signals from external devices to the main mix. Effects return signal may also be mixed into the monitor system via the effects/reverb to monitor control (H).

EFFECTS OUTPUT (SEND) JACKS (6)

Two output jacks from the effects buss are provided to enable matching to professional line level as well as instrument level effects devices. The high level jack is a relatively low impedance (600 ohms) and is capable of more than 2 volts RMS, while the low level output jack provides approximately 0.5 volts RMS at 10K ohms impedance.

SUM OUTPUT JACK (7)

For added convenience, the XR-700 features a main/monitor sum output to provide a mix of both main and monitor systems for feed to various external devices. This feature allows a high level signal to be fed to remote locations to enable remote listening to the **total** program material being mixed through the XR-700. In addition, this sum feature allows tape recording, etc., while the normal main and monitor master outputs are being used for other purposes.

POWER AMP INPUTS (8)

Each power amp in the XR-700 features an input jack to facilitate patching in other signals. The power amp input jacks are of the switching type that are normally internally connected to the graphic outputs. Whenever plugs are inserted into the power amp inputs, these connections are broken and the power amp input jacks feed directly to the internal power amplifiers. This unique feature enables either of the power amps to be patched separately as needed within the system.

GRAPHIC INPUTS AND OUTPUTS (9)

Each graphic of the XR-700 has been equipped with patching jacks both at the input **and** the output to allow patching either graphic elsewhere within the system. The graphic inputs are of relatively high impedance type (50K ohms) and require approximately a 1 volt RMS nominal level. The graphic outputs are low impedance type (600 ohms). The graphic inputs are of the switching type that are normally internally connected to the main and monitor outputs. Insertion of a plug into a graphic in jack disconnects the graphic from the preceding circuitry making the graphic independent of the mixer section.

MASTER OUTPUTS (10)

The master outputs deliver signal from the main and monitor mixing amplifiers and may be considered the primary signal outputs from each respective buss. The output level is relatively low impedance (600 ohms) and is capable of better than 4 volts into a 600 ohm load, with considerably higher levels available into higher load impedances. Signal from these outputs is normally patched to the graphic in switching jacks to complete the signal flow to the graphic equalizer/power amp combination. Connection of external devices such as tape decks, etc., to these outputs will in no way affect the normal operation of the XR-700's other systems.

POWER AMP OUTPUTS (11)

The power amp output jacks are provided as a means of connecting speaker systems to the two internal 100 watt power amps. Each power amp has two output jacks which are wired in parallel. The internal amplifiers are designed for 4 ohm **total** loads and each amplifier will supply maximum power into this impedance. Different impedances may be used with the internal amplifiers with some sacrifice in output power. Caution should be observed in using lower than 4 ohm total loads since this tends to increase the heat dissipation as well as enhancing the possibility of energizing the power amplifiers' internal short circuit and/or thermal overload protection systems.

It is vital that the wire gauge of the speaker connection cables be as large as practical and that the length of the connecting cables be reasonably short. Significant sacrifices in performance will result with smaller wires and/or long speaker cable runs.

CAUTION

TO INSURE MAXIMUM POWER, INTERFACE SPEAKER CABLING SHOULD BE KEPT AS SHORT AS POSSIBLE AND THE LARGEST PRACTICAL WIRE SIZE SHOULD ALWAYS BE USED. HIGH LEVEL AMPLIFIERS GENERATE EXTREMELY HIGH CURRENTS WHICH ARE GREATLY AFFECTED BY THE RESISTANCE OF THE SPEAKER CONNECTION WIRING.

CAUTION

UNDER NO CIRCUMSTANCES IS IT RECOMMENDED THAT THE POWER AMPLIFIERS IN THIS POWERED MIXING SYSTEM BE USED WITH EXTREMELY LONG SPEAKER CABLES OR WITH "SNAKE" INPUT/OUTPUT MULTICABLES.

FUSE (12)

The fuse is located within the cap of the fuseholder. It is necessary that the fuse be replaced with the proper type and value if it should fail in order to avoid damage to the equipment and to prevent voiding the warranty. If your unit repeatedly blows fuses, it should be taken to a qualified service center for repair.

POWER SWITCH (13)

On domestic units, the power switch is of the three-position type with the center position being "OFF." This switch has two "ON" positions, one of which is used to ground the amplifier properly. One of the "ON" positions will yield the lowest amount of residual hum or "popping" when the mic or mixer is touched and this is the position that should be used.

On export models, we utilize a simple ON/OFF switch that does not have multiple "ON" positions since the grounding (earthing) conditions in most countries are made positively through standard tamper-proof plug-in systems.

LINE CORD (14)

For your safety, we have incorporated a three-wire line (main) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amp in a two-pin plug system without proper grounding facilities, suitable grounding adaptors should be used. Much less noise and greatly reduced shock hazard exist when the unit is operated with the proper grounded receptacles.

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS. BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME.
THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

DURATION PER DAY IN HOURS	SOUND LEVEL dBA, SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
3/4	110
1/2 or less	115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS. EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

CAUTION
 THIS MIXING CONSOLE/PREAMP HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE SIGNAL (VOLTAGE) FOR PLAYING MODERN MUSIC. IMPROPER USE OF THE GAIN/EQUALIZATION CONTROLS AND/OR IMPROPER USE OF INTERNAL/EXTERNAL BUSES MAY CREATE CLIPPING (SQUARE WAVES) AND POSSIBLY CAUSE SUBSEQUENT DAMAGE TO THE LOUDSPEAKER SYSTEMS. EXTENDED OPERATION OF THE GAIN/EQUALIZATION CONTROLS IN THEIR MAXIMUM POSITIONS IS, THEREFORE, NOT RECOMMENDED. PLEASE BE AWARE THAT **MAXIMUM POWER CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE GAIN/EQUALIZATION CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.** IT IS COMMON PRACTICE AMONG USERS OF SOUND REINFORCEMENT EQUIPMENT TO IDENTIFY THE INDIVIDUAL CHANNELS WITH A STRIP OF TAPE PLACED ABOVE OR BELOW THE ROW OF VOLUME FADERS. MANY TYPES OR BRANDS OF TAPE HAVE A VERY STRONG ADHESIVE WHICH CAN ADHESIVE TO THE PAINT ON THE FACEPLATE AND ACTUALLY REMOVE THE TAPE IF REMOVED. WE STRONGLY RECOMMEND THAT SCOTCH TAPE NOT BE USED ON PAINTED SURFACES NOR ANY OTHER TAPE THAT IS NOT ESPECIALLY DESIGNED FOR SUCH APPLICATIONS. MEDIUM OR LIGHT ADHESIVE MASKING OR MIXER LABEL TAPE IS RECOMMENDED IF TAPE IS USED. ANY TAPE LEFT ON PAINTED SURFACE FOR EXTENDED PERIODS WILL BE DIFFICULT TO REMOVE. NEVER USE CLEAR OR SCOTCH TAPE FOR THESE APPLICATIONS.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e. a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, heater, radiator or another heat producing amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag, or an ammonia based household cleaner if necessary.
13. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
14. This unit should be checked by a qualified service technician if:
 - A. The power supply cord or plug has been damaged
 - B. Anything has fallen or been spilled into the unit.
 - C. The unit does not operate correctly.
 - D. The unit has been dropped or the enclosure damaged.
15. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

SUMMARY OF FUNCTIONS:

7 in. 1 main out, 1 pre monitor out, 1 post effects out.
 3-band EQ each channel, main headphone, monitor
 headphone, reverb, 2 patchable 7-band graphic equalizers,
 100W per channel stereo power amp with DDT*

INPUTS, EACH OF 7 CHANNELS:

1 low Z balanced mic, 1 high Z unbalanced line, and 1 high Z unbalanced return line

INPUTS, MASTER:

1 unbalanced auxiliary for main, monitor & effects, 1 unbalanced high Z effects return; 1 high Z unbalanced line for each graphic and each power amp

OUTPUTS, EACH OF 7 CHANNELS:

1 low Z unbalanced send line

OUTPUTS, MASTER:

1 low Z unbalanced line each for main, monitor, sum, main & monitor mix, effects (high level), effects (low level), main graphic & monitor graphic, 1 mono headphone line each for main & monitor, reverb footswitch

OUTPUTS, POWER AMP:

Two parallel each channel, 4 ohm minimum parallel load

MIXER SECTION:

CHANNEL MICROPHONE INPUTS:

Mic Impedance: Low Z (600 ohms) balanced
 Nominal Input Level: -28 dBm, 30 mV RMS
 Minimum Input Level: -46 dBm, 4 mV RMS
 Maximum Input Level: -4 dBm, 0.5V RMS

CHANNEL LINE (HIGH Z MIC) INPUTS:

Line Impedance: High Z (220K ohms) unbalanced
 Nominal Input Level: -14 dBV, 200 mV RMS
 Minimum Input Level: -32 dBV, 25 mV RMS
 Maximum Input Level: -10 dBV, 3V RMS

CHANNEL RETURNS & AUXILIARY INPUTS:

Line Impedance: Medium Z (22K ohms) unbalanced
 Nominal Input Level: 0 dBV, 1V RMS

MAIN GRAPHIC & MONITOR GRAPHIC INPUTS:

Line Impedance: High Z (220K ohms) unbalanced
 Nominal Input Level: 0 dBV, 1V RMS

EFFECTS RETURN INPUT:

Line Impedance: High Z (220K ohms) unbalanced
 Nominal Input Level: 0 dBV, 1V RMS
 Minimum Input Level: -14 dBV, 0.2V RMS
 Maximum Input Level: +6 dBV, 2V RMS

MAIN, MONITOR, CHANNEL SEND, MAIN GRAPHIC, MONITOR GRAPHIC & EFFECTS (HIGH LEVEL) UNBALANCED OUTPUTS:

Load Impedance: 600 ohms or greater
 Nominal Output: 0 dBV, 1V RMS
 Maximum Output: +18 dBV, 8V RMS into 50K ohms load
 Maximum Output: -14 dBm, 4V RMS into 600 ohms load

EFFECTS (LOW LEVEL) UNBALANCED OUTPUT:

Load Impedance: 10K ohms or greater
 Nominal Output: -12 dBV, 0.25V RMS
 Maximum Output: +6 dBV, 2V RMS

HEADPHONES: (Mono output for main and monitor)

Load Impedance: 4 ohms to 50 ohms
 Maximum Output Power: 100 mW

THE FOLLOWING SPECS ARE MEASURED WITH A NOMINAL INPUT GAIN SETTING OF +14 dB ALL CHANNELS; ALL MASTERS SET @ 12:00; ALL EQ SET FLAT; LOW Z INPUTS TERMINATED @ 600 OHMS; HIGH Z INPUTS AND ALL

OUTPUTS TERMINATED @ 47K OHMS

FREQUENCY RESPONSE:

(Any in/out combination with 1V RMS output)
 +0, -2 dB, 30 Hz to 20 KHz

PREAMP HUM & NOISE: (All channels on)

-82 dBV High Z line inputs

-80 dBV Low Z mic inputs

OVERALL DISTORTION:

(Any in/out combination, 20 Hz — 20 KHz @ 1V RMS)
 Less than 0.1% THD, typically below .05%

EQUALIZATION: (Each channel)

+15 dB @ 60 Hz & 8 KHz, Shelving

+15 dB @ 600 Hz, Peak/Notch

EQUALIZATION: (Graphic)

-15 dB @ 100 Hz, 200 Hz, 500 Hz, 1 KHz, 2 KHz, 5 KHz & 10 KHz, Peak/Notch, Average "Q" of 1.5

MAXIMUM AVAILABLE GAIN:

+14 dB Master control
 +32 dB Channel control High Z
 +16 dB Balanced input amp
 +62 dB Total

LED READOUT RANGE:

-21 to +6 dBV main & monitor

POWER AMP SECTION: (240SC Module with DDT* Compression)

FREQUENCY RESPONSE:

+0, -1 dB, 20 Hz to 30 KHz @ 1W into 4 ohms

RATED POWER & LOAD:

100W per channel into 4 ohms

POWER @ CLIPPING:

(1% THD, 1 KHz, 120 VAC line)

Typical, single channel:

75W RMS into 8 ohms

125W RMS into 4 ohms

2 ohms not recommended

TOTAL HARMONIC DISTORTION:

Less than 0.1%, 100 mW to 100W RMS, 20 Hz to 20 KHz,

4 ohms, Typically below .05%

INTERMODULATION DISTORTION:

Less than 0.1%, 100 mW to 100W RMS, 60 Hz & 5 KHz,

4 ohms, Typically below .05%

DDT* DYNAMIC RANGE:

Greater than 26 dB

DDT* MAXIMUM THD: (1 KHz)

Below 0.5% THD for 6 dB overload

Below 1% THD for 20 dB overload

HUM & NOISE:

90 dB below 100W, 20 Hz — 20 KHz

SLEW RATE:

Greater than 15V/uSec

DAMPING FACTOR:

Greater than 100 @ 1 KHz, 4 ohms

INPUT SENSITIVITY:

1V RMS for 100W into 4 ohms

INPUT IMPEDANCE:

22K ohms overload protected

POWER REQUIREMENTS: (Domestic)

600W, 120 VAC, 50/60 Hz

Due to our efforts for constant improvement, features and specifications are subject to change without notice.

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