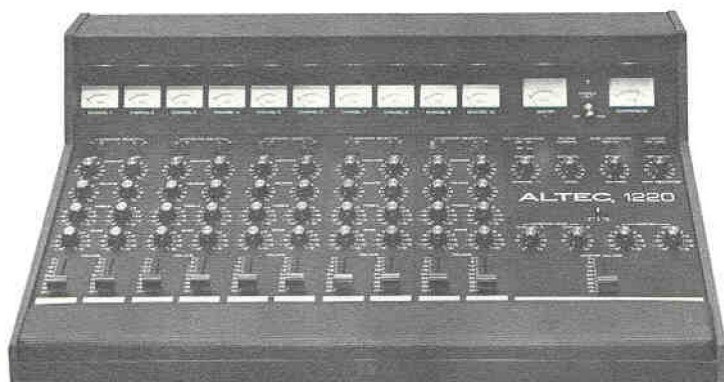


# ALTEC®

## 1220 AUDIO CONTROL CONSOLE

### OWNER'S MANUAL



1220A AUDIO CONTROL CONSOLE

1220AC AUDIO CONTROL CONSOLE



*Specifications and components subject to change without  
notice. Overall performance will be maintained or improved.*

# ALTEC®

SOUND PRODUCTS DIVISION

1515 S. Manchester Ave., Anaheim, Calif. 92803

42-02-044130-02

Litho in USA CP-1173-2.5K

# DATA CONTENTS

Item	Page
SPECIFICATIONS	3
CONTROLS, CONNECTIONS AND FEATURES	5
<u>Channel Controls and Features</u>	5
<u>Main Controls and Features</u>	6
<u>Channel Input/Output Connections and Features</u>	8
<u>Main Outputs and Features</u>	9
<u>Primary Power Controls and Features</u>	10
OPERATION	11
<u>Portable Travel Case</u>	11
<u>Controls and Indicators</u>	11
<u>General Setup Procedure</u>	11
<u>Recommended Mixing Procedure</u>	13
<u>Use of Peak Limiter</u>	15
SPECIAL OPERATING OPTIONS	16
<u>Console Paging Microphone/Bypass</u>	16
<u>Auxiliary Input Via EXT REVERB IN Jack</u>	16
<u>Group Submixing</u>	16
<u>Submixing on Reverb Channel</u>	16
<u>Connecting 1220 Consoles for Multiple Operation</u>	16
SIGNAL FLOWS	17
<u>Input Channels</u>	17
<u>Main Channel</u>	17
<u>Electronic Crossover Output Circuit</u>	17
<u>Monitor Channels</u>	17
<u>Auxiliary Input Channel</u>	18
<u>Reverb Circuit</u>	18
<u>Peak Limiting Circuit</u>	18
CONVERSION OF 1220 CONSOLE TO 240 VAC, 50/60 HZ OPERATION	18
COMPONENT REPLACEMENT PROCEDURES	21
<u>Removal of 1220A Console from 1220AC Case</u>	21
<u>Replacement of Panel Light Bulbs via Diffusing Lens</u>	21
<u>Rear Access to Chassis Interior</u>	21
<u>Replacement of VU Meters or Meter Light Bulbs</u>	21
<u>Replacement of Channel Modules and Master Control Module</u>	21

Graphics	Page
Figure 1. Converting to 240 VAC, 50/60 Hz Operation	18
Figure 2. Location of Voltage Rating Identification	18
Figure 3. 1220 Console Signal Flow Chart	19-20
Figure 4. Meter Panel Assembly Diagram	21

# SPECIFICATIONS

Type:	Portable 11-channel solid-state mixer/preamplifier with self-contained reverb unit
Gain —	
Main Outputs and Electronic Crossover Outputs:	86, 78 or 74 dB for channels 1 - 10 with 150-ohm source 38, 30 or 26 dB for channel 11 with 600-ohm source
Monitor Outputs:	83 dB
Input Level:	-55 dBm for +8 dBm output (channel VOLUME and MASTER VOLUME controls at -14 position)
Input Sensitivity:	0.45 mV rms for +21 dBm output (channels 1 - 10) 200 mV rms for +21 dBm output (channel 11)
Input Clipping Level:	-8 dBm
Power Output:	+21 dBm maximum at less than 0.5% THD from 30 Hz to 20 kHz for all outputs +21/-25 dBm at switched MAIN OUTPUT (XLR3 connector)
Frequency Response:	+1 dB from 30 Hz to 20 kHz (150-ohm source with channel VOLUME and MASTER VOLUME controls at -14 position)
Total Harmonic Distortion (THD):	Less than 0.5% from 30 Hz to 20 kHz Typically less than 0.2% from 50 Hz to 20 kHz
Crossover Frequency:	500 or 800 Hz with +10 dB shelving balance
Input Impedance:	5000 ohms nominal (channel 11)
Source Impedance:	150 ohms nominal (CHANNELS 1-10)
Load Impedance:	600 ohms nominal 600/150 ohms from switched MAIN OUTPUT (XLR3 connector)
Nominal Output Impedance INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS Jacks:	1000 ohms

Noise Level (20 kHz bandwidth):	-127.5 dBm equivalent input noise (typical for each channel)  Output noise more than 80 dB below full output with MASTER VOLUME control at -14 position and all channel VOLUME controls at ∞ position (closed)
Tone Control Response:	+16 dB at 100 Hz (LF) and 10 kHz (HF)
Limiter Attack:	Recovery within 1 dB in first 1/4 cycle
Limiter Release:	63% recovery in 0.5 second (FAST) or 1.5 seconds (SLOW)
Limiter Distortion:	Typically less than 1% for 10 dB of gain reduction (compression) with +8 dBm output
Controls —	
Each Mixer Input Channel (Channels 1 - 10):	1 VOLUME control, linear slider 1 BASS control, rotary 1 TREBLE control, rotary 1 REVERB control, rotary 1 MONITOR volume control, rotary 2 MONITOR SELECT — channel A/OFF, channel B/OFF switches, rocker
Auxiliary Input (Channel 11):	1 CHANNEL 11 volume control, rotary
Monitor Channels A and B:	2 MONITOR LEVEL controls, CHANNEL A and CHANNEL B, rotary
Master Channel:	1 MASTER VOLUME control, linear slider 1 MASTER BASS control, rotary 1 MASTER TREBLE control, rotary 1 REVERB LEVEL control, rotary 1 REVERB INTERNAL/EXTERNAL switch, rocker 1 CH. 1-10 ON/STANDBY switch, rocker 1 MONITORS ON/STANDBY switch, rocker 1 ELEC. CROSSOVER 500 Hz/800 Hz switch, rocker 1 ELEC. CROSSOVER BALANCE control, rotary 1 Output Level switch, 3-position slide (-4, 0, +8) 1 LIMITING ON/OFF switch, rocker 1 LIMITING FAST/SLOW switch, rocker 1 LIMITING GAIN REDUCTION control, rotary
Meter Panel:	1 CONSOLE LIGHT OFF/MAX control, rotary

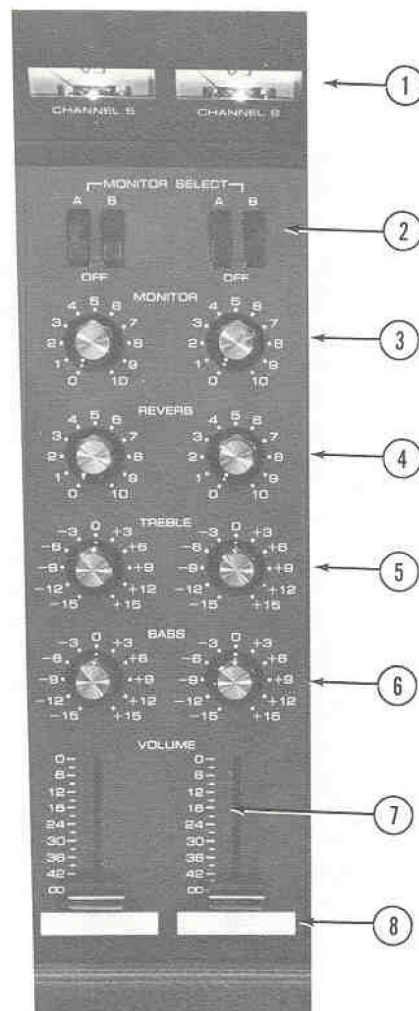
SPECIFICATIONS (Continued)

Rear Panel:	1 ON LINE GND/OFF/ON POLAR GND switch, 3-position toggle (power) 1 POLARITY switch, toggle 1 PUSH TO RESET pushbutton (circuit breaker) 1 LINE LEVEL 600 $\Omega$ /MIC LEVEL 150 $\Omega$ switch, rocker 1 REVERB RELEASE/LOCK lever
Indicators —	
Meter Panel:	10 Input channel VU meters, CHAN- NEL 1 through CHANNEL 10 1 MASTER VU meter (master channel) 1 Primary power-on indicator, red pilot lamp (LED) 1 GAIN REDUCTION VU meter (compression) 12 Panel illumination lamps
Rear Panel:	1 GROUND INDICATOR lamp, orange ('Shockchek')
Connectors —	
Input:	10 XLR3-13 type connectors - LOW IMPEDANCE MICROPHONE IN- PUTS 150/250 OHMS, channels 1 - 10 3 Standard 1/4" phone jacks — 1 CHANNEL 11 AUX INPUT 1 EQUALIZER IN 1 EXT REVERB IN
Output:	1 XLR3-14 type connector - MAIN OUTPUT 2 Standard line connectors - AC OUTLETS

Output (Continued):	22 Standard 1/4" phone jacks — 10 INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS 1 EXT REVERB OUT 1 CHANNEL 11 AUX OUTPUT 1 EQUALIZER OUT 1 EFFECTS FOOT SWITCH 1 MONITOR OUT CHANNEL A 1 MONITOR OUT CHANNEL B 2 MAIN OUTPUT/FULL RANGE 2 ELECTRONIC CROSSOVER OUTPUTS - HIGH FREQ 2 ELECTRONIC CROSSOVER OUTPUTS - LOW FREQ
Battery:	1 Heyco 2-terminal connector - BATTERY IN 24/28V
Power Requirements:	120/240V ac, 50/60 Hz, 50 watts —or— 24/28V dc battery, 1A maximum
Overall Dimensions —	
1220A:	36"W x 24"D x 11"H
1220AC:	37-3/4"W x 26"D x 12"H (without legs) or 36"H (with legs)
Weight —	
1220A:	62 pounds
1220AC:	116 pounds
Case (1220AC only):	Luggage style with black Lavant vinyl covering and heavy metal cor- ner bumpers

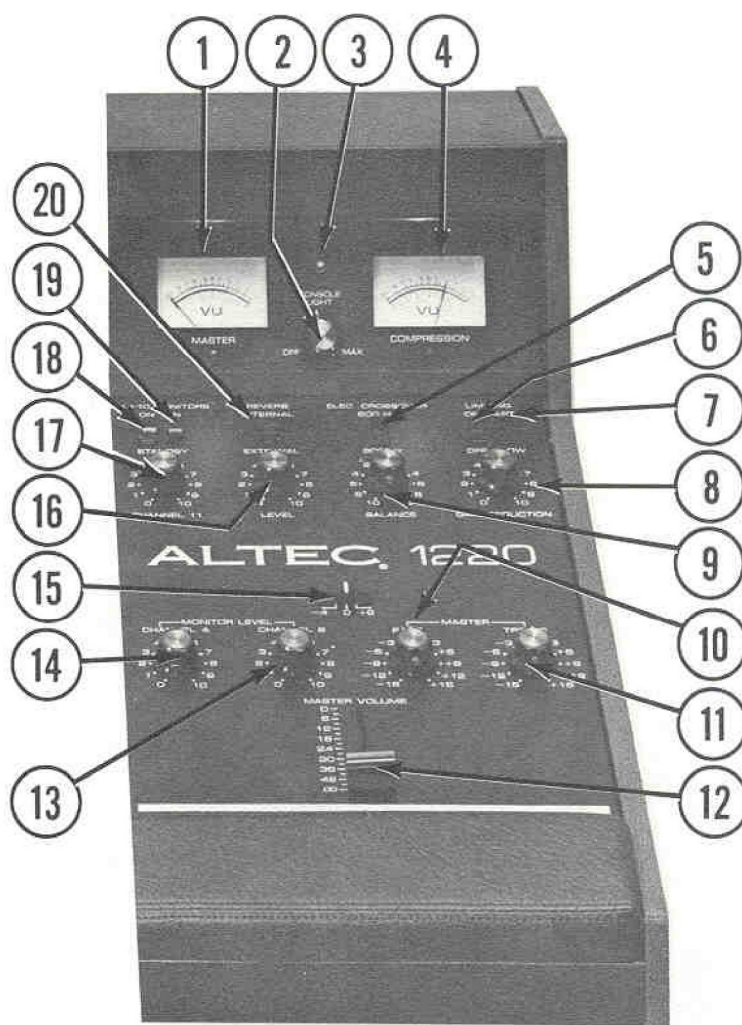
# CONTROLS, CONNECTIONS AND FEATURES

## Channel Controls and Features



1	VU METER	Displays output for corresponding channel. All meters illuminate when ac power is on.
2	MONITOR SELECT switches	Provide independent selection of monitor channels A and B. Each channel may be switched on or off of monitor channel A and/or B.
3	MONITOR volume control	Adjusts gain of channel signal prior to entry onto monitor channel. Turn clockwise to increase gain.
4	REVERB control	Adjusts gain of internal reverb or external echo for corresponding channel. Turn clockwise to increase gain.
5	TREBLE control	Adjusts high-frequency portion of signal for corresponding channel. Adjustment range from center position is $\pm 16$ dB at 10 kHz.
6	BASS control	Adjusts low-frequency portion of signal for corresponding channel. Adjustment range from center position is $\pm 16$ dB at 100 Hz.
7	VOLUME control	Adjusts gain of corresponding channel output. Slide control from $\infty$ toward 0 to increase gain. Scale values correspond to attenuation of volume in dB.
8	Write-In blocks	Provide for identification of channel assignments. Write only with soft lead pencil. Use damp cloth to remove writing. Do not use eraser or abrasive material, or writing surface may become unusable.

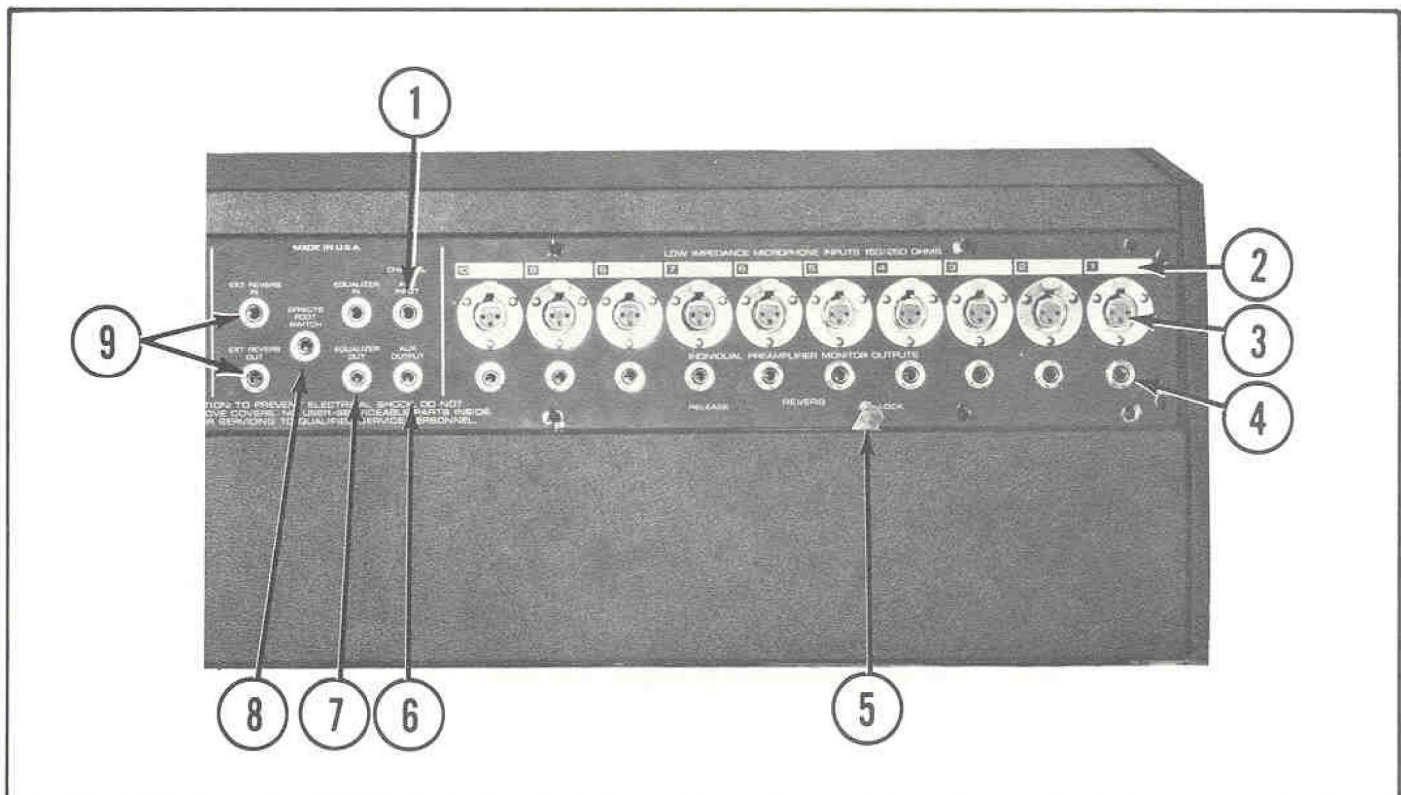
## Main Controls and Features



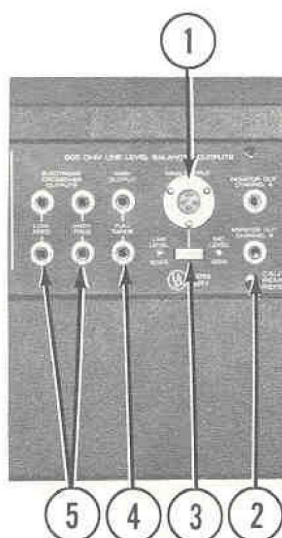
1	MASTER VU meter	Displays output of all combined input signals. Meter illuminates when ac power is on.
2	CONSOLE LIGHT control	Adjusts panel light intensity. Continuously adjustable from OFF to MAX (maximum). Turn clockwise to increase light intensity.
3	Power Indicator	Illuminates when power is on. Red pilot lamp.
4	GAIN REDUCTION (compression) VU meter	Displays amount of compression applied to output signal when peak limiting is used. Optimal readings range from -10 to 0 on GAIN REDUCTION (compression) VU meter when proper signal level is displayed on MASTER VU meter. Meter illuminates when power is on.
5	ELEC. CROSSOVER switch	Selects 500 Hz or 800 Hz electronic crossover for amplifiers connected to high- and low-frequency outputs. Speaker system characteristics determine proper switch position.
6	LIMITING ON/OFF switch	Activates peak limiter when set to ON position.
7	LIMITING FAST/SLOW switch	Selects fast or slow recovery time to restore full gain following a condition of compression. FAST position typically is used for music and SLOW position is used for vocal applications. Recovery time to 63% of full gain is 0.5 and 1.5 seconds for FAST and SLOW positions, respectively.

Main Controls and Features (Continued)

8	GAIN REDUCTION control	Provides adjustable threshold level for peak limiting. Functions in conjunction with the MASTER VOLUME control. Threshold level range of GAIN REDUCTION control is approximately 15 dB. Rotate control clockwise to increase gain reduction (compression).
9	BALANCE control	Adjusts respective levels of bass and treble portions of signal at LOW FREQ and HIGH FREQ ELECTRONIC CROSSOVER OUTPUTS. 'Flat' response is at zero (0) position. Shelving range is +10 dB. Turn control counterclockwise to shelve (attenuate) bass portion of signal, and clockwise to shelve (attenuate) treble portion of signal.
10	MASTER BASS control	Adjusts low-frequency portion of all main channel outputs and ELECTRONIC CROSSOVER CHANNEL OUTPUTS. Maximum adjustment range is $\pm 16$ dB at 100 Hz. Rotate clockwise to increase low-frequency response.
11	MASTER TREBLE control	Adjusts high-frequency portion of main channel outputs and ELECTRONIC CROSSOVER OUTPUTS. Maximum adjustment range is $\pm 16$ dB at 10 kHz. Rotate clockwise to increase high-frequency response.
12	MASTER VOLUME control	Adjusts gain of all channels simultaneously. Slide control from $\infty$ toward 0 to increase gain. Scale values correspond to attenuation of volume in dB.
13	MONITOR LEVEL CHANNEL B control	Adjusts monitor volume of all channels assigned to monitor CHANNEL B. Turn control clockwise to increase volume.
14	MONITOR LEVEL CHANNEL A control	Adjusts monitor volume of all channels assigned to monitor CHANNEL A. Turn control clockwise to increase volume.
15	Output Level switch (-4, 0, +8)	Selects output level for zero (0) VU on MASTER VU meter, referenced to -4, 0, or +8 dB for main channel outputs and ELECTRONIC CROSSOVER OUTPUTS. Input sensitivity of amplifiers connected to 1220 Console determine switch position. Gain positions of -4, 0 and +8 provide outputs of 0.5V rms, 1V rms and 2V rms, respectively.
16	REVERB LEVEL control	Adjusts level of combined reverberation signal (internal or external) applied to main channel. Turn control clockwise to increase signal level.
17	CHANNEL 11 volume control	Adjusts gain of auxiliary CHANNEL 11 signal. Turn control clockwise to increase gain.
18	CH. 1-10 ON/STANDBY switch	Applies all combined input signals to main channel outputs when set to ON. Removes all channel signals except CHANNEL 11 when set to STANDBY.
19	MONITORS ON/STANDBY switch	Turns on monitor CHANNELS A and B when set to ON. Turns off monitor CHANNELS A and B when set to STANDBY.
20	REVERB INTERNAL/EXTERNAL switch	Selects internal reverb or external echo. Internal reverb system of 1220 Console is selected when REVERB switch is set to INTERNAL. External echo system connected to EXT REVERB jacks is selected when REVERB switch is set to EXTERNAL.



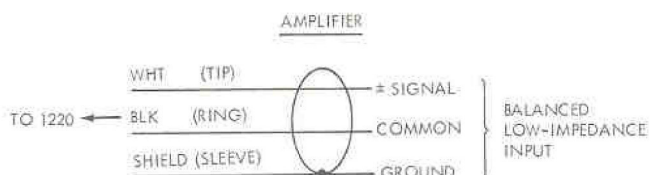
1	CHANNEL 11 AUX INPUT jack	Accepts cable from another 1220 Console, tape recorder, or other device. Standard 1/4" phone jack.
2	Write-In blocks	Provide for identification of channel assignments. Write only with soft lead pencil. Use damp cloth to remove writing. Do not use eraser or abrasive material, or writing surface may become unusable.
3	LOW IMPEDANCE MICROPHONE INPUTS 150/250 OHMS XLR3 type connectors	Accept cables from low-impedance (150/250 ohms) microphones or other devices. Ten transformer-isolated, balanced input channels with XLR3 type connectors.
4	INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS jacks	Enable separate channels to be connected to monitor amplifiers, power amplifiers, tape recorders or other devices that accept 1000-ohm source impedance, high-level, unbalanced inputs. Nominal output for each channel is 0.15V rms. Standard 1/4" phone jacks.
5	REVERB RELEASE/LOCK lever	Locks internal reverb unit to prevent mechanical damage to reverb spring when transporting 1220 Console. Reverb spring is locked when locking lever is in LOCK position (extreme right side).
6	AUX OUTPUT jack	Combines all outputs of INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS, CHANNEL 11, and REVERB channel. Independent of all controls on Master Control Panel. Nominal output is 0.15V rms. Standard 1/4" phone jack.
7	EQUALIZER IN and EQUALIZER OUT jacks	Provide for connection of external equalizer to "shape" combined acoustical output of MAIN OUTPUTS and ELECTRONIC CROSSOVER OUTPUTS. Equalizers such as the ALTEC 9014A (narrowband), 9018A (broadband), and 9860A (active narrowband) may be used. IN jack connects to equalizer output. Standard 1/4" phone jacks.
8	EFFECTS FOOT SWITCH jack	Connects accessory foot switch. Pressing foot switch mutes all reverb sound. Standard 1/4" phone jack.
9	EXT REVERB IN and EXT REVERB OUT jacks	Provide for connection of external reverb to ten input channels. Reverb volume is adjusted by corresponding channel REVERB controls. EXT REVERB IN jack connects to reverb unit output. Standard 1/4" phone jacks.



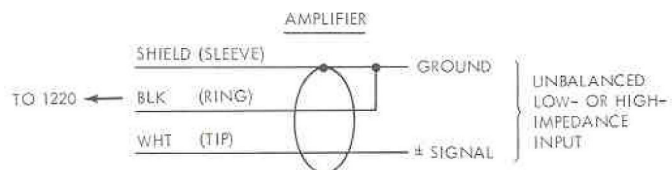
1	MAIN OUTPUT connector	Provides balanced connection to power amplifiers having 600-ohm line-level inputs or 150-ohm microphone-level inputs. XLR3 type connector.
2	MONITOR OUT CHANNEL A and B jacks	Provide connection to power amplifiers having nominal input impedance of 600 ohms or greater. Balanced stereo phone jacks (ring, tip, sleeve).
3	LINE LEVEL 600Ω/MIC LEVEL 150Ω switch	Matches 1220 Console to input impedance of power amplifier or preamplifier by selecting LINE LEVEL 600Ω or MIC LEVEL 150Ω. Affects only MAIN OUTPUT XLR3 connector.
4	MAIN OUTPUT/FULL RANGE jacks	Provide connection to power amplifier having nominal input impedance of 600 ohms or greater. Provides balanced or unbalanced drive, depending on type of phone plug used. Balanced stereo phone jacks (ring, tip sleeve).
5	ELECTRONIC CROSSOVER OUTPUTS LOW FREQ/HIGH FREQ jacks	Provide connection to power amplifiers having nominal input impedance of 600 ohms or greater. LOW FREQ and HIGH FREQ jacks provide outputs for low- and high-frequency ranges, respectively, with electronic crossover of 500 Hz or 800 Hz, according to position of ELEC. CROSSOVER switch on front panel. Provide balanced or unbalanced drive depending on type of phone plug used. Balanced stereo phone jacks (ring, tip, sleeve).

## SPECIAL DATA ON STEREO JACKS

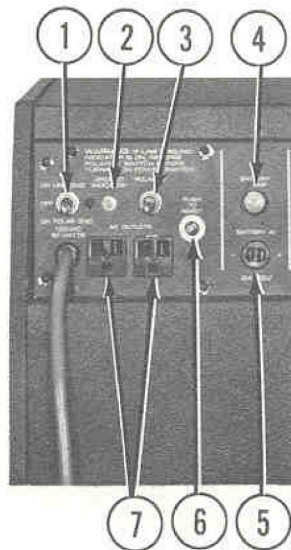
All output jacks are wired for balanced, low-impedance (600 ohms) input to power amplifiers such as the ALTEC 1609A (transformer-coupled). Use 2-conductor stereo shielded cable terminated with stereo jacks (ring, tip, sleeve) for connection to the 1220.



To connect the 1220 for unbalanced input to high-impedance amplifiers, such as the ALTEC 9477B, connect one signal lead to the shield (ground) at the amplifier end of the cable. Proper connection of the amplifier end of the cable is shown below.



# Primary Power Control and Features



1	ON LINE GND/OFF/ON POLAR GND power switch	Applies 120V, 50/60 Hz line power to 1220 Console when at either of the two ON positions. Provides for three-wire ground at ON LINE GND position or polarized two-wire ground at ON POLAR GND position. Provides no power in OFF position.
2	GROUND INDICATOR orange lamp	Illuminates to reveal potential hazard of electrical shock when line power cord is plugged in. Power switch should be left OFF until illumination (if any) is extinguished by POLARITY switch. This is ALTEC's exclusive 'Shockchek' feature.
3	POLARITY switch	Extinguishes any illumination of GROUND INDICATOR to eliminate potential hazard of electrical shock when power switch is at ON POLAR GND position.
4	BATTERY 1 AMP fuse	Protects 1220 Console against any excessive current drain from battery power supply. Fuse applies only to battery-power operation.
5	BATTERY IN connector	Accepts power cable from 24/28V battery. Heyco 2-terminal connector. Accepts standard push-on terminals such as AMP FASTON 250 Series.
6	PUSH TO RESET pushbutton	Resets overload protection circuit breaker for 120V, 50/60 Hz operation. If circuit breaker opens repeatedly, see qualified service personnel.
7	AC OUTLETS	Provide additional source of 120V, 50/60 Hz power at all times when 1220 Console is plugged into line power outlet. Maximum acceptable power drain is 300 watts for each outlet.

## OPERATION

Models 1220A and 1220AC Audio Control Consoles are identical except for the travel case supplied with the 1220AC. The 1220A is intended for permanent or semipermanent installation. The 1220AC is readily portable and may be stored or set up in a few minutes.

### Portable Travel Case

The portable travel case supplied with the 1220AC is a black, vinyl-covered wood cabinet. The 1220A is secured to the bottom section of the two-piece case by four screws which also attach rubber bumpers. The top cover is completely removable and contains storage compartments for microphones, interconnecting cables and the detachable steel legs.

The bottom section of the travel case is equipped with four brackets to receive the threaded steel legs. With the legs installed, the case becomes a convenient stand for the console. Be sure each leg is fully threaded into the bracket and securely tightened before raising the console.

### CAUTION

Do not raise the console from one side, using the opposite legs as a pivot, as this applies excessive pulling pressure to the brackets. Two persons should lift the console (one from each side) and set the unit squarely upon the legs.

### Controls and Indicators

Operating controls most frequently used are located on the top panels shown on pages 5 and 6. Input connections and the REVERB locking lever are located on the rear of the console as shown on page 8. Main outputs and primary power control features are shown on pages 9 and 10. Details of control/indicator functions and input/output connections are given in the associated tables.

### General Setup Procedure

After microphone positions and speaker locations are determined, use the following procedure to make connections and set controls.

Step 1. Set controls and switches to the following positions:

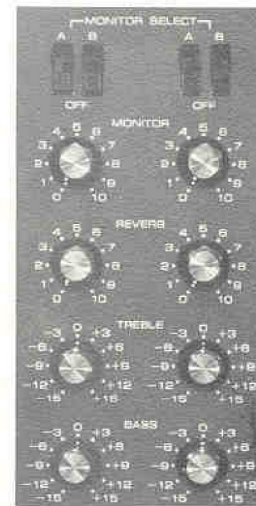
- a. Power switch to OFF (center).



- b. MASTER VOLUME control to 14.



- c. All channel VOLUME controls to  $\infty$ .
- d. All channel MONITOR SELECT switches to OFF.
- e. All channel MONITOR and REVERB controls to 0 (fully counterclockwise).
- f. All channel TREBLE and BASS controls to 0 (center).



- g. CH. 1-10 and MONITOR ON/STANDBY switches to ON.
- h. CHANNEL 11 volume control to 0 (fully counterclockwise).



- i. REVERB LEVEL control to 0 (fully counterclockwise).
- j. If internal reverb is to be used, set REVERB INTERNAL/EXTERNAL switch to INTERNAL and move REVERB RELEASE/LOCK lever fully to the RELEASE position (left side as viewed from the back of the console) to release reverb spring. If not using internal reverb, or if external echo devices are to be used, set REVERB INTERNAL/EXTERNAL switch to EXTERNAL, and move REVERB RELEASE/LOCK lever fully to the LOCK position (right side) to lock reverb spring.



- k. If LOW FREQ and HIGH FREQ ELECTRONIC CROSSOVER OUTPUTS are to be used, set ELEC. CROSSOVER switch to 500 Hz or 800 Hz according to crossover points of speaker system to be used. Set BALANCE control to 0 (center). Crossover of 800 Hz is strongly recommended for high-level music, to protect against high-frequency driver failure.



- l. Set LIMITING switch to OFF and GAIN REDUCTION control to 0 (fully counterclockwise).



- m. Set MONITOR LEVEL CHANNEL A and CHANNEL B controls to 5.
- n. Set MASTER BASS and TREBLE controls to 0 (center) for 'flat' response.



- Step 2. Connect microphones/microphone cables to the LOW IMPEDANCE MICROPHONE INPUTS 150/250 OHMS connectors for all channels required.



- Step 3. If desired, connect the speakers, monitors, tape decks or other line-level devices to the INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS for each channel to be monitored or amplified separately. Nominal output impedance is 1000 ohms. Approximate output voltage is 0.15V rms.
- Step 4. If CHANNEL 11 is to be used, connect the low-impedance tape recorder, an additional 1220 Console, or other low-impedance device to the CHANNEL 11 AUX INPUT jack.
- Step 5. If combined CHANNELS 1-11 signals are to be amplified prior to master control functions, plug the power amplifiers, tape decks, or other devices into the AUX OUTPUT jack.



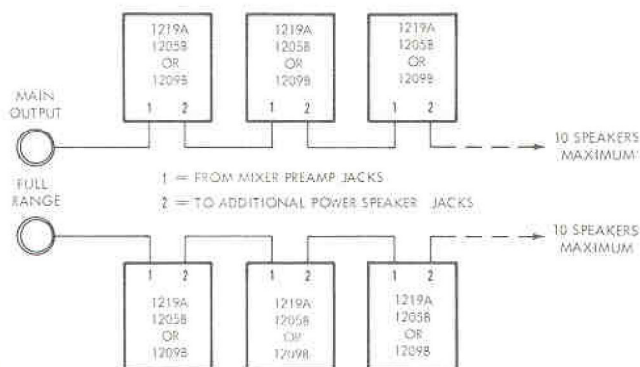
- Step 6. If it is desired to 'shape' the effects of the output sound with a device such as the ALTEC 729A Acousto-Voicette™ or the ALTEC 9860A Active Equalizer, plug the input cable of the device into the EQUALIZER OUT jack of the 1220 Console. Plug the output cable of the device into the EQUALIZER IN jack.
- Step 7. If an external echo device is to be used, plug the input cable of the device into the EXT REVERB OUT jack. Plug the output cable of the device into the EXT REVERB IN jack.
- Step 8. If muting of reverb (external or internal) is desired, plug a foot switch into the EFFECTS FOOT SWITCH jack.
- Step 9. Plug all power amplifiers or speaker systems into the appropriate connectors for the 600 OHM LINE LEVEL BALANCED OUTPUTS. If using the switched MAIN OUTPUT, place the LINE LEVEL 600Ω/MIC LEVEL 150Ω switch to 600Ω or 150Ω according to the requirements of the associated sound system.

#### CAUTION

All power amplifiers and speaker systems should be turned off while making cable connections to the 1220 Console.



Multiples of ALTEC 1205B, 1209B or 1219A Powered Speaker Systems may be grouped into a single sound system as shown. Up to 20 powered speakers may be grouped in two cascades of 10 speakers each for up to 1700 watts of audio power. Plug the shielded cable into the TO ADDITIONAL POWER SPEAKER jack of the first powered speaker and into the FROM MIXER PREAMP jack on the second powered speaker; continue interconnection until the last powered speaker is connected.



- Step 10. Plug the power cord of the 1220 Console into the 120V, 50/60 Hz line power source. If a battery power source is to be used, plug the battery power cable into the BATTERY IN connector.

**NOTE**  
Console lights do not illuminate with 28V battery operation.



Plug in all power amplifiers and speaker systems. Two 120V, 50/60 Hz power connectors (300 watts maximum for each connector) are available to connect external equipment. Power is available at the connectors at all times when the power cord is plugged into a 120V, 50/60 Hz source.

- Step 11. Check the GROUND INDICATOR on the rear panel. If the orange indicator is lit, change the position of the POLARITY switch to extinguish the indicator.

**WARNING**  
The GROUND INDICATOR must be extinguished to eliminate the potential hazard of electrical shock. This ALTEC 'Shockchek' feature is provided specifically to protect personnel from electrical shock caused by improper grounding of line power.

- Step 12. Set the power switch to the ON LINE GND or ON POLAR GND position, depending on the grounding technique used:

ON LINE GND — three-wire ground system  
ON POLAR GND — two-wire ground system

- Step 13. Turn on all power amplifiers for speaker systems.

- Step 14. Proceed to Recommended Mixing Procedure.

#### Recommended Mixing Procedure

After completing the general setup procedure, use the following recommended mixing procedure. This procedure is typical for all channels except auxiliary CHANNEL 11. For CHANNEL 11, use Steps 2 and 3 only.

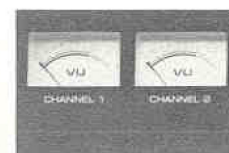
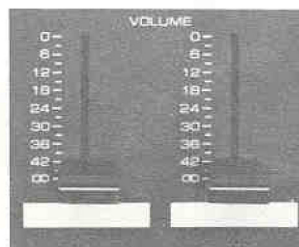
- Step 1. Adjust the CONSOLE LIGHT control for the desired illumination of the instrument panel.



- Step 2. Set the MASTER VOLUME control to the -14 position for the initial setup and set the CH. 1-10 switch to the ON position.



- Step 3. Adjust the VOLUME control of the selected channel while talking or singing into the microphone, until the proper level is obtained on the corresponding CHANNEL VU meter. Optimum level is obtained when the meter indicator fluctuates near or about zero, with maximum deflections no higher than +3. Defer use of the MASTER VU meter until setting the final output level.

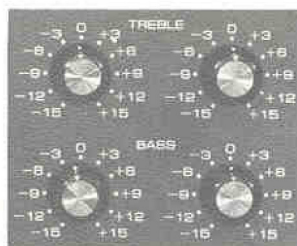


- Step 4. If onstage monitor speakers are used, assign the channel to the appropriate monitor speaker with the MONITOR SELECT A/B switches. Adjust the MONITOR volume control for desired volume. MONITOR LEVEL CHANNEL A and CHANNEL B controls on Master Control Panel must be set to an adequate level. Refer to SPECIAL OPERATING OPTIONS for a more detailed description of the use of these switches.



- Step 5. Increase the bass or treble response as desired by turning the BASS and/or TREBLE controls into the plus (+) area. From the 0 or 'flat' setting, this provides a maximum boost of 16 dB at 100 Hz for bass, and a maximum boost of 16 dB at 10 kHz for treble.

Decrease the bass or treble response by turning the BASS and/or TREBLE controls into the minus (-) area. From the 0 or 'flat' setting, this provides a maximum attenuation of 16 dB at 100 Hz for bass, and a maximum attenuation of 16 dB at 10 kHz for treble.



- Step 6. If internal reverb is used, adjust the REVERB volume control for the desired effect. On the Master Control Panel, the REVERB INTERNAL/EXTERNAL switch must be set to the INTERNAL position and the REVERB LEVEL control must be set to a desired minimum. Also, the REVERB RELEASE/LOCK lever must be moved to the RELEASE position (rear of console).



If external echo devices are used, adjust the REVERB volume control for the desired effect. On the Master Control Panel, the REVERB INTERNAL/EXTERNAL switch must be set to the EXTERNAL position, and the REVERB LEVEL control must be set to a desired minimum. Also, the REVERB RELEASE/LOCK lever must be moved to the LOCK position (rear of console).

#### NOTE

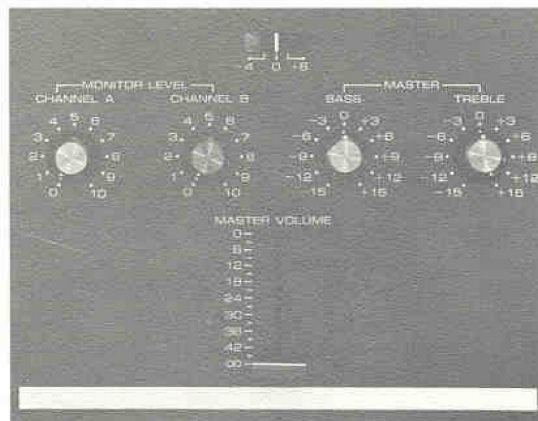
Internal reverb or external echo may be shut off by setting the REVERB INTERNAL/EXTERNAL switch to the opposite position, i.e., to EXTERNAL position when using internal reverb.

- Step 7. Repeat Steps 3 through 6 for each of the other input channels to be used. Previously adjusted channels may be temporarily disconnected from the LOW IMPEDANCE MICROPHONE INPUTS 150/250 OHMS connectors while adjusting subsequent channels.

As additional channels are used, feedback may increase. To overcome this problem, slightly decrease the setting of the MASTER VOLUME control. The number of open microphones (turned up to full gain) should be kept to a minimum because many open microphones increase unwanted feedback.

- Step 8. Verify that all temporarily unplugged microphone cables are reconnected to the LOW IMPEDANCE MICROPHONE INPUTS 150/250 OHMS connectors.

- Step 9. Adjust the MASTER VOLUME control for the proper level of combined input signals on the MASTER VU meter. The optimum level of combined output is obtained when the meter indicator fluctuates near or about zero, with maximum deflections no higher than +3.



- Step 10. Adjust the MASTER BASS and TREBLE controls for the desired sound effects.

Step 11. Set the Output Level switch for optimum output of the 1220 Console to the power amplifiers and speaker system. For average signal output of zero on the MASTER VU meter, the following voltages are produced at the MAIN OUTPUT/FULL RANGE jacks of the 1220 Console:

Output Level Switch Position	1220 Console Output Signal
-4 (dBm)	0.5V rms
0 (dBm)	1.0V rms
+8 (dBm)	2.0V rms



#### Use of Peak Limiter

The peak limiter prevents signal distortion by limiting the amplitude of any part of the signal that would otherwise exceed the rated output level (nominally +21 dBm) of the 1220. In effect, the peak limiter automatically and continuously adjusts gain to limit output of the 1220.

It should be noted that limiting action cannot occur unless the MASTER VOLUME control is set to drive the 1220 at an adequate output. Thus, the MASTER VOLUME control and the GAIN REDUCTION control should be used together in setting up final output. The MASTER VU meter should show fluctuations around the zero level on the scale before attempting to introduce limiting action.

The peak limiter should be used only when distortion or sound pressure level cannot be controlled readily by more conventional methods. A special problem of distortion may arise when very large changes of signal level occur which are beyond the practical range of the master control functions. Another problem may arise when the sound pressure level of the entire system must be limited by a continuous 'riding' of the MASTER VOLUME control. The following procedure describes proper use of the peak limiter to resolve these problems and at the same time to minimize distortion.

Minimum limiting is obtained with the GAIN REDUCTION control turned fully counterclockwise to 0; maximum limiting fully clockwise to 10.

Step 1. Set the LIMITING ON/OFF switch to the ON position.



Step 2. For music reproduction, set the LIMITING FAST/SLOW switch to the FAST position. For speech reproduction, set the switch to the SLOW position.

Step 3. While observing the GAIN REDUCTION (compression) and MASTER VU meters, turn the GAIN REDUCTION control clockwise until peak program levels no longer produce distortion (or excessive sound pressure level). Use only enough gain reduction to remove undesired distortion. Too much gain reduction removes all dynamic quality of sound reproduction. When no limiting action occurs, the indicator of the GAIN REDUCTION (compression) VU meter remains at zero (0). As limiting begins, the meter indicator moves to the left into the black portion of the meter scale. Deflection from zero (0) indicates the degree of gain reduction imposed by the peak limiter.

The MASTER VU meter indicates true output of the 1220 (as determined by the Output Level switch), with limiting inserted.



## SPECIAL OPERATING OPTIONS

### Console Paging Microphone/Bypass

One channel of input CHANNELS 1 - 10 may be patched to auxiliary CHANNEL 11 for a use independent of the other input channels, such as a console paging microphone. Connect the appropriate INDIVIDUAL PREAMPLIFIER MONITOR OUTPUT to the CHANNEL 11 AUX INPUT jack. The CHANNEL 11 control becomes a submaster gain control for this channel. This input remains on the main channel when the CH. 1-10 ON/STANDBY switch is set to STANDBY and shuts off the other input channels.

### Auxiliary Input Via EXT REVERB IN Jack

The EXT REVERB IN jack may be used as an auxiliary input channel for high-level input devices (tape recorder, additional mixer, etc.) when the REVERB INTERNAL/EXTERNAL switch is set to the EXTERNAL position. Connect the desired source to the EXT REVERB IN jack. The input signal of this channel is applied ahead of the circuit containing the CHANNEL 11 AUX INPUT jack and is removed from the main channel, along with the other input channels, when the CH. 1-10 ON/STANDBY switch is set to the STANDBY position.

### Group Submixing

Any number of similar inputs of CHANNELS 1 - 10 may be combined and adjusted with a single control. Assign channels with similar type inputs (such as drums) to one of the monitor channels, i.e., CHANNEL B; then patch the output of monitor CHANNEL B to the CHANNEL 11 AUX INPUT jack. The CHANNEL 11 volume control then becomes the submaster gain control for this group (drums) of channels. The level of all these mixed channels may then be lowered or raised with the CHANNEL 11 volume control. Keep the VOLUME controls of the individual channels minimal, using the CHANNEL 11 volume control for most of the gain.

Console No. 1

(Vocal inputs and vocal outputs only)

Console No. 2

(Instrument inputs only — combines with vocal outputs of Console No. 1 for mixed vocal/instrument outputs)

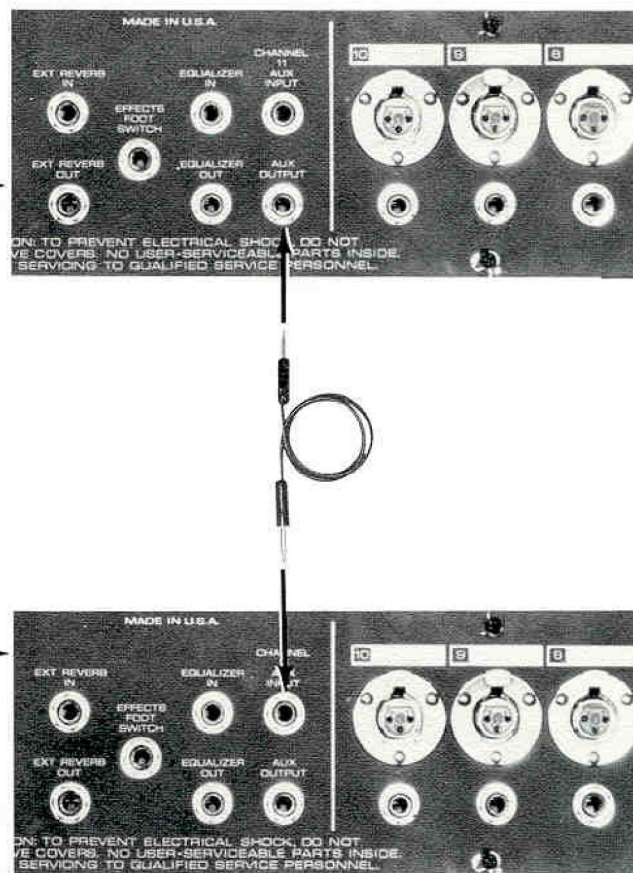
### Submixing on Reverb Channel

The reverb channel may be used to submix a desired group of input channels, with the combined output signal arriving at the reverb output. Set the REVERB INTERNAL/EXTERNAL switch to the EXTERNAL position. Connect the EXT REVERB OUT jack to a high-impedance device (amplifier, tape recorder, etc.), then use the REVERB controls of the desired channels to achieve the desired submixing at the reverb output.

### Connecting 1220 Consoles for Multiple Operation

If more than 10 channels are needed, 2 or more 1220 Consoles may be cascaded (connected in series). Two cascaded consoles provide 21 input channels, three provide 31 input channels, etc. The illustration below shows two consoles connected, with vocal inputs assigned to Console No. 1 and instrument inputs assigned to Console No. 2. This arrangement provides a 'vocals only' output from Console No. 1, and a combined 'vocals and instruments' output from Console No. 2. Assignment of similar groups of inputs to different consoles simplifies the setup of channel and master controls.

To connect the consoles, plug a shielded cable into the CHANNEL 11 AUX OUTPUT jack of the first 1220 Console and into the CHANNEL 11 AUX INPUT jack of the second 1220 Console. The CHANNEL 11 volume control of the second 1220 Console is then the submaster control of the first 1220. Both 1220 Consoles operate normally, except the MASTER VOLUME control of the second 1220 Console controls both consoles. Any number of additional 1220 Consoles may be connected in this manner for an unlimited number of input channels, with only one final MASTER VOLUME control for all 1220 Consoles.



## SIGNAL FLOW

Knowledge of signal flow through various parts of the 1220A will enable the operator to use the console with greater effectiveness and flexibility. This section describes these signal flows in conjunction with the signal flow diagram of Figure 3.

### Input Channels

CHANNELS 1 - 10 receive input signals via the LOW IMPEDANCE MICROPHONE 150/250 OHMS connectors (channels 1 - 10), which are independently transformer-coupled to the input circuitry. Each of the 10 channels have controls to adjust volume, bass, treble and reverb-send levels. Output of each channel may be monitored on two selectable monitor channels, A and B. The input channel may be assigned to monitor channel A or B, selectively, or both monitor channels at the same time. Outputs of the 10 input channels appear at the high-level INDIVIDUAL PREAMPLIFIER MONITOR OUTPUTS on the rear of the console. Each input channel is independently monitored with a VU meter prior to entry onto main (master) channel.

### Main Channel

The main (master) channel receives signals from the 10 input channels and the reverb-receive signal. These combined signals appear at the CH. 1-10 ON/STANDBY switch, which permits this signal flow to continue on the main channel or to be taken off at STANDBY. Following the CH. 1-10 ON/STANDBY switch, the CHANNEL 11 AUX INPUT enters the main channel, and combined signals of reverb and CHANNELS 1 - 11 are fed to a summing amplifier.

Following the summing amplifier, the combined signal is available for use at the CHANNEL 11 AUX OUTPUT jack. Also following the summing amplifier is the point on the main channel where an equalizer may be connected in series with the signal flow. Master control of the combined signal is then applied with control functions of volume, bass and treble. A peak-limiting control function is also available at this point to compensate for excessive signal excursions. If peak limiting is not used, the LIMITING switch should be left in the OFF position to maintain maximum 'purity' of the signal in the main channel. Following the master control functions, the main channel is monitored with a VU meter. A branching circuit is provided for high-frequency and low-frequency outputs with electronic crossover. The main channel continues to an output level switch which selects the main output level that is best for a power amplifier of given input sensitivity.

#### NOTE

Changes in switch positions of the Output Level Switch do not influence the MASTER VU meter because of its location in the circuit.

Following the output level switch, the main channel is transformer-coupled to two main outputs. The MAIN OUTPUT/FULL RANGE jacks have an output impedance of 600 ohms. The MAIN OUTPUT (XLR3 type connector) is switchable for balanced output at 600 ohms LINE LEVEL (for power amplifier) or 150 ohms MIC LEVEL (for additional mixers, etc.).

### Electronic Crossover Output Circuit

Branching from the main channel following the master control functions, an electronic crossover output circuit provides separate high-frequency and low-frequency output signals. An electronic crossover circuit splits the signal into separate bass and treble channels. The low and high frequencies are separately amplified and transformer-coupled to the LOW FREQ and HIGH FREQ output jacks. The BALANCE control differentially adjusts the signal level applied to the high-frequency and low-frequency portions of the electronic crossover circuit, allowing 10 dB of high-band or low-band shelving (attenuation). The crossover point is selectable at 500 Hz or 800 Hz with the ELEC. CROSSOVER 500 Hz/800 Hz switch.

#### NOTE

The ELECTRONIC CROSSOVER outputs and the main output levels are simultaneously changed with the Output Level (-4, 0, +8) Switch.

### Monitor Channels

Two monitor channels, A and B, are provided to monitor input CHANNELS 1 - 10. Each input channel may be assigned (switched) to either or both monitor channels. This permits onstage or cross-stage selective monitoring by simply setting the MONITOR SELECT A and B switches to the position desired on the input modules. The signal level of each input channel assigned to a monitor channel is adjusted with the corresponding MONITOR control. The MONITOR control on each input channel electrically follows the slide-type channel VOLUME control, so any changes of the VOLUME control setting will affect the MONITOR output.

The monitor channel busses are fed to the monitor summing amplifiers via the MONITORS ON/STANDBY switch, providing the option of switching the monitor channels on or off. A master MONITOR signal level control is provided for each monitor channel by the MONITOR LEVEL CHANNEL A and CHANNEL B controls. Following the master control functions, the monitor channels are transformer-coupled to the MONITOR OUT CHANNEL A and MONITOR OUT CHANNEL B jacks.

### Auxiliary Input Channel

An auxiliary input source with a nominal impedance of 600 ohms may be connected to the CHANNEL 11 AUX INPUT jack. Signal level adjustment is accomplished with the CHANNEL 11 control. CHANNEL 11 is summed onto the main (master) channel after the CH. 1-10 ON/STANDBY switch, and thus is not affected by operation of this switch.

### Reverb Circuit

A reverb unit is built into the 1220 Console. An external reverb system may be used via the REVERB INTERNAL/EXTERNAL switch. This switch also may be used as a master on-off switch for either the internal or external reverb unit. Each input channel (except CHANNEL 11) is applied to the reverb circuit at a level determined by the channel REVERB control. The combined reverb signal is adjusted by the master REVERB LEVEL control and enters the main (master) channel ahead of the CH. 1-10 ON/STANDBY switch.

An EFFECTS FOOT SWITCH jack is available to provide muting of the reverb by action of a foot switch. Closing this external switch shunts the reverb-receive signal to ground.

### Peak-Limiting Circuit

A peak-limiting circuit is provided to control excessive signal excursions which are otherwise beyond the practical range of the master control functions or the external powered speakers. When peak limiting is used properly, excessive signal excursions are reduced in level by an amount determined by the threshold set with the GAIN REDUCTION control. The resulting gain reduction is monitored with the GAIN REDUCTION (compression) VU meter. Fast and slow settings of limiter response optimize recovery time of the limited signal. The FAST setting is typically used for music, and the SLOW setting for voice. If limiting is not required, the LIMITING ON/OFF switch should be left in the OFF position.

## CONVERSION OF 1220 CONSOLE TO 240 VAC, 50/60 HZ OPERATION

Consoles shipped from the factory are wired for operation from a 120 VAC, 50/60 Hz line. Use the following procedure to convert the console for operation from a 240 VAC, 50/60 Hz line.

- Step 1. Remove 16 sheet metal screws from perimeter of rear panel.
- Step 2. Carefully lay rear panel back to extent permitted by cable harness.
- Step 3. Slide rear edge of console over edge of table for access to four screws securing lower rear panel to chassis.
- Step 4. Remove four screws securing lower rear panel; remove panel by lifting to clear reverb locking lever.
- Step 5. Locate terminal board TB2 adjacent to power transformer. Remove strap 'A' connecting terminals 1 and 2, and remove strap 'B' connecting terminals 3 and 4 (see Figure 1). Connect strap 'C' to terminals 2 and 3.
- Step 6. Locate voltage rating identification stickers supplied within console, adjacent to terminal board TB2. Remove 240 VAC sticker and affix sticker over 120 VAC rating on the rear panel as shown in Figure 2. Retain remaining identification sticker (120 VAC) within console in case of need for reconversion to 120 VAC operation.
- Step 7. Install lower rear panel over reverb locking lever and press panel into place. Secure panel to chassis with four screws removed in Step 3.
- Step 8. Install rear panel by aligning mounting holes of chassis and panel, and installing screws removed in Step 1. Screws are received by screw clips attached to chassis; these must be aligned to screw mounting holes in rear panel.

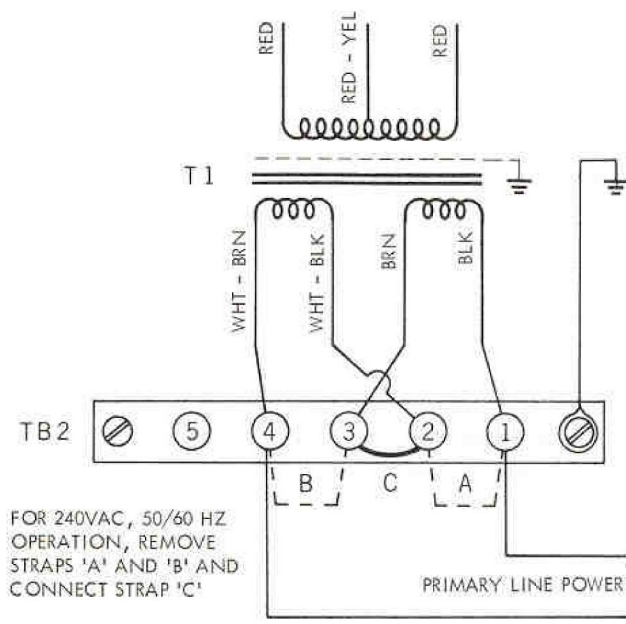


Figure 1. Converting to 240 VAC, 50/60 Hz Operation

ATTACH PROPER VALUE  
VOLTAGE RATING  
IDENTIFICATION STICKER  
OVER PREVIOUS RATING  
VALUE



Figure 2. Location of Voltage Rating Identification

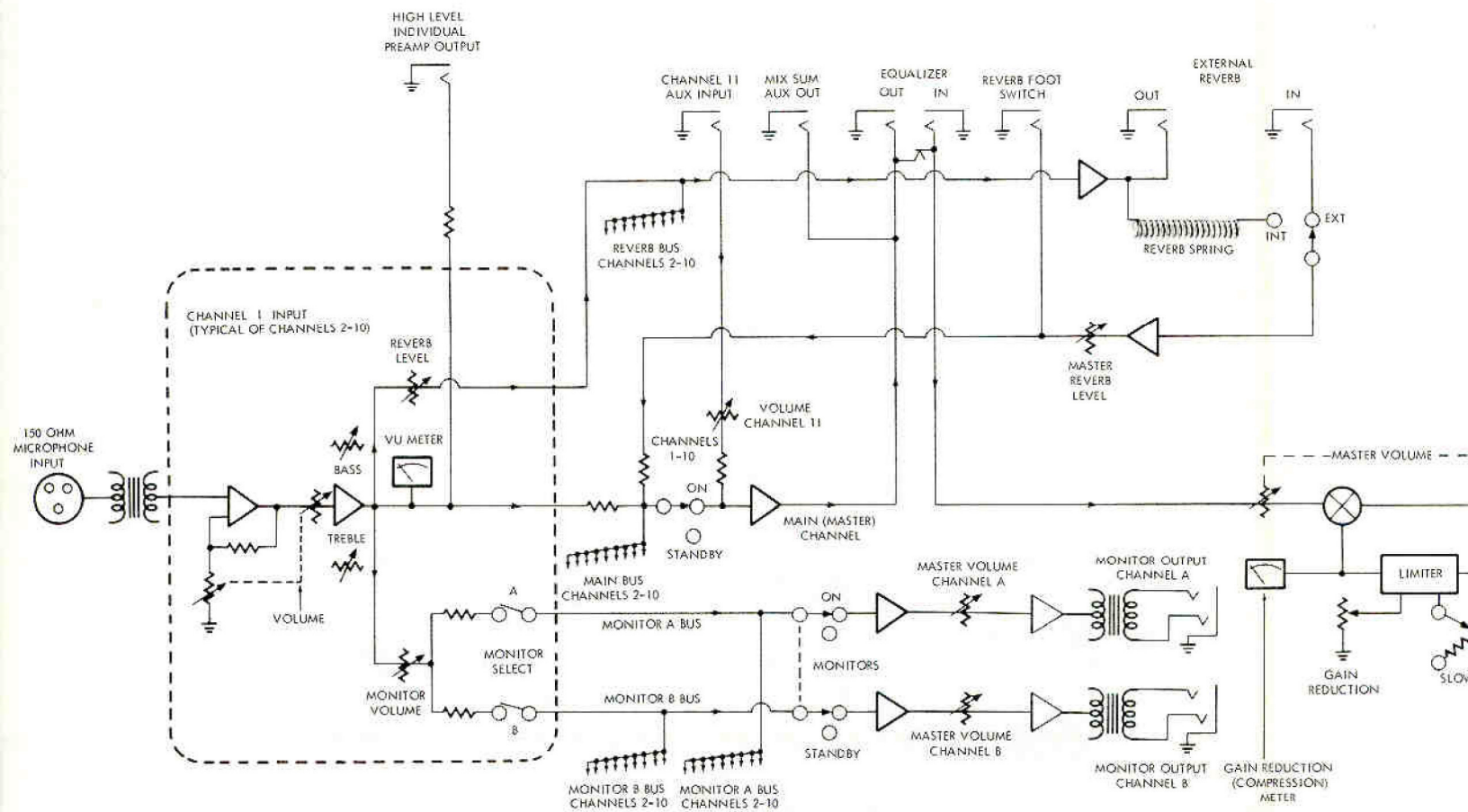


Figure 3. 1220 Console Signal Flow Chart

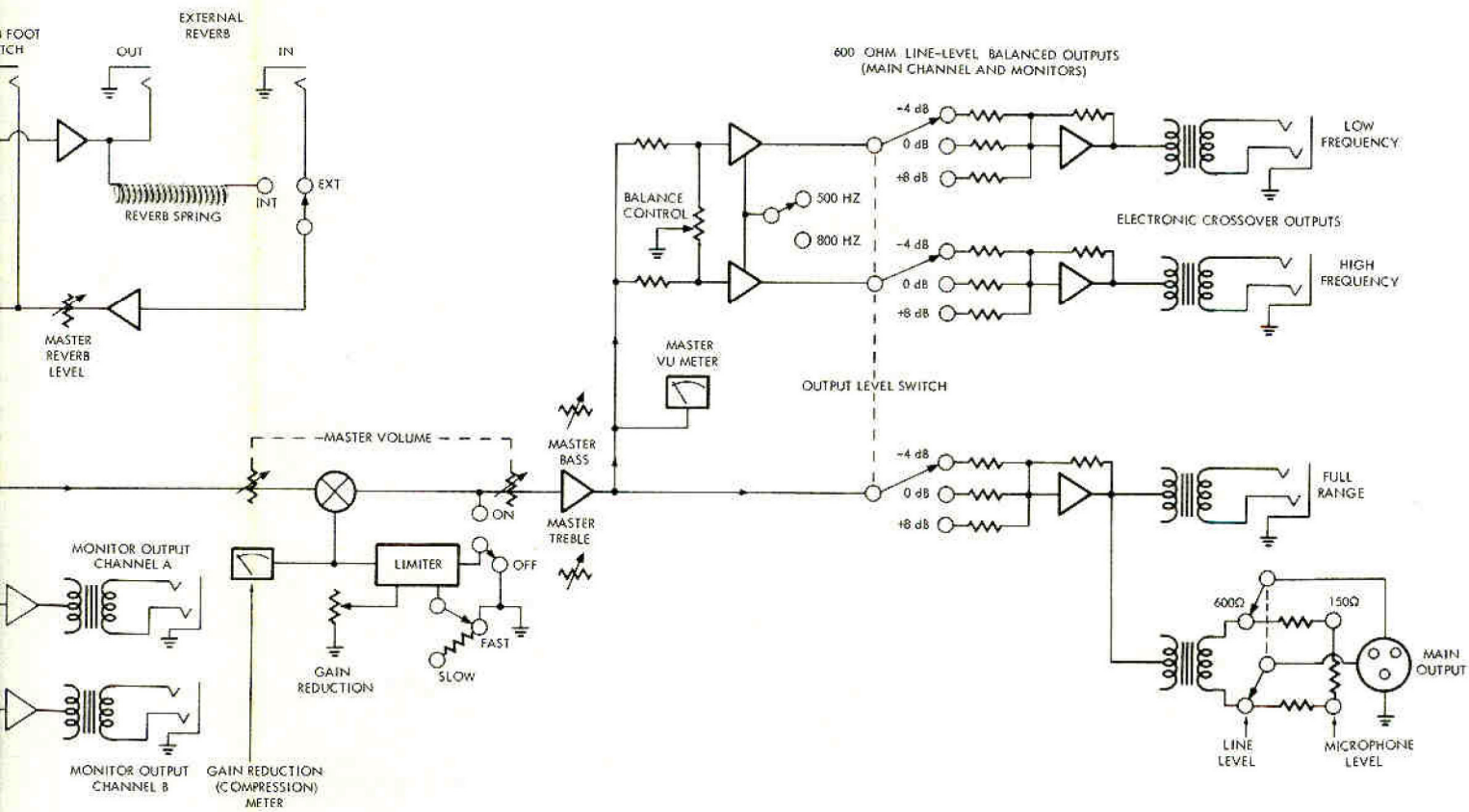


Figure 3. 1220 Console Signal Flow Chart

## COMPONENT REPLACEMENT PROCEDURES

The 1220 Console is designed for quick and easy replacement of console light bulbs, VU meters and circuit board modules. Replacement of VU meter light bulbs and VU meters can be accomplished by removing the rear panel. Console light bulbs may be replaced when the diffusing lens is removed from the upper console housing.

### Removal of 1220A Console from 1220AC Case

The 1220A Console is secured to the 1220AC Case with the same four screws that fasten the feet to the underside of the case. To remove the case, slide the console over the edge of the table for access to two supporting feet; remove the two feet and attaching screws. Turn the console for access to the two remaining feet; remove the two feet and attaching screws. The 1220A may then be lifted free of the case. Reinstall the case by reversing the procedure.

### Replacement of Panel Light Bulbs via Diffusing Lens

- Step 1. Remove the four screws which secure the front of the top cover (see Figure 4).
- Step 2. Pull the lip of the top cover forward just enough to allow the diffusing lens to drop free.
- Step 3. To release the bulbs, press inward and turn counter-clockwise.
- Step 4. Install an identical type bulb (28V, 40 mA, Type 1819) by pressing inward and turning clockwise.
- Step 5. Slip the rear edge of the diffusing lens over the panel bracket as shown in Figure 4. Pull the top cover forward just enough to permit the front edge of the lens to be raised into position, then push the top cover to capture the edge of the diffusing lens.
- Step 6. Install the four screws removed in Step 1.

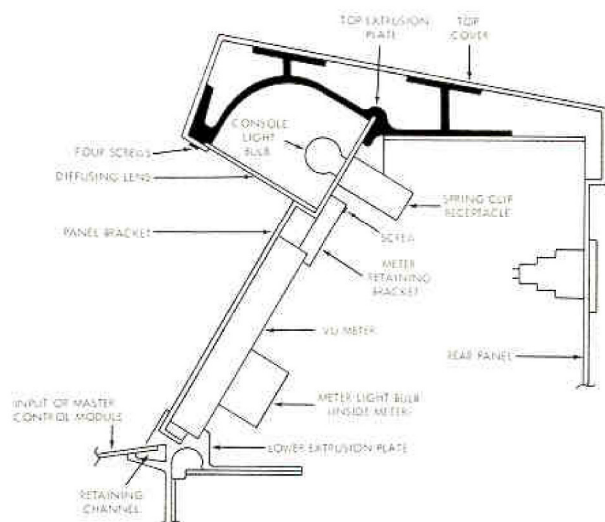


Figure 4. Meter Panel Assembly Diagram

### Rear Access to Chassis Interior

Remove 16 sheet metal screws from the rear panel. Lay the rear panel back to the extent permitted by the cable harness. Replace the panel by aligning the mounting holes of the chassis and panel, and installing the 16 sheet metal screws.

#### NOTE

Retaining screws are received by screw clips (Tinnerman clips), which are clipped to the chassis and also must be aligned properly to the mounting holes.

### Replacement of VU Meters or Meter Light Bulbs

- Step 1. Remove the rear panel as described in Rear Access to Chassis Interior.
- Step 2. Unsolder the four wires from the meter terminals, noting the color of the wires with respect to the terminal connection.
- Step 3. Loosen the screw of the meter-retaining bracket just enough to allow the bracket to swing free from the meter. Use care that the screw (retained by Tinnerman clip) does not fall into the lower chassis.
- Step 4. Remove the VU meter by tilting it back and lifting it from the channel of the lower extrusion plate.
- Step 5. If the meter bulb is to be replaced in the meter, pop off the meter face cover for access to the meter bulb. Install an identical type bulb (3V, 330 mA).
- Step 6. Install the repaired or replacement VU meter in the channel of the lower extrusion plate and position it against the meter panel (see Figure 4).
- Step 7. Position the notch of the meter-retaining bracket over the top edge of the VU meter and tighten the bracket screw.
- Step 8. Solder the wires to the meter terminals in accordance with the wire color and terminal connections noted in Step 2.
- Step 9. Replace the rear panel as described in Rear Access to Chassis Interior.

### Replacement of Channel Modules and Master Control Module

The master control module or any of the five channel modules (two channels each) may be replaced in the front panel of the console in a few minutes. Since the five channel modules are identical, they may be interchanged to verify a defective channel module. Use the following procedure to replace a defective module:

- Step 1. Slide the front portion of the console over the edge of the table for access to the arm rest retaining screws on the underside of the chassis.

#### NOTE

For Model 1220AC, the wood case must first be removed from the console (see Removal of 1220A Console from 1220AC Case).

- Step 2. Loosen four screws through the access holes in the underside of the chassis. These screws secure the padded strip to the chassis. Loosen the screws only enough to allow the padded strip to be slid forward from the channel modules.
- Step 3. Use a phillips screwdriver to remove the two screws at the lower edge of the module being replaced or exchanged.
- Step 4. With the padded strip slid forward, lift up the lower end of the module and slip the upper end of the module from the retaining channel.
- Step 5. Grasp the plastic cable connector (not the wires) and remove it from the circuit board by pulling upward with a rocking motion.

NOTE

Place reference marks on the edge of the connectors and circuit board to assure proper reconnection.

Each input control module has one connector and the master control module has two connectors; one on the lower circuit board and one toward the rear of the chassis.

NOTE

The wires join the connector with pin-type connectors; if the wires inadvertently pull out, they may be reinserted into the connector (compare with the adjacent module for wire color and location).

- Step 6. Remove the two phone plugs from the jacks on the underside of the module (the master control module has only one plug).

- Step 7. At this point, one channel module (two channels) may be interchanged for troubleshooting purposes or a replacement module may be installed.

- Step 8. Insert the phone plugs removed in Step 6.

NOTE

The red plug connects to the connector designated RED.

- Step 9. Insert the cable connector(s) removed in Step 5. Observe correct orientation indicated by reference marks of Step 5. Press the connector onto the pin terminals with a rocking motion.

CAUTION

Ends of plastic cable connector must be flush with ends of board connector or individual pin plugs will not mate with proper pin receptacles. Damage to the console resulting from improper connection is not covered by warranty.

- Step 10. Insert the upper edge of the module in the retaining channel and press the lower edge of the module in position on the chassis, aligning the screw mounting holes. Install the securing screws and snugly tighten.

- Step 11. Slide the padded strip fully toward the panel modules. Tighten the four securing screws via the access holes in the underside of the chassis.

- Step 12. For Model 1220AC, the case may then be attached.

A SEPARATE MANUAL IS AVAILABLE  
FOR SERVICE AND REPAIR INSTRUCTIONS.  
PLEASE WRITE TO:

LITERATURE DEPARTMENT  
ALTEC  
1515 SO. MANCHESTER AVENUE  
ANAHEIM, CALIFORNIA 92803